

MAKATON VOCABULARY DEVELOPMENT PROJECT  
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## **MENTAL HANDICAP AND NONSPEECH SYSTEMS**

Compiled and Written by Nicola Grove, MSc, LCST  
Edited by Margaret Walker, MSc, LCST

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# INTRODUCTION TO MENTAL HANDICAP & NONSPEECH SYSTEMS

## INTRODUCTION

The format adopted here will be followed in all succeeding issues which focus in some detail on research into non-verbal communication with handicapped clients. Articles are ordered alphabetically according to author, some being reviewed very fully, others only briefly. Cross references between individual articles are made within the text, e.g. where two articles in the same issue refer to similar findings.

### Cross-Reference: Subject Index

At the end of each entry, a cross reference is given to other subjects for which the article is relevant. At this stage most of these references are to Research Information Service issues. However, as the issues accumulate, so I hope the cross referencing will assume more relevance, and enable you to make connections between different pieces of research and to "place" each article in a broader perspective. You may find it helpful to underline these cross references in a different colour.

### Points to bear in mind

1. I have not read every paper listed, and not every paper is accompanied by a summary. Since reading papers is a subjective activity, you may find the presentation inconsistent, and feel that you would have given prominence to different articles from those I have selected. My summaries are not intended as substitutes for the genuine article and I would strongly recommend you obtain the originals of papers you are interested in, and forming your own judgements.
2. There is a great danger in overgeneralising results obtained with specific studies, often using precisely defined methods with a small number of subjects. It is very important therefore not to take the clinical applications I have suggested as rules of thumb, but to consider them sceptically and apply them cautiously.
3. Terminology: I have made assumptions about your familiarity with some of the technical terms involved, which I hope are justified. I have assumed that you would adapt this information when sharing it with others who do not have a similar background. Pleas have been made for a glossary of terms, but there are problems attaching to this. Where is is appropriate, technical terms will be explained within the text, but to gloss every one would be very time consuming. For the present, then, make a note of any term you find really incomprehensible, try looking it up and if this fails, reserve it for the questionnaire (Spring 1981) and let me know.

## Issues

A plan of topics will be issued at six monthly intervals (with Issue 5). Because of the work involved, it has been decided to modify the original programme and compile 5 topics between July/December, 1980 and 5 from January/June 1981. The single issues (5 and 10) will take the form of supplements.

## 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 Talliss,  
BIMH Information & Resource Centre,  
Wolverhampton Road, Kidderminster, Worcs.  
Tel: Kidderminster 850251

## Addendum:

See Vol,1, Issue 2, Page 1

Kiernan 1978 "Alternatives to speech, etc."  
The description of this paper should read:  
Kiernan 1977 "Alternatives to speech, etc."

We apologise for this error.

## MENTAL HANDICAP & NONSPEECH SYSTEMS

Bailey, R. & Tait, E. (1979)

Knowing, but not doing, Makaton Apex 7, 2, 1979 65-67

### Cross-Reference

MVDP Research Information Issue: NONSPEECH SYSTEMS OF COMMUNICATION: MAKATON (Supplement) TEACHING METHODS: CLIENTS

### Summary

A small scale, detailed study of Makaton learning by 5 young institutionalised, non-communicating mentally handicapped clients. The training programme moved from attention-shaping - imitation - comprehension and apparently on to expression, though this is unclear (see critical points, below).

### Results Included

1. Overall improvement in comprehension for both Makaton and spoken language (Reynell Developmental Language Scale - Verbal Comprehension).
2. General lack of spontaneous expressive usage of Makaton.
3. Retention of signs was associated both with the level of Makaton comprehension attained and the number of signs comprehended.
4. No improvement in social skills (PPAC Gunzburg Charts) - a deterioration noted in 3/5 subjects.

### Critical Points

1. The fundamental flaw in this study is that the main burden of the argument, that comprehension of Makaton does not necessarily predict spontaneous Makaton expression, seems to have emerged post hoc, instead of being integrated into the original experimental design.

In order to evaluate such a finding, we need information about transfer of learned skills which is missing throughout the article. The literature review contains no reference to relevant work in this area with the mentally handicapped.

In the Method section, ambiguity surrounds the procedures taken to effect spontaneous use. There are no details at all of how expression was trained, and it appears that there was no teaching protocol for expression (although reference is made to "teaching and testing for understanding and using Makaton").

Concerning spontaneous use on the wards, it would appear that staff were given only general guidelines, rather than specific instructions for its promotion. The lack of explicitness here makes it unclear whether the authors wish to investigate the spontaneous generalisation from receptive to expressive skills, in the virtual absence of specific reinforcement and training in the expressive mode, or generalisation of trained expressive skills from one environment to another.

In the Results section, no information, even of a descriptive nature, is given on spontaneous use in the day to day environment, or its failure; we are only provided with expressive scores on the post-teaching test.

Hence, the authors' recommendation that comprehension and retention of Makaton should be established before Makaton usage takes place spontaneously, applies - on the basis of the evidence available to us - only to a situation where there is no specific programme to train expressive usage, and its generalisation from one environment to another.

(See Smeets, 1978, Smeets & Striefel, 1976, b,c, This Issue - who argue that there is no need to teach understanding of signs separately, since training in expressive use of signs can generalise to receptive use.)

2. Other important information is omitted: the comprehension teaching protocol and details of assessment procedures; and the subject descriptions are inadequate.

### Clinical Applications

1. The authors found that learning profiles were very individual, and suggest that teaching programmes should be geared accordingly, e.g. taking note of rates of learning and types of learning patterns; gradual increase in learning contrasted with sudden spurts. (See also Bricker, 1972, Hall & Talkington 1970, This Issue.)
2. The findings on lack of development of social skills parallel those with autistic subjects (Benaroya et al 1977, 1979; Konstanteras et al 1979 - See MVDP Research Information Service AUTISM AND NONSPEECH SYSTEMS OF COMMUNICATION. It would be interesting to know whether any of the subjects had autistic tendencies. E. Tait felt that with one subject, deterioration in social skills was linked with a growing awareness of what social interaction involved, and a commensurate frustration. This is a stage to watch out for in the training of non-communicating subjects, and again we need more information, e.g. on whether the deterioration was permanent.
3. The recommendation that comprehension and retention of Makaton must be established before spontaneous usage can occur needs to be interpreted with caution (See above, Critical points). It agrees with some of the findings in autistic studies, and is in line with traditional ideas on normal language development, and with speech therapy teaching techniques. However, some current linguistic theories on language acquisition lay emphasis on the interaction between use and understanding, and how expression in itself contributes to comprehension (see a provocative and fascinating article by Ruth Clark (1980) Errors in Talking to Learn - First Language 1, 1980 7-32 RNID). Further research needed.

