

Research Report

Vocabulary Evaluation

Anne Tucker (2002)

Introduction.

The purpose of this investigation is to ascertain whether hearing children benefit from the introduction of the "Signs for Success" programme. It intends to consider the impact of using sign language on young children's vocabulary development, which is crucial to their future language acquisition. Furthermore it proposes to discover its effect on age, gender, ethnicity and additional needs.

It is intended that the study will be implemented using two groups of children for a period of ten weeks. One group will receive sign intervention and the other group for comparison will experience no sign. During teaching sessions with the signing group signs will be introduced simultaneously with spoken English. To determine the effect of the sign intervention both groups will be assessed at the beginning and the end of the project. Finally, it is proposed to ascertain the views of teachers and parents on the benefits of using sign with hearing children.

The research will take place in a large nursery school with three and four year olds from a variety of ethnic backgrounds. It is in an area close to the city centre with high levels of unemployment and single parent families. It is part of an Education Action Zone (EAZ).

The study was prompted by concerns about the speaking and listening skills of the children. This was highlighted during a recent OFSTED inspection, which stated that they were below the national average. There were increasing numbers of children entering the nursery with listening and attention difficulties and communication difficulties.

The teacher researcher has been the Special Needs Co-ordinator at the nursery for several years. She began a programme of accredited study with a university

on inclusive education. This prompted developing links with the early years class at a school for the deaf. Staff became interested in sign language. Then more recently the EAZ funded a project in the area also encouraged teachers in local schools to use sign with young children. Robinson, who led a training session at the nursery, inspired the signing initiative. She extolled the advantages of using sign to improve children's language and literacy development. As result the teacher researcher was motivated to attend training sessions teaching sign led by a deaf tutor.

The EAZ evaluates the signing initiative at local schools. The teacher researcher was encouraged to begin her project by the comments of a nursery teacher who was already using sign with her children:

"It has helped using signs when talking about feelings and other abstract concepts. Signs are pictorial. They help the children to understand."

This clearly promoted the benefits of using an iconic system with children who are underachieving in their speaking and listening skills.

Literature Review.

Most research, in the field of sign language and non-verbal communication, was based in America during recent decades. Initially it focused on the hearing children of deaf parents but recently it has involved hearing children in schools and pre-schools. Daniels is recognised as the most prolific researcher on the subject. The majority of her research involved hearing children in early years education. She has directed three studies involving experienced teachers and large groups of pre-kindergarten children who are analogous to nursery children in England. This investigation closely resembles Daniels' (1993) second study, which is described later. There are similarities in the children's ages, the methodology and the teaching programmes used in each study.

Daniels research with children of nursery age.

Daniels' (1992) study involved sixty poor black African American (AA) children from four nursery classes. Two classes received sign intervention and the remaining classes received no sign instruction. When the project concluded the children were assessed using the revised version of the Peabody Picture Vocabulary Test (PPVT-R), which measures hearing children's receptive vocabulary. There was a dramatic difference in the results between the signing and non-signing groups. The signing children's vocabulary had improved

substantially to almost the national average.

To substantiate these findings, Daniels (1993) directed a similar study involving seventy- six children, all except one white child, were AA. It is the methodology of this study that the teacher researcher intends to replicate. The difference between Daniel's first and second studies was that the PPVT-R assessment was also administered prior to the investigation in the second study. Its purpose was to show that the signing children did not start with an advantage. These pre-test results indicated the scores of the two groups were almost identical at the beginning of the study but by the end of the study there was a dramatic difference. The signing group therefore had made much greater progress. Daniels' next study followed the progress of the signing group of children from her (1993) research, during their kindergarten year. When tested at the end of the following year the improvements in the children's receptive vocabulary during the pre-kindergarten year had been maintained.

Daniels' (1994) research also considered whether the teacher's signing experience had affected the children's results. Her study of one pre-kindergarten teacher, who had no previous signing experience, for a period of three years, concluded that the children's scores increased in conjunction with the teacher's experience. However, Daniels' (1997) study of a kindergarten teacher of white children showed no appreciable difference in the test results as her experience increased. These differing results Daniels suggests occur because the signing strategy had the greatest impact on children with poorer language skills.

Daniels' research in a historical context.

Since linguists notably Stokoe (Sacks, 1990) in the 1960's, acknowledged American Sign Language (ASL) as a valid language there was a much wider acceptance of sign language. Growing interest developed in the language skills of the hearing children of deaf parents, who used spoken language and sign language. Initially researchers such as Wilbur and Jones, Philip and Elizabeth Prinz and Griffiths (Daniels, 2001) conducted studies with individual children and siblings. They concluded that ASL was acquired earlier than spoken English. The new signs and words were different thus it was concluded that the children were learning sign and spoken language as separate language systems. Crucially they suggested that the language acquisition of these children was also faster than their peers.

Results in recent studies with hearing infants of hearing parents (Garcia, 1999,

Whaley, 1999 and Goodwin and Acredolo, 2000) too, were consistent with the previous findings of accelerated vocabulary growth and syntactic development. Garcia (1999) and Goodwin and Acredolo (2000) have published manuals encouraging parents to sign with their babies, prompted by these findings. Goodwin and Acredolo (2000) long term study with children who had sign intervention as babies showed that those children continue to outperform their peers in IQ tests. Daniels' (1993) study on the lasting benefits of sign intervention would go some way to substantiating this claim.

