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Parallel Bimodal Bilingual Acquisition: A Hearing Child Mediated in a Deaf Family

Abstract

The aim of this longitudinal case study was to describe bimodal and bilingual acquisition in a hearing child, Hugo, and in what ways these were guided by his Deaf family. Video observations of the family interactions were conducted from Hugo's age of 10 months until he was 40 months old. The family language was Swedish Sign Language (SSL). With Hugo, however, the parents used one language base in which single gestural signs or vocal words were often simultaneously inserted, the latter when not in visual contact. Hugo showed awareness of visual attention to SSL communication at 22 months and differentiated vocal and gestural modality according to his partner two months later. During the 28-month and 32-month sessions, a grammatical analytic phase might explain why Hugo's SSL was rare. Findings are possibly vital for a broader international audience than professionals who meet bimodal bilingual children.

RESEARCH ON BIMODAL BILINGUAL ACQUISITION has directed its attention to important areas such as linguistic phenomena (Van den Bogaerde 2000) underlying knowledge (Petitto and Holokowa 2002; Petitto, Katerelos, Levy, Gauna, Tétreault and Ferraro. 2001) and age as a critical factor in bilingualism (Mayberry, 2007).

In order to fill a gap about hearing Kids Of Deaf Adults¹ (KODA) this study inductively explores interactions as we know very little about the ways bimodal bilingual acquisition is guided. However, we know that both deaf mothers and their hearing children blend modalities simultaneously, which is clearly different to monomodal bilingualism. Within an interactional frame, language is learned by social actions, that is, a connection between mediation and acquisition in which intersubjectivity is fundamental. Such longitudinal information regarding bimodal bilingualism extends the research field as well as being useful for educational purposes.

This study investigated naturalistic interactions, between a KODA and his Deaf family members by means of video-observations from the child's age of 10 to 40 months. Firstly, episodes of joint attention were inductively explored concerning mediation and acquisition of action and language structure. Mediation corresponding with changes, that is, transforms in the child's acquisition, was defined as critical changes. Secondly, the findings were in an abductive process compared with previous literature on KODAs language

¹ Hearing children of Deaf adults are culturally described (Bishop 2008) as Kids of Deaf Adults (KODA). This acronym refers to linguistic affiliation and also to identity (Bull 1998). Deaf with a capital 'D' is used for cultural affiliation, whereas lower case 'd', as in deaf, refers to audiological status.

acquisition. In the following intersubjectivity, mediation and associated concepts, and bimodal bilingual acquisition of KODAs are presented.

Intersubjectivity

Intersubjectivity is an interactional foundation of dual trust that develops between the baby and the emotionally present caregivers (Susswein and Racine 2008). This engagement develops in mutual activities such as play and games. By the end of the first year, the infant shows secondary intersubjectivity that focuses on joint attention with reference to objects in the world (e.g. Susswein and Racine 2008; Trevarthen 1993).

Spencer (2004) reported fewer and shorter utterances from deaf mothers to their 12-month or 18-month-old hearing child compared to hearing mothers. These utterances consisted of one or two formal signs and a directing point towards the reference. The child's switch of focus from toy to visual communication is claimed by Spencer to be one reason. Repeating seemed therefore to give the young child increased opportunities to perceive the utterance even when produced in the child's visual peripheral field. Another way of keeping intersubjective interactions in sign languages is by displaced or modified signing in the child's line or field of vision and tactile signing on the child's body and closeness to the object (Cramér-Wolrath 2011; submitted; Bailes, C. Erting, L. Erting and Thumann-Prezioso 2009; Malmström and Preisler 1991; Spencer, Swisher and Waxman 2004). Accordingly a triadic visibility at storytime, a triangular seating position, was reported (Mather, Rodriguez-Fraticelli, Andrews and Rodriguez 2006).

What is frequently reported is deaf mothers' vocal and simultaneous blending of signed and spoken languages (Cramér-Wolrath 2011; Emmorey, Borinstein, Thomson and Gollan 2008; Pettito et al. 2001; Van den Bogaerde's 2000; Van den Bogaerde and Baker 2005). These mothers might have been advised to use spoken modality with their hearing child but it is not unlikely that they used vocal or blended modes for reasons of intersubjectivity and mediating their child's acquirement of bilingualism.

Mediating

An adult can find out and direct further communication to the child's interest by follow-in of the child's focus (Tomasello and Ferrar 1986). This is one way of using the *Zone of Proximal Development* (ZPD) (Vygotsky 1934/1962). The concept explains the zone where an individual, with some help usually from a more mature person, is able to accomplish a task. When a person needs support throughout the whole task, the level is beyond his/her capacity. On the other hand, when given a task on a level that has already been achieved, no new development will occur. In Vygotsky's words, ZPD implies: "What the child is able to do in collaboration today he will be able to do independently tomorrow" (Vygotsky 1987, 211). The supporting or mediating role that a more mature person has in the developing process was labeled scaffolding (Bruner 1983). This is a temporary process by which, for example, a parent or a sibling, seemingly intuitively, supports the child's success in performing a task. In order to carry out a task, a child can monitor his/her own actions by self-scaffolding internal thought (Wertsch 1985) and by speech for oneself (Vygotsky 1934/1962), commonly referred to as private speech (Bodrova and Leong 2003).

