

Effects of parental style of interaction on language development in very young severe and profound deaf children[☆]

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Abstract

Aims: (1) To study the influence of different styles of parent–child interaction in the language development of very young deaf children. (2) To find out if there are differences in parent–child interaction between two groups of very young deaf children following an Aural/Oral or a Bilingual approach to education. *Methods:* Subjects were selected from all deaf children in the County of Avon who were under 3 years of age at the time of first assessment, had severe or profound, bilateral, sensorineural hearing loss and no associated medical problems. There were 16 children and families at the start of the project but only 13 completed all the assessments. The Bristol Language Developmental Scales (BLADES) was used to assess both sign and spoken language development. Interaction was studied through analysis of contingency and book-reading applied to selected periods of 3 min from four videorecorded sessions, taken at 3 months intervals for a period of 1 year. *Results:* From the 13 children studied, only seven presented with some degree of expressive language measurable by the BLADES. Analysis of contingency showed that parents present with higher percentage of both Direct Related Acts and ON then their children Acts (On Acts: where both individuals are involved in the same task). Regarding bookreading, it was observed that parents often attend to child initiatives and acknowledge most of them but they make little effort to expand or use the child's message as topic for further conversation. In the reduced sample of seven children with expressive language, those with better language development had parents with: (a) higher percentage of DR acts; (b) higher percentage of ON acts; (c) higher percentage of appropriate responses to child communicative initiatives. *Conclusions:* In this small group language development seems to be facilitated by encouraging child participation and using a more contingent and child centred interaction. No significant differences were found between oral and bilingual families in terms of quality of interaction. © 2002 Elsevier Science Ireland Ltd. All rights reserved.

Keywords: Deaf children; Interaction; Language development

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1. Introduction

Interaction studies, initially, between hearing parents and children, became popular in the late 1970s and seemed to indicate that parental style of interaction played a crucial role in the overall development of normal children [1–6]. This type of research soon extended to include mother–child pairs where the child had some form of impairment.

The questions professionals and researchers set themselves were of three kinds. Did the impairment, whether of a motor, cognitive or sensory nature, alter the usual patterns of parent–child interaction as seen with normal children? If so, in what way? And, if parents behaved differently, were the differences conducive to encourage progress in the child or did they have a negative effect?

Although generally aimed at finding answers for the above questions, research on interaction with hearing impaired children took different forms, since it had to take into account the hearing status of the parents and the mode of communication.

The majority of works focused on comparing interaction between two groups only: hearing mothers and their hearing or deaf children [7–15].

A few studies included deaf mother–deaf child pairs, together with the two groups mentioned above, and in others the hearing mother–deaf child group was also divided according to educational programme [16–20].

In general the outcome of these studies indicated that, in comparison with hearing mothers–hearing children pairs, hearing mothers of deaf children were more dominant, less responsive and not tuned to their child's cognitive ability. On the other hand, deaf children were less responsive, less compliant and participated less when interacting with their hearing mothers. As a dyad, hearing mother–deaf child pairs established much less complex interaction, spent less time in joint activities and seemed to show less enjoyment.

It is important to stress at this point that many of the differences described in these studies are qualitative. They reflect not just a delay in the establishment of parent–child interaction but actually show very abnormal patterns of interaction.

Finally, those studies that compared deaf children in Aural/Oral and Total Communication Programmes, report that the differences described above are more obvious in the first case and much attenuated in the second [16,17]. However, it is the level of communication and not the communication mode per se which seems to play a role in determining quality of interaction. When deaf children are divided according to their communicative ability, irrespective of communication mode, those who are better communicators, show an interaction pattern closer to that of hearing children [18].

The present study is part of a wider research project mainly designed to assess language and cognitive development in very young severe and profound deaf children. Spontaneous samples of spoken and signed language were obtained from video-recorded play sessions between parents and children. While analysing the language samples it was interesting to notice that children with the same degree of hearing loss, similar cognitive development and the same type of intervention seemed to be acquiring language at very different rates. Observing the various parent–child pairs in the video-recordings one could not help noticing the striking differences in parents' attitudes when interacting with their deaf child. These different interaction patterns could very well be playing a major role in holding back or facilitating the deaf child's language development. To verify this hypothesis an analysis of parent–child interaction was designed with two main objectives:

1. To find out if quality of interaction, that is, a more successful flow of verbal or nonverbal communication is associated with improved language development?
2. To determine if there are differences in parent–child interaction between children following an oral only or a bilingual approach to education.

