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## SIGN LANGUAGE DEVELOPMENT IN YOUNG DEAF CHILDREN<sup>1</sup>

The author attempts to describe what differences/similarities between deaf and hearing children occur in the acquisition of linguistic and communicative competence in spoken and sign languages. The sign language is considered as a real language system. Studies of the acquisition of sign language by two groups of deaf children, a) of deaf and, b) hearing parents, are reported. Polish Sign Language (PSL) and signed Polish are shown as facilitators for the deaf subjects in acquiring metalinguistic skills.

### **Preface**

Recently models of child language acquisition are not only constructed from the findings of studies of hearing children's spoken language development, but also are modified by important information about deaf children's linguistic development. Considering the role of deafness in language development could provide us with more information about fundamental theoretical issues of human language development.

Congenital deafness makes it impossible for a child to acquire naturally spoken language as hearing children do. Indeed, studies of the spoken language proficiency of deaf children at various ages show that this acquisition is painfully slow even with residual hearing, hearing aids, and visual lip-reading (Schlesinger & Meadow, 1972, Meadow, 1980). However, there is a different modality of language through which the deaf child can learn sign language more naturally rather than spoken language. This evidence allows us to describe how deaf children acquire sign language which relies not on auditory but on visual processing, and what differences or similarities between deaf and hearing children occur in the acquisition of linguistic and communicative competence in spoken and sign language. The fact that there are deaf children exposed only to spoken language which cannot be acquired by them naturally in the same way that hearing children do, leads also to the next question: could knowledge about spontaneous visual language development in children not exposed to sign input provide information on the process of human language

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development? In this paper, we try to answer these questions through presenting some research findings on the deaf child's linguistic development.

## **The acquisition of linguistic competence in sign language**

### **Sign language as real language**

As linguistic studies have shown, sign languages are visual-spatial languages that have their own grammatical and linguistic structure. Therefore, differently structured from spoken language, it is an independent language which is passed down from one generation of deaf people to the next. The grammar of sign language relies on space, handshape and movement; this language also has nonmanual components – facial expressions, body movements – that play an important linguistic role in constructing visual-spatial utterances. On the whole, just as in spoken languages, sign language, such as American Sign Language (ASL), is structured at syntactic (Lillo-Martin & Klima, 1990), morphological (Klima & Bellugi, 1979) and phonological (Stokoe, 1960) levels of analysis. Similar conclusions were suggested in the initial reports on Polish Sign Language (PSL): it has a natural, complex grammar which is similar to the grammar of other previously described sign languages (Farris, 1994; Świdziński, 1998; Tomaszewski, 2000b).

### **Deaf children of deaf parents as native signers**

Reports on the stages in the deaf child's acquisition of ASL have suggested that deaf children of deaf parents learning sign language are systematic, regular, and productive in their language just as are hearing children, that is, a deaf child's linguistic progression through stages is similar to that by hearing children learning spoken language.

How does a deaf child of deaf parents produce signs at the lexical level? Some studies indicate that the acquisition of sign language may be faster than that of spoken language: the age of appearance of first signs occurs at least 2 to 3 months earlier than that of first words for both deaf and hearing children exposed to sign language (Bonvillian et al., 1994). McIntire (1977) reported that the growth of sign language vocabulary also appears to be faster: a child had a vocabulary of more than 85 signs at 13 months while hearing children exposed to spoken language at that age are just acquiring their first words. This suggests that manual signs may emerge earlier because neuromuscular development of the system used in signing occurs earlier than development of the systems used for speaking. Also, it is important to note that these findings point to earlier phylogenetic development of the communicative function of gestures in compared with speech. Indeed, various scholars through the centuries have argued that first languages used in pre-historic times were gestural languages. Hence, at the prelingual stage, gestures (no signs) used by deaf and hearing children may reflect the existence of biological foundations of the language acquisition process; just as gestures in hearing children support ongoing speech, so gestures in deaf children can provide support for ongoing sign language.

The possibility of earlier acquisition of signs furthers an earlier production of sign combinations in ontogenetic language development. Deaf children acquiring sign language from their deaf parents begin to create sign combinations at 16.7 months (Bonvillian & Folven, 1993). Most hearing children, however, begin to combine spoken words for the first time between 18 and 22 months. Nevertheless, two-gesture utterances in sign language usually emerge at about the same age as two-word utterances in spoken language.