Bimodal bilingual acquisition of KODAs

Most issues presented in this section are dealt with in the current study. An longitudinal overview of acquisition in Sign Language of the Netherlands (SLN) and spoken Dutch was given in a study by Van den Bogaerde (2000). This with additional results was compiled in an orientation of native sign language acquisition described by Baker, Van den Bogaerde, Coerts and Woll (2000). Van den Bogaerde's study (2000) comprises three hearing boys who were video-observed between their ages of 12 and 36 months while interacting with their deaf mothers. They attended preschool from the age of 30 months. The children's spoken language was parallel to or slightly ahead of their signed language. All three produced both representational words and signs at the age of 12 months.

At the age of 24 months the boys made word combinations, posed questions and used finite verbs. Concerning SLN, signed verbs, verb location inflection, combining signs and producing imperatives were observed in two of the children's language. One child made use of visual attention, which might be connected to a study claiming that hearing children aged 9, 12 and 18 months spent less time looking at their deaf mothers than the deaf children did, owing to their mother's use of vocal mode (Spencer, Swisher and Waxman, 2004).

Further, in the study by Van den Bogaerde (2000) one child at 24 months made non-manual markers for WHAT-questions, whereas the other two posed manual WHAT-sign questions. When such questions are used, according to Reilly and Bellugi (1996), the caregivers shift to include appropriate grammatical facial behavior, in contrast to the previous ungrammatical omission of facial components. The latter however, concern the mediation of deaf children of Deaf parents and are therefore also interesting to study in the case of KODAs. For example, it took as long as up to five and six years of age before linguistic facial expressions, like furrowed eyebrows in WHAT-questions, were performed correctly (Reilly and Bellugi 1996). Thus, the face in signed languages has multi-linguistic functions as well as showing emotions. The analytic phase of *blank face*, separating the linguistics channels in the hands and in the face, is shown after about two years of age (Reilly 2006).

Vocal mode by deaf mothers was reported by Spencer (2004) and Koester, Traci, Brooks, Karowski and Smith-Gray (2004) found significant durations of vocal play with the hearing children and fewer gestural communications with 9-month-old infants. The mothers in Van den Bogaerde's (2000) study simultaneously blended gestural and vocal mode, so-called simultaneous communication (Emmorey et al. 2008). Further, mixed elements from both languages within an expression are reported (Petitto et al. 2001; Van den Bogaerde and Baker 2005). A case study (Cramér-Wolrath 2011) reported vocal initiations and re-establishing expressions used by the parents based on their child's meaningful feedback on vocal utterances. At the child's age of 15 months the parents discovered him making unsuccessful vocal initiations; they then reconsidered and omitted their vocal initiations, instead increasing redirecting tap and waving expressions until the child was 36 months old. This corresponded with the child's modality recognition, shown, for example, by gaze-check insertions in signing.

The purpose of this study

Within a social interactional frame, the aim of this longitudinal case study is to analyze and describe a hearing child's mediated acquisition of Swedish Sign Language and spoken Swedish. The specific focus is on the communicative actions and language structure between the child and the family members.

Method

This single-case study is based on a longitudinal collection of video-observations of a hearing child in his Deaf family. Brief field notes were taken and a semi-structured interview was later made with the parents. In order to map the child's naturalistic bilingual acquisition in spoken Swedish, that is, in vocal-aural modality and in SSL in gestural-visual modality, an inductive explorative case study method was chosen (Yin 2009). The video-observed interactions between the child and his family members are analyzed with regard to critical changes in language structure and in actions. Transformations are described qualitatively (Creswell 2007) and chronologically (Yin 2009) from the child's age of 10 months to 40 months.

Participants

Background information has been kept to an absolute minimum to secure the family members' confidentiality. All participants have been given fictive names and the main person in this study is a hearing boy, Hugo. His Deaf family consists of two congenitally deaf sisters, his twin sibling Diana and his three-year-old sister Nicolía and his Deaf parents. The extended family is hearing.

Father attended a school for the deaf where SSL, signed Swedish, lip-reading, written Swedish and speech were used. Swedish Sign Language was the language of choice in his peer group. Mother grew up with severe loss of hearing and attended a school for the hard-of-hearing where the language of education was spoken Swedish. From the first grade she used sign language with her schoolmates. The family language was SSL and parents consider the family to be part of the Deaf community.

Hugo was 19 months old when he joined the local preschool, using spoken Swedish throughout the full day. Diana, like Nicolía, attended a preschool for deaf children with an SSL-approach. The sisters acquired SSL as their first language in which they communicated with Hugo.

Data collection

Data was collected through video observations in the family's home on 12 separate occasions from the time Hugo was 10 months old until he was 40 months old. During these occasions, his parents were asked to act and communicate as normally. For this study, the entire storytime and playtime activities at the sessions were filmed continuously. The session normally started with storytime, which gradually evolved into playtime activities. Storytime consisted of parents and children looking at and commenting on pictures in a book, observed from 12 months. In order to follow one specific story over time, the book *The Frog and the Pig* (Velthuijs 1999) was introduced when Hugo was 13 months old.