2. Subjects, materials and methods

The study took place in Bristol, capital of the English County of Avon. The total population of Avon is estimated to be 837 500 inhabitants of which 164 920 are children aged 0–16 years.

2.1. Subjects

Subjects included all deaf children living at the time in the County of Avon who fulfilled the following criteria:

1. under 3 years of age at time of first assessment;
2. severe to profound, bilateral, sensorineural hearing loss;
3. no other major health problem.

2.1.1. Age and gender

Of the initial group of 16 children meeting these criteria, only 13 continued until the end of the study. Their age ranged from 9 to 36 months. There were seven girls and six boys.

2.1.2. Family background

Families varied considerably in financial status, level of parental education, number of children in the family and marital status. The Registrar General's Classification determines social class, according to parental occupation. To assess the socio-economic situation of these families, the occupation of the parent who was the main bread winner was used.

Number of families per social class.

Social class	Number of families
I	2
II	2
III	4
IV	2
V	3

2.1.3. Cause of deafness

The cause of deafness was genetic in two cases, possibly associated with prematurity in two and unknown in nine.

2.1.4. Degree of hearing loss

Four children were severely deaf (average of 70–90 dB across frequencies in the better ear),

and nine were profoundly deaf (average of over 90 dBHL across frequencies in the better ear). Subject 8 had worse hearing levels at the beginning of the study but hearing improved after an associated conductive problem was treated.

The hearing levels shown in Table 1 are all unaided levels, from the better ear. Those on the left were obtained either by Pure Tone Audiometry or behavioural testing, at the time the project started. Based on those, the children's hearing loss was classified in severe or profound. Those on the right represent the latest available audiometric results, all by Pure Tone Audiometry, at the time this study was being concluded. For subjects 6 and 9, it was not possible to obtain recent hearing levels. There are slight variations in audiometric results with time, but these do not alter the initial classification. The only exception is subject 8 whose recent hearing levels, if present initially, would have precluded his being part of the project. However, even with these improved levels, this child is still presenting significant language difficulties. Average age of diagnosis for this group of children was 11 months.

2.1.5. Hearing aids

All children were fitted with hearing aids within 1 month of obtaining a definite diagnosis. Hearing

Table 1

Unaided hearing levels in the better ear, for frequencies 0.5 kHz–4000 Hz in dBA or dBHL at the start of the project (left) and recently (right)

Subjects	0.5 kHz	1 kHz	2 kHz	4 kHz
1	–/65	80/90	95/95	95/120
2	95/90	105/105	115/115	120/115
3	NR/NR	95/NR	NR/NR	NR/NR
4	NR/NR	NR/NR	NR/NR	NR/NR
5	85/90	85/95	100/100	90/90
6		105	100	110
7	NR/100	NR/120	NR/NR	NR/NR
8	70/30	55/40	70/40	70/45
9	NR	NR	NR	NR
10	NR/100	NR/105	NR/115	NR/115
11	80/55	90/85	90/80	80/75
12	NR/100	NR/115	NR/NR	NR/NR
13	NR/110	NR/NR	NR/NR	NR/NR

aid use was observed to be consistent for the majority of children. Review clinics for hearing aid users took place regularly, usually every 3 or 6 months, according to the cases.

2.1.6. Cognitive ability

Children's cognitive ability was assessed, at the start of the project, with the Griffiths Mental Developmental Scales. Their General Developmental Quotients (GDQs) ranged between 83 and 136 with a mean of 106. General Developmental Quotients follow a normal distribution in the same way as Intelligence Quotients and the average range lies between 75 and 125. Two children in this study had GDQs above average (134 and 136).

2.1.7. Communication mode

All families in Avon were offered the possibility of following either the aural/oral (A/O) or the Bilingual approach to their children's education, after careful discussion of both methods. Four families chose to follow an A/O programme while nine participated in a programme which included exposure to British Sign Language (BSL) soon after diagnosis.

2.1.8. Support from peripatetic services

Visiting teacher support began immediately after diagnosis and the peripatetic teacher was usually present during the first hearing aid fitting. Counselling and guidance was provided to all families throughout and after diagnosis. Subsequent peripatetic support differed according to the communication mode adopted by the families.

2.1.9. Educational provision for children in aural/oral programmes

1. Weekly home or nursery visit by peripatetic teacher.
2. Speech training was not routinely provided in this age group. Provision and amount of speech training depended mainly on the age and level of communication of the child, as well as the parental interest.
3. Early placement in mainstream nurseries was available and encouraged. Advice was pro-

vided to the nurseries by the peripatetic teachers.

