

MAKATON VOCABULARY DEVELOPMENT PROJECT

Research Information Service

1988, Volume 2, Issue 5

MENTAL HANDICAP AND NON-SPEECH SYSTEMS

Compiled and Written by Nicola Grove, MSc, LCST

Edited by Margaret Walker, MSc, LCST

Published by
Makaton Vocabulary Development Project
© 1988 Margaret Walker for MVDP

MENTAL HANDICAP AND NON-SPEECH SYSTEMS

INTRODUCTION

MENTAL HANDICAP AND NON-SPEECH SYSTEMS

INTRODUCTION

Research into the use of non-oral methods of communication with the mentally handicapped continues to grow; yet it is still very diversified and fragmented. The failure to develop a truly cumulative body of research in this field is due in part to poor documentation of variables and method (Remington & Light 1983) thus it means that general conclusions remain hard to draw. Introduction of non-oral methods may still be contended (Faw et al 1983; Weller & Mahoney 1983). However, there seems to be a consensus that signs and symbols are appropriate tools when oral methods have failed; and that the possibility of speech developing will not be inhibited as a consequence.

Kiernan (1983) updating his review of the literature, suggests some basic criteria which research should meet:

Subject descriptions

As well as basic demographic characteristics such as IQ, Sex, CA, MA, subject descriptions should include a comprehensive picture of communication behaviour and previous methods of teaching, before the experimental training began.

Methodology

Should include samples of real-life interaction, both within training sessions and in the student's environment.

Outcome

Should be assessed by a range of standardised procedures, but should also include an analysis of how functionally signs are used to communicate.

Of the studies documented here, few if any meet all these criteria. However, a broader focus is developing, and issues which relate to actual communicative needs and situations are being considered. Areas of concern which recur include the following:

Comparisons between sign and verbal training

The evidence is now overwhelming that sign does not inhibit the development of speech. However, the question of sign as a facilitator of speech still remains open. Much of the evidence is still at the level of reported data (Jones 1980) or as in the work of Daniloff & Shafer, too vague for us to know whether the children spoke as a result of their exposure to signs. In addition, some studies report that speech did not develop subsequent to signs

(Duker & Michielsen; Faw et al; Francis & Williams). However, there is some experimental evidence to support that signs may have a mediating effect on verbal learning (Wells, Penner & Williams). The question is how far this effect pertains to the structured teaching of associations, as opposed to informal learning. At this stage of research it seems that spontaneous generalisation from sign to speech may occur, but that if speech is the desired aim, it may be necessary to teach the associations directly (see the work of Schaeffer for suggestions (RIS, I, 4, 34-36)).

The paper by Reid & Kiernan offers limited evidence that signs and words may be encoded separately in short term memory, and hence perhaps processed differently.

Use of non-oral methods with preschool children

The suggestion that parents of mentally handicapped babies and children should be encouraged to use non-oral methods as a prophylactic measure is a recent development in the field. Waiting until a child has failed to develop speech (as advised by Browder et al) may make the task of teaching through non-verbal methods harder, because of the legacy of failure, and disturbed interactions. Jones proposes that since speech will not be inhibited, the routine teaching of signs and symbols will at least do no harm. Le Prevost suggests that using sign at this early stage will facilitate communication and by-pass certain problems associated with the use of speech. However, Weller & Mahoney conclude that the development of good communication skills in young children may have more to do with providing the right kind of input and support to parents than with the modality used. There is no evidence as yet to what extent signs (or symbols) are requisite.

What is missing from these studies is any reference to research into the development of communication in normal and in handicapped babies. There is no discussion of the relationship between gesture, body language and in the interactions of normal children and their caregivers; nor of how patterns of communication differ in handicapped children. In this context, some interesting questions are raised about the use of sign with prelinguistic children. It could be that providing sign input early, fosters the development of nonverbal intentional behaviours and thus ensures a good foundation for the later teaching of language, whether visual or oral.

Predictor variables

It is in this area that the lack of truly cumulative research is perhaps most acute. Many studies attempt to relate outcome to some subject characteristic, or baseline behaviour; but the populations, teaching methods, assessments and environments are too diverse for any kind of pattern to emerge (Porter & Schroeder; Daniloff & Shafer; Dieich & Hodges; Khan; Song). In Kiernan's words "We have to conclude that, at the moment, we have no way of predicting precisely how a child or adult will respond. This is not surprising, given the lack of subtlety in assessing pre-teaching variables and their potential interaction" (1983). The study by Porter & Schroeder, in particular, illustrates how complex the interaction may be between institutional environment, CA, presence of organic handicap, and severity of retardation. The only conclusion permissible at this stage is that no grounds can be offered for excluding students from non-oral programmes.

Attention to the functional value of signs or symbols for communication .what in Makaton training comes under the heading of informal use, is beginning to emerge as a research concern. Many studies fail to make any application from the teaching sessions to real life (Browder et al; Deich & Hodges). However, a number illustrate aspects of functional usage:

Pragmatic categories of use

As in the autistic literature, distinctions are drawn between the levels at which a student can communicate, by Song; Daniloff & Shafer. These include: receptive; imitative; prompted (i.e. manually, or cued); responsive (or elicited, where the student uses a sign/symbol in response to a question or directive); and self-initiated, spontaneous use. The problem of how to effect spontaneous use has not received the attention it warrants in the literature relating to the mentally handicapped.

Generalisation

The process of transferring skills learned in one situation to another is undoubtedly implicated in the ability to communicate spontaneously, Duker & Michielsen, and Karlan et al., experimenting under very controlled conditions, found that a degree of generalisation occurred. Faw et al in the more fluid and realistic setting of a hospital ward, did not. Once again, the effect of structure seems to be critical.

Environmental variables

The role played by environment, specifically the institution, recurs in several papers (Browder et al; Faw et al; Porter & Schroeder) and is discussed specifically by Francis & Williams. Failure to achieve carryover is attributed to common problems such as staff turnover, and poor administrative communication. The study by Faw et al is particularly useful in illustrating the difficulties involved.

Measurement criteria

Increasingly, researchers are setting objective criteria by which to judge the success of learning. This is especially characteristic of the experimental research (Deich & Hodges; Broder et al; Faw et al; Reid & Kiernan), but Daniloff & Shafer also set targets in order to move students through their programme.

There are practical difficulties in determining whether or not a sign has been learned. Fawcett & Clibbens address the problem of assessing sign production, and propose a method of construction in a reliable scale of measurement. This paper is a most useful contribution to the field.

Kiernan makes the point in his review that criticisms of research design often seem unnecessarily purist. However, in the absence of good documentation, research cannot attempt to provide the answers which practitioners need. It is this concern, to make the connections between research findings and practical needs, which is the basis for the summaries presented here. Reading papers, summarising the key elements and giving comment and possible application must always be a subjective activity. No summary can ever be a substitute for the original paper.

Kiernan, C., Reid, B. & Jones, L. 1983)

Signs & Symbols : Use of nonvocal communication systems
Heinemann Educational

Remington, B. & Light, P. (1983)

Some problems in the evaluation of research on non-oral communication systems
In Advances in Mental Handicap Research Vol.2, Ed. J. Hogg & P. Mittler
John Wiley & Sons Ltd (1983)

NOTATIONS USED THROUGHOUT ISSUES

- * Papers/Books available for reference from:
Royal National Institute for the Deaf, Library
105 Cower Street, London WC1E 6AH
Tel: 01-387-8033

- Papers/Books available for reference from.
Mr. Pager Tallis
BIMH Information & Resource Centre
Wolverhampton Road, Kidderminster, Worcs.
Tel: Kidderminster 850251

MENTAL HANDICAP AND NON-SPEECH SYSTEMS SUMMARIES OF RELEVANT ARTICLES

- Browder, D.M., Morris, W.W. & Snell, M.E. (1981)

Using time delay to teach manual signs to severely retarded students
ETMR, 16, 252-258, 1981

This study documents the training procedures used to teach 5 food preference signs to a retarded adolescent boy with limited verbal comprehension and unintelligible 'vocal imitations' (expressive signing only was taught). The design involved two techniques:

Multiple baseline 'baseline' was the subject's performance on the test items prior to training. These baseline scores were then used to assess the effect of training. Introduction of the signs was staggered - a sign for one food item was trained until it was mastered, at which point the next sign was trained. Baseline assessment continued on the signs which had not been trained (hence the term multiple baseline). Once training had finished, the signs were reviewed weekly. A follow-up 'probe' (assessment) was taken 16 weeks post training.

