MAKATON VOCABULARY DEVELOPMENT PROJECT
Research Information Service
November 1980 Volume 1 Issue 4

AUTISM AND NON SPEECH SYSTEMS

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Published by
Makaton Vocabulary Development Project

INTRODUCTION TO AUTISM & NONSPEECH SYSTEMS

INTRODUCTION

Research into the use of nonverbal communication with autistic subjects currently presents a confused picture to the reader. There are very few clear results emerging other than those in general terms, which are that signs and symbols succeed with this population where verbal training fails. In other respects the reports conflict in terms of the use to which the signs are put:

- whether or not speech develops as an incidental result of sign training

and crucially -

- whether a simultaneous SIGN/SPEECH presentation should be used in teaching autistic children.

Each of these areas will be discussed before presenting the individual papers.

A general point to bear in mind for this Issue is that the samples are in general extremely small, usually using less than five subjects. Autistic children differ so widely from one another that it is difficult to generalise from the behaviour of individuals to the larger group. It has been argued by Gersten (1980) that single subject designs, which permit analysis of details in individual learner performance across a variety of situations, are more appropriate for autistic subjects than comparative research (which seems to match groups and compare the outcome of different treatments). Precise methods, however, are needed to ascertain which specific teaching methods are effective for which types of children. The research on nonverbal communication in autistic children is increasingly characterised by this approach.

1. Mode of Presentation - The role of Signed Speech

A growing body of evidence suggests that there may be two distinct subgroups of autistic children, mute and verbal, who will respond differently to signed speech training. Whereas the verbal children seem able to attend to both the visual and auditory components, the mute child typically displays overselective attention - that is, he attends only to the visual stimulus, and ignores the spoken word. Mute autistic children are unlikely to develop speech, although they will almost certainly learn to sign (Carr 1979). Studies on information processing skills of autistic children indicate a relative difficulty with the processing of auditory information, compared to spatial, and a preference for tactile-kinaesthetic cues (Oxman et al 1978).

It has been suggested by some researchers (Fulweiler & Fouts 1976; Bonvillian & Nelson 1978), that a primary difficulty for autistic children lies in their ability to make specific auditory - visual cross-modal associations and Bonvillian & Nelson suggest that use of signed speech may actually be confusing for such children, and interfere with learning. They suggest using sign only.

On the whole, research does not support this contention, and there seems to be an assumption that even if mute children are not attending to the spoken word, its presence does not interfere with learning, and may in the long term lead to the formation of receptive sign-word associations (Creedon 1976, Shaeffer 1980).

Gersten (1980) reviews research on overselective attention, and information processing by autistic children, and suggests that researchers may be altogether too glib in the way they have interpreted and applied the findings. He suggests that overselective attention is demonstrated by many, but not all autistic and moderately-severely mentally retarded children, irrespective of whether or not they have expressive language. The correlation with mental age (assumed by Carr, 1979) is not always predictable. As regards information processing, Gersten criticises the research for being too laboratory based, and analysing abstract and arbitrary connections, which cannot safely be generalised to more naturalistic contexts. For example, in an experiment using a common everyday occurrence - a candle burning out - the autistic children's sequencing deficit disappears. Gersten argues powerfully for process oriented, single subject designs which investigate learning in real life settings. With regard to overselect attention, he advises against "working round" the deficiency by using "within stimulus prompts" (using visual means only to teach visual referents, e.g. a SIGN only condition in the teaching of object names) - since this does nothing to expand the child's breadth of attention.

In summary, then, the available research suggests that practitioners should assess whether or not their autistic and mentally retarded clients have a problem of overselective attention. Where this is the case, Carr in his 1979 paper suggests that it may be appropriate to adopt the techniques described by Schaeffer (1980) - see this Issue. The teacher uses signed speech herself, but trains sign and speech skills separately and concurrently - increasing the child's attention to auditory cues, as a separate skill to communication through sign.

Children with well developed verbal imitation skills are less likely to display overselective attention, and to develop effective speech through a signed speech training programme. There is no evidence to date against the use by teachers of signed speech to autistic children, although mute children who are only capable of attending to the visual component may need additional training to develop speech as well as sign - and soma never learn to speak.

A point worth making in relation to this discussion is the lack of interest shown in the tactile-kinaesthetic feedback provided by sign (notable exceptions being Oxman et al 1978; Creedon 1973, 1976; Miller & Miller 1973). This is clearly an area which will assume mere prominence and needs investigation.

2. Spontaneous use of sign

All too few of the research projects described here explore whether or not the children use the signs which they learn in the teaching environment, spontaneously and creatively in other settings. Researchers are now becoming aware of the need to move out of the laboratory, and the later papers (e.g. Casey 1978; Konstanteras et al 1979) include information on how signs were generalised. In particular Schaeffer (1978, 1980)

regards spontaneity of use as a critical criterion of true learning. The difference between imitation, elicited expression, spontaneous expression, and receptive knowledge of signs is one to be constantly borne in mind by both researchers and practitioners.

3. Does signing facilitate speech?

This question has already been partially discussed in the section on the role of signed speech input. It appears that whether or not autistic children develop speech subsequent to learning signs depends partly on whether in the first place they were mute, or had some verbal skills. In general, there are few reports in the literature of speech being used successfully by nonverbal autistic children (Carr 1979). However, two notable practitioners, Creedon & Schaeffer, have claimed success in teaching speech to mute children through an intermediary sign programme. In Creedon's case, age seemed to be a crucial factor, in that all the younger children - under 4½ developed speech skills, whereas older children had more difficulties. Unfortunately, neither Creedon nor Schaeffer have produced any reliable data, accessible to statistical evaluation of some kind, in support of their claims - and the descriptive evidence they provide is insufficient to determine what were the crucial variables in learning. It is to be hoped that this evidence will be in the future.

NOTATIONS USED THROUGHOUT ISSUES

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

° Papers/Books available for reference from:
Mr. Roger Tallis,
BIHM Information & Resource Centre,
Wolverhanpton Road, Kidderminster, Worcs.
Tel: Kidderminster 850251

AUTISM & NONSPEECH SYSTEMS

Benaroya, S., Wesley, S., Ogilvie, H., Klein L.S. & Meaney M. (1977
Sign language and multisensory input training of children with communication and related developmental disorders
J. Autism & Childhood Schizophrenia 7, 1, 1977, 23-31

° Benaroya, S., Wesley, S., Ogilvie, H., Klein, L.S. & Clarke, E. (1979)
Sign language and multisensory input training of children with communication and related developmental disorders: Phase II
J. Autism & Developmental Disorders, 9, 2, 1979, 219-220
Cross-Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
Describes the results of a programme which taught signed English and speech using a "multisensory intrusion approach" to six autistic and communication disordered children.

The three main steps in the programme were intrusion play, imitation of teacher's body movements, and pairing objects in the school environment with the manual signs and verbal message (taught by moulding). The programme developed from single word acquisition and simple phrases, to demonstration of relational concepts. The Language Master was used to introduce pictures.

Records were kept of progress in sign acquisition in the teaching sessions, and socioaffective behaviour in free play sessions.

Results (from 1979 Paper)

1. Children acquired signs, combined them and used them spontaneously (no definition given, but it seems to mean "unprompted in the teaching situation". There is no report of a transfer of signing skills to the play sessions).

2. Overall there was significant improvement in receptive and expressive language, acquisition of rudimentary steps in abstraction and concept formations, better impulse control, and increased interaction with objects in the environment.

3. The programme did not improve the children's social interactions with peers. As regards interaction with adults, the conclusions are unclear, since the authors imply first, that there was an improvement here - and in the next paragraph contradict themselves.

   The authors suggest that the inter-relationship of linguistic and social behaviour may be closer in normal than in autistic children. See Bailey & Tait, 1979, MVDP Research Information Service, Vol.1, No.3 for a similar finding.

Critical Points

1. Poor subject descriptions - no information is given on IQ, language comprehension, use of natural gesture or communication skills at the start of the project. There is no information on the education programmes followed previously by the children, and their successes or failures therein.

