BIMODAL BILINGUAL ACQUISTION OF ISRAELI SIGN LANGUAGE (ISL) AND HEBREW BY A HEARING CHILD OF DEAF PARENTS

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ABSTRACT

The issues of 'sign advantage' and 'continuity' were examined in the context of the early bilingual acquisition of ISL and Hebrew by a hearing child of deaf parents. The long-term follow-up study showed that for the hearing child Signed Language (SL) presents an advantage over spoken language in terms of the age at which the classical milestone of language development are achieved. The results additionally strengthen the case for the claim that there is a natural continuous transition in SL development from 'gestures' to 'signs'.

INTRODUCTION

Despite the different modalities used in speaking and signing, children acquire SL in the same fashion that children acquire spoken language. From birth throughout childhood they show the same stages of language acquisition, consisting of a pre-linguistic communication stage followed by the one-word stage and the two-word stage, and then progressing to the development of syntax and morphology.

However, there are conflicting claims as to whether exposure to SL provides an early age advantage in the rate of early vocabulary development. Bonvillian and his colleagues (Orlansky and Bonvillian, 1985: Bonvillian and Folven, 1987, 1993) reported that bimodal bilingual children began signing two months before they began speaking (on average at age 8.5 months), and their sign lexicons were on average more than twice the size of their speech vocabularies by one year of age. Studies comparing SL acquisition and spoken language acquisition in monolingual deaf and hearing children observed similar patterning of more rapid vocabulary development in the manual modality (Anderson and Reily, 2002). And yet, Van den Bogaerde (2000) as well as Petitto, Katerelos, Levy, Gauna, Tetreault and Ferraro (2001), observed more parallel development of speech and signs.

Meir and his colleagues (Meir and Newport 1990, Meir, Mauk, Cheek and Moreland, 2008), claimed that the achievement of early vocabulary milestones (i.e. the first, first 10 and first 50 items) is delayed in children acquiring spoken language due to a better motor control over the sign articulators than of the speech articulators in early language development. Volterra and Iverson (1995), on the other hand, argued that the reason for the observed early sign advantage is that researchers tended to over attribute 'sign status' to many gestures that are common to all children, speaking and signing altogether, in the pre-linguistic communicative stage. It has also been claimed that a linguistic status was ascribed to children's production of gestures on the basis of structural resemblance (resulting from the iconicity of many signs and gestures) without analyzing the symbolic usage of the gestural signs across various contexts.

Another area of debate relating to SL acquisition has centered on the transition between children's gestural communication and their use of SL. The main question in this regard is: if gestures and signs are produced by the same articulators, can the child's transition from using gestures to using signs during SL acquisition be clearly defined?

Petitto (1987) claimed for discontinuity between the pre-linguistic gestural communication stage and the symbolic use of language in SLs acquisition. She observed that at a certain point of development in ASL, pointing gestures become re-organized as part of the linguistic system. When re-organization took place, deaf children, who had previously tended to point freely to persons, objects and locations, initially avoided pointing to a person, followed by a period of pronominal reversal errors consisting of pointing towards the interlocutor to refer to the self – a characterization of pronoun development.

Yet, the phenomenon of pronominal reversal errors was not observed in studies conducted on other sign languages such as Italian Sign Language (Pizzuto & Capobianco 2005). Additionally, both Hoting and Slobin, (2007), and Morgenstern Caet, Collombel-Leroy, Limousin and Blondel (2010), observed that pointing gestures are smoothly incorporated into syntactical constructions.

The current study focused on investigating the two controversial issues: 'sign advantage' and 'continuity' in the context of early bimodal bilingual acquisition of ISL and Hebrew by a hearing child of deaf parents.

METHOD

A longitudinal case study followed a hearing child's bimodal bilingual acquisition of ISL and Hebrew, from the age of 8 to 24 months. The child, Ziv, was videotaped at his home every two weeks for 30 minutes each time while interacting freely with his family. The deaf mother is a daughter of deaf parents and a native signer of ISL, while the deaf father is a son of hearing parents and learned ISL in early childhood in his educational setting. Both parents used code-blended utterances (signs + words) in interaction with Ziv and had, on average, 100% phonation in the words.