4. Attendance to parents' group. This group met once a week and parents were able to choose between attending a talk on some relevant subject or a language group where they could learn about language development and how to stimulate their child's spoken language progress.

2.1.10. Educational provision for children in the programme with sign

Children following a Bilingual approach (BIL) had access to exactly the same services as above, plus:

1. Optional weekly sign classes for parents provided by the pre-school service for deaf children.
2. Contact with deaf adults/families also organised by the pre-school service for deaf children.
3. Children attending mainstream nurseries had the support of a deaf adult in the nursery, usually once a week.
4. Sign enrichment group. One morning a week, some of the children attended a special group in the School for the Deaf, where only deaf staff were involved.

2.2. Assessment tools

2.2.1. The Blades

Language was assessed by using the Bristol Language Developmental Scales (BLADES) [21]. The BLADES is a test of expressive language. It was chosen because it does not require verbal commands, is applicable to very young children (from 15 months onwards) and has a Syntax Free Scale which can be used with both spoken and signed languages.

The BLADES was standardised following a large longitudinal study of language development which took place in Bristol and was part of the Bristol Language Projects directed by Gordon Wells. A group of 128 children from across the social scale participated in the study. Samples of

Table 2
Language levels and corresponding median age and age range in months

Level	Age in months	Range
I	<15	<15–21
II	21	<15–24
III	24	15–30
IV	27	18–36
V	30	21–42
VI	36	24–51
VII	42	27–57
VIII	48	33–>60
IX	57	39–>60
X	>60	45–>60

naturalistic speech were collected in these children's homes, every 3 months from 15 to 60 months of age. They were then analysed in terms of their conversational purpose and semantic and syntactic features. Results of this analysis have shown that children develop language in a certain order, that is, the emergence of language items follows a sequence that is the same for all children. The BLADES is based on this fact and includes three main areas of language performance: pragmatics (the purpose for which language is used in conversation); semantics (the meanings that are expressed); and syntatics (the form and structure of language). For each of these areas there are ten developmental levels. To be assigned to a certain developmental level, children have to show evidence of having mastered a minimum number of items in that level. That number is the criterion score for the level.

Based on the research outcomes of the Bristol longitudinal study, it is possible to associate each BLADES level with a certain age which is the median age in months at which the children in the original sample reached those levels.

Table 2 represents the median age in months at which levels were obtained in the standardisation sample.

In this study, assessment of language development is carried out through analysis and coding of the child's language samples. These samples were transcribed from the videorecorded play sessions described before.

2.2.2. Interaction measures

All 13 children were included in this analysis and for each child and from the videorecorded sessions, four periods of 3 min, corresponding to the four sessions throughout the year were analysed (both for Contingency and Bookreading).

Note: Both the study of contingency and bookreading analysis were previously used by S. Gregory and S. Barlow (1986) and adapted to this study with permission.

2.2.3. Several measures of Interaction were used

2.2.3.1. Contingency analysis. Recording in a pre-determined period of time the number of child acts directly related to those of the mother and vice-versa.

The study of contingency analyses the acts of one element of the parent–child pair in relation to the previous act of the other. For the purpose of this analysis, all acts of the parent and all acts of the child, within a 3 min period, were recorded separately. For each act, whether of the mother or of the child, the actions of the other, just prior to the act or following it were also noted. The acts of both the mother and child were analysed separately. The person whose acts are being analysed is described as the actor.

Definition of act. An act is an event in the stream of behaviour. An example would be to pick up a piece of toy and put it in position. A new act commences when there is a shift of focus of attention, or after a pause. Acts which are irrelevant for the stream of behaviour such as pushing a toy out of the way, or serve only to facilitate the activity, such as standing up a toy which has fallen over, are ignored.

Within the contingency analysis, the following were considered:

1. The total number of acts separately for children and for parents (TNAs).
2. The percentage of directly related acts (DR acts) both for children and parents, that is, the percentage of the child's acts which followed directly from the previous act of the parent and visa versa.

3. The percentage of ON acts (ON acts), that is the acts where both individuals were involved in the same task. This was also analysed separately, from the point of view of the child and from the point of view of the parent. The task which is ON is the one in which the actor is engaged.

2.2.3.2. Book-reading analysis. Three aspects of this activity were considered separately.

Time of joint attention to book (TJA). In each session, within a 3 min period, a record was made of the total number of seconds when both parent and child were engaged in looking at or communicating about the same pictures in a book.