In fact, the training programme established production of signs through imitation, prior to comprehension training. For a discussion of the role of imitation in training signing skills, see Bricker 1972 This Issue. Smeets & Striefel 1976 see This Issue, speculate that with their subject her imitation of signs may have contributed to receptive learning.

Bricker, D.D. (1972)

Imitative Sign Training as a Facilitator of Word-Object Association with Low-Functioning Children  
American J. Mental Deficiency 1972, 76, 509-516

Cross-Reference

NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE  
(Supplement)  
TEACHING METHODS: CLIENTS

Summary

An experimental study investigating a procedure for enabling subjects to comprehend the association between an object and its name. Previous studies had identified a group of low-functioning children who were unable to correctly select a named object of a pair, despite intensive training in word-object association. The authors hypothesise "it is possible that severely retarded children are unable to use verbal labels as cues for appropriate discriminations without some prior alternative discrimination programme".

Twenty-six institutionalised mentally retarded children were used in a matched pairs design, forming an experimental and a control group. All had "severely limited language skills". The children were all pretested on their ability to select a named object. The experimental group received the following training:

<u>Phase 1:</u>	Sign imitation	"Do this" (physical prompt and reinforcers used)
<u>Phase 2:</u>	Sign/word pairing	"Do <u>rake</u> " (word and sign modelled simultaneously)
<u>Phase 3:</u>	Sign/word + object pairing	"Do <u>rake</u> " (word and sign modelled and object presented)

Results

The post-test scores were superior for the experimental group. The author argues that making the signs had made it easier for the subjects to discriminate between the words and between the objects.

Critical Points

1. The control group received no training at all, so there is no certainty that the effect was due to the use of signs as distinct from training (however, in previous studies with a parallel group, control training programmes did not have an effect and the author felt justified in using a "do nothing" group in this experiment). See Kahn 1977, This Issue, who used a similar programme with a control and a placebo group.

Clinical Applications

1. This study illustrates the difference between experimental and teaching procedures. The normal process in teaching is to start with the association of object + sign, rather than with imitation.

The question of whether to use imitation as such as a pre-programme stage is somewhat controversial in clinical practice. The Thomas Coram Research team use a test of imitation of nonsense signs as a predictive measure before admitting a client to a programme. Many therapists use some kind of imitation work, often of generalised body movements, to increase awareness and attention among clients. Margaret Walker feels that imitation of hand gestures as a pure exercise in imitation could lead to confusion when clients are then asked to use signs communicatively; and further that it may increase meaningless motor activity in clients with autistic tendencies. Her feelings are shared by other practitioners. We urgently need detailed information (preferably a small well controlled research study) on this area.

This study seems to indicate that imitation of signs per se can increase a subject's attention to words. We do not know what effect it has on communication. This question recurs constantly in relation to the literature on mentally handicapped and autistic subjects, since imitation in isolation is an early stage in many behaviour modification programmes which train communicative skills (see Bailey & Tait 1979, Hobson & Duncan 1979, This Issue).

2. The author notes the variation in learning rates, which was widespread in the experimental group. She suggests that whereas the training procedures were effective for some of the children, for those who were slow to catch on, they are inefficient. (See also Bailey & Tait 1979, This Issue.)

This study is extended by van Biervliet 1977, This Issue.

\*Brookner, S.P. & Murphy, N.O. (1975)

The use of a Total Communication Approach With a Non-Deaf Child: A Case Study  
Language, Speech and Hearing Services in Schools VI 131-139, 1975

Cross-Reference

MVDP Research Information Service: DEVELOPMENTAL LANGUAGE DISORDER  
AND NONSPEECH SYSTEMS OF COMMUNICATION

Summary

Paper describing the effect of introducing total communication into the language programme for a retarded boy (WISC Performance 62) with severe receptive and expressive aphasia for the spoken word. His communication subsequently improved dramatically. Signing was an integrated part of a programme using reading, writing and auditory training.

Critical Points

Authors provide an appendix of words used by the child, but not unfortunately enough examples of how these were combined to gain any insight into the structure of his communication. No distinction is made between which words were spoken, written or signed.

Clinical Applications

1. Provides evidence of the beneficial effects of signing on communication, and subsequently behaviour.

2. Author stresses the importance of teachers and parents expanding the child's productions and using signed phrases and sentences rather than being content with single words.

\*Carrier, J.K. Jr (1974b)

Nonspeech Noun Usage Training with Severely and Profoundly Retarded Children  
J. Speech & Hearing Research, 17, 510-517

Cross-Reference

MVDP Research Information Service: SYMBOL SYSTEMS: PREMACK  
(Supplement)

Summary

Account of how Premack system was used to teach noun usage to 62 severely and profoundly mentally retarded children. Forerunner of NONSLIP programme (see MVDP Research Information Service 1, 1). Concludes that most severely retarded children can efficiently learn noun usage through this method, which means that they can:

- Establish and discriminate pictures from objects
- Discriminate among symbols (geometric figures)
- Use symbols to represent pictures and objects

For a more detailed account of the procedure, see Carrier 1976 (reference in MVDP Research Information Service 1, 1).

\* Cornforth, A.R.T., Johnston, K. & Walker, M. (1974)

Teaching Sign Language to the Deaf Mentally Handicapped Apex 1974, 2, 1, 23-35

Cross Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF  
COMMUNICATION: MAKATON (Supplement)

Summary

Description of early Makaton teaching programme in four Surrey hospitals over periods ranging from three years (Hospital 1) - nine months (Hospital 4). Subjects were deaf, mentally handicapped adults ranging from near normal - severely retarded, many with additional physical, emotional and linguistic problems.

Results

Testing at the end of the teaching period indicated that substantial learning had occurred, both receptive and expressive. Some subjects are described as using the signs communicatively, and some as linking signs in short phrases. IQ level did not appear to be related to the number of signs learnt. Comparison of the length of teaching period indicated that a nucleus of the signs could be taught in a few months.

### Critical Points

1. Only descriptive information is given of methods and content of training. Crucially, there are no details at all about spontaneous communication - how and when it occurred, and how it related to scores on the assessments, IQ levels, length of training and particular hospital. This has emerged as one of the priority areas in sign language research, which it would have been difficult for the authors of this early article to foresee, but the omission of hard data here detracts from the strength of the article.
2. Little comparison is made between the four hospitals, and the effect of length of teaching time is inadequately investigated. For example, do the results indicate that a ceiling in the development of comprehension and expression is reached after nine months? or were the subjects in Hospital 1 remembering and using more 'advanced' signs than in Hospital 4?