Studies on the development of the grammatical complexity of sign language in the deaf child's utterances have shown that deaf children learning sign language natively, start at around age three producing morphosyntactical visual-spatial sentences which are called verb agreement. In grammatical occurrence verb agreement means the verb moves from its subject location to its object location. Also, at around age three, deaf children can perform some of the regular changes in the movement of verbs which are called inflections showing how an action is carried out, whether it is habitual, continuing, or repetitive.

In summary, longitudinal studies of sign language show that in spite of the difference in modality – auditory and visual – the milestones of language development may be the same in the deaf child exposed to sign language from birth as in the hearing child. In other words, signed and spoken language acquisition follow identical stages of development: babbling (7-10 months)<sup>1</sup>, first-word stage (12-18 months), two-word stage (18-22 months), stage of word modification and rules for sentences (22-36 months) (Newport & Meier, 1985).

### **Deaf children of hearing parents**

The majority of hearing parents do not know both sign language and the community of deaf people. This is why the deaf child of hearing parents is incompletely exposed to language input until s/he arrives at preschool or school for the deaf where sign language is used as a means of communication. In spite of the lack of access to sign language input, deaf children devise linguistic systems of their own based on spontaneous gestures called home signs. As Goldin-Meadow & Feldman (1977) showed, homesigners develop systematic means of communicating gesturally, as well as gestural names for people, objects and actions; also, these children could produce, first, one gesture at a time, and then combine gestures to create two-gesture utterances. Further studies have demonstrated that deaf children's home signs exhibit structure not only at lexical and syntactic, but also morphological, levels (Goldin-Meadow & Mylander, 1984). It seems that Goldin-Meadow's results support the nativistic hypothesis providing substantial evidence of the existence of an inborn capacity for linguistic competence. However, Goldin-Meadow's subjects were exposed to *idiosyncratic gesture* input in the visual modality, and so home signs alone are not sufficient to support the spontaneous generation of a signed language. There are still different kinds of visual input to which deaf children might potentially be exposed: *home signs*, or *non-native signing*. Hence, it would be interesting to look further into gestural language emergence among homesigners within their peer context, particularly, in the case of symmetric situations where the home sign of one child could serve as a linguistic model for another deaf child. This could provide new insights into the nature of visual language development in homesigners as joint precursors of linguistic constructs. Recently, a study was made of the emergence of signed language among deaf homesigners who came together in schools in Managua (in Nicaragua) in the early 1980s (Morford & Kegl, 2000). Researchers have discovered that there was a stage of development that mediated between homesign systems and the emergence of a full-fledged sign language. Also, this was the way initial research work was done on gestural language development among Polish deaf homesigners at an oral preschool where they were subjected to a spoken lan-

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<sup>1</sup> In the prelingual period deaf children produce manual movements which resemble the structure of vocal babbling in hearing children in spite of their inability to produce rhythmic vocal babbling (van den Bogaerde, 2000).

guage teaching program and had access neither to Polish Sign Language nor to Manually Coded Polish<sup>2</sup> (Tomaszewski, 2000a). Subjects were video-recorded in different play situations. The goal of this study was to describe how the homesigners create lexical items and combine them grammatically into manual sentences, and whether or not the structure of these utterances resemble that of Polish Sign Language (PSL), in particular, sign utterances created by deaf children exposed early to PSL. Gestural language productions of subjects are being analyzed from the point of view of sign order as reflecting the position rules used in PSL. The early results of this study<sup>3</sup> indicate that home signs contain at least two types of gestures: deictic gestures, and characterizing gestures. Pointing gestures are a concrete representation of nouns – people, objects and places – within the visual field. Just as when the homesigners make first contact with each other they often use pointing gestures to direct attention to actual objects and places in the environment; at first this type of gesture is strictly situation-bound and is more used than symbolic signs. Hence, this may make it difficult for homesigners to create and use symbolic gestures that enable them to talk about things in decontextualized settings. However, home signs can – but slowly – develop into formal signs as displaced references which are disconnected from objects; at this point children also begin to use the characteristic pointing gesture to indicate arbitrary locations in space set up – as Butcher et al. (1991) called them – as place-holders for absent objects. Similarly, at first instead of using symbolic temporal signs deaf children who have been lately exposed to PSL (at ages 5-6) often produce points at arbitrary loci beyond the here-and-now (Tomaszewski et al., 2000). Deaf homesigners also create iconic characterizing gestures which refer to predicates: actions (e.g., moving hands with tight-drawn fingers in an up-and-down repeated alternating movement used to refer to drive) or attributes (e.g. hands forming a circle in the air used to refer to the shape of a ball). They also use iconic gestures that refer to entities (e.g. moving hands with tight-drawn fingers in a repeated up-and-down movement used to refer to a vehicle, such as a car, bus or truck, or hand circle used to refer to the ball itself).