Number of child's communicative initiatives (CCIs). In each session, the number of spontaneous communicative initiatives by the child and parental responses to those were recorded. In a communicative initiative the child attempts to convey a message. This may take the form of describing an action, making a request or it may also be a point but associated with naming and calling parental attention, by looking or touching.

Number of successful points to the book (SPs). In each session, the number of points to the book made by each pair was recorded. A point to the book was defined as an action by which parent or child point or mention a picture in the book, without actively calling for the other's attention. If the other element of the pair attended to the point, that was considered as a successful point.

2.2.4. Indicators of quality of interaction

Within the contingency analysis:

- Higher number of total acts, since this would indicate a more active interaction and therefore more fluent communication.
- Higher percentage of DR acts and ON situations, both for the parent and child, since this would indicate a more effective flow of communication and improved attention to the other partner's activity.

Within the bookreading analysis:

- Increased TJA.
- Higher number of CCIs, and more important, higher percentage of appropriate responses by parents. An adequate response would be one

that shows real understanding and expands on what the child was trying to communicate. Simple repetition and acknowledgement were not considered.

- Increased attention to the other translated into higher percentage of successful points to the book.

2.3. Assessment schedule

The assessments took place throughout 1 year and were based on four video-recorded sessions of free and structured play between parent and child at 3 month intervals. The duration of each session was 30 min.

Assessment of language development was carried out through analysis and coding of the child's language samples which were transcribed from the 4 × 30' video-recorded play sessions.

For the study of contingency and for each child, a period of 3 min out of each of the four 30' sessions, was selected. During this particular period, parents and children played with miniature house toys.

For the study of book-reading, the first 3 min of book reading activity, within each of the four video-recorded sessions were used.

3. Results

3.1. Assessment of language development

Of the initial 16 children only 13 completed all the assessment sessions. Of these, only seven showed some degree of expressive language measured with the BLADES.

Before entering into a more detailed analysis of the language development of the older seven children, something needs to be said about the other six children's communicative behaviour.

3.1.1. Communicative behaviour of the six children with no expressive language

Interest in communication seemed to vary among these children. Children 8, 12 and 13 were very alert and eager to interact with their parents and made use of facial expressions to communi-

Table 3

Communicative behaviour of the six children who did not yet present with expressive language

Subjects	Age (months)	HL	Com. mode	Vocalisations	Facial expressions	Gestures	Calls for parental attention	Imitated signs or speech
8	18/27	S	BIL	+++	Yes	Yes	Yes	No
9	18/27	P	A/O	++	Yes	Yes	Yes	No
10	18/27	P	BIL	++	No	No	No	Yes
11	15/24	S	BIL	+	No	No	Yes	Yes
12	12/21	P	BIL	++	Yes	Yes	Yes	Yes
13	09/18	P	BIL	+	Yes	Yes	Yes	Yes

cate mainly surprise and annoyance. In at least one case, gestures were also frequently used. Child 8 used gestures to express wants (requesting a toy) and pointing followed by visual contact for the same purpose or just to share information (pointing to pictures in a book).

Table 3 summarises the communicative behaviour of these six children.

Four children were beginning to imitate sign (children 10, 11, 12 and 13) but this happened only in the last session and imitations cannot be scored with the BLADES.

Table 4 shows the language levels obtained for the other seven children and the corresponding language delays. None of these children presented with normal language development. The BLADES levels obtained ranged from I to IV, which corresponds to language delays between 24 and 6 months.

Table 4

Results of language assessment

Subjects	Age (months)	Level of HL	Com. mode	BLADES level	Language level (months)	Language delay (months)
1	36/48	S	A/O	II	21	24
2	33/45	P	BIL	II	21	21
3	30/39	P	BIL	III	24	15
4	30/39	P	BIL	I	15	24
5	30/39	S	A/O	IV	27	12
6	30/39	P	A/O	IV	27	12
7	21/30	P	BIL	III	24	6

3.2. Contingency analysis

3.2.1. Total number of acts (TNAs)

The average number of acts per session ranged between 10 and 24 for parents and 12 and 21 for children. For both groups it was noticed that it increased with the child's age.

There was no correlation between language delay and TNAs for parents. There was, however, some association between language delay and TNAs by the children, showing that, children who participate more in the interaction, present with less language delay (Fig. 1). For the purpose of this comparison, only the reduced sample of seven children was used since, as described above, the other children had no measurable expressive language.