Ziv's utterances were coded using the ELAN transcription program (Max Planck Institute for Psycholinguistics). ELAN data annotation is arranged on a series of tiers, each focusing on different aspect of the data. The tiers used in our template fall into four broad groups: 1 the translation tiers: 2 signed productions (gestural and signs): 3 spoken productions: 4 mixed productions.

Two main criteria were set to attribute 'lexical status' to Ziv's early manual or verbal productions: 1. The form had to be used in relation to a referent across contexts. 2. The form had to bear a phonetic resemblance to at least one unit from the conventional lexical form. To ensure that we did not over-attribute 'sign' status to early manual gestural productions, we set two additional criteria for the first 10 items: 3. Over a given period, the phonetic execution of the early forms must become more consistent and conventional. 4. The use of form must become more flexible and symbolic as the language-acquisition process advances; that is, it must refer to a class of related referents and be used for various intents in various contexts.

RESULTS

Early vocabulary development

Ziv achieved the vocabulary developmental milestones – the first, first 10 items and first 50 items – earlier in ISL than in Hebrew. The first recognizable sign was produced at 11 months, while the first word was spoken at 13 months (see diagram 1). The 10-item vocabulary developmental milestone was achieved in ISL at 13.5 months while in Hebrew it was achieved at 19 months (see diagram 1). At the age of 16 months, a noticeable acceleration in the rate of acquisition of new signs was observed. At the age of 20 months, the pace of the acquisition of new words started to accelerate followed by a noticeable spurt at the age of 21 months. The milestone of 50 items was

achieved in ISL at 19.5 months, and in Hebrew at 22.5 months (see diagram 1). The production of the first two representational sign utterances (i.e. a string composed of signs other than pointing such as: COW WHERE> *Where the cow?*) was observed at 21 months and the production of the first two-word utterance was observed several weeks later at 22 months.

Diagram 1: Increasing words and signs acquisition over several months
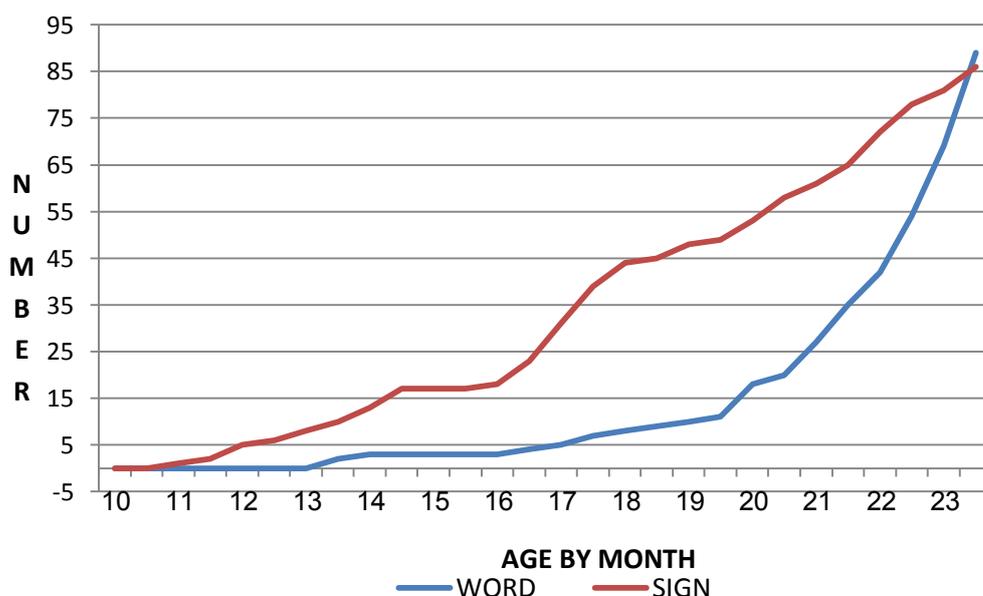
A majority of the first 10 recognizable signs (LIGHT, FALL, BYE-BYE, BIRD, FATHER, BIG, BALL, NO, FISH, BUTTERFLY) and the first 10 recognizable words (Fish, Duck, This, Hot, Father, Horse, Pacifier, May-sister name, Finish, You), occurred in a context of imitation, and their production was at first highly context-bound. Nevertheless, all 10 early recognizable signs and words underwent a gradual process of de-contextualization in the course of ISL and Hebrew development. Thus, for instance, Ziv initially produced the sign BIRD only to refer to a big bird mobile hanging from the ceiling of his room (Figures 1.1-1.2). In later stages, he produced the sign BIRD when he heard birds singing outside, saw pictures of birds, or requested his parrot doll (Figure 2.1-2.3, 2.4-2.6).