2. No examples, or frequency counts are given to illustrate the children's success in learning to sign. There is no information at all on whether the signs learnt in the classroom transferred to other environments.

3. Since the teaching programme is a total package, it is difficult to evaluate which of the procedures were crucial to success - not all the steps may be necessary (Carr 1978, this Issue).

Clinical Applications
The results from the programme suggest that the ability to learn and use a language will not necessarily lead to an increase in social interactions. The relationship between linguistic and social skills is not fully understood at present, and needs further investigation (see Bailey & Tait, 1979; Walker, 1977, MVDP Research Information Service, Vol.1, No.3. In Walker's research, social maturity (Vineland) was not predictive of success in expressive use of signs - but socialisation as measured by Gunzberg's PAC Charts, was).

Bonvillian, J.D. & Nelson, K.E. (1976)
Sign language acquisition in a mute autistic boy
J. Speech & Hearing Disorders, 41, 1976, 339-347
Cross-Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
A single subject case study describing the teaching of signed speech to a 9 year old autistic boy with minimal receptive skills, and no useful expressive communication. He had previously experienced intensive training to develop verbal language, with no success. Moulding and imitation were used in the early stages of the sign programme. Signs were used to him by all staff in the centre, and at home by his mother. Records were kept of his use of signs in the teaching session, classroom and at home.

Results
The boy learnt to use, and combine, 56 different signs in six months. In terms of his grammatical structure, and meaning, his range of two word combinations was similar to that of young normal children. Some of his early combinations, however, were long and complex - e.g. "no mother car play school" (i.e. mother is not coming to pick me up in the car, because I'm going to play at school".

Adaptive behaviour - e.g. tantrums - reduced attention - improved, and his score on the PPVT rose from 3.6 years to 4.11 years in the six months.

The authors suggest that the boy's cognitive and linguistic abilities had been relatively untapped by previous speech-oriented teaching.

Critical Points
Although a table of the signs learnt over the six months is provided, there is unfortunately no indication of how they were used - e.g. which were combined, which contexts seemed to favour use of which signs, role of reinforcement. The paper was written before the role of context in communication had assumed the importance it currently has.

(More details of this case study are given in Bonvillian & Nelson, 1978, see below.)

See Fulweiler & Fouts, 1976, this Issue, for a similar case study with a different outcome.

* Bonvillian J. & Nelson, K. (1978)
Development of sign language in autistic children and other language handicapped individuals
In P. Siple (Ed) Understanding language through sign language research, Academic Press, New York, 1978, pp.187-213
Cross-Reference
MVDP Research Information Service, Vol.1, No.2 REVIEWS AND BIBLIOGRAPHIES

Summary
This paper includes the following: description of the linguistic progress of an autistic child exposed to signing; reviews of published and unpublished studies of sign programmes with autistic and retarded and aphasic subjects; discussion of merits of different communication modes; recommendations for future research.

Clinical Applications

1. Pre-training Assessment
   Should include details of range of syntactic and semantic structures comprehended and used; comparison of spontaneous vs. non-spontaneous output; testing on imitation and comprehension of different modes of presentation - SIGN: SIGN + SPEECH: SPEECH.

2. Predictive Measures
   The following are suggested: comprehension of and memory for, pantomime and gesture; age (pre-adolescents faring better than adolescents and adults); good receptive skills.

   High Creak scores and low scores on language tests were directly related to difficulties in learning. IQ measures were not clearly predictive of performance. (This ties in with findings with the mentally handicapped.)

   In addition, once training has commenced, the authors suggest that those signs which are used correctly without preceding imitation or prompting are likely to be the best retained; and that duration in the programme is positively correlated with the

number of signs learned, and with production of phrases. See Hobson & Duncan, 1979, MVDP Research Information Service, Vol.1, No.3, 15.

3. Teaching Methods

i) Mode of presentation
Simultaneous speech and signing may pose difficulties for autistic children with cross-modal perceptual problems. Authors suggest that programmes should be varied, perhaps beginning with sign alone and moving to sign and speech, and the responses of individual clients explored.

If simultaneous programmes are successful, other forms of redundancy might be usefully exploited, such as the printed word.

See Introduction for a discussion of this issue.

ii) Selection of signs

a) For the child taught by the authors, the most difficult signs to learn were those involving complex finger configurations and “2 hand different signs” (where hands carry out separate and different movements). This is in line with the findings of the Thomas Coram Research Unit.

b) The semantic relations underlying 2 word combinations in the one child studies were similar to those of young normal children - offering limited support for a developmental basis to the selection of signs to be combined (see Konstanteras et al 1979, this Issue).

c) Those signs first learnt were also those first mastered, and should therefore be chosen to have optimum communicative value.

iii) A signing environment
It is strongly recommended that children be exposed to a total signing environment, with opportunities to observe adults signing to one another (see Fenn 1975, MVDP Research Information Service, Vol.1, No.3, 10). Films and videotapes of adults signing could be used as teaching material.

iv) Level of teachers’ signing
Programmes should not be “locked in” to the development of the teachers’ signing skill, going from one sign to two to several in combination only as she becomes more expert.

This reinforces MVDP teaching which stresses use of fluent signing from the start: we should perhaps pay more attention to the relationship between teachers and clients signing skills (see Fenn 1975, MVDP Research Information Service, Vol.1, No.3, 10).

4. There was a wide variation in outcome of all the studies, relating not only to differences between the subject but also to the different factors in treatment. The authors feel that “any serious comparative programme evaluation is for the future,

when highly similar groups of subjects can be tested before training and then evaluated as they move through contrasting educational criteria" the implication being that more detailed process studies are required.

The authors conclude that the studies reviewed are a powerful indication that sign in itself opens up communication for nonverbal clients.

This paper is highly recommended - remember that the authors are describing limited and specific studies with autistic subjects and whilst many of the findings are applicable to other types of handicap, some (eg mode of presentation) may only be relevant to this group.

Brady, D.O. & Smouse, A.D. (1978)
A simultaneous comparison of three methods for language training with an autistic child: An experimental single case analysis
J. Autism & Childhood Schizophrenia, 6, 1, 1978, 271-279

Cross Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
A single subject, simultaneous treatment design aiming to investigate the effectiveness of three training methods on comprehension instructions by an autistic boy - SIGN only, VERBALISATION only, and SIGN + VERBALISATION simultaneous (Note: this boy was the subject of the Fulweiler & Fouts 1976 study, see this Issue).

The boy had "some receptive communication ability", and used a few words and signs communicatively.

Results
The simultaneous SIGN + SPEECH approach was significantly superior to either SIGN or SPEECH alone. The SPEECH alone treatment resulted in decreased performance. The authors conclude that one mode of treatment should not be automatically adopted for all autistic children, whose needs are very different (this is a comment on the suggestions of other researchers that SIGN alone is the most appropriate mode for autistic children - see Bonvillian & Nelson, 1978, this Issue). The theory that autistic children suffer from a specific cross-modal deficiency is questionable - the simultaneous SIGN + SPEECH treatment "consists of a unique stimulus pattern that summates across all sense modes'
- See Introduction for a discussion of this point
- See Carr 1979, this Issue.

Brady & Smouse do not draw a distinction between mute and verbal children, and there are indications that these two groups may respond differently to the task of processing simultaneous sign and speech information.

Critical Points

1. There is no information given on the child's responses to SIGN alone, and simultaneous SIGN + SPEECH, prior to the experiment. This is particularly important, because the child had received training in total communication (see Fulweiler & Fouts, this Issue). This is almost bound to have had an effect on his subsequent performance.

2. The baseline taken for comparison was the child's responses to SPEECH alone - i.e. the instructions used in the experiment were given through SPEECH and the child's responses recorded. This served as the basis for comparison with responses during training. Using one only of the training methods to yield baseline data means that the child had more exposure to SPEECH alone than to the other two methods. This in itself may have had an effect.

3. Whereas a single subject process study can give us information about how learning occurs, a single subject design in an experimental study such as this is very weak. It is impossible to generalise, as the authors do, from this subject - whose responses are likely to be very individual - to all autistic children.