The subjects were also found to produce some inflectional morphemes as directional verbs. In PSL inflectional systems comprise morphological processes in which specific changes in movements<sup>4</sup> are used to modify directive verbs to agree with their noun arguments (Tomaszewski, 2000b). The homesigners in our study perform spatial modifications in the form of directive verbs by altering direction of movement of the gesture serving to modify the predicate to agree with one of its arguments (e.g. “don’t like sb.” gesture is moved from the signer to the addressee to mean *I don’t like you*; this gesture is moved from the addressee to the signer to mean *You/she don’t like me*; or, from first addressee to second addressee (in triad situations) to mean *You/she don’t like him/you*; gesture pro-

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<sup>2</sup> Manually coded Polish or signed Polish [MCP] refers to any constructed signing system that represents words in Polish sentences with signs from conventional sign language, along with invented signed translation equivalents for Polish grammar words. In Poland, MCP is used in deaf education, where many teachers and parents communicate with deaf children by means of this artificial system. In the subsection of this paper, *Other forms of sign language*, the effect of MCP on the linguistic development of deaf children is discussed.

<sup>3</sup> This study merely presents first results of the research in question; homesigners’ utterances are being analyzed after about three months of exposure to others’ home signs in a preschool environment.

<sup>4</sup> e.g. altering direction of movement, adding repetition to movement, changing size of movement.

duced simultaneously by two hands from the signer to the addressees to mean *I don't like you* (phrase *you* occurs in the plural)). These spatial devices innovated spontaneously by the subjects who are exposed neither to PSL nor to Manually Encoded Polish resemble grammatically inflectional forms found in PSL; this may be some evidence that at the level of inflectional morphology deaf children, in relation to the context, tend to create and use PSL-like forms as directive signs without input in this language.

As our study has demonstrated, at the level of the syntactic structure at first the homesigners combine their gestures into strings, thereby expressing semantic relations in two-gesture combinations. Their semantic constructions contain characterizing gestures representing predicates and pointing gestures representing arguments which play differential thematic roles (e.g. children produce a characterizing gesture *drive* representing the act predicate and pointing gesture at the other child representing the argument playing the actor role; this way they comment on the fact that the peer is playing a game "Driving a car"; one child made a characterizing gesture *look* at representing the act predicate and pointing gesture at the camera representing the argument playing the recipient role to request that his peer look at the camera). The children also create sentences by producing gestures with two types of predicate structure containing two arguments. For example, one child produced the gesture *fall* with a predicate structure containing actor and recipient to comment on the fact that his doll (actor) fell (act predicate) out of the pram (recipient); or another child produced the gesture *put into* near a doll's mouth with a predicate structure comprising the patient and recipient to request that his peer put (act predicate) a dummy (patient) into the mouth of the doll (recipient).

From the analyses it was found that our subjects – but not all – create complex sentences which contain at least two propositions. For example, one child produced a complex sentence in which two propositions were related to each other and served as argument against the false information that he had received from his peer: he produced "take a picture" gesture, pointed at the "video-camera-man", produced a gesture for negation, and then a "shoot a film" gesture to deny one proposition (*he doesn't take pictures*) and assert the truth of an alternative proposition (*he shoots a film*). The other child also created a complex sentence containing two act predicates: he pointed at his peer, produced a "cuddle" gesture and then a "walk" gesture to comment on the fact that a girl of the same age both cuddles (act1) and walks (act2) a doll in a pram.