In this study (Table 1) the observation sessions (Column A) focused on Hugo's interactions at different ages (Column B). The number of people in the sessions varied from two to five (Column C). Hugo's participation, referred to as 'active time', consists of interchanging involvement that is actively communicating with other family members', which is exemplified in the descriptive Episodes. The duration of Hugo's active time varied between 4 to 23 minutes for storytime, and for playtime between 8 and 19 minutes (Column D). Hugo made some initiations with the observer/researcher (an SSL signer) that are also included in the analysis.

Table 1. Information regarding video observations of Hugo

A Session No	B Hugo's age in months	C Hugo's partners	D Hugo's active time in minutes
1	10	Diana & Mother	18 play
2	11	Diana, Nicolía & Mother	19 play
3	12	Diana & Mother	17 story 08 play
4	13	Diana & Mother	17 story
5	15	Diana & Mother	23 story 10 play
6	17	Diana, Nicolía & Mother	04 story
7	22	Diana, Nicolía, Mother & Father	15 play
8	24	Diana, Nicolía, Mother & Father	13 play
9	28	Diana & Mother	10 story
10	32	Diana, Nicolía & Mother	04 story
11	36	Diana, Nicolía & Father	06 story
12	40	Diana, Nicolía & Mother	13 story 12 play

Field notes were made immediately after each observation. They contained brief information on the session observed and comments by the parents. The semi-structured interview, concerning Hugo's bilingual and bimodal language acquisitions, was carried out with the parents in their home and was video-documented.

Data analysis process

In order to reveal new findings in comparison to previous literature, the method for this study was chosen to explore (Yin 2009) critical changes in episodes of interchanges. An episode is in joint attention and consists of an initiation followed by the participants' interchanging turns.

Critical changes are defined as transforms in the child's language acquisition, which over time, correspond with mediated communicative actions and language structure. 'Errors' are considered not to be faults but possible transforms within the acquisitions or mediations (Cramér-Wolrath submitted).

All eight storytime observations and the seven playtime observations have been fully transcribed (Table 1). Storytime was not observed at sessions 1, 2, 7 or 8 the last session took place outdoors. During the transcriptional inductive work, exploration (Yin 2009) of the interactions and possible critical changes were noted in the transcript. To find further critical changes in each participant's paths, in relation to Hugo's language acquisition, the changes between partners and cross-activity were noted in tables. These were compared with the field notes. A selection of episodes containing changes in Hugo's and his interlocutors' communication was chosen. These episodes were described in-depth (Yin 2009) and inductively analyzed in detail (Creswell 2007).

Quantitative analyses of lexicon in vocal and gestural modalities and also of simultaneously communicated utterances at the 15-month and 22-month sessions were made from the transcript.

In order to find further patterns, an abductive procedure was adopted in relation to previous literature (Cohen, Manion and Morrison 2007; Creswell, 2007; Guvå and Hylander 2003; Yin, 2009).

Finally, a representational collection of episodes was described in English. This final description required further investigations to describe and translate the structure of language acquisitions into a foreign language not used by the participants. These episodes have also been analyzed from an attentional expression perspective (Cramér-Wolrath 2011). As a whole, the analytical process was characterized by an iterative procedure in which data were continuously compared.

Trustworthiness

Trustworthiness has been a matter of continual concern from planning to presentation of the study (Cohen et al. 2007). Video observation over a 30-month span of the same participants engaging in the same activities and environment made it possible to follow and confirm shifts in and between each participant's interactions over time. In order to ensure trustworthiness, detailed episodes based on transcriptions and analyses are presented (Creswell 2007). Additionally, another researcher and the author independently transcribed video sessions from 15 and 22 months. Only two differences in opinions were detected and then discussed until consensus was reached. The author analyzed the remaining data.

Regarding Hugo's motor-activity, analyses of storytime were compared with those of playtime. Those comparisons gave extended information about the two activities. Storytime episodes are for this reason supplemented with playtime results and episodes.

Presentation of results

The bimodal bilingual acquisition findings are presented chronologically according to the critical changes, which evolved through the data analyses. Divided into three communicative segments based on Hugo's age at 10-13, 15-24 and 28-40 months each segment is introduced by a brief presentation of the participants' interaction during the corresponding months. The critical changes analyzed are described over time by representational Episodes that also illustrate the interactional and communicational context. A translation of

the communication can be found just above some of the Episodes. Within the Episodes, utterances, both vocal and signed communications are in their original syntax but translated into English.

While working with the analyses it was found that simultaneousness became visually obvious when different font styles were blended rather than written on different lines. The key to the structure (Table 2) shows how lower-case letters illustrate information while sign is in CAPITAL LETTERS. Vocal words are *italicized* and in combination with simultaneous blended gestural mode *CAPITAL ITALIC LETTERS* are used. Hyphens are used for different purposes. Between two capitalizations they indicate that one sign is translated into more than one word. Capitals followed by a hyphen and lower-case letters give structural information. Squared brackets are inserted with Swedish when considered important.