Time delay This procedure was used to reduce errors and speed up learning. Once the subject had been trained to imitate the signs, he was prompted (using modelling and handshaping) immediately he failed to respond. During training, prompts were faded by introducing a delay of up to 4 seconds between responses and prompts.

Results The subject learnt all the signs to criterion in 26 sessions, though on follow-up only 3 were maintained at this level. Seven months later, he was able to sign the 5 food items 50-100% of the time when asked 'what's this?' and this was despite his having been moved to a new ward where the staff were unaware that he had learnt any signs and consequently had provided no reinforcement.

There were errors with the time delay procedure and these are discussed.

Comments

1. Some attempt was made to probe 'informal' use of the signs, but in a limited structured framework. There is no indication of how functional the learning was in daily life.
2. The study demonstrates that systematic training can be effective in promoting learning even with very low ability students; though as the authors point out, it is difficult to determine the role played specifically by time delay.

Cooney, A & Knox, C. (1980)

An evaluation of a sign language programme taught to a group of severely/profoundly retarded children In 'Preparation for Life'.

Programmes for Mentally Handicapped People in Australia in the 80's.
Ed.G.McIntyre and T.R. Parmenter, Sydney: Prentice Hall of Australia.

This paper describes a 24 month Makaton programme, in three phases, with a group of 7 severely retarded children, ranging from 10-1 4½ years old, IQ around or below 30 (Standford-Binet), all with some, mainly unintelligible speech. A control group was originally planned, but abandoned due to problems with illness.

Phase 1 (6m) was the pilot study in which Makaton signs were taught to the 7 children.

Phase 2 (9m) sign teaching was extended to other classes and groups. The original children were therefore exposed to other children and nurses using signs.

Phase 3 (9m) an assessment record was developed as part of a further research study on all children in the pre-school unit who were using signs.

Tests and Observations

The PPVT and RDLS (Comprehension and Expression) were administered at the beginning and end of Phase 1 and Phase 3 (ie months 0, 6, 15, 24). The Phase III RDLS was administered with signs.

Verbal and nonverbal interactions of staff and students were observed during Phase 1.

Sign Classification Record

A 6 point scale was used to categorise sign usage ranging from "1 - where eye contact was not established and hand shaping by the teacher was required" to "6 - consistent, spontaneous and appropriate use of the sign without needing direction".

In addition, reproduction of the signs was assessed on a right/wrong basis, for 6 monthly observations.

Teaching Method

After a lack of success in teaching signs unsystematically for a year prior to the onset of research, the Makaton Vocabulary was introduced. Teaching began with hand shaping and moved through imitation to production.

Results

During Phase 1, there was a trend for both verbal and nonverbal interactions to increase; the children did not vocalise less when they learned to sign. During Phase 3, 6/7 children improved on the 6 point sign classification record, so that by the end of the programme, at least half their signing was consistent, spontaneous and appropriate. The PPVT and RDLS

scores improved over the course of the programme with Reynell Comprehension showing the greatest improvement. The importance of teaching through a structured programme is illustrated by a downturn in performance for all the children during a month's holiday when signs were only used informally. Once the structured programme was re-introduced, the children improved and regained their competence.

Assessment of sign production during the final six months of Stage 3 showed that the most difficult signs were those made with both hands, when the movement was similar, but in opposite directions, made in front of the body (eg TABLE); fingerspelt signs and signs made out of sight were also difficult.

Although no formal assessment of speech usage was made, it was noted that many of the children increased the amount of vocalisations, or use of single words when they signed.

Comments

1. Lack of background information makes it difficult to evaluate their paper. We are not told enough about previous communication training, the teaching method used, and the kind of reinforcement outside the teaching sessions that staff provided to know what it was about the programme that made it a success. For example, structured teaching was clearly very important, but without knowing whether this had been tried before, perhaps with speech, we cannot assess the relative contributions of teaching method and modality. The lack of baseline scores, in particular make it impossible to determine the significance in the changes observed, either in the observations of verbal and non-verbal interactions, or in the test scores.
2. There are a number of interesting observations which, again would be more useful if more details were provided. The assessment of reproduction errors leads to conclusions about the effect of sign structure on learning, but we do not know what criteria was used to classify the signs, nor the percentage of errors in each category. The sign classification record, a welcome development towards the recording of actual usage, is too imprecise in the definition of categories to be sure what is meant by the terms used. The authors acknowledge that this record needs to be modified.
3. Useful points from this paper include :

The evidence that sign training does not depress verbal skills;

The finding that provision of structured training is crucial to the maintenance of sign competence;

and the indications of which signs may be difficult to produce, some of which agree with other research findings (eg Wilson 1983).

* Daniloff, J.K. & Shafer, A. (1981)

A gestural communication program for severely and profoundly handicapped children
Language, Speech & Hearing Services in Schools, 12, 4, 258-268, 1981

Describes the progress made by a group of children in a sign programme based on the Amerind Scale of Progress (Skelly 1979, see RIS, I, 3, p.24).

Subjects were 21 severely - profoundly retarded children, mainly living in a residential centre. Brief details are given, including MA, CA, mobility, proneness to seizures, and use of medication, presence of verbalisation or vocalisation, toilet training and aetiology.

Teaching was done by the speech/language clinicians, on an individual basis, for 15 minutes, 3/4 times a week. There was an initial trial period of 3 months, after which the programme was extended for 1 year.

Active reinforcement outside the training sessions was promoted through instruction, training and support of staff.

The programme differed in some respects from the steps laid down by Skelly. First the children were taught by being physically guided to sign in response to actual objects, or models. Next they were prompted to make the signs themselves (called here signal retrieval). Next came the transfer of this skill to other environments. Only at this point did the trainers accompany signs with speech. The next stage was self-initiated spontaneous use in appropriate social contexts. At least half the children did this naturally; structured situations and peer modelling were used with those who did not. This level was set as the criterion of acquisition for a sign. A new sign was introduced once a sign reached this criterion. The final two stages were use of vocalisation to accompany 50% of gestures, and a decrease in signing as it became a support for speech rather than the other way round. Again, the children who reached these levels seemed to do so naturally, without specific training.

Results

All the children reached criterion on some signs over the year, though there was a lot of variation (range 1-33). 17 of the children reached the vocalisation stage (6 of these were not apparently vocalising before the programme), and 4 progressed beyond this stage.

Predictor variables MA, CA, seizures, medication and ability to walk did not predict progress, and the authors do not consider that aetiology was relevant either. The children who were toilet trained progressed better. Vocalisation and verbalisation also predicted success.

Performance in the initial trial period was positively related to long term progress. Children who made initial gains were likely to acquire more signs over the year.

Informal observations by the researchers suggested that the success in carryover was due to the co-operation of individuals involved with the children; and further, that one of the most important factors was the elevation of morale and excitement generated by the programme.

Comments

1. In the broadest sense, this was obviously a successful programme. The children had apparently failed to benefit from prior training in communication. However, it is difficult to evaluate the programme in any very useful way, because of a lack of information about what the previous training consisted of, and baseline (i.e. pretraining) communication behaviour of the children involved.

2. Similarly, although it is clear that carryover (generalisation) occurred, the extent of this is not documented; nor are the signing skills of the staff described.