As for the use of gesture order in homesigns, the children tended to order gestures for patients, actors, acts, and recipients in two-gesture sentences. They created some predominant ordering patterns in their constructions containing at least two gestures: *patient-act* (e.g. the pointing gesture for the patient, shoes, preceded the gesture for the act, take off), *act-actor* (e.g. the gesture for the act, fall, preceded the pointing gesture for the actor, child) or *actor-act* (e.g. the pointing gesture for the actor, train, preceded the gesture for the act, run), and *patient-recipient* (e.g. the pointing gesture for the patient, car, preceded pointing gesture at the signer or other child as argument playing the recipient role). The homesigners very often tend to produce gestures for the objects before gestures for the act in their manual clauses. It seems to be related to children's motoric actions on the world; that is, the children present the object to express the transfer action, first locating that object and then moving it to its other location. This process also is found in deaf children exposed early to PSL in which some of their utterances indicate that the objects occur before the location act.

It is noted that two ordering patterns – act-actor and actor-act – alternate in children's

two-gesture utterances. Alternative use of one of these patterns seems to depend on talking about events which take place not only in the present but also the past or future. The first pattern which is found in some – but not all – of the homesigners’ two-gesture sentences occurs when the children talk about present perfect (e.g. one child produced a characterizing gesture for the act *take away*, and then a pointing gesture at the actor, his peer, to comment on the fact that his peer took the toy away from him), or present continuous (e.g. the other child produced a pointing gesture at his peer followed by the characterizing gesture for the act, *drive*, to comment on the fact that his peer is driving a car). Gesture order *act-actor* also occurs in two-sign sentences among deaf children exposed to PSL when they use a pointing gesture at the actor. Sign-order may be grammatically transformed, to be sure, when these children produce a symbolic sign referring to the surname of some child instead of using the deictic gesture. That is, they first produce symbolic name signs for the actor and then sign for the act, thus creating actor + act sentences akin to subject-verb in conventional sign systems. The second ordering pattern *actor-act* refers to present continuous with a future meaning: the children inform that they will be doing something in a moment (e.g. one child produced a pointing gesture at the other and then the characterizing gesture for a future act, *write*). Moreover, it is important to note that some subjects were found to use the gesture *wait a moment* in reference to the future (one open hand in front of the chest, palm facing forward and fingers pointing up with a very short double movement; it is interesting that this gesture somewhat resembles the PSL sign AFTER-THAT or THEN). One should also pay attention to children’s use of an ordered motor action schema: if the child wants to evoke pragmatically changes in the world, he must first point at his person in the environment and then produce a gesture for the act (e.g. *sit, run, come in*) to request that this person performs this action; or, if the child wants his peer to do something with an object, he also must – as earlier noted – first situate that object (patient) and then produce a gesture for the act predicate on the object (e.g. *move, give, throw in*). We suggest that the homesigners not exposed to a language model create some gestures or gesture-orders in a productive way to develop their ability to abandon in their thoughts the “here and now” for the sake of a different time or space; this is the basis for development of the competence for symbolic representation of events in the world.

As our studies have shown, homesigners’ utterances contain not only pointing and characterizing gestures but also gestures for negation. The fact that they perform an act of prohibiting something by using the manual negation in their gesture sentences is evidence of their understanding of some social behaviors. The subjects were found to produce some gestural forms of negation with differential meanings according to the context: (1) forbidding somebody to do something, (2) denying the truth of someone’s statement, (3) rejecting a referent, another’s offer or suggestion, and (4) nonexistence of some referent. It is interesting that both the homesigners and other deaf children exposed to PSL show a strong tendency for positioning negations at the end of clauses (e.g. one child produced a gesture for the act *bend*, pointed at his peer, and then gestured negation to convey that his peer shouldn’t bend the paper). Indeed, in PSL signs for negation the final positioning rule is observed when creating visual-gesture sentences with negation.