Reynolds, (Daniels, 2001) a university professor, became actively involved in teaching signs in her daughter's nursery for two years. Reynolds noted that the children learnt effortlessly and that they retained their skills even without further sign. These findings support the conclusions of Daniels and Goodwyn and Acredolo on the lasting advantages of using sign. Reynolds suggested that it is unnecessary for teachers to be highly trained in signing before using it with young children. As a nursery teacher with limited signing experience, the researcher considers that these conclusions were encouraging for her study.

Academics have also considered the effect of using signs to improve the reading skills of, in particular, children who were the underachievers. For instance Hafer and Nashida (Daniels, 2001) concluded that signing was an effective teaching strategy for learning sight vocabulary because signs were iconic thus emphasising the meaning of the words learnt. They found that the multi-sensory approach motivated the children. Nashida also taught finger spelling to enhance phonic awareness to her class. Her class of poor Hispanic children with limited language skills when assessed using the Grey Reading Test achieved levels at or above their grade.

An inclusive project took place in England (Robinson, 1997), which explored the benefits of teaching hearing children aged five and six years, BSL in a school where deaf children were integrated one afternoon a week. To enable this process a deaf tutor worked with children and supported staff. The hearing children learnt to communicate with their deaf peers and their attitudes towards the deaf children were transformed. Robinson (1997) concludes that using BSL helped the hearing children to develop their reading skills and it has greatly benefited less able readers. An additional benefit of the project was that the deaf tutor and the hearing teacher collaborated to teach together. In their final interviews both the deaf tutor and deaf auxiliary worker suggest that the initiative could have had a

greater impact if it had begun at nursery level. Their suggestion was another incentive for the study. For the remainder of this chapter the teacher researcher intends to reflect on previous research and compare it with her investigation.

Age.

The children in the signing studies vary in age from infants of a few months to children as old as eight years. Daniels' research concentrates on young children aged between one and five at a crucial period in their language development. She intends to:

".....take advantage of this small window of optimal opportunity that exists during the pre-kindergarten years for young children to acquire language readily.this accelerated language growth period, which developmentally occurs in early childhood." (Daniels, 2001 p 34).

When comparing findings from her kindergarten study (Daniels, 1997) where the children had made less progress than the pre-kindergarten children (1994), Daniels concluded that signing was more effective with children with poorer language skills. However, the teacher researcher questions this argument was it instead due to more accelerated progress at the critical younger age. The teacher researcher intends to consider this during her investigation involving children whose mean age is three years and eleven months.

Gender

There is little evidence from research about the effect of using sign on boys and girls . An exception is Whaley's (1999) study with nursery children, which indicated that the girls used far more signs than the boys. As gender is an area that is under researched the teacher researcher intends to consider gender differences during her investigation.

Ethnicity

In her first two research projects with pre-kindergarten children Daniels notes that all the children, except for one who is white, were AA. These children had made dramatic language gains. In a later study of Daniels, with an all white group of kindergarten children, the children did not make such large language gains. Daniels concludes that sign possibly provides greater vocabulary gains for student who have greater needs. As a teacher of a multi-ethnic group of children the teacher researcher intends to consider whether children's ethnicity affects

their response to signing.

Children with additional needs.

For the purposes of the study this includes children with English as an Additional Language (EAL) and Special Educational Needs (SEN). The first research project that details children with EAL is Nashida's (1998) study. Most of the participating children were Hispanic kindergarten children, whose first language was Spanish. They entered her class with poor language skills, but with sign intervention the majority of her students were reaching the levels expected. Her study concluded that sign was really effective at teaching this disadvantaged group to read. The teacher researcher intends to consider the progress a child in Group A with EAL during the investigation.

There is only limited evidence of the effect of signing on young SEN children. For instance Robinson (1997) suggests that the less able readers, in particular, benefited from the signing intervention. Chase, (Daniels, 2001 p 97) a three and a half year old and nonverbal child, when introduced to signs by his teacher spoke his first word in less than a year. In the teacher researcher's group there is a boy who is autistic. During her investigation she intends to consider his response to using signs and any subsequent improvements to his language.

Teachers' perspectives.

Teachers involved in the research suggest a variety of advantages of using sign with their children. Reynolds noted that the pre-school children retained sign language effortlessly in comparison to her older students. Nashida maintained that sign focused the children because it was silent encouraging them to concentrate and attend. In Robinson's (1997) study the hearing teacher suggested that focussed the children visually and thereby improved their maths skills. Teachers in Daniels' study state that using sign promotes the memory and that it is motivating. A kindergarten teacher also considered that it helped children learn vocabulary and that, they enjoy sign because their whole body is involved in the process.

Teachers involved in the EAZ signing project referred to in the introduction complete evaluations. They maintained that the multi-sensory approach benefited children with additional needs for example a reception teacher stated: "It provides a means to success for children who are visual and kinaesthetic learners (most SEN)". In another reception class their teacher indicated the children's

shared enjoyment using sign: "The children see it as fun and they are eager to learn.....it enriches because it creates a sense of togetherness and mutual support." During her investigation the teacher researcher intends to formulate and distribute a questionnaire to ascertain, in greater detail, teachers perspectives in the local schools.