Table 2. Key to the episodic structure

Key	Episodic example
Colons: indicate someone's utterance	e.g. Hugo: or Hu:
Lower-case letters: Information and also language structure	Hugo: points at the top of the shelf
<i>Italic: Spoken and or simplified word</i>	Hu: <i>my pens</i>
CAPITALS: SIGN or SIMPLIFIED SIGN	Hu: MINE
<i>ITALIC CAPITAL: SIMULTANEOUS SIGN AND SPOKEN LANGUAGE</i>	Hu: <i>PENs up-there/point</i>
slash indicate simultaneous bimodal blending, also with simplified words	<i>doggie/DOG</i>
CAPITAL hyphen CAPITAL: one sign translated into more than one word	Father: NO HAVE-NOT PEN
CAPITALS hyphen lower-case: SIGN-structure	Fa: BRING-down-pen-can
Round brackets: initiating or reestablishing code* followed by initiatee and partner	(rD: Hu → Fa)

* Round brackets contain initial letter according to five attentional types (Getting, Directing, Redirecting, Maintaining and Checking); re-establishing holds an 'r' before the attentional type. The code continues with the initiatee and the partner. (Cramér-Wolrath, 2011).

A distinction is made between continuous and partly simultaneous 'code-blend' (Van den Bogaerde and Baker, 2005). Bimodal continuous simultaneous blending in gestural and vocal utterances is referred to as 'SimBlend' whereas 'blending-in' refers to simultaneous insertion of elements from gestural or vocal mode, on the basis of the other language structure. A 'code switch' is an alteration to the other language (Emmorey et al. 2008). Observe that a slash indicates simultaneousness, for example in *there/point*.

Example of SimBlend: *WHAT's that* looks at and points at the ball.

Example of blending-in simultaneous insertion: *Hugo look there/point BALL*.

Example of code switch: *Hugo look there/point BALL FOOTBALL*.

The "descriptive terminological framework for vocal and gestural modalities" proposed by Volterra and Erting (1994, 301) has been used. The concepts 'simplified word form' or 'simplified sign form' were added to elucidate the symbolic utterances of a young child using symbolic vocalization or symbolic gesture as well as uttered sign/s or spoken word/s not (yet) performed conventionally (e.g. *doggie* [Swedish: *vovve*]).

Results

Interactions from 10 until 13 months

During the first four sessions (10 until 13 months) Hugo focused on motor movement, managing play with toys.

Mother followed-in Hugo's activities and added labels vocally or simultaneously with a sign as long as Hugo was not looking at her and was visually focused on his activity. Mother watched Hugo carefully and the moment he looked up at her, she labeled by simultaneous vocal and gestural mode or switched into signs. She exaggerated her voice, face and/or body, introduced toys and extended Hugo's activities by showing/instructing him what to do with the objects; she also encouraged him by naming, confirming, nodding and smiling. Mother explained what was going on with the other twin and around them, like giving information about why she was going to leave the room.

Hugo's handling of or pointing at real objects often occurred in combination with vocalizations or with sounds made with or by the object. By looking at Mother, Hugo got her attention and by looking at the object, he directed her attention. In these cases she responded as if to an intentional request and vocal tuning-in vocalization was observed, for example, to Hugo's: *vrr rr v v uh*; while looking at each other Mother: *muff*. Hugo smiles: *uf*.

The modality used by Mother was connected with whether she had mutual gaze or not with Hugo. Consequently, it was noted that Mother's responses to Hugo while having mutual gaze generally began in the gestural mode. It seems as though Mother intersubjectively adjusted the choice of language to Hugo's visual focus.

The 12-month session was the session when Mother's vocal and simultaneously performed attentional expressions were most frequent and also most successful. This was the first session involving books, in which Hugo mostly sat opposite Mother and his twin sister Diana often sat on her lap. By placing the book so that all of them could see it and share the pictures, a triangular setting was arranged. Mother signed in front of and tactilely on Diana, which Hugo repeated with 'errors', that is, in different handshapes and location. This in turn Mother responded to with the correct sign. In the triangular setting, Mother could both see Hugo's gestures and face and possibly also lip-read his vocalizations, some of which were produced simultaneously. With Hugo sitting beside Mother, the exchange shows that a mismatch might have occurred when Hugo initiated attention in vocal mode without eye-contact or gestures exemplified in Episode 1.

While looking at animals in a book Hugo says *doggie* [Sw: *vovve*]. Hugo looks at the book and repeats *doggie* three times (G: Hu→Mo no response).

Mother points at a cat and simultaneously sign/says *CAT CAT*.

Hugo looks at her (D: Mo→Hu) and responds *mimimijaje* (imitating the sounds of a cat).

Mother smiles and responds (with a soft face and voice) *yeaa* [Sw: *jaaa*].

Hugo looks down at the book, points at the dog: *doggie*.

Mother points at the dog (rD: Hu→Mo) and continues: *that is a doggie/DOG* [Sw: *det är en vovve/HUND*], repeating *DOG* five times.

Hugo looks at Mother's hands signing (conventionally signed on one's thigh).

Hugo responds DOG on Mother's thigh while saying *doggie*.
Mother takes Hugo by the wrist moves Hugo's hand back to his thigh, there making the DOG sign while holding Hugo's wrist while saying *doggie*.
Hugo responds DOG on his own thigh and then points at the dog picture.

Episode 1: Hugo and Mother, at 12 months.

After observing Mother signing DOG, Hugo repeated the sign tactilely on Mother, which he frequently observed her to do on Diana but Mother moved Hugo's hand back to his signing space. Tactile signing on Hugo was very rare throughout the entire study. In this study, neither of the parents was observed to imitate sounds of an animal, which Hugo did when saying *mimimijaje*.