In sum, despite homesigners’ impoverished language learning conditions they can create a visual language by using the processing mechanisms of visual-gestural language, and de-



riving visual language rules, thus supporting the nativist hypothesis claiming a specific biological capacity for language. Children seem to have natural, innate tendencies or strategies that they use when acquiring language, even without the exposure to a linguistic model.

### **The acquisition of communicative competence in sign language**

Every speaker of a language must know not only the phonological, morphological and syntactic rules but also the rules of speaking. The speaker must acquire knowledge about the appropriate use of linguistic rules in different social situations and social roles to communicate effectively with other people. How do deaf children develop a communicative competence using language in different contexts ?

Longitudinal studies on deaf/deaf interactions show that deaf parents as native signers are able to communicate with their deaf child through sign language, to respond to their child's developing language appropriately, and to adjust linguistic forms – manual words and sentences – to the language level of the deaf child effectively. Hence, the social interactions with not only deaf adults but also older deaf children may help the young deaf child to acquire communicative competence in sign language.

Sign language relies on the visual channel and spoken language on the auditory channel. Therefore, conversational elements – attention-getting, eye gaze and turn-taking – used in PSL differ somewhat from those used in Polish spoken language. However, as investigations have shown, general structure of deaf adults' sign language conversation appears to be similar to that of conversation in spoken languages (Baker, 1977). Conversational PSL skills of deaf young children ranging between 5 and 7 years are now being studied (Tomaszewski, in preparation). Subjects learn to use visual components of conversation and so acquire discourse strategies similar to those of adults PSL users. For example, in PSL conversations, before beginning the signed information deaf children obtain the visual attention of the addressee by waving a hand in front of her, touching the person, and tapping a table or floor; they also have no difficulty maintaining topics by eye gaze and turn-taking. However, there is a difference between deaf children of deaf parents (DCDP) and deaf children of hearing parents (DCHP) in discourse strategy concerning the use of some specific signs that play a major role in taking turns to speak. For example, DCDP produce the sign LOOK AT with specific short double movement and shut their eyes to signal the addressee that they aren't ready to take the turn (similarly, in this situation, hearing children may say *look here!* or *come now!*). This difference results from the absence of early exposure of DCHP to sign language in which DCDP have an opportunity from birth to develop conversational skills from their parents. It is not possible, though, for DCHP to acquire naturally PSL from their parents, they can acquire – but at a later age (e.g. 4 – 6 years) – language from peers, older children, and deaf adults. One of the goals of this study is to describe if deaf young children produce hand gestures (no signs) that alternate with signing. As shown initially, manual gestures appear to be communicative; that is, they serve as effective conversation regulators in PSL. The deaf children often produce interactive gestures which help coordinate turn-taking during a visual conversation: e.g. one child first conveyed a message in PSL and then transferred a turn by producing a hand gesture towards the addressee with the palm up to request that his peer confirm the information. Also, young children produce interactive gestures by moving them away from the signing space as the specific area in which manual signs are made; it means the

addressee may now take a turn. Also, they produce hand gestures towards themselves or into the signing space to take or continue the turn. To sum up, because of the visual modality through which sign language is produced and received, signers use different gestures rather than those of speakers: signers produce conventional hand gestures serving as regulators in PSL conversations; speakers, instead, produce idiosyncratic manual gestures which form an integrated system with the speech they accompany.

Some studies describing deaf children's ability for conversational repair strategies indicate that deaf children are effective communicators who respond, like their hearing peers, by revising their messages in attempts to repair communication breakdown (Ciocci & Baran, 1998). Similarly, in studies of social interactions between deaf and hearing preschoolers, Łukaszewicz (1999) offers interesting findings: deaf children exposed to a bilingual program display the ability to repair communication breakdown when they interact with hearing peers who don't know sign language. When some deaf children realized that their messages which they conveyed to their hearing peers in sign language were not understood, they revised their statements by making a shift from sign language to "gestural language".