In view of the fact that staff motivation obviously played a large part in the success of the programme, more information in this respect would have been useful.

3. The programme described here has a number of interesting features, particularly the insistence on spontaneous use as a criterion of acquisition.

- Duker, P.C. & Michielsen, H.M. (1983)

Cross-setting generalisation of manual signs to verbal instructions with severely retarded children
Applied Res. in Ment. Retard., 4, 29-40, 1983

This experimental study with three children addressed three research questions:

1. Generalisation 'requires that the individual be able to respond correctly in other settings and with other persons to stimuli which are similar to those used for training'. The question was whether the subjects would generalise their responses to verbal instructions from the training session to classroom and ward, with teachers and nurses not involved in training.
2. Instructional procedure the use of transfer of stimulus control was explored in effecting responses to verbal instructions alone, in the absence of visual stimuli such as pictures or objects. In this procedure, the children were taught to respond with a sign, first to objects + sign + verbal label. Object and sign were gradually faded and finally the verbal label was presented as verbal instructions, such as "drink", "sleep", "listen to music (it is not very clear from the description given quite how the instruction related to the verbal label). The verbal instruction was presented as the probe (assessment) stimulus, on the ward and in the classroom (see Smeets & Striefel 1976, RIS, I, 3, 25-26; Van Biervliet, 1977, RIS, I, 3, 29-30 for rather similar procedures).

The children were also taught not to respond when other verbal instructions were presented inappropriately. It was hoped that this would enhance discrimination of the instructions, and cut down on the number of trials needed to teach the 3-4 different responses.

3. Facilitation of speech two of the children were able to imitate a range of words, though none were meaningfully used. The verbal instruction was presented, and any attempts to imitate it vocally were recorded, during the training sessions.

Results

1. Generalisation did occur spontaneously across settings, for all 3 subjects.

The authors do not refer to any other literature on generalisation, but this is an interesting finding compared to Faw et al (this Issue, page 10) Kohl et al (1978) (RIS, I, 10, 10-12), neither of whom found that generalisation occurred readily from one setting to another. Possibly these children were successful because the skills involved were very specific.

2. Teaching the children to inhibit their responses when appropriate did seem to help in learning. Other references relevant to this procedure are provided.
3. Acquisition of signs did not facilitate vocal imitation. The authors do not offer any further discussion of this finding, which again is interesting in the context of other studies. Reports of speech developing spontaneously when signs are used are quite numerous. In general, there seem to be two patterns in the literature. In some cases, speech skills are deliberately taught and reinforced, along with the signing (e.g. Schaeffer 1978, RIS, I, 4, 34-36. Direct teaching was also employed successfully by Reid, in one of the projects associated with the Thomas Coram Research Unit). In others, speech skills seem to develop naturally, after a certain length of experience using signs for communication (e.g. in this Issue, Kahn 1981; Daniloff & Shafer 1983). Neither situation is very comparable with the one described here.
4. The authors felt that the structure of individual signs (in terms of iconicity and motoric complexity) may account for individual variation. Note should be taken of these factors when selecting signs.

Comments

It is not clear from the paper how appropriately the signs were elicited during probe sessions - instructions such as "sleep", "eat pudding" are very specific to certain situations. Using them out of context, purely to assess a kind of rote response, would not be very productive in the long term. This kind of pragmatic consideration will also account for variation in scores. The authors note that the children did go on to acquire additional signs after the study ended (47 in one case), but again there is no information on how functionally they were used.

* Deich, R.F. & Hodges, P.M. (1982)

Teaching nonvocal communication to nonverbal retarded children
Behav. Modification, 6, 2, 200-228, 1982

Summary

A symbol system using Premack's design was taught to 28 hearing nonverbal children, ranging from profoundly - moderate1y retarded. Three of these were found to be fast learners, acquiring an average of 50 symbols, and constructing complex 'symbol sentences' of up to 9 symbols. The remaining 25 learned an average of 10 symbols in 6 months, and 13 of these could construct 2 symbol sentences. A matched control group of 20 children was given equal time in verbal one to one interaction with comparable materials.

Results

1. Overall, there were positive correlations between mental age (MA), receptive speech, levels of attention, knowledge of concepts (such as size, colour, etc.) and speed and amount of learning and retention. (The 3 fast learners were those with the highest MA, speech and attention). However, MA did not predict learning success for all subjects, and within the slow learning group, higher MA levels were not associated with the number of symbols learned; though MA and retention were significantly related.
2. Many of the slow learning children experienced problems in shift - having learnt to match symbol to object, they were not automatically able to match object to symbol. The authors describe how an interim procedure was designed to teach this.
3. Control group comparisons

The control group was compared to the slow learning experimental group. No difference emerged between groups on IQ, MA, concept knowledge, expressive speech and vocalisation. The experimental group improved their receptive language, co-operation, and attention level scores (the control groups attention span actually decreased). This suggests that the experimental group had learnt a specific communication skill which had a positive effect on these other areas of behaviour. However, the fast learners showed no comparable change in receptive language and attention span, so these findings are difficult to evaluate, particularly in the absence of information about the rating scales and how reliably they were administered.

Comments

1. Although the number of symbols learned and retained was significant, the average percentage of symbols retained by the larger slow learning group (around 57-58%) falls well below the criterion level of 80% set during the actual teaching phase. Furthermore, the subjects took a long time to learn - an average of 63.4 minutes per lesson for the more competent, and 246.8 minutes per lesson for the least able. The impression given is of a massive investment of time and energy, and rather poor retention rates. However, it must be remembered that these were children of very low ability (mean IQ 18 on a composite of tests).

2. One of the stated aims of the study was to determine how far the use of the system would generalise to non training situations, in the face of a lack of information in published studies about the "ecological validity" of communication systems. Disappointingly, the authors seem to have restricted their exploration of generalisation to the recognition of untaught symbols shaped like their referents (the children had some success in doing this). There is no discussion of the real communicative potential of the system in everyday life.
3. Demonstrates how even very low ability children may be taught a few symbols, and some of the problems involved in doing so.

- Faw, G.D., Reid, D.H., Schepis, M.M., Fitzgerald, J.R. & Welt P.A. (1981)

Involving institutional staff in the development and maintenance of sign language skills with profoundly retarded persons
 J. Applied Behavioural Analysis, 14, 4, 411-423, 1981

This study evaluated a programme designed to involve staff in developing signing skills with hospital residents.

In the first experiment, 6 care staff taught 6 residents 9 signs in daily use, using pictures as stimuli, in groups of 3, and using direct instruction, modelling (i.e. demonstrating the sign), manual guidance reinforcement and feedback. During these training sessions, all the residents learnt to identify the pictures with signs; scores were variable, but most were in the range 80-100%.

The staff were formally taught 34 signs, and specific informal procedures such as comments about the residents, reminders, and supervision of training were used to promote staff signing. There was continual discussion of the need to create a 'signing environment'.

Observations were made to assess the extent of signing by residents and staff on the living unit, using time sampling. The observer watches, and records behaviour at preset intervals - here 10 second observe, 5 second record, alternating every minute between staff and residents.

In addition criteria were set for accepting a sign as correct; the sign had to include all the 'critical components' of shape, movement and location.

The results of these observations showed that staff vocalised to residents 55% of the time, and signed 15%. The residents did not increase their levels of signing or vocalising during the experiment.

In the second experiment, 5 residents were tested for their ability to sign in response to real objects, and only 1 showed 100% generalisation. The others were then given specific training individually in pairing objects and pictures by staff members on the living unit. This resulted in increased generalisation, which was maintained over an 11 month follow-up period.

There were no observations made after this experiment of unstructured interactions between staff and residents.