Mother used a format of 'point-WHAT-question', first answered rhetorically. Signs referring to balls and motor complex signs got Hugo's attention even when performed in his peripheral visual field. Ungrammatical WHAT-questions and imperatives were frequently used, at the 13-month session with pointing, supported by vocal mode, maintaining attention to focus as in Episode 2.

Mother and Hugo look at pictures. Mother signs/asks in Hugo's periphery: WHAT *is that*/point [Sw: VAD *är det*/pek], Hugo looks at the picture (M: Mo→Hu)
Mother: point/*there!* utters in Hugo's line of vision BALL-point [Sw: BOLL-pek]..
Hugo looks at Mother's hands signing BALL-point. Hugo looks at the picture.
Mother: point-BALL,
Hugo follows her hand moving from point to form the sign BALL. (rD: Mo→Hu)
Mother signs BALL EAGER BALL-point at the Frog kicking the ball. Hugo looks at the picture.

Episode 2: Mother and Hugo, at 13 months. Observe that the slash indicate simultaneousness.

Mother was sensitive to when Hugo gaze-followed in the visual-gestural modality (BALL) and switched to solely signing. She guided Hugo's gaze to alter, between signing and pictures, by moving her pointing and gesture in his line of vision. Mother's simultaneous utterances consisted of inserting a word or sign into the language base used, which could possibly be related to including other family members and to attracting Hugo's peripheral visual attention. In the field notes Mother made a comment on the languages' different structures and, in accordance with Hugo's acquisition, the importance of using SSL without vocal mixing. However, simultaneous insertions seemed to extend and emphasize the symbol's equivalent meaning in the two languages.

Interactions from 15 until 24 months

At the beginning of these months, Hugo used 'WHAT-point' and '*what there*' with and without pointing. He also used and differentiated words with simultaneous pointing: *there, that, up, another, where is it, what is that*. Symbolic play with private speech was observed in both modes.

To get and keep Hugo's attention during storytime, his interest in balls was still an important factor. Mother scaffolded Hugo's 'gaze-altering' by directing the pictured ball with a point and a WHAT-question as a peripheral sign, Episode 3. She got Hugo's interest and he looked up at her and he repeated the question by blending.

Mother sits opposite Hugo on the floor with Diana on her lap. Mother opens the book.
Hugo pulls the book in her hand (to get a look at the picture) looks at the picture.
Translation: "Frog kicks the football that flies up in the air and away. -Ball fly over-head, there. Yaaa, Pig sees the ball come and pass over his head. -Oh, Ball-up"

Mother holds the book in front of Hugo, points at a picture, signs WHAT, Mother points at the ball WHAT mutual gaze with Hugo. (D: Mo→Hu)
Hugo signs/says WHAT/*wha(t is) tha(t)* [Sw: VAD/*va(d) dā(r)?*] looks at and points at the ball.
Mother lays the book down on the floor, turned so that all of them could see.
Mother points at the pictured ball, nods. Hugo looks at the picture. (rD: Mo→Hu and Di)
Mother signs close to the book and in Hugo's periphery field of vision BALL, FOOTBALL. During the last sign Hugo looks at (focuses on) the sign (rM: Mo→Hu) and then looks at the picture.
Diana crawls away.
Hugo raises his hand over his head FLY-UP (simplified signs), points at the picture while looking at it, gazes at Mother. (rG:Hu→Mo)
Mother (has his gaze while) pointing towards the book (a picture of Frog kicking a ball) as in 'that' nods FOOTBALL, then narrating in sign language while Hugo looks at the signing: FOOT-BALL FIST-hand (as classifier for ball with her left hand) right index finger-KICK left hand-FIST-straightens out in a SPHERE-hand movement as going up and far away ahead of the kicker. Mother gazes Hugo, they smile and he bumps on his butt, looks at the picture, gazes at Mother and looks at the picture, Hugo: simplified BALL(-shaped)-fly-UP-slightly backwards over his head (Pig perspective).
Mother points, taps on the picture and narrates: PIG, LOOK BALL FLAT-hand classifier moves towards and passes over her head, accompanied by gaze.
Hugo looks up sees Mother signing (rG:Mo→Hu) LOOK BALL.
Hugo looks at the picture: BALL(-shaped)-fly-UP.

Episode 3: Mother and Hugo, at 15 months.

Hugo shifted his attention to signs and then back to the picture of interest, a football. Mother got not only naming or simplified VERBalizations as responses; she also got to know Hugo's focus, which she followed-in and enlarged into verbs, SSL-narrative structure with a one-person perspective, classifiers, referential-pointing as for the third person pronoun 'it', and pointing towards subjects in the book rather than naming them as earlier. Throughout these months Hugo got attention by gaze, but he used simplified words and words in the other person's peripheral surrounding which without gaze-contact were not responded to simply because they were probably not heard.

At 15 months, Hugo's lexicon, during the recorded 33 minutes, contained more representational words (19) than representational signs (12); of these he separately used 12 for the same meaning. His lexicon had about the same number of separately used signs (16) as separately used words (18). Of these, 13 had the same meaning. Of the separately used words, 5 were also used simultaneously with a sign, that is, not used as separate signs. Hugo made some combinations of words and one combination including signs, thus simultaneously blended, 'LOOK WHAT-pointing'.