One should realize that there are some differences in the polisensorial reception of information in deaf and hearing children. According to Baron-Cohen (1995), there are two mechanisms which have a major role in the process of communication: *eye – direction detector* (EDD) and *shared-attention mechanism* (SAM). EDD performs three important functions: it (1) detects the presence of someone's eye gaze, (2) determines what object someone's eyes are directed towards, and finally (3) determines if someone looks at us. On the other hand, the function of SAM is to share a common field of attention with the partner. This mechanism has reference to social relations in the triadic situation (Subject A – Subject B – Object). Since these regulating mechanisms function not only in visual but also auditory modality channels, the creation of a common field of attention only in the visual channel is more complex than in the auditory channel; therefore, the possibility of a deaf child's polisensorial association of received information is dramatically restricted. Indeed, as studies have shown, deaf mothers tend to produce far less language during toy-play interactions with deaf young children than is typical for hearing mothers of hearing children (Kyle & Ackerman, 1989). While many auditory signals are received by hearing children even though their visual attention is fixed on the object (e.g. toy), visual signals that come from the different sources escape the deaf child's visual attention. So the deaf child learning sign language needs to shift visual attention from environment to visual communication in order to receive messages from others; in other words, he/she must learn to shift attention between elements of the environment and the addressee as source of visual information in order to initiate conversation successfully.

### **Other forms of sign language**

In educational environments deaf children may be exposed not only to PSL though interacting with older deaf children and deaf adults but also to different varieties of sign language – (1) signed Polish (or Manual Code Polish (MCP)) and (2) Pidgin Sign Polish. Signed Polish (SP) is called Simultaneous Communication which stresses the simultaneous use of speech with manual signs to represent a spoken language visually. It is claimed that the young deaf child will learn Polish better if he is exposed visually to grammatical



features of Polish through signs and fingerspelling. However, signed Polish isn't real or natural language since SP signs which are borrowed – but not all – from PSL, and fingerspelling, reflect visually the grammatical structure of Polish. It is possible to say that SP is a visual reflection of Polish or, in short, is a signing system rather than a language on its own. Therefore, the exposure of young deaf children only to SP may not provide them the complete linguistic access that is needed to internalize the entire language. Indeed, as Supalla (1991) showed, deaf children who were exposed only to Manual Code English (MCE) with no access to ASL tended to create spontaneously ASL with grammatical forms that aren't to be found in MCE. Hence, deaf children with exposure to SP may exhibit impaired potential for natural language acquisition and processing; consequently, it might contribute to the impairment of deaf children's capability for creating and comprehending the grammar of PSL.

On the one hand, the bilingual program for the deaf assumes that one should provide the deaf child with accessible PSL input as early as possible to make it easier to learn a second spoken or written language (Polish). On the other, PSL which is based on the visual modality does not have a written form and differs grammatically from Polish, so it seems to provide no fully effective support for learning to read and write Polish. As Vygotsky (1989) noted, the development of social speech precedes the development of inner speech which consequently leads to the emergence of written speech. That is, hearing children who have access to the auditory channel can move through the stages from first spoken language learning, through the acquisition of inner speech, to written language. The nature of the acquisition of written language by deaf children is very different from that of hearing children because the structure of PSL differs both in mode and language from written Polish. Therefore, signed Polish may have an important role as an "intermediary" between PSL, inner speech and written language. In other words, the combination of PSL and elements of signed Polish could become a means of providing a more effective bridge from PSL as first language and literacy.

One of the varieties of sign language is Pidgin Sign Polish. This sign system has been described as a mixture of natural sign language and spoken language arising out of contact between the two languages. As American linguistic studies have shown, Pidgin Sign English (PSE) contains reduced structures not found in either natural sign language or spoken language and so PSE isn't the native sign language of the deaf community (Woodward, 1973). In any case, Pidgin Sign Language is a language which develops naturally when deaf and hearing people who don't know – or minimally – each other's languages need to communicate. This system is used for classroom communication and to converse with hearing people who have limited knowledge of natural sign language. Deaf people communicating with a hearing person who is able to use signed Polish, tend to change to a different signed language variety; that is, they use signs to represent words in Polish sentence order. It is also important to note that Pidgin Sign Language may be used by bilingual deaf persons when they communicate with each other alternatively in Polish Sign Language and signed Polish; such mixing might be regarded as code-switching. According to Jakubowicz Batoréo (1998), the use of two languages in contextually different ways is one aspect of the bilingual's pragmatic competence.