In their discussion, the authors address the question of why residents did not seem to increase their communication on the living unit after they had successfully learnt signs in training. They suggest three possibilities:

1. Difficulty in generalising from pictures to real objects. The lack of observational data after the second experiment make this hard to assess.
2. The residents may not have been taught enough signs.
3. The system used in observing may not have been sensitive to the 'brief quality' of resident signing. The authors seem to think that some signing was going on which was not picked up.

In conclusion, they comment on the lack of evidence to support the theory that signing leads to an increase in vocalisation. They suggest that, since signing is 'an abnormal communication system', all efforts should be made to teach speech, and signs introduced only when these have failed.

Comments

1. This is one of the few studies to take account of the importance of staff signing. It is all the more disappointing therefore that, despite reasonably well documented training procedures, there is no information on the quality, frequency and function of staff signing. What pragmatic considerations governed their use of signing to residents, and what if any attempts did they make to encourage signs in the unstructured interactions on the living unit? The authors make no comment about the apparently low level of staff signing (15% of observation intervals), and do not seem to consider that this may have played a role in the failure of residents to use their signs in this setting. As they themselves comment, the absence of observation data after the second experiment is a major oversight of the study.
2. During training sessions, the residents were taught only to sign in response to pictures and objects their behaviour here being responsive, or elicited. However, signing for communication in daily life, requires a degree of self initiated behaviour so that signs can be used spontaneously to express a variety of functions, such as requesting, indicating, and so on. The fact that residents were trained only to respond may again have played a part in their general lack of signing on the living unit. It is a pity that no records could be made of the apparently fragmentary signing that seems to have taken place.

The distinction between types of signing behaviour has been made none generally in the literature on autistic children than with the mentally handicapped, but would have been relevant in this study (see Introduction to RIS, I, 4, and Daniloff & Shafer's programme - this Issue, page 6).

A related point is that the authors do not provide any information generally as to the quality of interactions between staff and residents. Given that institutional life is known to depress the level of communication, this is an important consideration (see Francis & Williams, 1983, this Issue, page 13).

3. Criteria for accepting signs as correct are a welcome inclusion, but further information on how 'critical components' of the sign were assessed would have been useful, see Fawcett & Clibbens, 1983, this Issue, page 12.
4. The authors' conclusion seems somewhat overstated on the basis of the evidence presented here. In particular, the assertion that signing is an abnormal means of communication is made without any reference to its use by intelligent deaf people, or to the role of gesture in spoken communication.
5. This paper illustrates how important it is to build into training specific procedures to develop generalisation, and communication in unstructured settings. In particular the general lack of signing by staff, despite systematic, if somewhat informal, training and supervision, highlights the necessity of adequate teaching and support of staff.

*Fawcett, G.F. & Clibbens, J.S. (1983)

The acquisition of signs by the mentally handicapped: Measurement criteria
BJDC, 18, 1, 13-21, 1983

This paper examines some of the problems involved in measuring the acquisition of signs, and suggests some possible solutions.

It is argued that 'counting' the number of signs 'acquired' by a subject is not a simple procedure. They point out the variety of ways in which comprehension and production of signs can be assessed and scored. In performance terms, not only may the signer be inconsistent, but the assessor may vary his criteria of what is comprehensible, or correct, from one day to the next.

The authors set out to test the reliability and validity of some assessment procedures.

Reliability is tested over time, and between raters. If a number of raters are using a scale, will there be a reasonable agreement between the scores they award, over a given period of time? Reliability is measured usually in terms of % agreement: the criterion was set here at 90%.

Validity refers to the extent to which an assessment truly reflects what it sets out to measure. In this case, if a certain number of signs are adjudged correct on an assessment, are they actually comprehensible to an observer? Two measures of validity were used here:

- (1) a rating of how far the observers subjectively felt that the assessment gave a good result
- (2) independent observers viewed a recording of the signs, and wrote down the glosses (verbal equivalents).

Finally, the authors describe a procedure for assessing sign production, which has satisfactory levels of reliability and validity "a simple, accurate, reliable scale, which raters felt at ease with". This consists, in summary, of scoring right or wrong, each of the parameters of sign: place, movement, handshape and orientation (see PIS, II, 1, Linguistics of Sign Language).

Comments

The authors see the primary application of this paper as to research, but the information is also extremely useful for practitioners. The problems of assessment which they outline occur in both teaching and record keeping. Although some training is obviously needed to use such a scale, it appears quite simple to operate. As has been suggested elsewhere, an understanding of the structure of signs is useful for teaching and assessment, and could be used where appropriate for in-service training to extend the understanding and expertise of people involved in training.

- Francis, V. & Williams, C. (1983)

The effects of teaching British Sign Language to mentally handicapped non-communicating children
B.J. Ment. Subnor. 29, 1, 18-28, 1983

This study compared the progress of 4 mentally handicapped non-communicating children over three phases of a multiple baseline programme: baseline, 6 weeks perceptual-motor task training, and sign training. The signs used were selected from the Makaton Vocabulary. Training loosely followed the guidelines suggested in the Makaton Vocabulary Language Programme, but objects and actions, rather than pictures, were used initially. The duration of the project was 59 weeks. Entry into the programme was staggered for each subject. Thus the first remained in the baseline phase for 6 weeks, received 6 weeks perceptual-motor training, and (presumably) 47 weeks sign training. The fourth subject remained in the baseline phase for 24 weeks, followed by 6 weeks perceptual-motor training, and 35 weeks sign training. All were taught in the same group for 15 minutes, 3 times a week.

Signs used in training were generalised to the classroom by the class teacher and helper, both of whom had experience in signing. The rest of the class were apparently taught signs concurrently. All 4 subjects were resident in the hospital, and although efforts were made to promote signing by hospital staff on the wards, it was felt that this was hindered by high staff turnover (no measures were taken). All staff met with an experienced signer for 1½ hours a week for 5 months, and whenever possible attended Makaton Workshops.

The perceptual-motor task involved copying designs with cord on a peg board, with the same teacher, and for the same length of time, as the sign training. Learning here was individual rather than in a group, in order to assess the role of a one to one teacher-pupil relationship.

Assessments

Expressive and receptive signing vocabulary was assessed using a video of 120 pictures, four at a time. General behaviour and social interaction were measured through time sampling. Behaviour was categorised as appropriate, neutral, inappropriate or disruptive. Interaction between individuals was categorised as signing/vocal/physical, and further as between teacher and child, or child and peer. The direction of the interaction, whether from or to the child, was also noted.

Articulation and language were assessed informally, and described for each subject by the speech therapist.

Subjects

The 4 children were from 15-17 years, with mental ages (Hiskey-Nebraska) between 3 and 4 years. They are described as having severe and multiple learning difficulties and behaviour problems.

Results

Only the relevant completed statistical analyses for each child are reported here (full details available from the authors). There appear to be no significant uniform trends. Clear effects of sign training were found in only four areas:

1. Increased sign interactions (on social interaction measures) for 2 children.
2. A decrease in percentage of appropriate behaviour for 1 child.
3. An increased in percentage observed neutral behaviour for 2 children.
4. Increased expressive sign scores for 1 child.

All other changes in scores occurring during the sign teaching are ascribed either to baseline trends, or the common factors between perceptual motor and sign training (such as novelty effect; one to one child-teacher relationship).

In their discussion, the authors conclude that their results do not support claims made by Walker (1973) that sign teaching leads either to an increase in sign learning (in $\frac{3}{4}$); or to improved social and vocal behaviour. They offer 3 interpretations of their results:

1. Regular teaching of a novel, highly structured task which requires physical contact in a one to one teacher-child relationship will lead to the kind of generalised behaviour observed by Walker.
2. That the children's performance during baseline was so variable that it made subsequent changes difficult to detect in statistical terms.
3. That trends in baseline scores will account for any subsequent increase in level of scores.

The authors do not offer any further discussion to determine which interpretation would best suit their data.