Since no information is available on how the hospital environments compared, we do not know whether Hospital 4 (9 months) was actually better at promoting use of signs than Hospital 1 (3 years); this would then account for the high scores of 1 compared to 4. (Of course, since the same number of signs, 145, were taught in all hospitals, there is no way of knowing whether in the 3 years, the subjects in Hospital 1 would have learnt another 145 signs had they been taught.)

3. Other information omitted includes hearing loss profiles, verbal comprehension scores for the subjects and background references in the literature review. Tables of statistical analysis indicating the correlations referred to, and the results of comparing scores between the groups, would have been helpful.

### Clinical Applications

This early study demonstrates that effective learning of signs can take place through quite limited exposure to training. IQ should not be taken as a predictor of signing ability. See also Walker, 1977 This Issue, for a related study.

\* Deich, R.F. & Hodges, P.M. (1977)

Language without Speech

Souvenir Press, 1977

### Cross-Reference

See also MVDP Research Information Service: Vol.1, No.1 NONSPEECH SYSTEMS OF COMMUNICATION: Symbol Systems: PREMACK

### Clinical Applications

Anyone contemplating using a Premack type symbol system with severely retarded clients would find this book extremely useful as an aid to planning treatment. It also provides a general background to the study of non-verbal communication, including reviews of primate studies, of research on perceptual and cognitive deficits in mental retardation, autism and aphasia, and of neurological process affecting language and communication.

\*Fenn, G. (1975)

The Development of Language through signing in children with Severe Auditory Impairment

Final Report to Social Science Research Council

Cross-Reference

MVDP Research Information Service: DEAFNESS AND NONSPEECH SYSTEMS: MULTIPLE HANDICAP AND NONSPEECH SYSTEMS: NONSPEECH SYSTEMS OF COMMUNICAITON: PAGET-GORMAN SIGN SYSTEM (Supplement)

Summary

Investigates progress of two groups of children using PGSS: normal intelligence, deaf (NI) and mentally handicapped (MH) deaf cerebral palsied.

Attempts to answer questions:

1. Does PGSS provide a valuable communication tool - answer, definitely yes
2. Does signed English promote the acquisition of syntactic and semantic categories usually absent in the speech of deaf children?

(NB: a "telegraphic variant", similar to key word signing, was used with MH group - see Fenn & Rowe 1975, This Issue.)

Fenn feels that the concept of signed English may not be viable. Her list of reasons include:

1. Nonfluent adult signing (see Bonvillian & Nelson 1978, Konstanteras et al 1979) in MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS OF COMMUNICATION
2. Complexity of certain PGSS signs.
3. Lack of correspondence between the syllable structure of PGSS and spoken English (this may apply with Makaton signing too).
4. Lack of intonation and stress in signing - marking by duration which occurs in signing ceates problems for the child, for whom morphemes may become perceptually more evident than the words to which they are attached.

(NB: This may be a problem particular to the deaf, since in signing with hearing clients, the spoken patterns are there to interact with the signing. We have no information on the interaction between spoken language and Makaton signing, and its effect on our clients.)

5. Adults do not sign to one another in the presence of the children, who are tending to learn from one another, and are not exposed to syntactically mature conversation (see also Bonvillian & Nelson 1978).
6. Children are tending to use Paget signs like conventional sign language - eg omitting certain words and replacing abstract signs by mime.

See this paper also for details of children's performance on the Sentence Comprehension Test devised at Hester Adrian (Hobsbaum & Mittler 1971, Experimental edition) and for very useful details of sign language acquisition by the two groups of children.

## Clinical Applications

While the application is most direct to practitioners using PGSS many of her points are very relevant to Makaton.

### 1. Adult Signing

Non-fluent signing and the lack of a total signing environment are referred to in many of the autistic studies and do seem to imply that adults should reach a certain competence level and relax enough to sign to one another, before embarking on training programmes. This, I suspect, could cause a lot of difficulties (e.g. with motivation among teachers and nurses, who like to get results quickly to reassure themselves that it isn't a total waste of time signing). Similarly, how practical is the idea of implementing a total signing environment? (I suspect not very, when you are initially introducing the scheme to sceptical staff.) Certainly these are issues for us to bear in mind.

### 2. Relationship between structure of sign and of spoken English

Perhaps we could become more aware of the correspondence and differences here and their effects on clients.

With respect to word order, Fenn found that the two groups produced very similar sign language profiles, conventional word order had no meaning and selection and ordering was governed by semantic considerations - e.g. "cat washing" (the cat is being washed). This may be linked particularly with the effects of deafness but can be a problem for all types of language disorder.

We need information on the rules governing our clients' sign combinations (another research project).

3. The tendency to use mime rather than abstract signs may also characterise Makaton signers.

This is a very useful paper indeed, as are others by Fenn. See MVDP Research Information Service: DEAFNESS AND NONSPEECH SYSTEMS: NONSPEECH SYSTEMS OF COMMUNICATION: PGSS (Supplement).

#### \* Fenn, G. (1974)

Language without Speech. Paper presented to the AGM of the British Association for Applied Linguistics, Sept. 1974

A further description of The Meldreth Manor Project, including a discussion of the difficulties experienced in the learning of PGSS.

#### Fenn, G. (1976)

Against Verbal Enrichment

In Berry P. (ed) Language and Communication in the Mentally Handicapped Edward Arnold 1976 pp.84-94

### Cross-Reference

See MVDP Research Information Service: TEACHING METHODS: CLIENTS

### \* Fenn, G. & Rowe, J. (1975)

An Experiment in Manual Communication

British J. of Disorders of Communication, 10, 1, 1975 3-16

### Cross-Reference

MVDP Research Information Service: DEAFNESS AND NONSPEECH SYSTEMS: MULTIPLE HANDICAP AND NONSPEECH SYSTEMS: NONSPEECH SYSTEMS OF COMMUNICATION: PGSS (Supplement)

### Summary

Describes the progress of a group of 7 deaf/partially hearing cerebral palsied children with nonverbal abilities around the ESN/SSN borderline, and no comprehension or expression for speech. They were enrolled in a PGSS programme beginning with restricted, telegraphic structures (See Rowe 1978, MVDP Research Information Service, 1, 1 for a fuller description). Assessment took place after six months, using the Sentence Comprehension Test, and responses to "wh" questions for comprehension and video recordings of interactions with the authors for expressive signing.