Figure 1: Ziv producing the sign BIRD only to refer to a big bird mobile hanging from the ceiling of his room (age: 12 months).

1.1   1.2

Figure 2: Ziv producing spontaneously the sign BIRD to refer to bird singing outside (2.1-2.3) and for requesting its parrot doll (2.4-2.6)

2.1   2.2   2.3

2.4   2.5   2.6

All early recognizable signs were used at later stages, and continued to be part of Ziv's lexicon. Additionally, manual performance improved increasingly

over time and became more consistent and conventional (See Figure 3 an example for phonetic improvement in the production of the sign ROOSTER).

Figure 3: Phonetic improvement over time in the production of the sign ROOSTER

ROOSTER (17 months)   ROOSTER (20 months)

The semantic groups in Ziv's first 30 sign and first 30 word lexicons reflect his personal interests and are very similar to those of the early words and early sign lexicon among both speaking and signing children (compared with Nelson's 1973 data of children acquiring English, Dromi's 1987 data of children acquiring Hebrew and Anderson and Reily's 2002 data of children acquiring ASL).

Both Ziv's first 30 sign and 30 word lexicons consists of animals names (30% and 37% of each lexicon respectively), people (7% and 14% of the first 30 sign and word lexicon, respectively) personal inanimate objects such as toys (13% of each lexicon), inanimate impersonal objects such as flora and household names (10% and 20% of 30 sign and word lexicon respectively) as well as actions (16% and 3% of the first 30 sign and word lexicon respectively), expressive-social (7% and 3% of the 30 sign and word lexicon respectively) and properties (17% and 10% of the first 30 sign and word lexicon respectively).

Interestingly, the majority of Ziv's first 30 and 50 signs (60%) are classified as highly iconic. More interesting is the fact that Ziv's mother not only frequently enhanced sign iconicity when addressing Ziv, but she also frequently used iconicity to highlight structure-meaning associations for him. In Figure 4, for instance, it can be seen that Ziv's mother enhances the iconicity of the sign LION (producing the sign with expression that mimics a lion devouring and with tense manual movements) and that Ziv imitates her with pleasure.

**Figure 4: Ziv's mother enhances the iconicity of the sign: LION**

Pointing to self and to persons

Pointing/not-pointing at self and at persons was mentioned in the literature as an indicator of abrupt versus smooth transition to established SL

Ziv began to point at 9 months. While Ziv pointed at people right from the start, he only began to point to himself at a later stage. Ziv pointed at other people throughout his entire second year (see diagram 2).

Diagram 2: **Number of pointing toward self and others in each month**
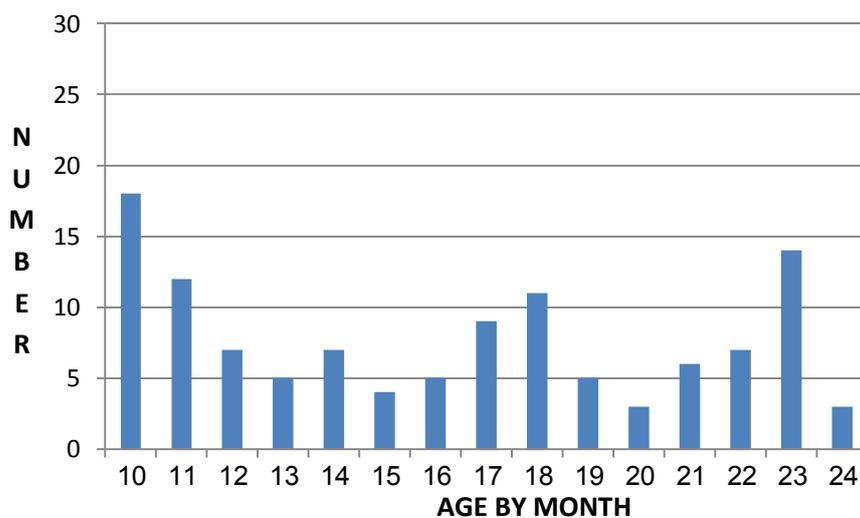
Nevertheless the function of pointing at people gradually expanded over the course of ISL development. Initially, between the ages of 9 to 12 months, the use of a pointing gesture was stiff and non-communicative (without seeking eye-contact) Additionally, though Ziv frequently pointed toward the caregiver, his pointing was in most cases an integral part of his reaching gestures (i.e., two hands open and closed rhythmically while extended in space). That is, Ziv frequently pointed toward the caregiver to signal his request to reach him, or to be raised into his arms (see Figure 5). Thus, the pointing to a person at that stage was not used for personal reference but for ritual requests.