4. During training, the child was bombarded simultaneously with three treatment methods, closely related, given by three different experimenters. There is bound to have been a massive interaction effect between the three treatments. The only conclusion one can draw from the results is that faced with a most confusing presentation, the child selected a particular input for preference. Given different training conditions, he might well have performed quite differently.

5. Explanation of the child's progress during the training is totally inadequate. For example, responses to SPEECH only peak to a high two thirds of the way through, and then deteriorate rather suddenly. This is not investigated. And it looks as though there may have been an experimenter effect during the first two blocks of treatment (i.e. the child made more responses to one teacher than to either of the others). No analysis of experimenter role is reported.

Clinical Applications

None.

° Carr, E.G. (1979)
Teaching autistic children to use sign language: Some research issues
J. Autism & Developmental Disorders, 9, 4, 1979, 345-359

Cross-Reference

MVDP Research Information Service, Vol. 1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary

A review of the literature which considers three research issues:

1. Does Signing Facilitate Speech?

On the basis of the evidence available, Carr suggests that there may be two distinct sub-groups of autistic children: those who are mute and those with some verbal ability (echolalic children are included here). He concludes that whereas the verbal group may develop speech naturally when exposed to simultaneous SIGN + SPEECH communication training, the mute group are unlikely to do so. The argument runs as follows:

Mute children tend to have low mental ages, and to have overselective attention -they tend to pay no attention to the auditory component of a simultaneous message, and respond only to the gestural component. Carr quotes research findings, including his 1978 study, in support of this claim. Mute children, therefore, are unlikely to benefit from simultaneous communication training - but may develop speech if SIGN + SPEECH are trained concurrently, but separately. This refers to the work of Schaeffer, see this Issue.

> See Introduction for a discussion of the role played by overselective attention in the learning difficulties of autistic children; and for an overview of the debate ahout teaching methods (SIGN/SPEECH/SIGN + SPEECH).
>
> See Creedon 1980 below for criticism of Carr's conclusion with respect to mute children

2. What is the Upper Limit of Sign Language Acquisition?

Does the teaching of sign language promote the acquisition of abstract and complex linguistic skills? Carr concludes that the upper limit of sign language acquisition may be quite high, including use of preposition and pronouns, syntactic variety, long utterances (average maximum 4.6 - 7.8 words), and generative and creative usage of language. Carr comments on the need for process studies - in which day-to-day gains in particular signing skills are related to particular interventions. It is difficult to assess which are the factors contributing to these linguistic achievements, because teaching procedures are not systematised.

3. Does Sign Language Acquisition Result in a General Improvement in Adaptive Functioning?

Carr gives a qualified "yes" in answer to this question, but points out that in the main, complex treatment packages are involved, and it is difficult to assess what effect signing procedures per se have on behaviour (eg Benaroya et al 1977, 1979 this Issue). Carr describes his own research on the training of spontaneous signing (i.e. self-initiated, in novel situations) by autistic children. Gains here were related to a decrease in self-stimulatory behaviour, Carr speculates that the reason for this may lie in the learning by the child that he can have an effect on the world around him (see Casey 1978 this Issue).

Carr also suggests that future research should evaluate the role of parent training.

Clinical Applications

The need for process studies is paramount in the field of mental handicap and other language disorders, as well as autism. The literature has been dominated by outcome

studies which, seeking to “prove” the efficacy of one programme or another, blur distinctions between very important factors in the learning process. It is becoming increasingly apparent that the teaching and learning of communication is too complex to permit a simple, easy answer - we need much more evidence on how children learn.

Process studies are the ideal research for clinicians lacking the time and finance for more experimental research. Painstaking recordings of even one subject, which can isolate the effects of different contexts and interactions, can yield valuable information, and would be of immediate practical use to the researcher.

If you want to embark on such a project, however, do seek advice from colleagues with research experience on how to set it up, and ensure objective recording methods, etc.

° Creedon, M. (1980)
Critical comments on “Teaching Autistic Children to use Sign Language: Some research issues
Letter to the Editor, J. Autism & Developmental Disorders, 10, 2, 1980, 243-244

Creedon criticises Carr‘s paper on three grounds:

1. Carr focuses on the issue of speech development by autistic children, where the priority is surely functional communication through whatever means.

2. Creedon‘s own mute clients have successfully developed speech.

3. In comparing auditory and visual stimuli such as sign and speech, other factors should be considered than the primary channel - the differences in temporal stability, and kinaesthetic and proprioceptive, spatial and motoric cues involved.

° Carr, E.G., Binkoff, J.A., Kologinsky, E. & Eddy, M. (1978)
Acquisition of sign language by autistic children, I : Expressive labelling
J. Applied Behaviour Analysis, 11, 4, 1978, 489-501
Cross-Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
Four nonverbal autistic children with minimal receptive ability were taught expressive sign labels for common objects, using a multiple baseline design, and a training procedure consisting of prompting, fading and stimulus rotation, i.e. five food label signs were taught.

Training 1 : Teach sign 1
Test 1 : Present all five foods, elicit signs
Training 2 : Teach sign 2 and recap sign 1
Test 2 : Present all five foods, elicit signs
Training 3 : Teach sign 3 and recap signs 1 and 2,
etc., etc.

(Stimulus rotation - in training, trials involving previously mastered signs were interspersed between trials involving the new sign.)

The aims were threefold:

1. To consider whether prompting and fading techniques were sufficient for teaching signs to autistic children lacking speech skills and signs before the study.

2. To study whether the procedures would enable the children to master a number of expressive sign discriminations.

3. To assess the efficacy of the simultaneous communication procedure.

The task was to teach the children to make a specific sign when shown a specific object.

Results

The procedures were sufficient to teach the sign labels - but an enormous number of trials were needed. The authors suggest that, in teaching, signs should be reinforced in other contexts, and that the reinforcement schedule should be intermittent, rather than continuous (i.e. rewards are not given for every occurrence of the desired behaviour, but at less frequent - but predetermined intervals). This promotes better generalisation to other contexts where staff/ parents are too busy to reinforce continuously.

The outcome of the investigation of the roles of the visual and auditory stimuli in the simultaneous communication procedure does not suggest that the children were acquiring auditory, as well as visual discriminations. However, the authors point out that a simultaneous presentation does not afford the child an equal opportunity to attend to the three types of cue (visual, vocal and lip reading). Furthermore, the children's receptive ability was not assessed in the present study: so it is not known whether the children would have responded in the receptive mode in the same way. Studies which investigate generalisation between receptive and expressive modes are needed (see Smeets & Striefel 1976c, MVDP Research Information Service, Vol.1, No.3, 26).

Critical Points

In order to test whether the children were attending to auditory, or visual cues when learning the signs, they were tested at the end of the training period under three conditions:

1	VISUAL	the teacher presented the object without saying anything
2	VOCAL	the teacher did not present the object, but said its name
3	LIP MOVEMENT	the teacher did not present the object, but mouthed it

The children had been trained to sign in the presence of the object, and the test indicates, not very surprisingly, that performance was better with the object present than absent. The children had clearly not learned incidentally the association between sign and word to which they had been exposed in training. Such a test, however, tells us nothing at all about the relative roles of SIGN + SPEECH in the learning process.

(See Schaeffer, 1980 this Issue, who claims that sign-word associations are learned in training.)

In other respects this paper is exceptional in the clear distinction made between experimental studies, and treatment programmes, and the differing requirements of each - a distinction all too often blurred by researchers who attempt to evaluate treatment programmes through controlled experiments (the two may not always be compatible). The information contained in the paper is sufficient to allow for replication by other researchers.

Clinical Applications

1. Results suggest that if enough attention is paid to reinforcement, clients can learn signs as labels simply by being taught through prompting, fading and stimulus rotation - i.e. you may not need a complex package which teaches other skills, such as imitation, body image.

   (Remember, though, that the learning of signs as labels is a very limited skill. Perhaps a broader based programme is more efficient to teach understanding and spontaneous usage. Needs further investigation.)

2. To facilitate generalisation to other settings, an intermittent reinforcement schedule should be adopted as soon as possible during training.