### Results

The children demonstrated comprehension of a wide range of structures. Analysis of the semantic categories used expressively indicated that they were at the first stage of normal language development. Although the order of signs in sequences appeared chaotic at first, it was demonstrated to observe certain rules. The authors hypothesise that the children were in the initial stages of acquiring word order.

### Critical Points

Despite the detail of this paper, a lot of information is missing which would put us in a better position to evaluate the effectiveness of the treatment programme, including: pretreatment assessment of functional communication, inter-rater reliability coefficients for scoring the expressive signs, details on how the children learned to combine the signs (Kiernan, 1977 MVDP Research Information Service, 1, 2).

### Clinical Applications

1. The technique of using semantic categories (such as agent: action, possessor: possession) rather than syntactic labels (subject: verb, determiner: noun) is well suited to the production of signs. Developmental linguists are now inclined to adopt a semantic/pragmatic approach to the study of language acquisition. (See This Issue, and MVDP Research Information Service, Issue: LINGUISTICS.) Anyone considering adopting a semantic framework for analysing expressive language (signed and spoken) will find this paper a useful reference.

### Teaching Methods

1. The authors noted on the video recording how much they missed, when the children were signing to them.

2. A “deviant” sentence pattern which recurred in the data of the type aba - car wash car - was felt to be an artefact of teaching. Often the therapist/teacher would respond to a child’s signing “car” by repeating the sign as a reinforcement, and then immediately expanding it to “wash car”.

Both points are well worth looking out for when teaching.

Hall, S.M. & Talkington, L.W. (1970)

Evaluation of a Manual Approach to Programming for Deaf Retarded  
American Journal of Mental Deficiency, 1970, 75, 3, 378-380

Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF  
COMMUNICATION: AMERICAN SIGN LANGUAGE (Supplement)

Summary

Study evaluating the effects of a manual approach on sign comprehension and language development of 30 deaf retarded subjects (mean IQ 42.3 Leiter Scale). A matched groups design allowed for comparison with hearing retarded controls, who received approximately equivalent classroom time, staff attention and language training.

Results

The deaf group made significantly larger gains than the hearing group in both sign comprehension (a wide variance here, cf. Bailey & Tait 1979, Bricker 1972) and language. The authors interpreted these results as supporting a “suppressed ability hypothesis” meaning that the handicap of deafness had prevented the subjects from realising their potential on the IQ assessment (and in how they communicated presumably). Their performance on the programme called into question the validity of the IQ levels obtained (see also Walker 1977).

Critical Points

The paper suffers from a lack of specificity with regard to training and assessment procedures which is common to early studies.

This is one of the few projects to provide an adequate control group, although the results seem to tell us more about the problems of assessing IQ than about the learning and use of signs.

\*Harris-Vanderheiden, D. (1976)

Blissymbols and the Mentally Retarded In Vanderheiden, G. & Grilley, C. (Eds)  
Nonvocal Communication Techniques and Aids for the Severely Physically  
Handicapped University Park Press, 1976

Cross-Reference

MVDP Research Information Service: MULTIPLE HANDICAP AND NONSPEECH  
SYSTEMS

NONSPEECH SYSTEMS OF COMMUNICATION: SYMBOL SYSTEMS - BLISS  
(Supplement)

\* Harris-Vanderheiden, D., Brown, W., Reinen, S., MacKenzie, P., & Scheibel, C. (1975)

Symbol Communication for the Mentally Handicapped: An Application of Bliss Symbols as an Alternate Communication Mode for Nonvocal Mentally Retarded Children with Motoric Impairment  
Mental Retardation, 13, 1, 34-37

Cross-Reference

MVDP Research Information Service: MULTIPLE HANDICAP AND NONSPEECH SYSTEMS

NONSPEECH SYSTEMS OF COMMUNICATION: SYMBOL SYSTEMS - BLISS (Supplement)

Summary

These two papers describe the outcome of a programme teaching Blissymbols to five cerebral palsied children, which was found to provide an effective limited means of respondent and expressive communication after 20 hours of training over 8 weeks. Harris-Vanderheiden (1976) gives a more detailed account. Information is included on selection procedures, implementation, follow-up and case studies.

Clinical Applications

Very useful reference papers for anyone using symbols with multiply handicapped children. Criteria for admission to a programme are proposed as follows:

1. Child shall be able to establish and maintain eye contact.
2. Child shall be competent on 6 stages of sensori-motor development, specifically object permanence.
3. Child shall be able to attend to a task for c. 5 minutes.
4. Child shall be able to follow oral directions.
5. Child shall demonstrate a desire to communicate.
6. Child shall be nonverbal.

(These criteria are obviously specific to the programme and cannot be lifted wholesale and applied to, say, a sign language programme. Their inclusion is a welcome rarity in published studies.)

° Hobson, P.A. & Duncan, P. (1979)

Sign Learning and Profoundly Retarded People Mental Retard. 17, 1, 33-37

Cross-Reference

MVDP Research Information Service: MENTAL HANDICAP: DOWNS SYNDROME TEACHING METHODS: CLIENTS

NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE (Supplement)

Summary

Study of learning and retention of signs by 9 retarded and institutionalised Downs Syndrome adult subjects. Training procedure taught productive use of the sign through imitation and physical prompts (see Bailey & Tait 1979) - there was no training in sign comprehension. Subjects' sign vocabulary was preassessed to

determine the extent of natural gesture used and incidental learning of signs used in the Hospital. Subjects were post-tested after 6 weeks training, and retention was assessed two months later, during which time staff were asked not to initiate signing with the residents.

### Critical Points

1. No data on rates of learning, spontaneous signing during and after training, and the relationship between comprehension of signs and their use.
2. Since there is no control group to separate the effects of training the hypothesis that profoundly retarded individuals will respond better to the use of manual signs than verbal stimuli is not supported by the evidence.

In other respects this is a well-documented study.

### Results and Clinical Applications

#### 1. Predictive Measures

Receptive vocabulary (PPVT) seemed to be a good predictor of ability to learn sign language.

The number of signs acquired after the 6½ week training programme was the most reliable predictor of the amount retained two months later.

Both these measures could be used as clinical guidelines.

Chronological age and initial signing vocabulary (i.e. the gestures used pre-training by individuals) were not related to success in the programme.

The authors caution against over or under-estimating potential on judgements of personality - "alert and responsive" vs. "stubborn, lazy and vacuous" - IQ and social learning scores.