A description of different signing systems.

During this study reference is made to various signing systems. In England the deaf community use British Sign Language (BSL), which is analogous with American Sign Language (ASL) in the States. ASL and BSL possess a similar structure, but many of the signs differ, as the languages have developed separately. Linguists now recognise these sign languages as valid, for like other languages they have distinctive phonology, syntax and morphology. It is impossible to translate word for word for ASL and BSL use a different sentence structure to English (Sutton-Spence and Wohl, 1998).

The term Sign Supported English (SSE) is also used in this study. The signs used are identical to ASL or BSL dependant on the country where it is used. However, when using SSE the signer signs the key or important words in the sentence whilst saying them, and it is not essential to sign all the words. As the signs accompany spoken English, the word order is the same as English but it is different to ASL and BSL.

In the studies of the children with deaf parents, mentioned earlier in this chapter, ASL is used. However, in Daniels' studies the teachers used SSE and ASL.

During her investigation the teacher researcher intends to use SSE throughout the project, for, as a hearing person it is easier for her to learn SSE. It is also the signing system being introduced in all the local schools and it would therefore ensure a consistent approach on transition to school.

Teaching programmes.

The most specific information about teaching methods is detailed in the research of Nashida and Daniels (Daniels, 2000). Nashida, when teaching reading to her kindergarten students, initially encouraged the students to hear, say and sign the word, augmented by accompanying real objects or pictures. She aimed to make the words more meaningful at the start of the process. Later, when the children had grasped some signs she introduced the manual alphabet with the correct letter name and sound. The teachers in Daniel's studies all used similar

programmes to introduce signs to their children. In each case they began on the first day using sign language simultaneously with spoken English. Signs were introduced to emphasise words and stressed for commands and requests, for instance "sit, stop" and "line up". The teachers at this time also gave a sign label for each activity area and signed the activities that took place there. For lessons and stories signs are usually introduced and taught first and then as the lesson continues the children sign the words with the teacher. The children are also taught the manual alphabet as they learn the letters. The crucial element of their system is that signing is used consistently. The teacher researcher intends to use some of the strategies adopted in Daniels' studies during her investigation.

This chapter has considered the growing research into the effects of using signing systems with young children to improve not only their spoken English but also their reading and writing skills. The next chapter describes the teacher researcher's investigation into the effect of introducing signs on children's vocabulary development.

The Teacher Researcher's approach to the study.

Introduction

The empirical research took place in a large nursery school, which is situated on an estate close to city centre. The area has low socio-economic status. It has the second highest unemployment rate in the city and there is also a high incidence of single parent families and over 50% free school meals. The district with its neighbouring district forms an EAZ. This compares with the Daniels (1992 and 1993) studies in schools classified as Title 1 denoting that over 50% of the pupils qualify for free lunch. The children are from various ethnic backgrounds.

The investigation took place in the children's second term at nursery, which is the spring term. At the time of the study the nursery had sixty-one children on roll and all but two children attended full time. The setting consists of three interlinking rooms and a large outside area. The timetable allows the children the opportunity to move between the rooms and chose from a variety of activities for long periods of the day. There are times when children work in their family groups with their key worker during the morning and afternoon sessions. These groups consist of approximately ten children who also have dinner together and meet at

the beginning and end of the day.

The investigation was implemented in the following six phases:

1. Questionnaires were distributed to teachers in local schools to ascertain what they considered were the benefits of introducing signing with their classes.
2. The study group (Group A) and a group of the same size, the comparison group (Group B) were selected.
3. Both groups of children were tested using the BPVS to assess their receptive vocabulary prior to the introduction of signing.
4. The signing programme was implemented with Group A for a period of ten weeks.
5. After this period both groups were tested again using the BPVS to assess improvements to their receptive vocabulary.
6. Group A's parents completed questionnaires giving their views on how their children had responded to the signing project.

1. Teacher questionnaires.

Over a period of two years prior to the investigation, several teachers in local schools had introduced signing into the curriculum with their classes. The teacher questionnaire enquired about the teachers' experience of using signs with their class, when and how it was used and the children's responses (see appendix). Questionnaires were distributed in week 1 and they were all returned completed. The teachers' responses will be discussed in the next chapter.

2. Selection of children.

As the teacher researcher was the member of staff to introduce signing to a group of children, it was appropriate that her group of ten children were chosen as the study group (Group A). For the purposes of the study a comparison group (Group B) were selected who did not experience any signing intervention, so that the effects of signing could be evaluated. A different member of staff taught group B. They were chosen because they were based in the same room as Group A and the group contained the same number of children. All the children in the investigation had no previous experience of signing, except for taking part in a signed song during the Christmas concert.

Age – The children's ages were similar in both groups. Their mean ages were 3 years and 11 months in Group A and 3 years 10 months in Group B, merely a month's difference.

Gender -The two groups, however, contained different numbers of boys and girls. Group A consisted of three boys and seven girls and group B contained six boys and four girls.