Casey, L.O. (1978)
Development of communicative behaviour in autistic children: A parent program using manual signs
J. Autism & Childhood Schizophrenia, 8, 1, 1978, 45-58
Cross-Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
Mothers and teachers used signed speech in the classroom and at home to teach four autistic children communicative skills, in such a way that these skills could be environmentally maintained. No direct treatment was applied to undesirable behaviour. “The specific question asked was whether or not the use of manual signs, by parents of autistic children, would increase communicative behaviour, and decrease undesirable behaviour, in relation to baseline conditions, for these children”.

The method used was a simultaneous SIGN + SPEECH procedure. Expressive use of signing was not taught directly (e.g. through moulding or imitation), but the children were reinforced socially for signing and/or speaking. The four children were all echolalic, with severe behaviour problems. If we accept the hypothesis of Carr 1979, that there are two distinct sub-groups of autistic children, in respect of ability to profit from a simultaneous approach, this group of children represent those with verbal skills, who might be expected to do so. (One child used and understood a few signs.)

The mothers used signed speech in individual sessions with their children, talking about picture cards. In the classroom, a highly structured education programme was followed, with the teachers using signed speech throughout the day.

A multiple baseline design was used. For the baseline, the children's responses were recorded during the mother-child sessions. At this stage, the mothers used no signs at all. Responses in the classroom, where the teachers did use signs, were recorded as well. During the treatment programme, signing was introduced to each child in a different week.

Baseline	Treatment
Weeks 1 & 2	Week 3 - only Tommy gets signs from mother Week - Freddie, Eric and Tommy get signs from mother Week 5 - Lori, Freddie, Eric and Tommy all have signs from mother

(This design allows us to see what effect is of the mothers using signs, as distinct from interacting verbally, had on the children's behaviour.)

Results

Four categories of communicative behaviour were recorded - appropriate interactions (i.e. responding to a task, playing co-operatively, or following directions) any attempts at manual signing of words, solicited verbal responses, and spontaneous verbal responses.

There were also four categories of inappropriate behaviour, self-stimulation, withdrawal, mildly and extremely disruptive behaviour.

For all the children, communicative behaviours increased and inappropriate behaviour decreased, as the treatment progressed. Individual profiles differed, but all the children improved. For most of the children ,in the classroom, and in the mother-child sessions, the main increase seems to have been in appropriate interactions and solicited verbalisations. Two children were beginning to make more use of manual signs and spontaneous verbalisations at follow-up. The child with previous experience of signing improved in all areas of communicative behaviour, and by follow-up, seemed to be fading signs and using spontaneous verbalisation.

The improvements in behaviour generalised to the home environment. The authors conclude that signs are valuable instructional tools, which are economic in terms of time and resources. Undesirable behaviours can be decreased by positive training in communication, without recourse to punishment (see Carr 1979, this Issue).

Critical Points

This is an interesting paper which takes account of many factors which tend to be neglected in the literature (e.g. generalisation). However, several areas are inadequately investigated.

1 Of the four types of communicative behaviour, appropriate interactions and solicited verbalisations seem to have already been employed by the children at the outset of

the programme. The main improvement was in these skills. Was it the case that the programme was effective in increasing behaviours already in the repertoire of the children - and less effective, until the very end, at increasing behaviours not in the repertoire?

2 Why did use of manual signs and spontaneous verbalisations improve for some children towards the end of the programme?

3 There is no attempt to analyse the data statistically so we cannot evaluate the significance of the changes - and we do not know, for example, whether inappropriate behaviours decreased as a function of increased communication.

4 Was the crucial variable the mothers signing in the classroom and at home, thus effecting continuity for the children between the two settings? What would the effect have been of the mothers signing only at home, and not coming into the classroom?

5 There is a lack of information about the prior responses of the children to the education programme - and whether signs had been used in the classroom before the outset of the study.

Clinical Applications

1. Evidence that sign in itself used in a specific way (i.e. by mothers in a teaching situation) has an effect on communicative behaviour.

2. Evidence that an increase in communicative behaviour can result in a decrease in inappropriate behaviour.

3. The idea of bringing mothers into the classroom for structured sessions has an immediate appeal for clinicians wanting ideas on how to increase generalisation to the home environment.

Creedon, M.P. (1973
Language development in nonverbal autistic children using
a simultaneous communication system
Paper presented at the Society for Research in Child Development Meeting,
Philadelphia, 1973

Creedon,M.P. (1976)
The David School: A simultaneous communication model
Paper presented at the National Society for Autistic Children
Meeting, Oak Brook, Illinois, 1976

Both papers unpublished. Available from the author at the Dysfunctioning Child Center,
Michael Reese Medical Center, Chicago, Illinois 60616

Cross Reference

MVDP Research Information Service, Vol.1, No.5
AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
These two papers describe the work of Creedon at her school for autistic children, which has been very influential in America.

The progress of severely retarded children has been monitored over periods of 1-3 years. The programme used is a total package, which adopts an intrusive approach, within a behavioural framework, to develop sensory integration, and focusing on communication through sign and speech.

Quite dramatic gains ware recorded. The eight children who learnt to sign before 4½ years of age all developed fluent speech. Social activity increased, self stimulation decreased, higher levels of play, and more constructive use of objects were noted. Language performance at the time of writing was for most children at a 2½3 year level, and was creative and generative.

The learning of signs enabled then to develop cognitively, to use logical thought, negate, problem solve, etc.

Sequence of Development - Sign
The children were initially echopraxic, imitating all hand movements. Then they began to inhibit this behaviour, and sign themselves, to structure behaviour, or label. Then sign combinations occurred.

Sequence of Development - Speech
Vocalisation began with spontaneous mouthing of single words. Then discrete syllables were heard, followed by gross imitation of intonation, word combinations occurring during singing and strongly rhythmic activities. Children who spontaneously generated speech and sign communication would fade the signs themselves.

Creedon suggests several reasons for the success of the programme:

1. Children are receiving tactile information when they sign. Typically, autistic children seem to rely more than normal children on touch, and on motor feedback to make sense of their perceptions. Defects in proprioception, leading to a lack of sensory integration, is suggested as an underlying factor in the syndrome.

   In conjunction with “sensori-motor integration therapy” signs may be a very appropriate mode of communication for these children.

2. Autistic children are usually better at tasks associated with R. hemisphere skills - such as spatial, musical, visually sequenced tasks - and are deficient in L. hemisphere skills - including the processing of sequential auditory input. Signs may be processed in the R. hemisphere. See Oxman et al this Issue.

3. Autistic children usually function at a sensori-motor level of development. For the normal child, imitation plays a large part in language learning at this stage. Perhaps the reinforced, highly structured learning of sign in the simultaneous language milieu facilitates the learning of associations by the autistic child - between imitated movements and the symbols they represent.

Creedon further makes suggestions for teaching priorities - concentrate initially on what has communicative importance for the child, rather than teaching concepts such as colour and body parts. The aim should be, not simply to teach imitation, but to teach how to learn through imitation. Teachers and parents further need to be able to express their own feelings directly through words and body language when dealing with children with affective disturbances.

Critical Points
These papers have a lot to offer in terms of a descriptive, “process-oriented” account of the progress in learning to communicate of this group of children, and the suggestions of a very experienced clinician, both theoretical and practical. ‘These are lectures, rather than research reports, and as such the content is appropriate. Nevertheless, we need much more information before we can evaluate Creedon‘s reports of success - it is to be hoped she will soon publish some hard evidence to back them up.

A teaching manual is also available from the author, at cost.

* DeVilliers, J.G. & McNaughton, J. (1974)
Teaching a symbol language to autistic children
J. Consulting & Clinical Psychology, 42, 1974, 1, 111-117
Cross Reference
MVDP Research Information Service, Vol.1, No.5
SYMBOL SYSTEMS - PREMACK

Summary
Premack type symbols were used to teach two autistic children to discriminate and finally to construct, simple commands, descriptions and questions, which described the interaction between subject and experimenter.

(Procedure very similar to NONSLIP - see MVDP Research Information Service, Vol.1, No.1, 20).