## Conclusions

The longitudinal studies on sign language have demonstrated that, in spite of differential modalities of languages, deaf children's acquisition of sign language is similar to that of the spoken language of hearing children, i.e., similarities in the sequence and time course of acquisition in the areas of phonology, morphology, and semantics. Moreover, Bellugi and her colleagues (Poizner, Klima, & Bellugi 1987) showed that deaf signers with damage to the left hemisphere display grammatical errors in ASL while deaf signers with damage to the right hemisphere show an incapacity for processing non-language visual-spatial relations but can create correctly linguistic constructions in ASL, thus suggesting that the brain is programmed biologically for language acquisition, regardless of modality.

Initially, Tomaszewski's (2000a) studies showed that deaf homesigners who haven't access to the linguistic model display active linguistic creativity within their peer context which enables them to enlarge their repertoire of symbolic communicative behavior in symmetric situations. This confirms Halliday's (1980) view that the source of the creative use of language is the process of meaning exchange between sender and receiver. Hence, the homesigners can create a simple system of symbolic communication and so produce new linguistic items in daily symmetric interactions in which the visual-gestural language may emerge and develop as a means mediating between these children. Moreover, these findings point to two important variables which can have a major effect on the structure and acquisition of homesigners' visual-gestural language – (1) preexisting non-linguistic input and (2) the visual modality. As earlier noted, when the child gets involved in peer relations with deaf play mates, the home signs of one child may serve as a linguistic model for another deaf child. The process in which the homesigners create some PSL-like forms (e.g. morphological properties, word-order) on a home sign basis without the benefit of the conventional language input illustrates how a second variable, the visual modality, shapes the structure of visual-gesture language. Moreover, sign pidgin form of the language may begin to emerge when more homesign systems are interrelated. Then the pre-existing non-linguistic input may be changed into a non-native sign input while older homesigners have an effect on younger homesigners' language development, that is, young deaf children are exposed to this sign pidgin. This process taking place in later generations of younger homesigners may contribute to the emergence of a child's sign language with fully developed kinds of grammatical properties.

It is interesting that homesigners who have no access to PSL input can develop the rudiments of a structural communication system with linguistic properties at the level of inflectional morphology. This evidence suggests that the morphological structure of any language may be regarded as a property of language whose development can proceed despite the absence of a conventional language model. There are a lot of deaf children whose deaf parents learned natural sign language late in life<sup>5</sup> and so seem to use sign systems that lack much of the morphological complexity of this language. Newport (1984) reported on the sign language acquisition of a deaf child with deaf parents who were

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<sup>5</sup> 90 percent of deaf children are born to hearing parents who can't provide early exposure to a natural sign language and tend rather to expose their children to spoken language; thus, these children often are found to be linguistically delayed relative to both hearing children of deaf parents and deaf children of deaf parents.

themselves nonnative signers. She showed that subjects' morphological structure does not differ from that developed by deaf children learning sign language from deaf parents with complete morphological systems.

The above findings support the nativistic hypothesis concerning human biological capacity for constructing the grammar of language. However, child language development is determined not only by innate grammatical competence, but also by the linguistic environment where parents and other adults expose the child to language input. The process by which the child, having fully access to linguistic input, constructs his grammar on the basis of this input is called denativization (Gee & Goodhart, 1985). Keeping a balance between nativization and denativization is a fundamental condition for normal child language development. In hearing children of hearing parents (HCHP) and deaf children of deaf parents (DCDP) nativization-denativization processes keep in balance. On the other hand, deaf children of hearing parents (DCHP), having no access to natural sign language input, will create their grammars on the basis of internal norms; thus, nativization-denativization processes would be more likely to be out of balance. Some DCHP, therefore, may not acquire linguistic competence in sign language completely. This is supported, indeed, by some studies in which DCHP as non-native signers were found to have trouble with aspects of sign language grammar, and understanding the meaning of sign sentences (Mayberry & Eichen, 1991). Also, other studies have shown that homesigners who are exposed to PSL input at ages 5-6 display difficulties in the use of some grammatical aspects of PSL that aren't found in their homesign systems (Tomaszewski et al., 2000). One may add that some of the characteristics of homesigners' later sign language acquisition resemble those of second language learning in hearing persons. However, contrary to homesigners, hearing persons who learn a second language (L2) have acquired their first language (L1) on the normal developmental schedule which may be the basis of their greater mastery of L2. On the other hand, since homesigners are often deprived of the opportunity for earlier acquisition of L1; they have difficulty in transferring from homesign systems to PSL. This supports the critical period hypothesis concerning first language acquisition. Thus being deaf isn't an obstacle for language acquisition as is lack of early exposure to an accessible language.