Ethnicity -The ethnicity of the children in the groups varied slightly for in Group A there were six AC children in comparison to four in Group B. In Group B there were four white children (for the purposes of this study the term white includes White UK, White other) more than in Group A where there were two. Each group had one child from Pakistan and one child whose ethnicity was unknown.

Children with additional needs - Each group contained a boy with EAL whose spoken English was limited. In each group there was also a boy with Special Educational Needs, who both received additional support for their speech and language difficulties. In Group A the boy had more significant additional needs as he had a language and communication disorder. The boy in Group B had speech difficulties and delayed language.

Family background -There was a high incidence of single parent families in both groups eight in Group A and six in Group B. However, there was a difference between the carers' employments in each group. In Group A the employment levels were much higher than Group B. The socio-economic background of the families also differs significantly. This is indicated by the numbers of families receiving free school meals, which is two in Group A in comparison with six in Group B.

3. First assessment.

It was imperative to establish a baseline before introducing a signing system to the Group A. A recent OFSTED report stated that the children's speaking and listening skills in the nursery were below the national average but no formal language assessment had taken place. The teacher researcher chose to use the same method of assessment prior to (pre-test) and after the investigation (post-test) to measure the progress of each of the group in the study. The BPVS (Dunn, Whetton and Pentile, 1981) was chosen because it is designed to measure the children's receptive or hearing vocabulary. It is intended to indicate the extent of acquired vocabulary in each group.

The BVPS was administered because it has several advantages. Importantly it is based on the Peabody Picture Vocabulary Test or PPVT. Daniels uses the revised version the PPVT-R in her American studies. The BVPS is more appropriate for use in England because it was developed to measure children's receptive vocabulary for standard English. It is an established test and widely accepted for research purposes. The BPVS was designed for use with children of two years and above and thus would be suitable for the nursery aged children in the study. It was also simple to administer with a clear instruction manual.

The teacher researcher chose to administer the long form of the test to obtain more detailed data. She administered the test, which differs from Daniels (1993) study, where the examiner was not the teacher and was unaware of the signing and non - signing children to eliminate any bias.

The children were assessed individually in a quiet room. They were shown four pictures on a test plate. Their task was to point to the picture, which illustrates the word spoken by the examiner. The test items were arranged in order of increasing difficulty. There are training plates, which were shown first to make the children aware of what was required of them during the test. As the children were in the lower age range the teacher researcher started from the same basal, plate 1, and continued showing the plates until the subject reached the ceiling that is the point where out of eight consecutive responses there are six errors. The children's responses were recorded and used to provide raw scores, which were converted into a standardized or normative score. The BPVS was standardised on age reference groups. Therefore the data obtained would be comparable to Daniel's data.

The children were responsive and involved throughout the initial assessment. They understood what was required, including a little boy autism. The testing process with twenty children was time consuming because it took fifteen minutes to screen each child. The children were tested on two different days due to time restraints and children's absence.

4. Signing intervention.

The signing system was introduced gradually to Group A during some of the group teaching sessions. The proportion of time when signing was used by the

researcher was less than in the studies of Robinson (1997) and Daniels (1993) where signing was used during the whole timetable. In this research the group were with the signing teacher for small proportion of the day. The teacher researcher chose to use SSE in which the key words are spoken at the same time as they are signed.

Teaching strategies which were implemented during the study

Initially the signs for classroom instruction were introduced and used at group times for example 'stop', 'sit down' and 'quiet'. Other new signs were presented in themes. For instance, when introducing the signs for animals the researcher used a big book of 'Old MacDonald had a farm'. This enabled the children to see the words and pictures of the animals whilst the signs were introduced. The new animal signs were practiced during the singing of 'Old Macdonald had a farm.' When the story of 'There was an Old Woman who swallowed a Fly' was introduced the teacher used a story sack with the book. A story sack is a drawstring bag, which contains items that illustrate and develop stories with young children. This particular sack contained an old woman cloth doll with a pouch inside the mouth into which could be fed all the animals 'swallowed' in the story. Each animal was named and signed prior to the story and the repetition in the story also reinforced the signs. The items in the sack were used again in a variety of games to revise the animal signs. The signs for colours were introduced in a similar way using the big story book 'Brown Bear, Brown Bear' and singing the signed song the 'Rainbow Song.' During this process the children were exposed to a multi-sensory activity. They were able to hear the words, see objects and illustrations in the book and simultaneously touch whilst making the signs.

The teacher researcher found that using big books with the children was particularly helpful for signed stories, as the whole group could clearly see the illustrations and print. Prior to reading the stories the signs for the key words were introduced and the children were encouraged to use those signs with the teacher as the story progressed. The group were encouraged to "switch off their voices" to practice words and short phrases. Gradually other stories were used which, allowed opportunities for repetition for instance 'The enormous water melon' and 'The Gingerbread Man.' During the period of the investigation the children were also taught the signs for some foods and drinks at dinner times and fruit times. They learnt signs for feelings and numbers. As the project progressed the new signs were modelled and the children were given the opportunity to use and practice the signs.