#### 2. Assessment

Although an initial sign vocabulary was not found to be a predictive measure in this study, it is useful to screen clients before putting them into a programme so you can be aware of what you are actually teaching.

#### 3. Mode of Presentation

Refers here to a comparison between presenting the subjects when testing, with the spoken word alone, or the word + the picture of the referent (See Carr et al 1978 MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS). Word + picture was more successful in eliciting signs than the word alone. (See also Bailey & Tait, 1979; Walker, 1977, This Issue for similar studies.)

#### \* Hoffmeister, R.J. & Farmer, A. (1972)

The Development of Manual Sign Language in Mentally Retarded Deaf Individuals  
J. of Rehabilitation of the Deaf, 1972, 6, 19-26

### Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE (Supplement)

### Summary

The results of this study demonstrated that 16 deaf mentally retarded clients in an institution were able to learn and use communicatively between 50-200 signs after a 24 week programme. The programme was continued and on a follow-up visit one year later it appeared that its results were successful (no details). Increased self-sufficiency and reduced behaviour problems were reported.

### Critical Points

Only very general conclusions can be drawn from this study because of the lack of specification of assessment and treatment procedures and quality of spontaneous communication by residents.

### \* Kahn, J.V. (1977)

A Comparison of Manual and Oral Language Training with Mute Retarded Children Mental Retardation, 1977, 15, 21-23

### Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE (Supplement)  
TEACHING METHODS: CLIENTS

### Summary

A group of 12 children were matched in 3's, and assigned to a verbal language group and a sign language group (both following a behavioural programme, devised by Bricker and her associates) and a placebo group (where training was in a non-communication skill). Both the language groups made progress, whereas the placebo group did not. There were no reliable differences between the performances of the two language groups. See this paper for references suggesting that the cognitive structures for gestural imitation precede those for the imitation of speech, implying that gesture-based communication is suited to the needs of profoundly retarded children.

### Critical Points

Lack of graphs and tables makes the information difficult to assess. There is not enough data about the subjects and an appendix of the signs and words chosen would have been useful.

### Clinical Applications

One of the few studies to provide an adequate control group. Results suggest that structure may be a more important factor in learning than whether signs or speech are chosen as the mode of communication. Illustrates the value of making sure all teaching is adequately planned and structured (see results from Thomas Coram Research Unit survey, MVDP Research Information Service, 1, 2).

Kiernan, C.C (1977)

Alternatives to Speech: A review of research on manual and other forms of communication with the mentally handicapped and other non-communicating populations Brit. J. Mental Subnormality, 1977, 23, 6-28

Cross-Reference

See MVDP Research Information Service, Vol.1, Issue 2 REVIEWS OF RESEARCH INTO NONSPEECH SYSTEMS

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

Breakthrough to Communication: Sign language and symbol systems for the non-vocal mentally handicapped child

Unpublished paper presented to the British Association for the Advancement of Science (Education Section) Meeting, Edinburgh, Sept.1979

Available at cost from: Thomas Coram Research Unit, University of London, Institute of Education,41 Brunswick Square, London WC1N 1AZ

Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF COMMUNICATION: PAGET GORMAN SIGN SYSTEM (Supplement) TEACHING METHODS: CLIENTS

Summary

A valuable paper making a number of useful points:

1. Presents results of TCRU survey of signs and symbol systems in schools, and evaluates them in terms of the needs of handicapped children (see MVDP Research Information Service, Vol.1, Issue 2 SURVEYS OF RESEARCH INTO NONSPEECH SYSTEMS).

Overall, it seems that behaviour and communication improve when systems are introduced, perhaps due to increased teaching input. More attention needs to be paid to how the children are communicating, and with whom.

2. Presents an individual case study, which illustrates effectively how communication develops through signs, expressing shifting needs and perceptions. Particular emphasis is laid on the basing of this programme on the child's individual needs and extending communicative functions through sign, rather than teaching a set of labels. For example, the child was taught to distinguish between the communication "I want (a drink)" and "Look, there is (a drink)".

(Recently, developmental linguists and therapists making use of developmental frameworks in the treatment of communication problems, have turned their attention to the functions that communication serves, i.e. how children use the skills they have, to demand, negate, inform, etc., in particular contexts, rather than the form their language takes (nouns, verbs, adjectives, etc.). This branch of linguistics is known as Pragmatics and will be discussed further in the MVDP Research Information Service: LINGUISTICS.)

This account demonstrates the importance for practitioners of ensuring that

clients are able to use each sign/word they learn in a variety of different contexts, and not simply as labels for pictures.

3. Suggests many hypotheses why sign and symbol programmes work (useful for parent and staff discussion groups).

#### Physical Factors

Bypasses deafness/muscular problems, etc.

#### Psychological Factors

- i. Ease of physical prompting (as compared to speech) means the child can quickly be taught the concept of communication.
- ii. Child is looking at and attending to the speaker in a situation which gives a consistent and perceptible reward, which again compares favourably to speech.
- iii. The skill of imitation is relatively easily taught and this can generalise to other new responses, including speech in some cases.
- iv. Employing a visual rather than an auditory means of communication bypasses the particular problem that mentally handicapped children have in processing auditory-vocal information. Early use of a visual system may promote intellectual development.
- v. Use of a symbol system (alone, or in association with a sign programme) can help to bypass another problem of mentally handicapped, which is the internal planning of sequential information. There is no need to recall the symbols, only to recognise and identify. If a child can manipulate the symbols (cards or plastic shapes) he may learn how to plan sequences. This factor may account for the success of NONSLIP (See MVDP Research Information Service 1, 1, SYMBOL SYSTEMS).
- vi. There is a reduction of anxiety and frustration when a nonverbal child finds a way to communicate, which could lead to improved speech production, e.g. by reducing tension of the speech musculature.

#### Social and Educational Factors

- i. With these programmes, communication is simplified and standardised. These effects have not been estimated per se; they may be substantial in the success of sign and symbol programmes.
- ii. Enhanced teacher motivation and increased attention to individuals accompanies the programmes.
- iii. Programmes are structured.
- iv. The introduction of a new programme may focus the teacher's attention on aspects of the environment which discourage communication and should be restructured.

- v. If the child is sensitive to the social interaction of his peers, the achievement of goals through using signs which he observes, may increase his motivation and encourage him to imitate the signs himself.

The effects of all these factors need to be isolated through research employing truly comparable sign, symbol and verbal language programmes, in order to determine how important the nonverbal component is in itself.