The hypothesis that sign use will lead to an increase in sociability is considered in relation to institutional structure. It is proposed that signing will have no more effect in combating the deleterious effects of institutions than will the teaching of vocal communication. However, it is possible that sign teaching encourages staff to interact more positively with residents, and that this will lead to the kind of positive changes noted by Walker in her research. In support of this proposition, the authors quote their own findings from a questionnaire circulated among hospital staff. Despite the fact that the project assessments of social interaction and behaviour showed no change, some of the nurses reported improvements, particularly in the case of one child. This suggests that staff may perceive change when the objective evidence is to the contrary. The authors comment that methodological flaws in Walker's research may have affected her findings.

In conclusion, the authors find that a limited success in teaching sign was achieved for 3 of the children. Some theoretical justifications for the use of sign are outlined. Limitations of the present study are noted, and suggestions for further research are made.

Comments

1. The use of objective measures of behaviour and social interaction is a welcome advance on previous research. Appropriate references, and considerable detail are provided.
2. However, a lot of background information which would be useful in clarifying the results of the experiment, goes unreported. In particular there is no description of how the teaching of sign in the classroom related to the design of the experiment. The frequency with which the children used signs to interact in the classroom is noted, but there is no assessment of the range of signs used, and whether they were signs acquired from structured teaching or not. One puzzling feature of the results is that three of the children seem to have learned signs during the perceptual-motor phase of training. This can be accounted for if the children were exposed to signs in the classroom during this period - but it means that the comparison explored here is not exclusively between training on a perceptual-motor task, and training in sign.

3. The omission of ward-based observation is noted by the authors as one of the limitations of the study. This is important in relation to the argument that nurses reported changes in behaviour which were not actually occurring. Assessments of behaviour in one setting (the classroom) are used to discount observations of behaviour in another setting (the ward). However, there is no evidence of what the children were doing on the ward, and how this compared with their behaviour in the classroom. The fact that 7/13 nurses reported improvements in behaviour for 1 child, suggests that his behaviour on the ward may in fact have modified over the course of the experiment.
4. Presentation of the results is rather hard to follow (some kind of visual display would have helped). There are occasional ambiguities in the text. In addition, some detail about the raw scores can be useful when statistical comparisons are diversified. It is not clear whether the lack of significant comparisons are due in part to overall low levels of learning, how many signs were taught to each child, how many learnt, and generalised, and how many acquired incidentally?
5. It is difficult to place this research in context because of a lack of reference to the available literature. Only Walker's research as described in the Makaton Vocabulary Language Programme receives critical mention.

It is interesting to compare this study with that of Bailey & Tait (1979) whose subjects were also institutionalised young people with severe behaviour problems. Some of their findings parallel those of Francis & Williams, notably a lack of improvement in social skills. Although reports of improved behaviour after sign training, such as those adduced by Walker tend to be anecdotal and therefore questionable, it may be that adolescents with severe behaviour problems are less likely to show improvements in this area than other subjects. As yet there is not enough information on how different groups progress in training to ascertain whether or not this is the case.

6. The term British Sign Language is considered by the Makaton Project to be inappropriate when applied to the use of signs with speech in the order of spoken English, as augmentative communication with speech handicaps. It is felt that, to promote clarity in an area where many sorts of sign communication occur, the term British Sign Language should be restricted to its use as a language in its own right incorporating the features specific to itself (see RIS, II, 1, Linguistics of Sign Language for a description).

- Jones, T.W. (1980)

Is it necessary to decide whether to use a non-oral communication system with retarded children
ETMR, 15, 2, 157-160, 1980

In this short paper, Jones reviews some of the literature on the impact of signing on speech skills in mentally handicapped students. He concludes that since there is no evidence to show that introduction of a non-oral system inhibits the development of speech, this kind of communication should be used routinely with language delayed children to supplement speech.

Comments

The relationship between sign/symbol use and speech skills is a complex one, which receives somewhat inadequate discussion here. Jones is correct in stating that no studies to date have shown that speech is inhibited by signing. Much of the evidence that it actually facilitates speech is however anecdotal, or reported in questionnaires, though there have been limited experimental studies which suggest that the sign functions as a mediating stimulus - an associative link in the acquisition of speech by previously non-verbal people. Various hypotheses have been advanced as to how and why it happens, but the effect could be more to do with the way in which signing changes the teacher/student relationship than with the actual medium of signing. Neither is it clear to what extent symbol use facilitates speech, and whether the same processes are involved as with signing.

See Kiernan's review of literature for further discussion, in C. Kiernan, B. Reid & L. Jones (Eds) *Signs & Symbols Use of Nonvocal Communication Systems*, Heinemann Educational, 1983.

Note that Jones' conclusion is in direct contradiction to that of Faw et al (this Issue, page 10). Whilst recommending the routine use of a non-oral system, he does not consider the question of whether this should be sign, symbol, or a combination.

See also Weller & Mahoney, 1983 (this Issue, page 27) for a comparison of oral and total communication programmes with preschool children.

* Kahn, J.V. (1981)

A comparison of sign and verbal language training with nonverbal retarded children
JSHR, 46, 113-119, 1981

A longitudinal study comparing the performance of 12 nonverbal, hearing mentally handicapped children matched in 3's and assigned to one of 3 groups: sign training, verbal training, and placebo.

The two experimental groups followed a language programme which moved from basic attention training to comprehension and production of 3 element phrases. In the sign group, teachers used total communication, but demanded only signs from the children. The placebo group received training in areas other than communication. Instruction was individual every weekday for 20 minutes over a period of 33 months, but some subjects participated for a shorter time. Six different trainers were involved. Prior to training, only 2 subjects demonstrated intentional communication (defined as pointing for request), and none showed any comprehension on the probes from the programme. There were four hypotheses:

1. Both language groups would progress further in the programme than the placebo group.
2. The signing group would progress further than the verbal group.
3. The signing group would spontaneously begin to use speech.
4. One or more of the Uzgiris and Hunt Scales of Sensorimotor Ability would correlate significantly with the phase of language achieved by the signing and verbal groups.

Results

As expected, the two language groups progressed further than the placebo group. In statistical terms, the performance of the signing group was not more advanced than that of the verbal group. However, the pattern of individual scores shows that only one of the verbal group could be considered to succeed in learning to speak, whilst 3 of the signers did learn to sign. On the strength of this finding, the author feels that sign language should be used with children with a poor prognosis for learning speech.

There was a small amount of transfer from sign to speech: the two most advanced signers were each saying 3 and 4 words at the conclusion of the study; indicating that total communication will not hinder, and may facilitate, the acquisition of speech.

Finally, the correlations between sensorimotor abilities and language skills are discussed. Scores on the Causality scale were highly correlated with success in learning to speak and sign. Scores on Object Permanence and Schemes (motor and symbolic play with objects) were correlated with success in learning to speak.

The author cautions against using these as predictors, because of the small number of subjects involved. However, on the basis of his analysis of the achievements of individual children, he suggests that stage 4 functioning of gestural imitation and causality may be necessary for a reasonable rate of learning sign; and stage 6 on Object Permanence Means-End and Schemes as attributes which might be important for speech to be learned. As in other studies, younger children did better than older children in the programme.

(See Kahn, 1977, RIS, I, 3, 17, which appears to be an interim report on the same project.)

Comments

1. This is one of a small number of studies which attempts an experimental comparison between sign and verbal training, and controls for the effect of teacher attention with a placebo group. However, the background information is sparse, and there is no indication of whether the training was reinforced in the children's environment, or whether they generalised what they learned to other settings. This is critical when comparing sign and verbal programmes, as it is likely that spoken words will be reinforced quite spontaneously in the environment, given that the words taught are in common use; whereas signs may only be used during training. With regard to the number of trainers involved, there is no information on whether checks were run to determine that teaching was reasonably uniform, or on possible effects specific to individual teachers.

2. It is disappointing that the discussion of correlations between sensorimotor and language abilities makes no reference to the considerable body of work available on normally developing children (see RIS, II, 2, Communication Before Language) which provide useful context for the assessment of these results.