In this sample, communication mode does not seem to influence the above association. With

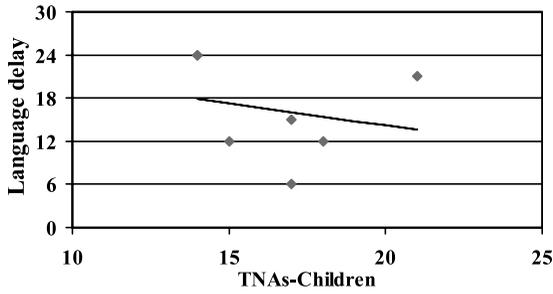


Fig. 1. Language delay and TNAs by children.

only one exception, the trend is similar to Oral and Bilingual children. NB: In graphs one, six and seven only six dots seem to appear. This happens when two pairs have exactly the same X and Y values.

3.2.2. Analysis of DR acts

Generally, percentage of directly related acts is higher for mothers than for children. This would be expected since mothers are supposedly more attentive to what children are doing.

Both mothers and children in the oral group have slightly higher percentage of DR acts than mothers and children in the bilingual group, although the differences are small.

The graphs in Figs. 2 and 3 attempt to compare language delay and percentage of DR acts for parents and children.

With one exception, children who achieve higher language levels with the BLADES (less language delay) tend to have higher percentage of DR acts (Fig. 2). The child who does not obey the correlation (yellow dot) is a child who presents with higher percentage of DR acts than his mother. In this case,

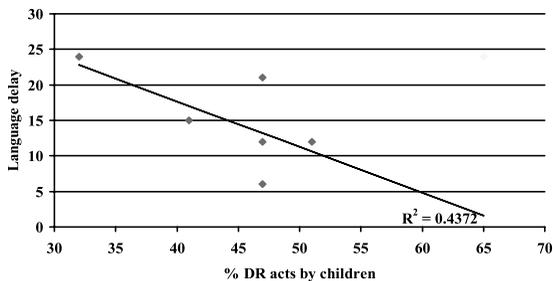


Fig. 2. Language delay and percentage of DR acts by children.

mother is very controlling and the child very well behaved and attentive. His language is however quite delayed. If this child is not considered the value of *r* is actually 0.466.

The association is slightly more obvious with parents' percentage of DR acts and language delay (Fig. 3). In this case, higher percentage of DR acts that is more attentive parents is consistently associated with less language delay on the part of their children.

Considering the percentage of DR acts, for parents and children throughout the year, it is also interesting to notice that children with better language development have parents who consistently present with slightly higher percentage of DR acts in every session. Figs. 4 and 5 compare the performance of two mother–child pairs across the four sessions. Language delay for the child in Fig. 4 is only 6 months while it is of 24 months for the child in Fig. 5.

3.2.3. Analysis of percentage of ON acts

Similar to what happened with DR acts, parents are more on task with their children than vice versa.

Both mothers and children in the A/O groups seem to be more on task with each other than subjects in the Bilingual group. The differences here are even greater than in the case of the DR acts.

There is no correlation between percentage of ON acts and Language Delay, where children are concerned. For the parents, however, with one exception (same child as in the analysis of DR acts), the graph seems to indicate again that parents more attentive to their children's actions have children with less language delay (Fig. 6).

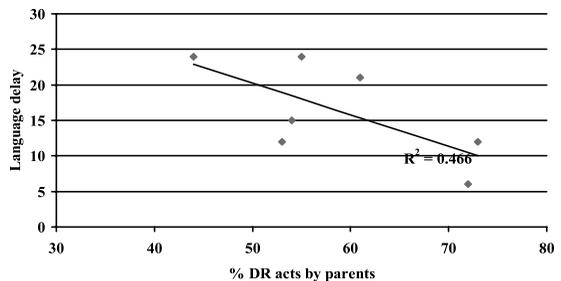


Fig. 3. Language delay and percentage of DR acts by parents.

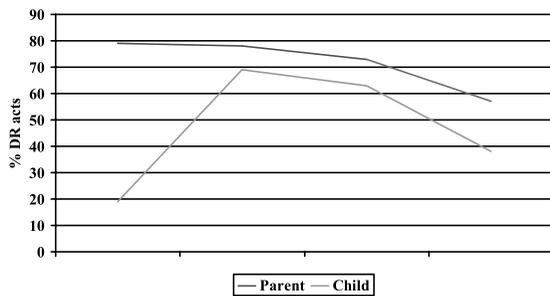


Fig. 4. Percentage DR acts for mother and child pair where language delay is 6 months.

3.3. Book reading analysis

3.3.1. Analysis of time of joint attention (TJA)

TJA seems to increase with the age of the child, irrespective of other factors. This becomes more obvious when TJAs for each age group are listed and averaged.