Teaching strategies were adapted and developed during the investigation. At the first story session when the 'Little Red Hen' story was told a video was taken. Observing children while they are doing an activity is informative but the video evidence clearly showed the involvement levels and responses of individual children. At the beginning of the story all the children were engrossed as they listened to the story and attempted to sign. However, towards the end of the session some individual children were looking around and were no longer involved in the activity, and by the end of the session only three of the children were fully involved. Using this information about the children's attention skills the following sessions were reduced in length and the teacher was more aware of varying the activity to involve the majority of the group.

During the third week of the study video evidence was used again during the telling of 'The Enormous Water Melon' story with the big book. Some characters in the story were signed using the initial letters of their name for instance Wee Willy Winkie was signed WWW. It soon became apparent that the children were less responsive to using letter signs than when they used more animated signs such as 'cat' and 'dog.' Using that information the teacher chose to use more pictorial signs with the children when possible. However, in week 6 the children were shown how to sign the initial letters of their names. They responded well, perhaps because it was something personal to them. Their faces showed obvious pleasure when they were chosen to leave the carpet or give out the fruit by their signed initial letter rather than their spoken name. After two weeks the whole group responded to their initial letter when it was signed. By week 8 the children also showed an interest in signing the names of members of staff using the letter M for Miss or Mrs and the initial letters of their surnames. In the final week of the project, a chart of the manual alphabet was displayed by the group's carpet area. The children were very interested finding the letters in their names on the chart and studying the hand shapes. To reinforce finger spelling 'The alphabet song' that is the letters in the alphabet are sung in order to the tune of 'Twinkle, twinkle little star' was also introduced at the same time.

Throughout the study SSE was used with the children for about fifty percent of the group time sessions which is approximately ten percent of the day. However in Daniels' study (Daniels, 2001 pg.36) SSE was used for fifty percent of the time and used American Sign Language (ASL) for twenty five percent of the time. In Robinson's (1997) study the deaf tutor worked with the teacher and children two

days a week that is forty percent of the time.

The teacher researcher had limited experience of using signs with children prior to the study, which could be compared to the teacher in Daniels' research in Prince Georges County Maryland (Daniels, 1997 pg 42.) She had attended staff training sessions with a deaf tutor once a fortnight for a few months to become familiar with SSE. The deaf tutor responded to the teacher's requests to learn and practice signed stories and themes such as colours and feelings. This enabled the teacher researcher to present new signs to the children. A dictionary of signs also became a valuable resource to increase her knowledge of signs. The teacher researcher explained to the children that she was also learning to sign. When they asked for a new word for example 'fox', a character in the 'Gingerbread Man' story the children and teacher searched the "big book" or dictionary together. Fruit times and dinner times, when the group sat together, offered positive opportunities to use signing. In week 5 the dinnertime prayer was presented with signs. It calmed the children and focussed their attention.

The group were pleased to share their "special" skills with their friends and other members of staff. The dinner supervisor who sat with the group at dinner times also showed an interest in signing. She asked to look at the dictionary and she also quickly taught herself to sign the manual alphabet and the prayer.

Deaf Awareness

In past years visits were arranged between the nursery and the Early Years class of a School for the Deaf. During the investigation two visits were arranged involving the signing group of children. In week 2, three partially hearing children visited the nursery, with their teacher and a Learning Support Assistant (LSA), to join in activities and share a story with the study group. Then in week 10 the researcher with Group A visited the School for the Deaf in a mini-bus. The hearing and partially hearing children were able to play together and the deaf LSA signed a story, which was narrated by the hearing teacher at the school. These school links enriched the project because it led to discussions about signing as a means of communication for deaf people. The children commented on the children's hearing aids and the quietness in the classroom after the visit. It also enhanced the relationship between the two schools as staff from the School for the Deaf appreciated that the hearing children and staff were making an effort to communicate with their children.

5. Final assessment.

The BPVS was administered after week 10 in the same way as the pre-test. The resulting standardised scores could be compared with the previous scores to measure the children's receptive vocabulary development during the study. However, during the second screening, some of the children were less motivated and their concentration had deteriorated. This may be due to the fact that there was only a relatively brief interval between the two assessments.

6. Parent questionnaires

To identify the views of Group A's parents on the effects of using a signed system with their children, the researcher formulated a questionnaire. This was distributed to parents during week 9. The questionnaire used a similar question format to the one in Daniels' study (Daniels, 2001 pg 62). It enquired about the children's response to learning signs, if they had shared signs at home and whether parents' considered that the experience of signing had benefited their child (see appendix). All questionnaires were completed and returned by the parents of Group A.

The findings from data obtained during this investigation will be presented in the next chapter. The teacher researcher recorded the study in a teacher's log where she also described the responses of individual children to the signing project. Individual case studies will also be outlined in the next chapter.

Results and Discussion.

The data was gathered from three main sources during the investigation. Firstly there were two sets of results from the BPVS assessment and also there were the teacher and parent perspectives from the questionnaires.

BPVS

Following each assessment a raw score for each child was calculated. For the purpose of evaluating and comparing the children's results the raw scores were converted to standardized scores. Standardised scores indicate in standard deviation units the extent to which a subject's score is above or below the mean score for people in the same age group. To indicate the progress made by the children during the investigation the difference between the first and second standardised score was calculated (see Appendix, Table 1).