In general terms, findings with normal children tend to be inconclusive, and to vary depending on what aspects of communication are being measured. For example, Object Permanence is usually a poor predictor of communicative ability, (gestural or verbal) whereas the Schemes scale is a strong predictor. Imitation and Means-End are reasonably good predictors. When levels of development are considered, the work of Elizabeth Bates and her group suggests that intentional communication behaviour is associated with Stage 5 abilities. However, work by John Bonvillian with normal deaf children acquiring sign as a first language suggests that basic signing for communication can occur from Stage 3 onwards. This is a controversial area of research which is not well understood at present, and Kahn's suggestions, tentative though they are, look somewhat premature

* Karlan, G.R., Brenn-White, B., Lentz, A., Hodur, P., Egger, D. & Frankoff, D: (1982)

Establishing generalised, productive verb-noun phrase usage in a manual language system with moderately handicapped children
 JSHD, 47, 31-42, 1982

This study investigated the efficacy of a particular training strategy to promote the expressive use of Verb-Noun (VN) phrases. In particular, the authors were interested in whether training would generalise to novel items, and in how to maximise such generalisation. It is one of several systematic replications by the principal author and his colleagues.

The method involved step-wise diagonal progression through a matrix of verbs and nouns, as follows:

Item	Verb	Noun
1	Pick up	Cup
2	Pick up	Chair
3	Carry	Chair
4	Carry	Crayon
5	Put	Crayon
6	Put	Scissors... etc.

The vocabulary items were selected after discussion with the teachers. In training, the experimenter performed an action, and asked 'What did I do?'. Correct responses were reinforced, and modeling or physical guidance was used when responses were incorrect. Each training session of three items was followed by three probes (assessments) to test the three items just trained, the next three items, and three items drawn at random from the matrix.

Subjects

There were 4 subjects originally .1 was discontinued, and another only completed 2 training steps; hence there is effective data on only 2. All were adjudged moderately mentally handicapped. (Test results to determine languages ages are provided but are difficult to interpret without knowing the tests: on the Utah test these ranged from 2.0y - 2.6y. A language comprehension test yielded higher results on some sections for the 2 who completed training.)

All came from one class where simultaneous communication was used throughout the day.

Results

These 2 subjects made substantial progress, and were able to generalise what they had learned. There were three possible categories of generalisation:

1. Novel combinations of trained items: e.g. a child trained on carry crayon and pick up cup could respond to pick up crayon and carry cup when these combinations had not been trained.

Generalisation in this category was very high, increasing from 0-97% and 0-100%.

2. Combinations of trained and untrained items. Eg a child trained on pick up chair and carry chair could respond to give me chair when give me had not been trained before in another combination.

Results here were partial; the subjects were able to respond to about ½ of these combinations. Nearly all the successful responses were to untrained nouns, rather than verbs.

The authors hypothesise that this was because the nouns were more familiar to the children, occurring more readily in their classroom environment.

3. Combinations of untrained items. Eg could the child respond to give me ball when neither items had been trained?

Only 3/16 responses in this category were correct: hence very little generalisation. The authors do not discuss why the children could respond to untrained nouns in the previous category but not in this category.

The authors conclude on the basis of this and previous studies that the matrix training approach is an effective teaching strategy to develop understanding or use of multi-element language structures. They suggest that further research is needed to investigate the role of receptive knowledge; the effect of training elements in isolation, alongside the matrix procedure; and the functionality to the subjects of the possible phrase combinations.

Comments

1. There does not seem to have been any prior assessment of the children's comprehension or use of the vocabulary used in the training (possibly the language tests used covered this, but there is no specific mention). There is no information relating to the children's use and understanding of sign combinations in the classroom.
2. The authors acknowledge that a major factor influencing the results could have been the frequency of occurrence of the vocabulary in the children's environment, which may have differentially affected nouns and verbs.
3. There is no indication of whether or not the children were subsequently capable of generalising responses learned in training to the classroom environment. Whilst this is a separate question for the researchers, it is relevant to consideration of the procedure as a teaching strategy.
4. Previous studies reviewed here suggest that rules learnt in this way may be somewhat difficult to modify - 1 child found it difficult to switch from Verb-Noun to Adjective-Noun combinations.
5. This is an interesting approach which is relevant to the teaching of combinations, whether of signs or words. Before employing such a procedure it would be advisable to read up the research, and to plan it carefully with a psychologist.

The paper serves as a reminder that there are many categories of generalisation skills, all of which may need separate training.

- Le Prevost, P., (1983)

Using the Makaton Vocabulary in early language training with a Down 's baby: A single case study
Mental Handicap, 11, 2, 28-29, 1983

A brief report on the use of Makaton with a Down's child from 1m - 3y. For the first seven months the mother used a limited number of signs (approximately 40) to the child, but did not attempt to elicit signs. Then the child was taught by modeling and physical guidance, to sign her requests.

The child's spoken language and comprehension have increased steadily, showing many of the features of normal language development. There was no control led comparison with other subjects, although compared to the average Down's child she was advanced in language but not motor skills. At 2y 8m years, her comprehension and expression were at a 2 year level on the Reynell Developmental Language Scales.

Several aspects of the child's progress are of interest. It appeared that with signing, the mother's monitoring of the child's attention improved. Signing seemed to facilitate interpretation by alerting the mother to the child's mistakes .e.g. pictures of apples and oranges being mistaken for balloons. Le Prevost concludes that the study highlights areas where the teaching of language skills has failed in the past .by not breaking the learning process into small enough steps; by not taking into account the part played by visual memory in the learning of speech, and by not realising how often the child fails in attempts to communicate.

Comments

1. This study suggests many areas for future research. More systematic comparisons with a larger group of children would need to elucidate whether or not the effects noted here are specific to the use of signing, (such as the process whereby errors are clarified) or could result from any controlled intervention which improved the communication between mother and child (see Weller & Mahoney, 1983, this Issue, page 27).
2. There is of course no way of telling how skilled linguistically the child would have been without the intervention; and in this respect a note about the language skills of above-average Down's children in the study quoted would have been useful.
3. Some of the points made amount to an argument for better oral teaching rather than the use of sign specifically. This is pertinent in view of the results obtained by Weller & Mahoney, who successfully used a highly structured programme with their parents to develop oral skills.

- Penner, K.A. & Williams, W.N. (1982)

Comparison of sign versus verbal symbol training in retarded adults Perceptual & Motor Skills, 55, 395-401, 1982

This small study explores the relationship between sign and verbal learning in 10 severely retarded institutionalised adults.

There were three training groups: sign only, verbal only and combined sign + verbal .to which the subjects were randomly assigned. All had 10 or more words; could colour match, and identify one colour; and could imitate words and signs. They were then taught 7 colour labels (in fact not all were introduced).

Results were obtained for receptive and expressive learning, and for retention after 1 month. The SV group learned as many signs as the S, and twice as many words as the V groups. Retention was better for the SV group on all measures except sign reception, where the difference was non-significant.

The authors conclude that sign seems easier for the mentally handicapped to learn than words. In addition, sign seems to mediate the learning of words. Some subjects were observed to use signs to recall verbal labels. The reverse does not seem to apply here. Words do not function as mediating stimuli in the acquisition of signs.

They emphasise that no definite conclusions can be drawn from this small sample, and call for replication and extension of the study.

Comments

1. It is a little difficult to evaluate the results as tabled, because the average number of signs learned is not compared to the average number taught.
2. In other respects this is a careful preliminary study which bears on previous research on the comparative effects of sign and verbal teaching. (See RIS, I, 3, papers by: Kahn 1977, p.17; 1978, p.22; VanBiervliet 1977, p.29; Bricker 1972, p.5-6; Kotkin, Simpson & Desanto 1978, p.22; Reich 1978, p.23-24.)