The deaf child may display delays in use of pragmatic devices to get others' attention and initiate discourse with others as compared with hearing children. The fact that the deaf child consciously shares attention with the addressee only in the visual channel suggests that this mechanism is more complex in sign language than in oral language. However, some studies have shown that, though visual-manual conversations require different attention-getting mechanisms than aural-oral conversations, deaf children can acquire discourse strategies in sign language comparable to those used by hearing peers in spoken language regardless of language modality. Yet, the deaf child (in particular, with deaf parents) may acquire sign language less naturally than the hearing child learning spoken language which is related to the fact that attention-sharing mechanisms require greater metacognitive awareness (Tomaszewski, 2000b). That is, the deaf child must be aware of the need for sharing visual attention with elements of the environment he explores as well as linguistic information from his interlocutors in order to detect the relations between the perceptual world and the symbolic world. This is a requisite for the acquisition of both cognitive and linguistic competence.

The differences between Polish Sign Language and written Polish in terms of modality, phonemic, morphemic, and syntactic rules may make it difficult for the deaf child to bridge the two languages. Hence, the deaf child's acquisition of written language requires

greater metalinguistic awareness than that of the hearing child. Spoken language serves as a bridge to written text and allows the hearing child to transfer linguistically his speaking ability to the written form of the language, thus facilitating the development of ability to read and write. In contrast, there is no one-to-one correspondence between PSL and written Polish. Therefore, not only PSL, but also signed Polish should be used as a facilitator of the deaf child's acquisition of written language. The deaf child should be provided with PSL input as early as possible to acquire – as Cummins (1980) called it – basic interpersonal communicative skills and cognitive academic language proficiency. Meanwhile, signed Polish could be regarded as a possible bridge between PSL (L1) and Polish (L2). The use of PSL and signed Polish may make it possible for the deaf child to acquire metalinguistic skills as reflected in the ability to discuss and compare two languages – PSL and signed Polish; this may be an important step in becoming bilingual in L1 and L2. However, it is important to describe what roles PSL and signed Polish can play in building a bridge from PSL and literacy. To this end research should be conducted on the influence of natural and artificial sign systems on the development of the bilingual deaf child's competence in the linguistic transfer between his ability to sign in PSL and to read and write in Polish. Also, the possibility of code-switching between PSL and written Polish language should be taken into account. It could provide us with more information about the nature of code-switching use in two different modalities.

As studies have shown, there are not only similarities, but also differences between deaf children and hearing children in linguistic development. This doesn't mean that differences must sentence the deaf child to limited language development, and so s/he must be deficient in linguistic and communicative competence. As Marschark noted (1993, pp. 9), "deaf children will experience a somewhat different world than hearing children and these differences undoubtedly will have implications for their psychological development". This doesn't suggest that deaf children's linguistic abilities are qualitatively different from those of hearing children, but rather indicates that deafness itself doesn't cause linguistic problems among young deaf children, but rather creates conditions that lead to linguistic deprivation which in turn causes the special linguistic problems of these children.

In sum, Polish Sign Language should be viewed as the deaf child's first language which s/he can acquire spontaneously from the natural linguistic environment; in short – s/he can display ability in sign language rather than in spoken language. Therefore, further studies ought to look at the linguistic capacity of deaf children rather than at their apparent linguistic deficiencies when compared to some idealized standard of Polish. Such studies are needed for understanding important issues: the acquisition of bilingual competence in PSL and the written form of Polish, the use of code-switching in PSL and signed Polish and written form of Polish language contact, not only from a psycholinguistic point of view, but also from a sociolinguistic perspective, as well as the influence of knowledge of PSL on cognitive development.

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