Considering the averages of TJA in all sessions for Bilingual and Oral/Aural groups, the difference between the two groups is negligible (A/O = 153s; Bil. = 149s).

Also with this particular activity, no association was found with language delay.

3.3.2. Analysis of child's communicative initiatives (CCIs)

Generally, number of communicative initiatives by child increases with time. More children showed CCIs at the 4th session than at the first.

Average of total number of CCIs is higher for Bilingual than for A/O children (4.7 and 3.5, respectively), but percentage of CCIs which have appropriate responses by parents, seems to indicate that parents in the A/O group are slightly more attentive to their children. These differences are, however, not significant.

Considering now the reduced sample of seven children with expressive language, Fig. 7 shows that, there is no real association between number of CCIs and language delay. The association between language delay and percentage of appropriate responses by parents is, however, much more obvious. This finding seems to confirm previous reports regarding the facilitative effect of parents'

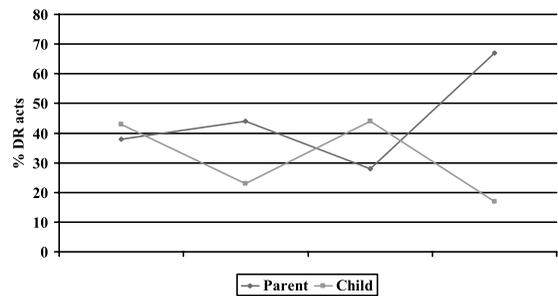


Fig. 5. Percentage DR acts for mother and child pair where language delay is 24 months.

expansions of their children's utterances on language development.

It is interesting to note that the two children with more language delay (both 24 months delayed), show very few CCIs and none of them are adequately answered by parents.

4. Discussion

4.1. Contingency analysis

In this study, although parents present slightly higher number of acts than children, the differences are not significant. This is slightly in disagreement with some of the previous research where children initiated interaction much less than mothers [10,16].

Also, contrary to previous findings, in this study both parents and children's contributions increase with age. Parent-child interaction in this particular group, although limited in some ways, does not seem to be deteriorating as observed in other studies [9,14].

An important finding of the present analysis is the association between quality of interaction and language progress. Quality indicators such as TN-Acts by child, and percentage of DR and ON acts from parents show some association with language development. This supports evidence from previous works suggesting that a more contingent and child centred interaction seems to facilitate language development [6,13].

It has also been observed that comparison of

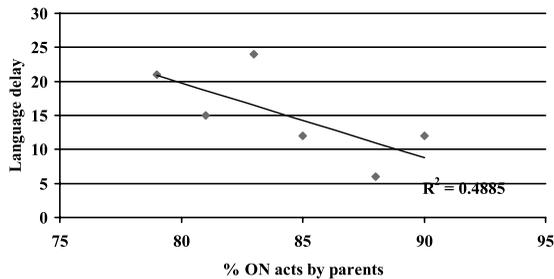


Fig. 6. Language delay and percentage of ON acts by parents.

the percentage of DR acts of mothers and children throughout the year with language delay, shows that children with better language development have mothers with consistently higher percentage of DR acts.

In this study, because of the small numbers involved, it is difficult to draw conclusions about the impact of different educational approaches on the quality of interaction. It was expected that children and parents in the Bilingual Programme would present with more effective interaction. In fact besides being exposed to BSL, these families also had the advantage of having been in contact with deaf adults who, as part of their role, advice families on the different and more effective patterns of communication normally used among deaf people.

Instead it was observed that quality of interaction between Bilingual and A/O children was rather similar, although A/O children present with slightly higher percentage of DR and ON acts both for mother and child. The works of Meadow et al., and Greenberg had suggested, on the contrary, that Bilingual programmes had a positive effect on parent–child interaction.

Adding to this, it is also possible that parents in the Bilingual group, although receiving guidance to improve interaction with their children, may find it extremely difficult to understand and adopt those patterns of communication in their daily routines. This is possibly one of the most difficult tasks presented to parents in a Bilingual Programme, more difficult even than the learning of BSL. It requires a completely different frame of mind and a great deal of conscious effort which is not easy to maintain, at least in the first stages of exposure

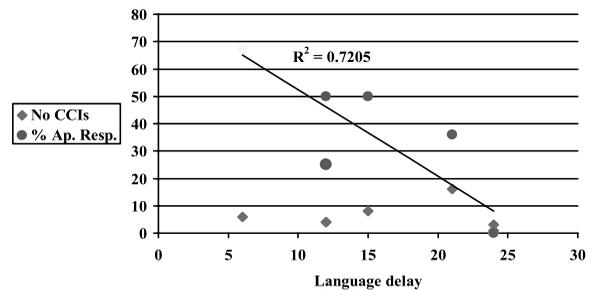


Fig. 7. Language delay, number of CCIs and percentage of appropriate responses by parents.

to BSL as was the case for all these families with the exception of the deaf–deaf pair.