At 22 months, Hugo's lexicon had increased with 13 signs, 10 deictic words and 25 words. He conducted more word multi-phrases and made two simultaneously blended utterances and seemed to start differentiating the two modalities. He stopped making vocal expressions for attention, instead making visual and gestural expressions. He started to look for visual responses but he began the interchange in vocal modality. When not getting a response, he switched into a gestural blend, by pointing, gaze-directing and morphological bimodal blend (*PENs*), as exemplified in Episode 4.

Father fetches pens from a shelf and puts them on a table a couple meters away from Hugo. Hugo walks towards the shelf. He points at the top of the shelf in father's periphery and looks towards Father who looks back at him. Hugo wants the pens up on the shelf.

Translation: "Hugo: My pens up-there! Draw, those pens up there are mine! Father: No you use those on the table. Hugo –Want that pen! Father: No those pens are not opened yet. Now go over there and begin. -Ah, carry me!"

Hugo, while saying *my pens* [Sw: *mina pennoj*], pointing-looks up at the shelf *draw* [Sw: *jita*], points at the pens, *pens up there* [Sw: *pennoj uppe dä*], looks at Father adding *PENs up-there/point MINE* looks up at the shelf, pointing at and says *pens*.
 Father waves in Hugo's periphery and re-establishes eye-gaze (rR: Fa→Hu) NO points at Hugo (as in you) moving his pointing hand to the table points at the pens on the table.
 Hugo shakes his head and stamps his feet, looks at the top of the shelf and points distinctly towards the top, gazes at Father, WANT points at the top of the shelf *pen wanne there* [Sw: *penna ha dä*], gazes at Father.
 Father: NO HAVE-NOT PEN HAVE points at the shelf NOT BEGIN points at the shelf. NOW BEGIN points at Hugo (as in you) point-hand moves to the table.
 Hugo bends down then reaches his arms towards Father.

Later in the same session Hugo in his private speech: points at the top of the shelf TOY MINE points at the top of the shelf says "*opps!*" [Sw: *Oj!*]"

Episode 4: Hugo and Father, at 22 months.

According to modality, Hugo used the second person possessive pronoun adequately in vocal mode, using "my" with plural "*pens*"; and in gestural mode he used TOY MINE. The second person pronoun pointing as for YOU was also observed.

His Parents initiated attention by redirecting expressions as Hugo also did during the most recent sessions. The Parents then made sure they had mutual contact by gaze when starting to communicate. In cases of bimodal simultaneous use, this was done by inserting elements from the other language into the language base used at that moment. Hugo was observed to look for responses in gestural mode and he focused on his Parents' faces rather than switching his gaze between signing and face.

At 24 months, Hugo showed awareness of visibility in gestural mode by persistently making sure he had the interlocutor's mutual gaze almost throughout multi-phrase SSL utterances. In using first names like in spoken language his own sign name HG and DAD, Hugo displayed cross-cultural expressions. Hugo also made verb inflections, as in Episode 5, VERBalizing SIT-on as SWINGing.

The family is outside in a playground. Diana nearly gets hit by a swing and begins to cry. Father lifts her up and comforts her while explaining to Hugo about the danger of FALL-OFF a swinging swing. Hugo looks at the swings for a while.

Translation: "Dad! Hugo swinging. Dad! Getting dangerous (I) fall/jump off and fly away."

Hugo waves in Father's periphery, DAD. While running towards Father, Hugo gets mutual gaze. (G: Hu→Fa)
 Father looks at Diana.
 Hugo taps Father, Father looks at him (rR: Hu→Fa)
 Hugo: HG (-sign-name for Hugo) SIT-on-SWING. Hugo sneezes (breaks the gaze-contact).
 Hugo waves in Father's field of vision signs DAD! Hugo taps Father and gets mutual gaze, (rR:Hu→Fa)
 Hugo: DANGEROUS *fall*/JUMP-OFF (word *fall* [Sw: *jamlä*] uttered at the same time as the sign JUMP where the sign-segment continued into OFF), Hugo turns around, thus breaking the gaze-contact while signing FLY (as a flapping bird) running ahead.

Episode 5: Hugo and Father, at 24 months.

Hugo's simultaneous blended *fall* and JUMP-OFF not only showed a way of enlarging the meaning of the utterance but also a bimodal translational skill.

Interactions from 28 until 40 months

The Parents' increased use of physical initiations from 28 months and the use of plugging in attentional checking confirmed their expectations for visual-contact. The initial stage of gaze-contact got shorter and shorter until the sign came almost at the same time or just before a visual check of the partner's visual-contact. This contact did not need to be carried out with mutual gaze but rather as a check that the sign was visible to the interlocutor. The signs were sometimes performed with a larger movement into the partner's peripheral field of vision and then checked for attention, which was also seen in Hugo's interchanges from 36 months. During the 28-month and 32-month sessions, Hugo's SSL production almost vanished, but his family commonly communicated in SSL with him.

He seemed consciously to use conditions of visibility when challenging his elder sister's interference by using vocal language, not showing facial expressions and without giving visual attention to her while communicating.

Even though Mother in particular, throughout the months, used vocal mode, from the 36-month session vocal attentional expressions were re-used (in field note). This coincides with making SSL-structural changes during signing while not having mutual gaze with the interlocutor, and therefore making gaze checks for the partner's visual attention. The latter behavior was observed in Hugo's communication at 36 months, thus showing adequate visual modality actions.