The paper centres round a one-subject case study, following an individualised programme. Planning treatment on an individual basis, taking into account unique communicative and educational needs, can be seen as the optimal approach to remediation of communication problems. However, many teachers and therapists are faced with the necessity of planning treatment for large numbers of clients, who can only be treated in groups. In these cases, it is impractical to suggest highly specific programming, and a compromise must be found. In practice, standardised teaching programmes can be adapted, within limits, to suit individuals, while maintaining the overall structure of the programme. The advantage of this approach is that the individual can benefit from the group interaction; for social signing among peers and with staff, a standardised programme whose content is held in common may be preferable to the highly individual programme whose content is accessible only to a few. More research is necessary to determine the most effective compromise between the two approaches.

\* Kopchick, G.A. & Lloyd, L.L. (1976)

Total Communication Programming for the Severely Language Impaired: A 24 hour approach

In L. L. Lloyd (Ed) Communication Assessment and Intervention Strategies, UPP Baltimore, 1976, pp.501-521

Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS MENTAL HANDICAP: INSTITUTION

Summary

Outlines rationale and method for implementing a total communication programme on a 24 hour basis for nonverbal clients in residential homes. The need for staff to use signs and speech continuously and in all contexts (including to each other) is stressed. (The same point is made by Bonvillian & Nelson 1978, MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS.)

Clinical Application

Many of the recommendations presuppose an ideal environment, but they provide useful guidelines for practitioners working in large subnormality hospitals (e.g. suggestions of how to gain administrative support, improve the living area).

Kopchick, G.A. Jr., Rombach, D.W. & Smilovitz, R. (1975)

A Total Communication Environment in an Institution Mental Retardation, 13, 3, 22-23

## Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS  
MENTAL HANDICAP: INSTITUTION

## Summary

Brief account of programme to establish transfer of signing skills from classroom to ward. Initially residents recognised and produced certain signs but showed little understanding of their communicative potential. Length of institutionalisation (on average 20 years) was felt to be a major factor here. Five staff were taught to use simultaneous communication at all times - when conversing with each other, non-signing staff and with residents.

Two groups (experimental and control) were formed of 9 residents, matched on age, sex and length of institutionalisation.

## Results

After 6 months the experimental group had "increased their language level" by an average of 20 months; the control group remained at the same level.

## Critical Points

Lack of specific detail makes evaluation difficult here. No information on subject profiles, assessment and teaching procedures, etc.

## Clinical Applications

### 1. Altering the environment

This article, and the preceding one, emphasise that the crucial factor in success with programmes in institutions is to change the environment so that communication, rather than compliance with routine, is promoted. Attitudes of staff members are critical.

### 2. Continuous Signing by staff

It has been suggested by other researchers that this should be a component of all programmes teaching signs (Bonvillian & Nelson 1978 See MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS; also Fenn 1975 This Issue). There are too many other uncontrolled variables in this study to evaluate the effect of continuous signing, but the possibilities here should be explored.

### 3. Style of signing

The authors feel that with hindsight, the slow, deliberate style which characterised the inexperienced signing of the staff may have been a positive factor in the results. This has also been suggested by some Makaton teachers -communication is slowed down, and signs and the speech which accompanies them, may be more readily apprehended by the client. However, other researchers (Bonvillian & Nelson 1978; Kiernan - personal communication) have suggested that inexperienced signing may have a negative effect on learning.

Arguments for slow deliberate signing are not, of course, arguments for bad signing!

\* Kotkin, R.A., Simpson, S.B. & Desanto, D. (1978)

The Effect of Sign Language on Picture Naming in two Retarded Girls Possessing Normal Hearing J. Mental Deficiency Research 1978, 22, 19-25 (1)

Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS  
NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE  
(Supplement)

Summary

A small scale study demonstrating the positive effects of a SIGN + VERBAL presentation, compared to VERBAL, on the learning of verbal nouns. The authors suggest that the relevant variables here are:

1. Signs form a static presentation which allows a child to take as long as necessary to process a single presentation.
2. Signs tend to have a gesture-concept associative relationship rather than a gesture-word relationship, thus providing the child with an additional cue.
3. Signs simultaneously paired with a verbal label provide the child with a multi-modal presentation.

Clinical Applications

This is one of the few well-designed studies in the field. Although limited, it does provide evidence that sign per se has an effect on learning, and suggests what the reasons for this may be. The design could be easily and cheaply replicated with other subjects by anyone working in the field who was interested in doing a small research project. The authors themselves suggest replication with a larger group of subjects, which might allow for further investigations of the factors involved (e.g. a comparison between SIGN alone, SIGN + VERBAL, VERBAL alone, as in some of the autistic studies). See Konstanteras et al 1978; Carr et al 1978; Brady & Smouse 1978 MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS.

\* Levett, L.M. (1969)

A Method of Communication for Non-Speaking Severely Subnormal Children British J. of Disorders of Communication, 1969, 4, 64-66

Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF  
COMMUNICATION: MELDRETH MIME (Supplement)

\* Levett, L.M. (1971)

A Method of Communication for Non-Speaking Severely Subnormal Children - Trial Results British J. of Disorders of Communication, 1971, 6, 125-128

Cross-Reference

As above for Levett, L.M. (1969)

\* Peters, L. (1973)

Sign Language Stimulus in Vocabulary Learning of a Brain Injured Child Sign Language Studies, 1973, 3, 116-118

### Cross-Reference

MVDP Research Information Service: MULTIPLE HANDICAP AND NONSPEECH SYSTEMS

### Summary

A very brief report of study indicating that a combined SIGN-WORD presentation facilitated the receptive learning of words. See Kotkin, Simpson & Desanto 1978, This Issue.

### Critical Points

It is very unclear from the report what the responses were and how the vocabulary was presented.

### \* Reich, R.(1978)

Gestural Facilitation of Expressive Language in Moderately/ Severely Retarded Preschoolers

Mental Retardation, 1978, 16, 113-117

### Summary

Looks at usage (imitative and spontaneous) of words and gestures in an informal nursery setting by 9 retarded preschoolers, with basic receptive language but almost no expressive skills. Twelve Control (word only) and twelve Experimental (word and gesture) words were used continuously by teachers, who reinforced contingently the children's usage of either C or E word.

### Results

No significant difference between children's imitation of C and E words, but in spontaneous use, E words were used significantly more than C words. This difference is put down to the effect of sign as a mediating stimulus, functioning to help retrieve words from Long Term Memory Storage and thus not needed when children were imitating with a minimal time gap. (See Vanbiervliet 1977, This Issue.)