Figure 5: Pointing at person using for ritualized request as integral part of the reaching gestures

From the age of 13 months, Ziv began to produce sharper and more directed pointing movements, while maintaining eye-contact with the caregiver. From the age of 14 months Ziv also used pointing at the interlocutor to get their attention. On these occasions, the pointing hand made an arched movement continuing from the interlocutor to the designated object (See Figure 6). Thus also in these cases the pointing toward a person is not used for personal references.

Figure 6: Using pointing at the interlocutor to get attention for an utterance.

1   **2**   **3**

Only from the age of 17 months did Ziv begin to produce strings of pointing in which one was directed at the interlocutor to indicate him as an actor. These utterances usually expressed the child's request for the caregiver to do a specific action for him. For instance, a string of pointing toward father and then pointing towards LEGO blocks interpreted in context: 'you build' (See Figure 7).

Figure 7: Ziv pointing to his father to designate him as an actor

1   **2**   **3**

At the age of 17 months, Ziv began to point toward himself for self-reference. No reversal pointing errors referring to the pronouns 'ME' and 'YOU' were observed.

SUMMARY AND CONCLUSIONS

Sign advantage

Our findings indicate that in the early stages of bilingual acquisition of ISL and of Hebrew, ISL presents an age advantage over spoken language in achieving early vocabulary developmental milestones:

One possibility for the lag observed in the developmental rate of the speech lexicon might indeed be better early control of the manual articulators than of the oral ones. Nevertheless, our data indicate that iconicity played a significant role in the social interactions between Ziv and his deaf mother. Ziv's mother was highly aware of the signs' iconicity and ultimately recruited it to highlight structure-meaning associations.

Thus it is possible that, though iconic connections between forms and meanings are not completely transparent for babies at early stages of language acquisition, the enhancement of the signs' iconicity could make the forms and their associative meanings more noticeable for the children.

Future studies are needed to further investigate the role of iconicity in deaf mothers 'motherese': namely, the iconic strategies they use to establish joint attention and joint reference with their babies in early stages of language acquisition. The potential contribution of the iconic features of signs to the process of structure meaning mapping in the early stages of language acquisition should also be investigated further, as most of Ziv's first signs were highly iconic.

The gesture-to-sign continuum

Our research leads to the conclusion that conceptualizing the 'gesture' and the 'sign' as two distinct kinds of actions, meaning that at some point in the timetable of language acquisition they replace each other, may be

counterproductive. The results of our study show that the use of early gestural-signs gradually became symbolic and conventional over time, without any abrupt change in their use.

The function of pointing to a person and to the self also gradually developed over time, used at first mainly for ritualized requests, then for getting a person's attention and directing it to an external entity, and later on also for personal reference. It was also gradually and smoothly incorporated into syntactical structures. Hence, the results strengthen the case for the claim that there is a natural, smooth and continuous transition in SL development from using early communicative ostensive actions to their more conventional forms. They support Adam Kendon's claims (2008) that we should abandon altogether the terms 'gesture' and 'sign' and develop a more comparative approach of how visible actions are used in different circumstances and communicational settings; this should ultimately include a comparative examination of how visible actions are used in different developmental stages of SL acquisition. Once we adopt such a comparative approach, the debate whether the sign advantage is actually a gestural advantage will become irrelevant, as the former is eventually a more elaborated version of the latter and not some different kind of 'semiotic' ostensive action.

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