This reinforces the suggestion of Gregory and Barlow [19], that teaching BSL alone does not lead to better interaction, and Bilingual programmes must include ample opportunities to train deaf children and their parents the adequate models of interaction which will then allow them to use BSL in a much more effective way.

It is possible that the problem with the Bilingual families in this study might be an insufficient provision of that specific training.

4.2. Bookreading analysis

Considering the results of the bookreading analysis, the first striking observation is that all interaction measures related to child's participation, show a steady improvement with age in the same way as described for the total number of Children's acts in the Contingency analysis. This happens for, Time of Joint Attention to the book, number of Child Communicative Initiatives, number of Child's points to the book and percentage of parents' points attended by child.

Increased child participation in the interaction with age is a feature of normal childhood development. In the presence of communication difficulties, child participation was expected to be affected in some way. The fact that this does not seem to happen with the majority of these children, may be a positive consequence of the guidance received by most of these families, which, although, perhaps, not sufficient, is very likely preventing a more severe breakdown in parent–child interaction.

A strong positive association has been shown between percentage of adequate responses to CCI by parents and language development. This finding confirms, once again, that attending to children's communicative initiatives and using them to expand the conversation, is a strong facilitative factor in language development. [6,20].

Measures such as TJA to the book and percentage of successful points to the book both for parents and children, did not reveal any particular associations with language development.

As in the analysis of contingency, comparing parents and children behaviour in the A/O and bilingual groups, some differences can be observed but they never reach significant proportions.

Generally, however, it is possible to say that no significant differences were found between oral and bilingual families in terms of quality of interaction.

5. Conclusions

In the same way that certain characteristics of parental speech seem to influence language development, the general attitude and behaviour of parents when interacting with their children, is also believed to have an effect not only on language but also on their social and emotional behaviour.

Each individual is born with a pre-determined set of genetic characteristics that will influence his/her overall development, personality and social adjustment. Since early this century, however, studies by psychiatrists and psychologists have demonstrated the enormous influence of child rearing attitudes and parental behaviours on the ultimate development and personality features of the child.

Of all conditions that may affect interaction, deafness, due to its pervasive effect on communication, is possibly one of the most disruptive for parent-child interaction.

This study intended to look at the possible influence of different styles of interaction on the language progress of young deaf children.

It is well known that language progress in deaf

children suffers the influence of many different factors. For that reason clear associations between outcomes and specific variables are difficult to establish. The problem is compounded when samples are small as is very often the case.

On the other hand, certain variable-outcome associations, although never reaching statistical significance, have been described frequently enough in works from different authors and should be given some consideration.

This study is no exception both in the small size of the sample and the number of variables that needed to be taken into account. Even considering only severe and profound deafness, differences in hearing ability can be wide enough to have some influence on language development. The same can be said about differences in cognitive ability even when the normal range is considered.

Some of the findings, however, reproduce those of previous studies and may therefore add strength to specific currents of opinion.

Overall, outcomes of the study in this particular area support the initial hypothesis that certain features of parent-child interaction do seem to play a facilitative role on language development.

Evidence from this and other works indicate that language development seems to be facilitated by encouraging child participation and using a more contingent and child centred interaction. In other words the most facilitative aspect in parent-child interaction is a high degree of contingency from parents. They should allow children enough initiative but be also highly responsive and follow the child's interests in play or conversation.

It could be argued that parents' style of interaction could, in turn, be influenced by the child's level of communicative ability and this is likely to happen to some extent. On the other hand, in this study, it is quite obvious from the videorecordings that parents' personality and attitudes are strikingly different from the very beginning, at a point when children's communicative ability is quite similar. It can also be observed that those attitudes and particular styles of interaction remain the same throughout the year irrespective of wide differences in the children's language progress.

Finally, the findings in this study highlight the need to provide parents with the knowledge of what constitutes a more facilitative interaction and actually teach them how to put it into practice. Apart from the above aspects which generally apply to all children, deaf or hearing, hearing parents of deaf children also need help to adjust their interaction and conversational style to the child's specific needs. While communicating with deaf children more reliance should be put on the visual channel. Also, if sign language is the medium of communication, parents need not only be proficient or, at least ahead of the child in this language, but understand that there is a need to divide the child's attention between the signs and the object or situations they refer to.