### Critical Points

In the analysis of responses there is no indication of whether the children used SIGN or SIGN + WORD or WORD; and no information on performance profiles - we do not know anything about the relationship between imitative and spontaneous use, nor how often how many children used a word.

### Clinical Application

Unfortunately very limited. Seems to indicate that use of gesture can facilitate spontaneous use of words, but we do not know how.

### Reid, B. Kiernan, C.C. (1979)

Spoken Words and Manual Signs as Encoding Categories in Short Term Memory for Mentally Handicapped Children

American J. of Mental Deficiency, 1979, 84, 2, 200-203

### Cross-Reference

MVDP Research Information Service: PSYCHOLINGUISTICS AND NONSPEECH SYSTEMS OF COMMUNICATION

\* Skelly, M. (1979)

Amerind Gestural Code Based on Universal American Indian Hand Talk  
Elsevier Press, New York, 1979

Cross-Reference

MVDP Research Information Service: ASSESSMENTS: APHASIA; APRAXIA  
TEACHING METHODS: INTERVENTION PROGRAMMES  
NONSPEECH SYSTEMS OF COMMUNICATION: AMERIND (Supplement)  
ACQUIRED LANGUAGE DISORDERS AND NONSPEECH SYSTEMS: APHASIA;  
APRAXIA; EXCISION SURGERY

Summary

An extremely comprehensive guide to the use of Amerind with a variety of patients: aphasic, apraxic, mentally retarded, and excision surgery (glossectomy and laryngectomy). The first section outlines the results of research projects carried out over many years and the second section is concerned with clinical applications. Theory and practice are closely related throughout the book in a way that is very valuable to the practising clinician. Ten of the research projects investigated the use of Amerind with different syndromes, and another ten were concerned with the effectiveness of transmission in teaching and training.

This section is of particular interest for Workshop Team Leaders, as it includes information on transmission at professional Workshops.

The second section includes a useful chapter on clinical testing: Skelly suggests that patients should be assessed on the Arthur adaptation of the Leiter Scale (a nonverbal intelligence test) with particular attention to patients' strategies in their approach to the test (a checklist for evaluating strategy and behaviour is provided). Skelly's own tests for auditory comprehension in aphasia, and apraxia are included.

Other chapters deal with clinical planning and programming and are admirably specific.

Modality of Input

In the light of research with autistic and mentally retarded groups, it is of interest that Skelly suggests that a simultaneous presentation of Amerind signal and speech is confusing for many patients of all syndromes; she favours presenting the signal first, to focus the patient's attention on the nonverbal component, and following it with the spoken interpretation. See also: Kotkin, Simpson & Desanto 1978 (This Issue) and for fuller discussion, MVDP Research Information Service: AUTISM AND NONSPEECH SYSTEMS OF COMMUNICATION.

\* Smeets, P.M. & Striefel, S. (1976b)

Acquisition of Sign Reading by Transfer of Stimulus Control in a Retarded Deaf Girl  
J. Mental Deficiency Research, 1976, 20, 197-205

Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS  
NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE  
(Supplement)

### Summary

Describes a successful training programme to develop comprehension of 10 signs for colour names in a girl who previously responded to instructions by imitating the behaviour of the instructor. Efforts to teach her to point to an object while demonstrating a sign had been unsuccessful. The term "sign reading" here refers to comprehension of the sign.

"Transfer of stimulus control" is the term for a procedure which teaches a subject to produce behaviour associated with one stimulus in response to a different stimulus, by pairing the two stimuli. In this case, if the girl was shown a colour card (first stimulus -  $S_1$ ) she could point to its match in her own array of cards (response behaviour, R). She was then taught to point to her colour card when shown the appropriate colour sign (second stimulus -  $S_2$ ). The procedure moves through three stages:

- (1) Imitation trials: colour cards only shown.
- (2) Simultaneous trials: colour card shown with one hand, sign made with the other.
- (3) Delay trials: sign made first, then card shown after a delay. The delay was increased by one second after each correct response until the subject could respond to the colour sign alone.

### Results

The girl learnt to respond to the signs and generalised her learning to other situations. She was also able to produce the signs when the trainer showed the colour cards, perhaps through incidental learning (indicating that training in receptive skills can generalise to expressive skills. But see the next article for further exploration of this process.).

### Clinical Applications

The authors see practical advantages to this procedure for teaching skills, since it is easy to administer, and results in a very low error rate. Anyone wishing to try it out with intractable clients should obtain the paper, which explains the procedure clearly and in detail.

\* Smeets, P.M. & Striefel, S. (1976c)

Acquisition and Cross-Modal Generalisation of Receptive and Expressive Signing Skills in a Retarded Deaf Girl J. Mental Deficiency Research, 1976, 20, 251-260

### Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS  
NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE  
(Supplement)

### Summary

An investigation of the effect that training in one language modality has on the acquisition of the trained skill in another modality. (This process is known as cross-

modal generalisation.) The two modalities here are receptive and expressive signing skills. Signs for pictures were taught in both modalities by the transfer of stimulus control procedure (see previous article).

### Results

In contrast to the previous study, with this subject, training of receptive sign discrimination had little effect on the expressive usage of the signs, whereas training in the expressive usage resulted in a near perfect acquisition of receptive skills. The authors speculate that the discrepancy between the two studies may be the result of the difference in response patterns between the two subjects.

The first girl (see previous article) always imitated the signs which were shown to her, even when she was only required to comprehend them. This suggests that overt expressive rehearsal of the signs contributed to her receptive learning. Thus it was easy for her to generalise the signs she learnt from the receptive to the expressive mode. The second girl showed no ability to imitate and was unable to generalise from the receptive to the expressive mode. See Vanbiervliet 1977, This Issue, for further discussion of cross-modal generalisation and for the mediating role of signing in learning.

### Clinical Applications

- (1) It may be more efficient to begin with training expressive signing than with comprehension of signs. This conflicts with traditional speech therapy training which places emphasis on training comprehension prior to expression. We need more research in this area. See Bailey & Tait 1979, This Issue, for a conflicting approach.
- (2) In the expressive sign training programme, imitation of signs was taught before the sign was demonstrated in the presence of the picture it represented. For a discussion of the place of imitation in communication programmes, see Bricker 1972 (This Issue).

#### \* Smeets, P.M. (1978)

Establishing Generative Performance and Cross-Modal Generalisation of the Manual Plural Sign in a Severely Retarded Deaf Girl

Brit. J. of Disorders of Communication, 1978, 13, 1, 49-57

#### Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE (Supplement)

NOTE: This paper is discussed out of its correct alphabetical sequence in the volume, because its findings cannot be easily interpreted without reference to the preceding Articles.