Comparing the results of Groups A and B.

The pre-test scores for each group were similar. The Mean Standardised Score (MSS) for Group A was 87.4, which can be compared to Group B's MSS of 88.2. a difference of only 0.8, which indicates the groups starting from a similar baseline. This indicated that the children had a similar level of competence with receptive vocabulary at the beginning of the project.

The results of the post-test scores indicate a substantial difference between the groups. The MSS for Group B was 90.5 and for Group A the MSS was higher at 94.7. There is, therefore a difference in the MSS between the sign and non-sign groups of 4.2 points. Although the improvement is less dramatic than in Daniels' (1993) study where the pre-kindergarten children MSS increased 17.24 on the PPVT-R, it also reflects an improvement in the signing children's language abilities.

There were also differences between the scores of individual children each group. In Group A more children's scores had increased by at least three in the second test. The most dramatic increases are also in Group A for example child 6 with an increase of 20 points, child 4 an increase of 18 points and child 8 an increase of 10 points. In comparison in Group B child 13's score increased by 15 points, child 14 by 14 points and child 15 and child 20 by only 2.

There were also some children whose scores had decreased in the post-test. In Group A one child's score decreased but in comparison in Group B four children had scores, which decreased in the post- test. Clearly the scores most affected by reductions at the post-test were in Group B.

Age

To ascertain if there was a difference between the impact of using sign with the younger and older children, the teacher researcher considered the children in two age groups at the time of the pre-test, that is those aged between 3 years and 6 months and 3 years 10 months formed the younger group and children aged from 3 years 11 months formed the older group. The younger children in Group A achieved a MSS difference of 6.4 and the older children whose MSS difference was 8.6.. In comparison in Group B the younger children had a MSS difference of 2 and for older children the difference was 2.8, which shows a less substantial difference. These results would seem to indicate that using sign has most effect on the older children. However, as this is such a small study further research

would need to be implemented to substantiate these findings.

In both younger and older groups there were children who showed a dramatic difference between their first and second scores. An example of an older child in Group A is child 1, whose score improved by 9. She showed little interest when sign was introduced and she was restless and inattentive. However, when finger spelling was introduced she learnt quickly and soon recognised other children's names from the initial letter. She became more enthusiastic and, by the end of the project was a more competent signer. An exception amongst the younger children was Child 6 who was the youngest child in Group A. In fact, her score at post-test showed the biggest improvement of 20 points. She was an enthusiastic signer from the first session and readily absorbed signs throughout the project.

Gender

In Group A the small sample of three boys achieved a remarkable difference between the pre-test and post-test scores the MSS difference was 12. The MSS difference between the girls' scores was 5.5, which although substantial was less pronounced. In contrast Group B scores barely indicate a gender difference, for the boys' MSS difference was 2.6, which is similar to the girls' mean difference which was 2.0. Thus these results would suggest significant gender differences when signing intervention takes place. However this evidence is based on a small numbers of children and would need to be substantiated by further research. Whaley (1999) also noted a gender difference in her nursery study but her conclusion differs for in her study it was the girls who seemed to use sign most and used it to communicate between themselves.

To consider an individual children more closely: the only boy who showed immediate interest and aptitude for signing was child 9 whose score difference of 8 points at the post-test showed the least improvement of the boys. He was enthusiastic at the beginning of the project and he was always involved. During the project his mother revealed that a member of his family was deaf and therefore the child had seen signing taking place previously.

Ethnicity

In Group's A and B there were four main ethnic groups. The largest of these groups were AC children. In Group A the six AC children achieved a MSS

difference of 6.8 in comparison with the four children in Group B whose mean difference scores were lower at 2.2. The two white children in Group A had increased their score dramatically at the post-test to 13.5 whereas the four white children in group B had a less pronounced increase of 3.5. In Group A the score of the child of Pakistani origin had substantially increased by 10 at the post-test. This contrasts with the Pakistani child in Group B whose score had decreased by 1 at the post-test. There is a different trend, however, for the children whose ethnic origin is unknown. In Group A child 3's score had decreased by 3 at the post-test, whereas in Group B child 18 had an increased score of 2. These results therefore, seem to imply that sign benefits most ethnic groups but it makes a considerable difference for white children and children from Pakistan.

Daniels' two studies (1992 and 1993) with pre-kindergarten children involved children who, with the exception of one white child, were AA. She argued that these children, who had poor language skills, gained most advantage from using sign to improve their English. In this investigation, however, there were four different ethnic groups and all but one were substantially advantaged by the use of sign. The White children and the child made the greatest improvement from Pakistan. However the AC children who could perhaps most closely compared with the AA children in Daniels' project had smaller increases in their post-test scores therefore challenging Daniels' assumption. Although it is significant that Daniels implemented more research and with larger groups of children on which to base her argument.

Additional needs

Firstly there were dramatic differences between the boys with EAL. Child 8 in Group A had a post-test score increase of 10 and child 16 in Group B had a post-test score that, in fact decreased by 1. These findings suggest that children with EAL particularly benefit from sign intervention, which compare with the results of Daniels and Nashida's earlier research.