It had been expected that, because of their contact with deaf adults and the specific advice received from them, parents in the bilingual programme would find interaction easier. As explained before this was not the case and, although some parents made an effort to adjust themselves to the specific needs of the child, they found great difficulty integrating those adjustments without disrupting the flow of interaction.

This is possibly an area where more specific intervention in the form of advice and practical teaching for parents may bring about very positive effects on the general progress of deaf children.

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References

- [1] T.G. Cross, Mother's speech adjustments: the contribution of selected child-listening variables, in: C.E. Snow, C.A. Ferguson (Eds.), *Talking to Children: Language Input and Acquisition*, Cambridge University Press, Cambridge, 1977.
- [2] M. Lewis, L.A. Rosenblum, *Interaction, Conversation and the Development of Language*, Wiley, New York, 1977.
- [3] R. Ellis, G. Wells, Enabling factors in adult-child discourse, *First Language* 1 (1980) 46–62.
- [4] C.E. Snow, Social interaction and language acquisition, in: P.S. Dale, D. Ingram (Eds.), *Child Language: An International Perspective*, University Park Press, Baltimore, 1981.
- [5] S. Barnes, M. Gutfreund, D. Satterly, G. Wells, Characteristics of adult speech which predict children's language development, *Journal of Child Language* 10 (1983) 65–84.
- [6] M. Tomasello, J. Todd, Joint attention and lexical acquisition style, *First Language* 4 (1983) 197–212.
- [7] H.S. Schlesinger, K.P. Meadow, *Sound and Sign: Childhood Deafness and Mental Health*, University of California Press, Berkeley, 1972.
- [8] P. Brinich, Childhood deafness and maternal control, *Journal of Communication Disorders* 13 (1980) 75–81.
- [9] J. Wedell-Monnig, J.M. Lumley, Child deafness and mother-child interaction, *Child Development* 51 (1980) 766–774.
- [10] S.W. Hengeller, P.F. Cooper, Deaf child-hearing mother interaction; extensiveness and reciprocity, *Journal of Paediatric Psychology* 8/1 (1983) 83–95.
- [11] S.W. Hengeller, S.M. Watson, P.F. Cooper, Verbal and nonverbal maternal controls in hearing mother-deaf child interaction, *Journal of Applied Developmental Psychology* 5 (1984) 319–329.
- [12] T.G. Nienhuys, J.A. Tikotin, Pre-speech communication in hearing and hearing impaired children, *Journal of the British Association of the Teachers of the Deaf* 7 (1983) 182–194.
- [13] T.G. Nienhuys, K.M. Horsborough, T.G. Cross, A dialogic analysis of interaction between mothers and their deaf or hearing preschoolers, *Applied Psycholinguistics* 6/2 (1985) 121–139.
- [14] A.R. Lederberg, C.E. Mobley, The effect of hearing impairment on the quality of attachment and mother-toddler interaction, *Child Development* 61 (1990) 1596–1604.
- [15] L.S. Koester, Face-to-face interactions between hearing mothers and their deaf or hearing infants, *Infant Behaviour and Development* 18 (1995) 145–153.
- [16] K. Meadow, M. Greenberg, C. Erting, H. Carmichael, Interactions of deaf mothers and deaf preschool children: comparisons with three other groups of deaf and hearing dyads, *American Annals of the Deaf* 126 (1981) 454–468.
- [17] J. Greenberg, R. Calderon, C. Kushe', Early intervention using simultaneous communication with deaf children, *Child Development* 55 (1984) 607–616.
- [18] M.T. Greenberg, Social interaction between deaf preschoolers and their mothers: the effects of communication method and communication competence, *Developmental Psychology* 16/5 (1980) 465–474.
- [19] S. Gregory, S. Barlow, in: B. Woll (Ed.), *Interactions between deaf babies and their deaf and hearing mothers, Papers from the Seminar on Language Development and Sign Language*, Monograph No. 1. International Sign

- Linguistics Association, Centre for Deaf Studies, University of Bristol, Bristol, 1986.
- [20] T.G. Nienhuys, T.G. Cross, K.M. Horsborough, Child variables influencing maternal speech style, deaf and hearing children, *Journal of Communication Disorders* 17 (1984) 189–207.
- [21] M. Gutfreund, M. Harrison, G. Wells, *Bristol Language Development Scales, Manual*, Nfer-Nelson, 1989.