At 40 months, Hugo used different attentional expressions, turn-taking and turn-giving as well as symbolic utterances in each language. In Episode 6 Hugo shifted his gaze between the partner and the objects he was conversing about and continually made checks for attention. However, during what seemed to be reasoning about the probability of running a remote-controlled car on petrol, he made no visual checks.

Translation: "I want, please? (short response not observable probably 'PETROL') In that car, fill petrol? (short response not observable probably 'NOD'). Petrol in that, hmmm, there is no petrol in that. No there is no petrol in that. There is no. Me filming, can I please come over to film, you do believe I can film, Yes? (short response not observable probably 'PETROL') Yes yes petrol, drive to the station and fill petrol, I think it's, what's it called, a country that's run out of petrol. So fill from another."

Hugo has been driving his remote-controlled car, then tries to negotiate with the observer to film with the camera.
Hugo gets mutual gaze with Observer (G: Hu→Ob)
Hugo: points to himself (as in I) WANT (to film?)
He gets a short response not observable probably PETROL.
Hugo looks towards the remote-controlled car on the floor (mutual gaze) FILL (break gaze) PETROL point (mutual gaze holding his pointing towards the) car?
Short response not observable, probably: NOD.
Hugo: PETROL looks at the car, then towards the Observer PETROL, (breaks gaze) point-car/wrinkle-on-nose, (C: Hu→Ob) NO PETROL point-car, NO-shake head HAVE-NO-shake head PETROL, squints eyes HAVE-NO.
Hugo gazes Observer (rG:Hu→Ob)
Point Hugo (as in I) FILM - FILM(-VERBalizing) appealingly-APPLY? (breaks gaze) point camera point Hugo (as in I) (mutual gaze) FILM(-VERBalizing) CAN BELIEVE points at the Observer (as in you) Y-E? (Short response not observable, probably PETROL) Y-E-S, Y-E-S PETROL, breaks gaze IN(-reference-point-localisation-in-signing-space) PETROL FILL STATION-reference-point DRIVE (C:Hu→Ob) point/to-reference, ONE THINK-squeezes nose, flaps hand (as in what is it called) (C:Hu→Ob) COUNTRY (C:Hu→Ob)
reference-point /there (C:Hu→Ob) PETROL (C:Hu→Ob) RUN-OUT/FINISH-reference-point. (mutual gaze)

INSTEAD POUR-IN N-E-W. Hugo looks at the Observer then down at the floor. Episode 6: Hugo with Observer, at 40 months.

Hugo used transparent and referential pointing, for example pointing at the car, pointing at the camera, and at himself signing FILM as in “can I have that to film?”, differentiating location in space (e.g. PETROL IN and COUNTRY-point-reference) and referencing to location as there (STATION-point-reference). He VERBalized the noun FILM and used verb inflection in DRIVE (towards the station-reference located in space). He also used a classifier, C-hand with thumb moving, for ‘driving the remote-controlled’ car.

Discussion

Overall, the Parents were found to mediate Hugo’s communicative skills by positive and encouraging attitudes to interaction, irrespective of the language used – with no corrections or special encouragement for a particular language form, that is, gestural, vocal or simultaneous insertion. However, before Hugo showed visual awareness of the partner’s attention, observed at 24 months, and when the Parents did not perceive Hugo’s utterances, he was asked to repeat.

Critical changes in the Parents’ interactive communicative actions were found to transform initiations and language structural aspects in accordance with cultural performance. The Parents used one modality base at a time throughout the entire study. However, they often simultaneously inserted into this base a symbol from the other modality, which in this way was highlighted. This finding differs from Van den Bogaerde’s data (2000; Van den Bogaerde and Baker 2005) in which the Mothers simultaneously and continuously mixed the languages. This might reveal differences between societies as well as time differences between these studies. The recognition of SSL as Deaf people’s first-language (Proposition 1980/81:100) led to an implementation of SSL in the school system. Such influences in society are suggested by Pizer (2007) to have an impact on hearing people primarily not getting in contact with deaf people. Thus, it is likely that both the status and the knowledge of and about SSL in Sweden have had an impact also on Deaf parents mediating their children’s language acquisition.

Mediating

As ‘a more skilled person’ (Vygotsky 1934/1962; Bruner 1983) the Parents used mediating tools to scaffold formats in the process of Hugo’s language acquisitions. This was done by functionally following-in children’s focus of interest, as predicted by Tomasello and Farrar (1986), and expanding in relation to Hugo’s focus/utterances by formats. The deaf sisters’ communication with Hugo provided SSL on a peer level, thus acting as partners and role models (Bruner 1983).