By the end of training, one child could produce and comprehend four-term statements which differ minimally. The other made slower progress, but could arrange the particles from a random configuration, to make an appropriate sentence.

Critical Points
The claim that the children were learning about “the basic communication functions of naming, commanding, describing and questioning” seems a little over ambitious. Specifically, the children learnt to discriminate a very limited set of alternatives, e.g.

- Joe/Bill/Brenda give cracker/pretzel/mint/nut/m&m/raisin to Adam
- Adam point cup
- What has Sue/ who has cracker

Information is needed on how well, if at all, the skills learned transferred to other lexical items in other settings, and this is not provided.

Clinical Applications
When the instruction Point replaced Give, with the same foodstuffs used as the objects, discrimination between the particles representing the foodstuffs -which had been successfully learnt - returned to chance level. The authors suggest that because the functions of the two speech acts are quite distinct, the learning does not transfer spontaneously. The implication is that one should begin by introducing many functions with a small vocabulary (as in Makaton training) so that no one word acquires a single rigid function.

Although the reason for failure to transfer seems more likely to lie with the overconcrete learning strategies of autistic children, than with a linguistic difference in the stimuli, the principles for teaching still hold good.

Fülweiler, R.L. & Fouts, R.S. (1976)
Acquisition of American Sign Language by a non-communicating autistic child
J. Autism & Childhood Schizophrenia, 6, 1, 1976, 43-51
Cross Reference
MVDP Research Information Service, Vol. 1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
A single subject case study which describes the acquisition of signs by a 5 year old autistic boy. After 20 hours training he had learnt a range of nouns and verbs, which he could combine first in verb-object, and then subject-verb-object forms. The child also combined signs and words, first signing and speaking both, then signing one element and speaking another. Signs were used spontaneously outside the clinic. Other aspects of behaviour improved - including attention and sociability.

Critical Points
It seems likely from the examples of signed phrases that the child was at this stage only communicating requests; his use of language may therefore have been somewhat limited. (We now have the benefit of recent linguistic research into the functions for which language is used, which the authors were unaware of when writing the paper - see Schaeffer 1978, 1980 this Issue).

After such a short training period this is probably to be expected, but it may be of significance in view of the fact that this child was the subject of Brady & Smouse's experiment one year later, when he had clearly regressed (described by his mother as having no effective communication). It is unfortunate that Brady & Smouse do not explore the reasons for this deterioration.

*Konstanieras M.M., Oxman, J. & Webster, C.D. (1978)
Iconicity and sign language in autistic children
In Siple, P. (Ed) Understanding language through sign language research, New York Academic Press, pp.213-235

Cross Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM
MVDP Research Information Service PSYCHOLINGUISTICS AND SIGN LANGUAGE: ICONICITY

Summary
Studies on information processing in autistic children are reviewed which indicate disordered auditory perception; a preference for visual channels; and a tendency to select only one of a number of modalities when discriminating a multi-modal stimulus.

An experimental study investigated the performance of 7 children considered “autistic”. Six were mentally retarded and one was deaf.

Iconic and non-iconic signs for nouns, verbs and adjectives were presented through picture cards. Imitation of signs was taught first, then receptive understanding and then the signs were elicited. The study aimed to assess the effects of iconicity, level of linguistic competence (i.e. imitation, comprehension and elicited expressive use) and grammatical category (nouns, verbs and adjectives) and the way these inter-related.

Results
1. Iconicity*
Iconic signs were learned better than non-iconic. In this respect autistic children differ from the adult deaf in their use of signs. We do not know if they are similar to deaf children learning signs for the first time.

2. Differential acquisition of parts of speech
Iconic verbs and adjectives were more easily learned than nouns. Authors offer evidence that these may be less complex than nouns for children at a sensori-motor level of development.

(But flash cards were used and verbs and adjectives were thus presented in a nominal framework.)

3. Mode of presentation
This was computed for the receptive mode only.

SIGN alone, and simultaneous SIGN + SPEECH were superior to SPEECH alone. In the case of the simultaneous presentation, speech appeared neither to facilitate nor impede learning. It is possible that the subjects were selecting SIGN and ignoring SPEECH, (i.e were showing overselective attention).

4. Level of linguistic competence
Performance was best for the receptive mode, then reproductive (i.e. imitated), then elicited expression.

Autistic children here seem to be functioning like young normal children.

Critical Points

1. No information is given on the children's verbal expressive and receptive skills, or any indication whether they had prior experience of signing. (Developmental profiles, however, are given in full. There is no indication whether the children were mute or verbal. (It seems likely they had some verbal skills.)

2. The conceptual levels of the vocabulary chosen were not evaluated - so we do not know whether the vocabulary was properly balanced in this respect.

* Iconicity refers to the concept of a visible association between the sign and the concept to which it refers. Iconic M.V. signs include: House, Car, Cow. Non-iconic M.V. signs include: Sister, Toilet, Biscuit.

Clinical Applications

1. Mode of presentation

Evidence is provided that autistic children benefit from SIGN or SIGN + SPEECH presentation. The authors stress that they do not know whether the children were attending to the verbal component in the SIGN-SPEECH mode. They do say that in their experience, if the child has minimal verbal understanding, it seems to aid in their acquisition of signs.

They also point out that this finding applies to comprehension only. (See Introduction for a discussion of this question.)

2. Selection of signs to be taught

Iconic signs were clearly learned more easily than non-iconic signs. Research with other groups supports this. (See Donlan, C. (1979) Iconicity and complexity in the learning of signs for superordinate category names in normal children. Unpublished M.Sc. Thesis, Human Communication, University of London. Available for reference from: School for the Study of Disorders of Human Communication, 85 Blackfriars Road, London SE1.

However, whether or not this implies that early signs should all be iconic is another question. In the Makaton Vocabulary, Stage 1, for example, there is a high proportion of iconic signs, but a considerable number of non-iconic signs. Clients do seem to be able to learn the non-iconic signs quite quickly (e.g. Mummy, Toilet, Please) - although they may have relatively more difficulty with them. Perhaps the iconic signs that they learn somehow "carry" the non-iconic ones - once the client has learned how to designate a referent through an iconic sign, the skill transfers.

A second point is that to teach all iconic signs at first might create a difficulty when you want to move to more abstract signs. You would, to put it very simplistically, first teach the client that all the signs look rather like the thing they represent and you would then have to teach that other signs look nothing at all like the thing they represent.

In other words, by having a balance early on, we may be teaching clients how to use truly symbolic communication; whereas to begin by teaching only iconic signs would be

teaching a more concrete skill which might not have the same implications for cognitive development.

Remember in any case that autistic clients may have a greater relative difficulty in learning abstract signs, than would the mentally handicapped.

3. Nouns, Verbs or Adjectives

The finding that verbs and adjectives were easier to learn than nouns is very puzzling, and the authors' suggestions are not altogether convincing. They do, however, make the point that normal children and adults rate verbs and adjectives as more highly ironic than nouns (unfortunately, there are no figures for the iconicity rating of each picture card, which would allow us to evaluate whether or not this was the case).

The study needs to be replicated before this finding can be understood and put to clinical use.

4. Level of Linguistic Competence

The findings imply that comprehension training should precede imitation, and training in elicited expression. However, as with all the studies on autism, the group was too small to allow generalisation. Other studies argue that training in expression should precede comprehension (Schaeffer 1978, 1980, this Issue; Smeets & Striefel 1976c, MVDP Research Information Service, Vol.1, No.3).

° Konstanteras M.M. Webster, C. & Oxman J. (1979)
Manual language acquisition and its influence on other areas of functioning in four autistic and autistic-like children
J. Child Psychology & Psychiatry, Vol.22, pp.337-350

Cross Reference

MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary

This paper studied the effect of mode of presentation (SIGN, SPEECH, SIGN + SPEECH) transfer of communication skills to other settings and levels of ability (receptive, reproductive, elicited, spontaneous).

Teachers spoke and signed all messages during a daily teaching period of 4 hours. Parents reinforced the work at home (mode of presentation was compared on testing).