- Porter, P.B. & Schroeder, S.R. 1980)

Generalisation and maintenance of skills acquired in 'Nonspeech Language Initiation Programme'
Applied Res. in Ment. Retard. 1, 71-84, 1980

This is a report of a 3 year study which examined the extent to which skills acquired on a NONSLIP programme generalised to other abilities. The skills taught included discrimination of number and colour; rote sequencing of symbols; symbol-picture matching; and labeling. Imitative, and then self-initiated verbalisation of the sentence is encouraged where appropriate.

The subjects were 31 children, aged 3-19 years. 15 were in the normal intelligence range. 14 were severely retarded, and 10 of these lived in an institution, were older than the rest of the group, and had more organic handicaps. All received ½ hour training in the NONSLIP programme 2 or 3 times per week.

Assessments

A 10 item battery of generalisation items was designed for the experiment, and included number and colour discrimination; 3 verbal imitation tasks; following of complex instructions; measures of receptive and expressive vocabulary; and Mean Length Utterance, obtained from 3 samples of unstructured communication.

The children were assessed pre- and post-training, and a random sample of 11 were assessed again 6 months later.

Results

Nearly all subjects showed gains on the assessments after training. The institutionalised group improved less than the rest. A complex of variables was obviously involved here. The six month follow-up showed that the skills learned were maintained reasonably well. 90% of the group were found to be using speech in their normal environment. Follow-up of the same subjects 3 years later showed that skills were still maintained, with improvement by some subjects.

Comments

1. The authors did control for the possible effect of repeating the assessment on learning. However, there is no mention of the possible effect of history. Many of the subjects may have made gains on the assessments anyway, whether or not they had been exposed to the NONSLIP programme, particularly given that the project lasted 3 years, and that some of the subjects were of normal intelligence, and very young when it commenced. More information about the experimental subjects, and about the subjects (38) who dropped out, might have thrown some light on this question.

Assuming that, for the older and more handicapped subjects at least, the gains were due to the training, this is good evidence that NONSLIP is not a mechanical procedure, but can effect real learning.

- Reid, B. & Kiernan, C.C. (1979)

Spoken words and manual signs as encoding categories in short-term memory for mentally retarded children
Am. J. Ment. Defic. 84, 2, 200—203, 1979

A number of research findings suggest that mentally handicapped people, especially those with low verbal IQ's, may prefer spatial to verbal responses, if given a choice.

The purpose of this paper was to investigate whether severely retarded children would encode signs and spoken words separately in short-term memory.

Six mentally handicapped children participated in the experiment. All could speak and understand language, imitate speech sounds and hand postures, and use gestures. The children learned signs and spoken word labels for cartoon faces, and were then given training in memory skills. In the experiment itself, there were 4 conditions, each comprising 4 trials of 3 face cards each: all words, all signs and two shift conditions with a change from signs to words, or words to signs, on the last trial.

After each trial there was a delay incorporating a “filler” task to prevent their repeating the names to themselves, and they then had to recall the 3 faces.

The results showed that the children’s performance got worse the more they were required to remember .i.e .as the number of trials increased. (This is what is meant by the term proactive inhibition used to describe the experiment.) However, under the two shift conditions, the children’s recall improved on the fourth trial, when the modality changed from spoken word to sign, or vice versa. This suggests that words and signs constitute separate encoding categories in short-term memory.

Comments

The findings which relate to preference for spatial encoding among the mentally handicapped and autistic have been much quoted in support of the effectiveness of nonverbal strategies, but few researchers have attempted to explore them experimentally. The results reported here are difficult to evaluate, in isolation; this was the first published study of a number in the same field carried out at Thomas Coram Research Unit, which it is hoped will be published in the near future. Hopefully these will include a larger group of students, and some with poor verbal skills.

Definition of terms, would have helped to make the paper more accessible to the non-specialist.

For a similar finding relating to the coding of signs, see:

* Inglis, A.L. (1979)

A pilot investigation into the memory coding strategies used by multi-handicapped children learning the Paget-Gorman Sign System
Aust. J. Hum. Comm. Dis. 6, 2, 32, 1979

Schepis, M.M., Reid, D.H., Fitzgerald, J.R., Faw, G.D., Van Den Pol, R.A. & Welty, P.A. (1982)

A program for increasing manual signing by autistic and profoundly retarded youth within the daily environment
JABA, 15, 3, 363-379, 1982

In this paper, the authors describe an extension of their previous research into the involvement of care staff in implementing sign language training (Faw et al 1981, see above page 10). Whereas in the earlier study, the emphasis was on formal teaching, the focus here was on promoting residents’ signing in the living environment.

The residents were 5 profoundly retarded and 4 autistic young people, with no functional speech. 3 occasionally verbalised. The staff were 15 care staff, working in twice daily shifts, 2 at a time on each 'module' (ward). The staff, and the retarded students, had taken part in the previous study.

The sign vocabulary comprised 17 words, 9 of which had been trained earlier. Criteria for sign acquisition as before, involved use of the 'critical components' of the sign. In addition, signs were classed according to whether or not physical prompts were required.

Observations were conducted, using time sampling for each resident, at 4 periods 12.15, 1.15, 3.15 and 5.15 - two for each shift, involving a meal time and a leisure period. A baseline assessment was followed by a period of formal observations during signing sessions. A multiple baseline design was used, so that the introduction of the signing programme was staggered across shifts and modules.

There were 2 follow-up observation sessions, 5 and 17 weeks after termination of formal observation.

Signing programme

A number of specific procedures were incorporated to promote interactions between staff and residents. These included:

1. Changing the physical environment:
a 'reinforced display table' was placed within reach of the staff and out of reach of residents. On this were items which the residents might want, including snacks and toys. The staff were encouraged to reinforce, or prompt and reinforce, signing by residents who approached the table, and to request residents to 'visit' the table if they did not do so independently.
2. Altering routine interactions to prompt, guide or reinforce resident signing:
staff were encouraged to interact intermittently with residents using signs - e.g. asking simple questions such as 'do you want a drink?'.
3. Mini-training sessions:
Intermittently during the day, staff would select an object and ask questions about it which could be answered by a target sign.

For all of these, a prompt, manual guidance and reinforcement sequence was used. In addition to these strategies, staff used the signs informally wherever appropriate.

Staff Supervision

Again, specific procedures were used to promote staff signing. Initially an in-service training course was given, then on a regular basis the supervisor modelled interactions with residents on the ward, and had brief interactions with staff in a way which focussed attention on the signing programme, and gave the staff feedback on their own performance.

Staff reaction to this procedure was assessed via a questionnaire.

Results

The training programme was successful in increasing the use of manual signing by both groups of residents in each period. The averages on baseline were around 10% and 7% (retarded) and 13% and 12.5% (autistic) on the day and night shift respectively. After the programme the averages were around 49.5% and 74% (retarded) and 53% and 80% (autistic).

Each resident increased his use of signs. This progress was generally maintained during follow-up observations. Staff reported being generally favourable to the programme, and were able to implement it with minimal interference to their usual routines.

With regard to the use of prompts, autistic residents seemed to need physical prompts more than retarded, possibly because they had less familiarity with the signs, were of lower ability, and suffered from a difficulty in processing complex auditory/visual information, common to autism.

The authors note that although there were some informal observations of spontaneous use of signing by residents, on the whole considerable staff effort was required to evoke and maintain signing. They suggest that future research could determine if and how this could be reduced, perhaps using a programme such as this in which intrusive prompts were gradually replaced by less intrusive.

As far as vocal behaviour was concerned, increases were reported for 4 of the residents with the highest verbal skills (2 were the only ones with verbal imitation). This finding is related to the work of Carr & Dores, suggesting that verbal imitation is a predictor of speech acquisition.

Finally the authors reiterate their caution, expressed in the previous paper, that signing is an 'abnormal method of communication' which should not be used routinely with the handicapped, and only employed where there is clear evidence of failure to develop vocal language. They suggest that specific procedures to promote staff signing should be included in training programmes.