Looking more closely at Child 8, he was extremely slow to settle at nursery. He did not speak at first and observed activities and refused to take part. During the first weeks of the project he seemed disinterested and unresponsive, but when the "feelings" words were introduced he was pleased to sign "happy" and "sad". He became more responsive and by week 10 he was one of the most enthusiastic signers and his mother explained that he demonstrated signs at home.

The boys with SEN had remarkably different outcomes at the post-test. Child 4 in

Group A had a pre-test standardised score of 61 but at the post-test his score had increased dramatically by 18 to 79. However, there was no difference between the scores of child 18 in Group B.

Child 4, who is mildly autistic, had great difficulty sitting at group times. He preferred to do activities of his own choice. He watched the others at times but throughout the period of the project he made no attempt to sign. He responded to the signed initial letter of his name by week 7 and soon learnt to say the names of other children when their letter was signed. It was not until much later during the following term that he began to use signs independently. His older brother responded in a similar way to sign and it was several months before he made his first sign.

These results suggest that using the multi-sensory stimulus of signing is beneficial to children with additional needs. However, the number of children was so small that, further research would be necessary to add credence to these findings

Teacher perspectives.

The teacher questionnaires were devised to ascertain their experience of signing in school, how they used signing and the children's responses. Ten questionnaires were completed by three nursery nurses and seven teachers (see Appendix). Most teachers taught early years children and on average they had two years experience using sign. They used it in a variety of different areas of the curriculum. The staff considered that, in particular, it improved their children's language and literacy skills. It has increased children's vocabulary acquisition, helped children's phonic awareness and improved their sight reading skills. One teacher responding to the questionnaire also suggested that children in her school appeared to be writing independently at an earlier age. The questionnaires were informative but on reflection the data would have offered closer comparison to this study if all the respondents had been staff in nursery schools.

These responses were very similar to those in the research of Daniels (2001) and Robinson (1997). Their experience and competence in using sign varied but all from the least to the most experienced extolled the advantages of using sign with their classes. Many of the benefits mentioned cut across age boundaries. It was considered by all to be an activity enjoyed by most children; the word "fun" is

used repeatedly and it boosted children's self confidence and self esteem. One respondent to the questionnaire also added that it promoted class group identity, as it was a shared experience. Sign was used across the curriculum from behaviour management to mathematics and all teachers stressed its use during language and literacy activities. The hearing teacher in Robinson's project has slightly different views. She was the sole exponent of the benefits of sign for teaching mathematical concepts and she considered that it only advantaged the literacy skills of children with poor concentration skills.

However what was most remarkable was that teachers involved in previous research and local teachers also voiced that they all intended to continue sign with future classes. There could be no better recommendation for the inclusion of sign in the curriculum.

Parent perspectives.

The purpose of the questionnaire was to ascertain the views of the parents of Group A on whether they considered signing had been beneficial for their children. It enabled the teacher researcher to evaluate the project. (see appendix for parent responses). There was a positive response. Eight out of ten children expressed enjoyment in sign and shared it with families and friends. The remaining children, including an autistic boy, had not expressed displeasure at learning sign. The parents expressed a variety of benefits for their children experiencing sign. They were pleased that their children were learning a new language and a different way to communicate. The children had shared a variety of different signs.

Parents' views were also sought during the research of Robinson (1997) and Daniels (2001). Robinson findings from parent interviews suggest that parents approved of their children learning to communicate in a different way and they were particularly pleased that sign was not taught as a separate subject but was, in fact, used to teach their children across the curriculum.

Parent questionnaire responses in this investigation were very similar to those in Daniels' (2001) kindergarten study. All parents completed the survey in this study in comparison to Daniels' (2001) research where the survey was completed by twenty-six out of thirty-four carers. This indicates the level of parental enthusiasm for the projects. In Daniels' study all but one of the children enjoyed sign whereas in this study two children, one of whom had SEN, displayed neither interest nor disinterest in sign.

Reflecting on this investigation it would have been more advantageous to involve and inform parents more fully about the work with their children throughout the project. The open question format of the questionnaire elicited informative responses from parents. Question 5, however, was too broad and should have been broken down into categories such as greetings, animals and feelings like the format Daniels (1997) used in her study. The responses therefore, could have documented evidence of the children's knowledge of signs.

Further reflection.

The teaching strategies used in this investigation can be most closely compared to the programmes adopted by the teachers in Daniels' research studies. It was introduced in a similar way beginning with "instruction words" and developing to include stories, finger spelling and a variety of themes. A significant difference, however, was that Daniels' teaching programmes lasted much longer and the children spent a greater proportion of their time experiencing SSE and ASL. In this investigation BSL was not used. However, SSE was particularly effective because the children experienced the visual sign and the spoken word at the same time. SSE was also a simpler method for the teacher researcher with limited experience to learn.

Although there were many similarities between the two groups selected for the investigation, it was not possible for the teaching programmes for each group to be identical. Primarily, a different teacher taught each group of children, and although work was planned jointly, individual teachers delivered it differently, which, compares with Daniels' (1993) study.