Results

1. Sign acquisition

All the children acquired productive use of signs, with slightly differing ability profiles. Spontaneous communication was limited for three quarters of the children. Use of signs predominated over sign + word and word alone. Analysis of semantic content revealed similarities with young normal children (see Bonvillian & Nelson 1978 this Issue). Fewer signs were recorded at home. This was thought to be due to limited parental signing skills.

2. Mode of presentation
Receptive ability was equally good for SIGN and SIGN + SPEECH (with one exception where SIGN alone was superior). Expressive ability showed very different patterns for individual children across reproductive elicited and spontaneous levels.

3. Psychometric assessments
Reynell Developmental Language Scales and Stamford-Binet were used, no improvements were noted.

4. Behavioural measures
On social interaction measures, although unoccupied behaviour decreased by the end of the programme, spontaneous socialisation did not improve (see Benaroya et al 1977, 1979 this Issue).

Examiners reported better concentration, task comprehension and motivation on psychometric testing at the end of the programme.

Suggestions for assessing and observing free interaction are given and a four step training programme in ability levels is quite clearly described.

Critical Points
1. No pre-training data on psychometric and behavioural measures is offered, e.g. there is no indication of rates of spontaneous communicative interactions, or verbal comprehension.

2. The information given on the children's expressive performance is limited and confused.

Clinical Applications
1. Mode of presentation
A simultaneous SIGN/SPEECH presentation seems well suited to the needs of minimally verbal, or non-verbal autistic children (see Introduction for discussion).

2. Levels of linguistic production
It is very necessary to analyse separately reproductive, elicited and spontaneous expressive signing.

3. Behavioural measures
Children should be assessed on behavioural measures (attention, motivation, social interaction, etc.) pre-training in order to give more reliable information on improvement in these areas.

As suggested in the Benaroya et al 1977, 1979, this Issue, study, signing competence does not necessarily bring improved social interaction in its wake with these children; this skill may need separate training - or perhaps it is an unrealistic aim.

4. Individuality
This study illustrates most clearly one of the features which characterises the research carried out with autistic children - samples are very small and profiles are extremely individual. It is not possible in most instances to make firm generalisations about this population; clinicians need to keep very accurate assessments and records to provide evidence for the effectiveness of different types of programme.

* McLean, L.P. & McLean, J.E. (1973)
A language training programme for non-verbal autistic children
J. Speech & Hearing Disorders, 39, 2, 1973, 186-193

Cross Reference
MVDP Research Information Service, Vol.1, No.5 SYMBOL SYSTEMS: PREMACK

Summary
This paper describes the training of three autistic children in the use of symbols to construct sentences descriptive of an interaction between experimenter and child - Linda/Jim give/insert ball/glass/car. Two-thirds of the children completed the programme successfully.

This is one of the earliest experimental studies which sought to discover whether or not autistic children could make use of Premak symbols. In this limited respect, it was successful.

Critical Points
The authors claim that the children's use of symbols was "analogous to standard expressive language performance". However, an equally valid interpretation of the data is that the children had learnt to associate a particular set of symbols in a particular sequence with a particular event. This is not the same as creative expressive language. There are no examples of generalisation to other sentences or symbols and none of productive use of the symbols (as found by DeVilliers & McNaughton 1974, this Issue).

For example, the children are said never to have made errors between word classes - they might incorrectly use the symbol for ball rather than car, but they never substituted an action symbol for an object symbol. However, since the position of the symbols by class never varied, it seems likely that the children had learnt which symbols belonged where, rather than any linguistic function.

See DeVilliers & McNaughton, 1974, this Issue for a very similar study.

Miller, A. & Miller, E.E. (1973)
Cognitive-developmental training with elevated boards and sign language
J. Autism & Childhood Schizophrenia, 3, 1, 1973 65-83

Cross Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary

This rather novel experimental study arises from a particular theory held by the authors about the nature of language, and the deficits of autistic children. They hold, following Piaget, that the young child first learns to direct body actions, then vision and hearing, and finally language and thought, towards objects and events beyond their immediate reach. Intentional body movement provides the foundation for the development of other intentional activity. Autistic children are typically unaware of the boundaries between their bodies and the world around them, and have difficulty with both intentional body activity, and the transition to more symbolic functioning - and are dominated by immediate sense impressions.

"Before mute autistic children can begin to develop language, they must first free themselves from their autistic preoccupations. They must then achieve awareness of their own bodies in relation to objects and events in order to deliberately initiate direction action. Finally, they must achieve a means of relating the directedness of their body actions to spoken language."

Recent research into the body movements accompanying the speech of young normal children offers some support to the Millers' theories. Micro-analysis of films of young children and babies demonstrate that they move in synchrony with their own vocalisations, and those of others. Synchronous behaviour of a slightly different kind also occurs in adults. (This area of research is known as microkinesics. For more details, readers are referred to the paper by Oxman et al 1978, summarised in this Issue.)

Body movement therefore seems to play a crucial role in the development of communication - the child begins to communicate through intentional movements such as pulling, pointing, then integrates movement and vocalisation for the purpose.

Moreover, it appears that autistic children do not show this synchrony of body movement with the speech they hear or produce themselves (research by Condon is quoted by Konstanteras et al 1978, see reference in this Issue).

The need to develop timing and co-ordination between body movement and speech is also stressed in the work of Schaeffer - see this Issue.

To train self-awareness and directed body action, in their group of autistic children, the authors used a series of exercises on raised planks - the children had to make their way along and between structures at different heights. The activity focused their attention and made them move purposefully. Signs were used by the teachers to direct the children, and to describe the children's movements (e.g. open/push/pull/walk/stop).

Signs were also taught through training films, and were used in the school settings.

Nineteen mute children with "little or no" verbal understanding, and no prior knowledge of signs were involved. Most of them were at a residential school, but six were at a day school. Length of participation ranged from 4-36 months - average about 13 months.

Results

As regards understanding, all learnt to respond to SIGN + SPEECH, and then to SPEECH alone later. Twelve children could respond correctly to 2 element combinations such as “bring hat” (signed and spoken) but had more difficulty with these than with single words.

Expressively, fewer signs (median 8) and even fewer words were used. The signs were generalised to other settings appropriately. One child progressed to understanding and using syntactical spoken language.

Factors correlated with success in the programme were:

- length of participation in the programme
- low Creak scores
- chronological age

the younger the child the more likely he was to use signs and words expressively. Age did not seem to be related to progress in comprehension.

Comparison of residential and day school children showed an advantage for the day school group, especially for expressive language. This group of children were younger, spent longer in the programme, and parents reinforced the treatment programme at home.

The authors conclude that the pairing of signs and words can lead to a transfer of meaning to spoken words, and for some children stimulate the development of expressive spoken language. They query the necessity of the elevated board training, but feel that their clinical observations endorse its importance.

(The question of whether training in a sense of body image as well as signs is necessary for these children to learn to communicate also arises in respect of studies by Benaroya et al 1977, 1979; and Creedon 1973, 1976, this Issue. Further research is indicated.)

Critical Points

1. Again, subject descriptions are inadequate - e.g. their visuo-spatial and body awareness abilities, level of receptive language, approximate mental ages.

2. More information on some of the interesting developments in the programme is needed. How exactly did the children transfer meaning from SIGN to SPEECH -and did the teachers systematically fade the signs? Were the board exercises measurably effective in training body image?

3. There is no information on whether the children had previously failed in speech training programmes - so we cannot be sure that success was related to use of sign, rather than structured intervention.

Clinical Applications

Predictive factors for success in a SIGN-SPEECH training programme are suggested. Clearly, the younger autistic children learn to sign, the better the prognosis for

communication (see also Creedon 1976, this Issue - all children in her programme who learnt to sign before 4½years of age progressed to using speech).

*Oxman, J., Konstanteras, M.M., & Liebovita-Bojm, S.F. (1979)
Simultaneous communication training and vocal responding in non-verbal autistic and autistic like children
Research Abstract: Int. J. Rehabilitation Research, 2, 3, 1979, 394-396
Cross Reference
MVDP Research Information Service, Vol.1, NO.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
Brief report of a short term project on the effect of a simultaneous SIGN + SPEECH communication programme on the ability to imitate speech. Over seven months an experimental group followed a simultaneous communication programme, and the control group followed a speech oriented socialisation programme. The children were pre- and post-tested for vocal imitation of speech sounds. Unfortunately, the two groups were not comparable at pre-testing on the test - the control group scored significantly more highly than the experimental group.