The triangular and triadic seating position that Mother established seems important not only to ease visualization between object and mutual eye-contact for interchanges in gestural modality, which was reported by Mather et al. (2006), but also the possibility to lip-read Hugo’s vocal and facial expressions. At the 10-month session Mother used ‘point-name-point’ format, and a few months later ‘point-what-questions’ (ungrammatical) rhetorically responded to, followed by ‘point-what-questions’. This is a well-known process

from the work of Bruner (1983). Hugo responded to the two latter formats first by pointing and then by naming. Without eye-contact, Mother made these labels in vocal mode or by inserting a sign simultaneously. With eye-contact, naming was in gestural mode or simultaneous with blending-in vocal mode. When Hugo named or used (point)-naming-(point), Mother responded by a gestural verb, thus VERBalizing the labeled noun, for example FOOTBALL-FLY. When Hugo responded to this with a gestural, VERBalized repetition, Mother extended into an SSL narrative including classifiers. Explanations as responses to Hugo's multi-phrases were observed from the 22-month session. From the 28-month session, communication became increasingly more equal as the Parents expanded on the mutual conversation. This sequence of transforms is similar to what Vygotsky (1934/1962) described as mediating in the child's 'zones of proximal development'. Evidently, the Parents, irrespective of the modality, used the same formats but scaffolded and switched the modality according to visibility.

In this study, the caregivers simultaneously inserted single symbols, thereby highlighting the equivalent meaning, from the other mode to the language base used at that particular time. This is essentially different from simultaneous communication or blending in the majority of utterances, as reported by Van den Bogaerde (2000) and Van den Bogaerde and Baker (2005). However, the latter study reported more blending of question words and nouns compared to verbs, which conforms to the result of this study.

Bimodal bilingual acquisition

In contrast to the parents and to what Petitto and colleagues (2002; 2001) suggested Hugo communicated simultaneously at an early stage and blended elements from both modalities in his utterances. Hugo, until 17 months, frequently blended 'what-questions', prepositions, nouns and pronouns but fewer verbs. This is apart from the hearing children's simultaneous blending reported by Van den Bogaerde and Baker (2005), which might due to age. Eventually, Hugo increased the vocal-based mode and at 22 months only inserted two signs simultaneously. One of them was *PENs* that, besides the vocal plural inflection, had equivalent meaning, which showed morphological changes in vocal modality. The structure of noun-mixed utterances according to De Houwer (2009) is mostly treated as being part of the actual language base. A similar pattern in blending morphology in English tense inflections simultaneously with ASL verbs was reported in adult use by Emmorey et al. (2008).

At the 22-month session, Hugo showed awareness of visual attention and two months later he just about separated the two modalities' use of gaze. He persistently requested and blocked mutual gaze while communicating in gestural mode. Hugo also expanded the meaning from Father's explication of the danger to FALL. Hugo said and thus translated *fall* as he simultaneously produced the sign JUMP-OFF continuing with a code-switch FLY. This might be considered a supplementary semantic code switch, which is rare (Emmorey et al. 2008; Van den Bogaerde and Baker 2005). However, Hugo did not yet give his partner a final eye gaze to finish the utterance or pass the communicative turn. At 36-month session, were these blending 'errors' separated in agreement with the language used. Finally, Hugo communicated in either language, but according to the addressees also in SimBlend.

Beyond blank face no signing

From 15 months, and increasingly between 24 and 32 months, Hugo was observed to use vocal mode in his private speech. This self-scaffolding seemed to function for a long time as predicted, by Wertsch (1985), as a monitoring tool in his actions. Concerning vocal modality, Hugo made morphological changes but also syntactic 'errors' prior to 28 months. During the 28-month and 32-month sessions, Hugo essentially used vocal mode, which probably derives from his being in preschool where, from 19 months, he used spoken language throughout the day. The omission of gestural mode might also display an analytic phase of distinguishing components in ASL (Reilly 2006).

From 36 months and onwards Hugo increasingly showed recognition for each language. Each communicative turn ended with a mutual gaze to give the floor for the next interchanging turn; this was also found in the bilingual, bimodal twin study by Richmond-Welty and Siple (1999). *Visual-contact* with checking and final mutual gaze was observed in Hugo's sign language around the age of three years, thereby showing an intersubjective awareness of having the partner's attention throughout an interchange. It also points towards the close connection with structural language development in accordance with the relevant linguistic content that Hugo showed at 40 months.

Finally, findings in this study both on acquisition and mediation seem useful not only for expanding the knowledge of interactions between a KODA and the Deaf parents but also for information and use in preschool. In settings with bimodal bilingual children it seems vital to inform about how these modalities work in the environment in order to understand the child's language conditions. In the wake of *baby signs* spreading over the world, the findings could make a useful contribution to professional activities such as preschools in general; the mediating actions arranging for and using gestural-visual formats would also contribute to special needs education, irrespective of hearing statuses. Additionally, the findings seem to contribute to bilingual research.

Further research

Throughout this study, the Parents simultaneously made insertions that highlighted the target, which differs from Van den Bogaerde's (2000; Van den Bogaerde and Baker 2005) data, where frequent simultaneous blending was used and was also reflected in the children's language (Petitto and Holokowa 2002; Petitto et al. 2001). Why in this study is the Parents' sparsely blending-in not reflected in Hugo's use and bimodal, bilingual acquisition? Instead, the results show that at 15 months, in private speech, he separated or code-switched the languages, but with his family up to 22 months he communicated simultaneously in both languages. Was this simultaneous communication a result of communicative conditions as Petitto and colleagues (2002; 2001) suggested and/or common underlying proficiency on the basis of which, as Cummins (1996) theorized, bilingualism develops? More knowledge is needed about bimodal-bilingual acquisition and cultural factors including various educational settings.

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