Although previous research suggests that even limited experience of using sign is effective the teacher researcher lacked in confidence using sign at the beginning of the project. She also experienced confusion due to regional variations in signs. For example two members of staff at the nursery had learnt to sign elsewhere and some signs they used were different. Regional signs also caused confusion when using the sign dictionary because several signs were different than those taught at the training sessions. The training sessions were beneficial but they were too infrequent. It would have been more advantageous to receive weekly training with another colleague thus offering an opportunity to practice in between sessions.

The findings and conclusions of this investigation are similar to those of Daniels' (1993) study. However this study goes further to consider the benefit of sign for different age groups, gender, ethnicity and additional needs. Importantly it indicates that the children who experienced sign intervention had increased competence in their vocabulary in comparison to the non-sign group. The size of a child's vocabulary is significant because it underpins the whole learning process for every word in a child's vocabulary acts as a currency for learning new words.

Conclusion and Recommendations.

Introduction.

The purpose of this empirical research was to investigate the impact of introducing a signing system to young hearing children. Sign was used simultaneously with spoken English thus a bi-model communication system was experienced by the children. It was intended to ascertain if there were improvements to the children's vocabulary acquisition and to look more closely at the impact on age, gender, ethnicity and additional needs.

Key Findings of the Investigation.

BPVS.

This test was used to assess the children's vocabulary acquisition. The data would suggest that:

- 1 The initial assessment showed that both groups began with very similar scores, which indicated their vocabulary acquisition was comparable prior to the sign intervention.
- 2 On average the children who experienced sign had substantially higher scores than the non-sign children, which would indicate that their vocabulary acquisition was improved as a result of using sign.
- 3 Experiencing sign benefited the older children in particular.
- 4 There was a gender difference. The findings indicate that using sign advantages the boys' vocabulary acquisition most.
- 5 Most ethnic groups benefited from experiencing sign but the children from Pakistan and the White children were most advantaged.
- 6 The SEN boy's acquired vocabulary increased dramatically due to sign intervention.

- 7 The child with EAL substantially benefited from experiencing sign.

These findings, therefore, indicate that using sign as part of the curriculum increases most children's vocabulary acquisition. This compares with the findings of Daniels' (1993). Although Daniels' (1993) research differs, as it does not consider the impact of using sign on age, gender, ethnicity and additional needs. However, the new findings of this study should be considered in the context that this investigation was brief and the group of children was small. They would need to be substantiated.

Teacher questionnaires.

The respondents had varying experience of using sign with their classes. They indicated these advantages to using sign with their classes:

- 1 The majority of respondents taught in early years education.
- 2 Teachers used sign in a variety of areas of the curriculum.
- 2 Staff in early years education used it across all areas of the curriculum. Teachers of older children used it mainly for Language and Literacy but also for behaviour management.
- 3 The majority of their children responded positively and enjoyed using sign.
- 4 All teaching staff considered that it improved children's language and literacy skills.
- 5 It improved children's sight vocabulary and their phonic awareness.
- 6 The bi-model approach helped all children but particularly those with additional needs.
- 7 Children's concentration improved because they were encouraged to focus their attention on the activity.
- 8 It improved children's self esteem.
- 9 It is a useful tool in behaviour management.

Parent questionnaires.

All the questionnaires were completed, which indicates parental enthusiasm for the project. The data would suggest that:

- 1 There were no responses that children did not enjoy it. In fact, all except two children enjoyed learning to sign.
- 2 The children enjoyed communicating in a different way using their hands.

- 3 It helped them to understand about children who could not hear.
- 4 The majority of children shared their knowledge of sign with family and friends.
- 5 The children retained a variety of different signs.

One parent expressed her enthusiasm for the project by this additional comment: "I positively believe this is a wonderful idea which I encourage, especially as my child has enjoyed it so much."

The responses were similar to those of Daniels (1995) and Robinson (1997), as they all emphasised the children's enjoyment. The teachers stressed children's improved academic performance whereas parents' noted in particular the children's increased self confidence and the ability to use another language.

Recommendations for future action.

The following actions should take place:

- 1 All staff implement a carefully planned signing programme so that sign becomes an integral part of the curriculum.
- 2 All staff attend regular training sessions at the nursery.
- 3 The programme begins when the children start nursery.
- 4 A part-time deaf tutor is employed to train staff and to work with the children in the classroom at least at the beginning of the programme.
- 5 Parents are informed fully about the programme and what that their children are learning so that they can offer support at home.
- 6 Parent workshops or training with the deaf tutor.
- 7 Liaising with staff at local schools so that there is continuity when the children transfer to school.
- 8 Continuing links with the school for the deaf.
- 9 Research within the nursery with a larger group of children into the benefits of sign taking into consideration age, gender, ethnicity and additional needs.
- 10 Research in reception classes in local schools to assess the lasting advantages of the sign intervention.

The signing group of children clearly benefited from the signing project in several respects. Importantly by increased vocabulary acquisition, which is fundamental to their future language development and learning, but it

also improved their self-esteem and confidence. They were more attentive and focussed. They showed an earlier awareness of letter sounds and names as a result of the multi-sensory approach. The teacher researcher continued signing with the children in the term following the project and she intends to introduce sign to her next group. This indicates her conviction that experiencing sign is beneficial to young children.

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