The results suggest that simultaneous communication training does not inhibit speech production or vocalisation in non-verbal autistic children.

Critical Points
Without further information, it is impossible to evaluate the study, or make any clinical applications.

*Oxman, J., Webster, C.D. & Konstanteras, M.M. (1978)
The perception and processing of information by severely dysfunctional non-verbal children: A rationale for the use of manual communication
Sign Language Studies, 21, 1978, 289-316

Summary
A useful review of the literature relating to information processing in autistic children which concludes that simultaneous communication (SIGN + SPEECH) is relatively successful with non-verbal autistic children because of their greater ability to deal with the information processing demands of a visual-tactile-kinaesthetic system than with a vocal-auditory system. Evidence from neuropsychological research indicates that autistic children suffer from severe left hemisphere damage, so that sign language, which appears to be processed in the right hemisphere, is a more effective communication channel than speech. Research on the inter-relationship between gestural activity, body movements and the phonetic structure of speech is also reviewed. (The work of Condon, who found that autistic children do not demonstrate the normal synchrony between body movement and speech, is discussed in detail in this paper. For a summary of this research, see Miller & Miller, 1973 this Issue).

This paper offers a useful summary of research findings. The authors do not make any comparison between the use of SIGN alone and simultaneous SIGN/SPEECH presentation.

Ratusnik, C.M. & Ratusnik, D.L. (1974)
A comprehensive communication approach for a 10 year old non-verbal autistic boy
Am. J. Orthopsychiatry, 44, 3, 1974
Cross Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

* Schaeffer, B. (1980)
Spontaneous language through signed speech
In Schiefelbusch, R.L. (Ed) 1980: Nonspeech language and communication: Analysis and Intervention Language Intervention Series, Vol. IV, University Park Press, Baltimore, 1980, chapter 17, pp.421-446
Cross Reference
MVDP Research Information Service, Vol.1, NO.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM
MVDP Research Information Service: TEACHING METHODS - CLIENTS
(This Cross Reference relates to all Schaeffer papers listed below)

*Schaeffer B., Kollinzas G., Musil A. & McDowell P. (1977)
Spontaneous verbal language for autistic children through signed speech
Sign Language Studies, 17, 1977, 287-328

Summary
These two papers summarise the work of Schaeffer, who has developed a coherent theory to explain the function of signs in the teaching of communication to non-verbal children. He is interested in two phenomena:

1 The emergence of spontaneous signing as a result of teaching.

2 The emergence of spontaneous speech subsequent to sign teaching.

Read one or other of these papers as an introduction.
The two longer papers reviewed below give more detail and are recommended.

* Schaeffer, B. (1978)
Teaching spontaneous sign language to non-verbal children: Theory and Method
Sign Language Studies, 21, 1978, 317-352

Summary
From his experience in teaching non-verbal children to communicate, Schaeffer claims that spontaneous signing is the usual outcome of instruction in sign, whereas situation -

specific speech is the predictable outcome of instruction in speech. Once non-verbal children have learned signs, they use them to express the same range of functions as young normal children in the first stages of spoken language acquisition.

Schaeffer hypothesises that the reason for this occurring lies mainly in the natural “goal directedness” of signs, compared to speech.

Mentally retarded and autistic children use their hands to grasp or push away objects, and some may use their hands to direct an adult towards an object they want. Thus “they know the relation between hand actions and the fulfilment of desires, and they know further that hand movements must be adjusted to fit the situation...” (i.e. different shapes are held in different ways). In teaching signing, a behaviour which is already functional is adapted relatively easily, and the spontaneity of desire - guided grasping transfers to the signs. For non-verbal children, the process clearly does not apply to speech.

Schaeffer suggests that this process is paralleled by the role of gesture in the acquisition of spoken language by normal children, whose earliest communications involve the use of hands to invoke adult help in obtaining objects (“protoimperatives”-requests) and the use of objects as tools to gain adult attention -showing, giving and pointing (“proto-declaratives”-description). Non-verbal handicapped children tend to use signs more readily to request than to describe.

Other factors which may explain why signs are easier to learn than words are:

1. Motor fluency language deficient children have relatively well co-ordinated hand movements compared to speech (with the obvious exception of the physically handicapped)

2. Total communication offers more cues, by using two information channels, than speech alone (see discussion of this point in Introduction)

3. Manual signs are easily shaped and moulded compared to speech sounds.

4. Many signs are iconic and resemble the objects and actions they designate.

Having put forward his theories, Schaeffer proceeds to describe in detail his teaching method. In summary, he uses behavioural techniques to convert a reach for a desired food item into a sign. Some of these are worth considering in more detail.

<u>1. Begin with desires</u>
The first language function to teach should be the expression of desires - this is the earliest to emerge in normal children, and grows naturally from goal-directed hand movements. It shows the child that communication is functional for him.

<u>2. Role of imitation, eye contact and sitting still</u>
Schaeffer stresses that these should <u>not</u> be taught as independent skills. To teach imitation on its own can interfere with the development of spontaneity, and may result in overlearning, so that the child will respond to an instruction by imitating rather than

obeying. However, some training in imitation can be introduced when the teacher decides to shape the signs, once the child is using them.

Eye contact and sitting still are not pre-requisites to communication, but grow from it, it is best to begin by teaching the signs, and develop these skills concurrently. Teaching them on their own (as many behavioural programmes suggest) is a meaningless activity.

(See discussion of role of imitation, MVDP Research Information Service, Vol.1, No.3).

3. De-emphasise receptive language

Schaeffer feels that training in comprehension of signs should not take place until the expressive functions of request and description have been taught. In receptive language teaching the child is required to respond to the teacher‘s sign by pointing to (or some other way of designating) the object referred to. Schaeffer maintains that learning this response will make it more difficult for the child to learn that he must produce the sign himself. The training in association between sign and referent that the child receives when he is taught expressive use of the sign is sufficient for him to develop understanding of the concept.

This suggestion - i.e. that expressive learning generalises to understanding - receives support from the experimental work of Smeets & Striefel, 1976, with the mentally handicapped learning signs (see MVDP Research Information Service, Vol.1, No.3); and also from the work of Ruth Clark on the relationship between comprehension and expression in young normal children (see MVDP Research Information Service, Vol.1, No.3).

5. Use “structured waiting” to develop spontaneity

Schaeffer’s method for encouraging the child to initiate signs himself is to gradually and progressively frustrate the child in his desire to reach an object - beginning by shaping and placing the child’s hand without making the appropriate movement. The teacher waits to reward the child until he has completed the sign on his own.

Critical Points

Critique of this and subsequent paper given on pages following.

Clinical Applications

1. Schaeffer‘s theories support the clinical intuitions of many teachers involved with Makaton, that imitation, eye contact and attention skills will grow naturally as signs are taught. Note, however, that he presents no hard evidence to prove it.

2. De-emphasis of comprehension in training runs counter to established practice in speech therapy, but should not be dismissed for this reason alone! There is no evidence either way that clients are confused, as Schaeffer suggests they may be. It is probable that here again, the non-verbal autistic client may differ from the more able mentally retarded. Further investigation of this controversial suggestion is needed. Remember that even if you do not teach understanding directly, you should still assess for comprehension. It is perfectly possible for a client to be able to produce the sign as a rote response, without fully understanding the association.

3. The principle of beginning try teaching desires is probably held by most practitioners working with clients who have severe communication problems. When teaching Makaton we usually begin by teaching the “proto-declarative” descriptive function, and this is appropriate for clients who have already learned that communication of same kind is functional for them. Schaeffer‘s theory implies that we should discover whether or not our clients can communicate requests, and point out aspects of their world as a means of gaining attention, before we start to teach then to label. If they cannot communicate requests, our training should begin at this level. More research is needed in this area.