Comments

1. This is an extremely useful paper, of obvious clinical relevance in suggesting ways to promote and maintain signed interactions between staff and residents. In conjunction with their previous research, it provides a strong argument that informal procedures will be insufficient to really establish signed communication.
2. With reference to the work of Carr & Dores, it is by no means clear that autistic people will necessarily suffer from cross-modal processing problems. Difficulties in responding to the spoken comment of signed speech seem likely to be related to over-selective attention, modality preferences, receptive and imitative speech skills.

There is insufficient information about the abilities of these autistic subjects to determine the reasons for their failure to use unprompted signing.

3. As before, the conclusion that signing should not be routinely adopted because it is an 'abnormal communication system' seems odd. A more justifiable rationale would be the amount of effort required, as evidenced in this paper, to ensure that a signing environment can be effectively implemented and maintained.

- Spybey. C. (1983)

The introduction of Makaton into an Adult Training Centre
Teaching and Training, 21, 2/3, 50-56, 1983

A description of how Makaton was implemented in an Adult Training Centre over an 18 month period. Parents were involved, and periods set aside for regular staff training; some problems were found in staff having opportunities to sign, and training was reprogrammed. Six trainees learnt to recognise and use Stages 1-5, and were able to supplement speech with signing. Vocalisation is said to have improved for some of the group.

Comments

Some information about how signing was used outside the training session would have been useful.

- Song. A. (1979)

Acquisition and use of Blissymbols by severely mentally retarded adolescents
Mental Retardation (USA), 17, 5, 253-255, 1979

This study examined the relationship between performance on a range of assessments, and learning of Blissymbols. The assessments consisted of the PPVT, Fairview Self-Help Scale, and questions designed to elicit the words selected for training. Desire to communicate was assessed by a questionnaire to the teachers.

Subjects were 4 nonverbal students; one of whom was dropped after 3 months because of physical problems. The MA of the other 3 was around 2y. Criteria for entry to the programme were: showing some desire to communicate; pointing to 10 PPVT items, and to major body parts. Duration of training was 10½ months.

Three levels of symbol acquisition were examined: receptive, respondent (elicited) use and spontaneous use. Daily records were kept regarding the frequency of use, date of symbol introduction, and number of teaching trials.

Results

All 4 students learnt a number of symbols (20-46 range). Spontaneous use lagged behind receptive and respondent, both of which were at about the same level. The authors comment that once the students had acquired the symbols receptively, they seemed able to use them as responses. Those symbols which were used spontaneously tended to be those which were acquired rapidly. Concrete words were learned more quickly than abstract. Despite overall compatibility in MIX, there was considerable individual variation.

With regard to predictive factors, a high score on the PPVT was related to rapid learning, but only if there was a desire to communicate. It is suggested that a more helpful way of evaluating the appropriateness of a programme is to carry out a period of simultaneous assessment and treatment (this approach has also been suggested by Kiernan 1983). Spontaneous use seemed to be associated as might be expected, with motivation to communicate, and with use of pointing and gesture.

The authors conclude that if a student is motivated to communicate, can respond to the PPVT, and shows rapid acquisition of symbols, then teaching of Blissymbols is justified. If the initial learning rate is slow, other methods should be explored. Two students in this study have now in fact started to learn signs.

Comments

1. There is no background information on how symbols were used in the classroom, and the quality of communication there. Was any specific encouragement given to the students to promote spontaneous use? It seems likely that the students who were naturally more motivated to communicate spontaneously would receive more reinforcement from staff to do so, but this possibility is not raised. (See Francis & Williams, for a discussion of relationships between environment and communication skills.)
2. Vocabulary seems to have been selected by the trainers on the basis of what they considered would be functional; however it was found that the students were more motivated to communicate interests than needs, and the vocabulary was modified in consequence. Hence it seems likely that vocabulary content may have been a major factor in learning. Although this is raised as a comment, it does not receive further discussion.
3. More information about the assessment of communication desire would have been useful; there is no way of telling how far subjective bias on the part of teachers and trainers influenced this assessment.

4. The performance of the student who was dropped is interesting - he learnt and used a large number of symbols in 3 months. However, it is not really explored.
5. A number of interesting points are raised by this study which could do with further investigation.

- Weller, E.L. & Mahoney, G.J. (1983)

A comparison of oral and total communication modalities on the language training of young mentally handicapped children
ETMR, 103-110, 1983

Against a background of increasing interest in the use of total communication programmes with very young handicapped children, this paper compares the effectiveness of two intervention programmes, one oral, one using signs, in developing the language abilities of 15 Down's Syndrome children. All were at the one word stage, with fewer than 50 words; were involved in infant stimulation programmes, with no formal language training, and were aged from 18-36 months at the onset of the study. The programme used was the Environmental Language Intervention Programme (ELI), which uses parents as the primary language trainers (MacDonald et al 1974). During the 5 months of the study, mothers were given intensive help weekly for 3 months, and this was then reduced. The daily lessons, lasting 20-30 minutes given by the mothers included training in comprehension, imitation, conversation, a structured play session, and generalisation. The mothers in the total communication group received weekly instruction from a signer throughout the programme. Signs were used 'augmentatively' (looks like key words signed and spoken). Children were not made to use either modality, but all attempts to communicate were reinforced.

Results

Various developmental scales were used to assess the children (REEL, Bayley, Uzgiris and Hunt). Mothers kept records of signs and words used, and these were computed for the last week of the programme. Significant improvements were seen for both groups (girls more than boys). These gains were deemed to be due to the intervention, as on average they exceeded the gain of one month which would be predicted by time alone. The signed and spoken vocabulary of the total communication group was 70% greater than that of the oral group at the end of the study. Despite this increase, there were no differences in cognitive achievements between the groups. The mothers of the total communication group were all successful in teaching signs, despite the fact that none were proficient at the beginning of the study.

The authors conclude that there is no evidence that teaching language through total communication is more effective than oral methods in increasing children's rates of oral language development. Conversely, oral language was not impeded by the use of signs. They stress that over a longer period of time, different results might have been obtained - these findings should not be interpreted to mean that total communication has no impact on oral language development.

Comments

1. This study suggests that it is the quality of intervention which counts rather than the modality which is used to develop young children's language skills. (It is worth noting that the ELI is a very thorough structured programme tailored to the needs of parents, who received a lot of support and training.)

This is in contrast to Jones 1980, and Le Prevost 1983, who argue that sign may play a specific role in the development of oral skills (e.g. by clarifying phonic confusions).

2. The problem addressed by Jones is not considered here - namely, how to select at an early stage the children who may in the future need training in nonverbal modality in order to develop communication adequately - e. g. those with perceptual problems affecting auditory processing.
3. A follow-up study would have been useful to ascertain whether the gains made by the children were sustained over time.

Macdonald J.D. et al(1974)

An experimental parent-assisted program for preschool language delayed children
JSHD, 39, 395-415, 1974

- Wells, M.E. (1981)

The effects of total communication training vs. traditional speech training on word articulation in severely mentally retarded individuals
Applied Res. in Ment. Retard. 2, 323-333, 1981

This study investigated the effect of traditional speech training compared to training using signs on word articulation in 3 severely retarded young women. The words used were matched for difficulty of articulation, and during a session training alternated between oral and total communication. The subjects were required to imitate the word, or the word sign. Recordings made before and after training indicated that there was greater improvement with total communication than with traditional speech training. In the discussion, some interesting features of learning are noted - one girl breaking up the word orally to correspond with the movements of the sign. Apparently the words and signs learnt in training were readily generalised, and anecdotal accounts of improvements in behaviour were received.

Comments

1. Provides further evidence that training in sign is likely to facilitate rather than impede, development of oral language.
2. There is no information about the subjects' speech, motor and imitative abilities.