* Schaeffer B. (1980)
Teaching signed speech to non-verbal children: Theory and Method
Sign Language Studies, 26, 1980, 29-63

Summary

Schaeffer and his co-workers trained signs and then introduced separate concurrent training of speech skills. Subsequently their clients began to speak spontaneously as they signed, and eventually faded the signs from their speech. He cites other studies which have described the emergence of speech in previously non-verbal children using signs - the most advanced claims being made by Creedon, q.v. this Issue).

Schaeffer suggests that speech emerges for several reasons:

1. During sign training, receptive word-sign-object associations are facilitated (see Carr 1979, whose clients did not learn the association).

2. The co-ordinated, rhythmic movement patterns of signing may in some way entrain concurrent verbalisations and foster development of more co-ordinated rhythmic patterns.

   This hypothesis is supported by current research into the relationship between body movements and speech in verbal communication. See a brief summary under Miller & Miller 1973, this Issue.

3. Transfer of spontaneity from sign to speech
   In young normal children, there is a gradual transfer of linguistic function from early communicative gestures to words. Schaeffer suggests that something similar happens in non-verbal children who have learnt to sign. One of his main points is that speech which emerges in this way is used spontaneously by the children just as the signs were - whereas typically, when speech is trained directly it is only used in a limited, situation specific way. Signs provide a necessary bridge, by teaching the child the function of communication (through adapting goal-directed hand movements, see previous paper).

As regards the fading of signs by the children, Schaeffer has some interesting observations. The boys seemed to switch from a sign memory code to a speech memory code. They began by signing in a “foreshortened” way when they spoke - then

pointing, then dropping the signs. The foreshortened signs would recur if they found new learning difficult. Soon after they faded their signs, they began incidentally learning unsigned words. Schaeffer suggests that as their speech skills grew stronger, the use of speech alone became less effortful than speaking and signing.

Teaching Methods

1. Sound production

Schaeffer is insistent that sound production skills should be taught as well as signs, but independently. Simultaneous production by the child should not be taught - but the teachers should always speak as they signed. He suggests that the crucial skill in sound production is delayed imitation - the echolalic child is basing his imitations on information in echoic short-term memory, which is encoded and decays automatically. If he can learn to imitate words after the teacher has completed then, his memory will be based on more stable information.

2. The teacher should speak as the child signs, and maintain a one-to-one correspondence between syllables and sign movements during concommitant speech. (The reason for this is to develop the rhythmic co-ordination between speech and movement referred to above.) Schaeffer also has suggestions for the fading of signs once speech has become established.

Research Topics

A list of possible research topics related to all Schaeffer‘s hypotheses is included at the end of both the above papers.

Critical Points

Schaeffer is unusual among researchers in the extent to which he is prepared to go out on a limb in advancing his theory and practice. Such intrepidity is to be welcomed in a field characterised to date by rather conservative and cautious attitudes - particularly as Schaeffer himself invites experimental validation of his hypotheses. Controversial theories and teaching methods such as these are very productive of debate and new ideas.

Schaeffer‘s work is not experimental. The main criticism that can be made is that no really valid data is offered in support of some very assertive claims. There is no doubt, from the frequency data and examples described in Schaeffer et al‘s 1977 paper, that the three boys concerned learned to communicate effectively and spontaneously through sign and then speech, where they had previously been more or less non-communicative, and in general terms this evidence supports the notion that non-verbal children will benefit through sign instruction.

However, although it seems apparent that this team of workers have experience with a number of non-verbal clients, Schaeffer only presents data on three of them, which is far too small a sample.

A noticeable omission from Schaeffer’s discussion of the role of total communication is any reference to the question of overselective attention in non-verbal children which has so pre-occupied other researchers. There is plenty of evidence that for many clients, the words are simply not salient cues - which would tend to cast doubt on

Schaeffer's theory that speech develops because receptive learning of spoken words is enhanced through sign training. On the other hand, maybe Schaeffer is correct in thinking that over the long term, autistic children can learn the association between sign, word and referent, once they are efficiently using the signs. It is unfortunate that he does not comment on this question.

These articles are not attempting to offer experimental evidence of specific hypotheses, but to advance theories and the practices which derive from them, with the aim of stimulating further debate. None of the teaching suggestions are validated, and from our point of view they should be considered as areas for experiment, rather than as prescriptions for treatment.

Webster, C.D., McPherson, H. Sloman L., Evans, M.A. & Kuchar E. 1973
Communicating with an autistic boy by gestures
J. Autism & Childhood Schizophrenia, 3, 4, 1973, 337-346
Cross Reference
MVDP Research Information Service, Vol.1, No.5 AMERICAN SIGN LANGUAGE AND SIGN SYSTEMS - AUTISM

Summary
Inconclusive account of the training of one autistic boy which moved from verbal commands to simultaneous SIGN + SPEECH commands. The boy apparently responded better once systematic signs were introduced into the programme. The results are difficult to evaluate, as the authors themselves admit - since it was difficult to establish which cues were controlling his behaviour. This is one of the early papers exploring the possibility of using non-verbal techniques with autistic children.

Wilson, D.A. (1977)
Signs for autistic children
Available from: D.A. Wilson, Clinical Psychologist, Sutherland House School for Autistic Children, Sutherland Road, Carlton, Nottingham NG3 7AP
Cross Reference
MVDP Research Information Service, Vol.1, No.5, MAKATON

Summary
This paper describes the use of signs (Makaton, but with some adaptations) in Sutherland House School, and considers the role of signing in communication. Literature up to 1977 is reviewed.

Wilson suggests that signs are a successful communication tool, because:
1. The ritualised hand postures of autistic children can be shaped.
2. Signed speech input seems to lead to the learning of associations between word and sign, word and object (see Schaeffer 1978, 1980, this Issue; Bricker 1972, MVDP Research Information Service, Vol.1, No.3, 5-6).
3. Signs can be held longer than words - a factor which is important when processing difficulties and limited memory span affect learning.

The children are described as functioning at a very low level indeed. Most were able to make signs for some food and drink items, and used the signs mainly as requests.

Signs were generalised to other objects in the same class, and were used across a variety of settings. Eye contact, smiling, and concentration improved during signing sessions.

Wilson draws an interesting distinction between sign spontaneity (which he feels was out of the reach of his clients - unlike Schaeffer) and sign fluency - i.e. the use of signs in response to different instructions and questions, and in different settings.

Further, he feels that the children had learnt associative responses between a stimulus and a sign - the signs were being used as signals, rather than in any truly symbolic sense. This distinction is one which is ignored by many researchers using the typical kind of design which teaches children to sign in the presence of a desired object, but does not include follow-up data on their subsequent usage. Wilson maintains that sign training cannot transcend cognitive limitations in a child who shows no evidence in other areas of behaviour, or symbolic action.

Finally, Wilson suggests that these very low functioning children, are not so much learning “what communication is about” but rather that they must compromise by signing before getting what they want. Signs give than some scope for choice, and making their wants explicit, and enable the parents to feel more in touch with the child. Rather than communication proper, the signed interactions are described as a “trade-off” - since they are limited and confined to the child and parent communicating requests.

This may well be a more realistic way of approaching communication training with severely retarded children whose progress is very limited. Certainly it appears that some researchers use the term “communication” in the loosest possible sense, and more discrimination about what is, and what is not, symbolic communication, is needed in the field.

Clinical Applications

1. Wilson’s work suggests that we should bear these distinctions in mind when planning treatment for severely retarded children. Sign fluency, signs as signals, and “trade-off” communication could be seen as the lowest levels of achievement, with sign spontaneity, and symbolic communication of a wider range of functions as achievements of a higher order.

2. Adaption of Makaton signs needs to be qualified and justification sought. As the signs in the Makaton Vocabulary are from British Sign Language, the efficacy of adapting them must be considered since this would be equivalent to altering English words to suit a very young child’s inability to pronounce them. It might well be more acceptable to keep the word or British Sign Language sign constant and accept the child‘ s approximation, rather than to adapt. This later view is that prescribed by the Makaton Vocabulary Development Project. (Editorial comment.)