### Summary

Mary (Smeets & Striefel 1976c) was taught "the pluralisation rule of ASL" concurrently in receptive and expressive modalities. Training procedures were effective in establishing generative understanding and use of the manual plural S-sign. Cross-modal generalisation occurred equivalently between receptive and

expressive modalities, in contrast to a previous study where receptive sign discrimination had little effect on expressive use. The author speculates that the complexity of the required response may play a part in the degree to which receptive → expressive generalisation occurs; the manual plural sign being less complex to acquire than a number of different signs for pictures. Since the same subject was used as in 1976, it is also possible that learning had occurred - Mary had simply got better at acquiring signs. See Vanbiervliet, 1977 This Issue.

### Critical Points

1. In contrast to the two preceding papers by this author, the training procedure is highly confusing, and does not seem appropriate to clinical use -a reversal condition is built in for experimental purposes whereby the subject, having been taught to associate the plural sign with plural stimuli, is then taught to associate it with a singular stimulus, before being retrained in the correct association.
2. The teaching was so over-specific as to cast doubt on the assertion that generative understanding and usage had occurred. Mary was taught to discriminate between presentations of one and two identically similar pictures - a simple conditioning paradigm rather than the teaching of the concept singular/plural. Furthermore, no steps were taken to discover whether or not she could generalise learning outside the training setting. The author himself implies that this is a limitation of the study.
3. The discerning reader of MVDP Research Information Service 1, 1 - NONSPEECH SYSTEMS OF COMMUNICATION, will already have mentally noted that the plural 's' sign is not the pluralisation rule of American Sign Language, but of signed English.

\* Sutherland, G.F. & Beckett, J.W. (1969)  
Teaching the Mentally Retarded Sign Language  
J. Rehabilitation of the Deaf, 1969, 2 (4) 56-60

### Summary

One of the earliest descriptions of the successful teaching of signs to deaf retardates in a large hospital. Suffers from lack of specific details on subjects, procedures, learning and follow-up. Mentions difficulty experienced in motivating the staff to learn to sign.

### Topper, S. (1975)

Gesture Language for a Nonverbal Severely Retarded Male Mental Retardation, 1975, 13, 3, 30-31

### Summary

Brief account of a successful pilot programme teaching 13 basic iconic signs to one severely retarded nonverbal man.

Vanbiervliet, A. (1977)

Establishing Words and Objects as Functionally Equivalent Through Manual Sign Training

American J. of Mental Deficiency, 1977, 82, 2, 178-186

Cross-Reference

MVDP Research Information Service: TEACHING METHODS: CLIENTS  
NONSPEECH SYSTEMS OF COMMUNICATION: AMERICAN SIGN LANGUAGE  
(Supplement)

Summary

This study was designed to determine if sign-object and sign-word training would be sufficient for the acquisition of word-object associations, without these receiving any direct training.

The model which accounts for this process proposes that if two stimuli control the same response, training a new response to one of the stimuli would increase the probability of the other stimulus also controlling that response. When this happens, the two stimuli are regarded as functionally equivalent for the subject, who will respond in the same way to either stimulus.

In this case, the stimuli were “nonsense” objects and their spoken names. These were established as functionally equivalent in the training of manual sign responses, i.e. the subjects could produce a sign in response to either word or object, and could identify an object or use a word in response to a sign. The experimenter then went on to see if the subjects could “miss out” the sign and identify the objects in response to the spoken name, or use the names in response to the objects.

Training was therefore in the receptive and in the expressive mode. The study extends the work of Bricker 1972, This Issue who trained only receptive word-object associations.

Results

Following sign-object, and sign-word training, subjects did acquire word-object associations. The functional equivalence theory seemed to be an adequate explanation of how the process occurred.

The most difficult stage for the subjects in the training programme was the linking of signs and words. The subjects were able to echo the word when asked “say ‘wup’” - but were not able to use it easily in response to the sign. In the preceding stage, the subjects had to produce the signs when they heard the words, and this too was difficult for them. Having learnt to do so, they did not readily generalise to the opposite mode (see Smeets & Striefel 1976 b&c, Smeets 1978, This Issue, for other work on cross-modal generalisation).

It seems that the signs in this experiment served as mediators in the learning of word-object associations (see Reich 1978, This Issue for similar results).

### Critical Points

1. The subjects in this study are described as having “some receptive and productive language: they could name a variety of objects, answer simple questions and initiate conversation”.

It seems therefore that the group were already capable of forming word-object associations without the mediating influence of sign (only one of the group is described as having prior signing experience). Hence we do not know how effective the procedure would be with subjects who have failed to develop the skill with verbal instruction alone, as demonstrated in the studies by Bricker 1972; and Smeets and Striefel 1976 b&c, This Issue.

2. Vanbiervliet implies that the training programme needs modification. In particular, Stages 5,6,7 (word imitation, word-sign production and sign-word production) seem to rehearse the use of signs and words in the absence of meaning and Stages 6 and 7 posed special difficulties for the group.
3. Although the procedures are explained in great detail, sufficient for replication, it is a very confusing paper to read and the connections between the theoretical model and the experimental procedures, are inadequately explained.
4. Subject descriptions are inadequate in respect of use and understanding of verbal language.

#### \* Van der Vegt, S. (1976)

A Uniform Communication System for use in an Institution for the Mentally Retarded  
Aust. J. Human. Comm. Dis. 1976, 4, 2, 100-102

#### Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF  
COMMUNICATION: AUSTRALIAN SIGN LANGUAGE

#### Summary

Brief paper outlining the use of simple signs in a subnormality hospital in New South Wales.

#### Walker, M. (1977)

Teaching Sign Language to Deaf Mentally Handicapped Adults (A Practical Account and an Experimental Evaluation)

In IMS Conference Proceedings, 3, Language and the Mentally Handicapped pp3-25

Available from: British Institute of Mental Handicap (Publications), Wolverhampton Road, Kidderminster, Worcs. DY10 3PP

Text of a lecture given in 1975 in which Walker presented the results of her unpublished M.Sc. dissertation

#### Cross-Reference

MVDP Research Information Service: NONSPEECH SYSTEMS OF  
COMMUNICATION: MAKATON (Supplement)

## Summary

Fourteen institutionalised, deaf, mentally handicapped adults were taught 145 British Sign Language signs over 9 months. These signs were selected on the basis of clinical judgement, and influenced by the work of Mein & O'Connor into vocabularies of hospitalised retardates. There was a wide range of chronological age (16-68, mean 35.0, s.d. 17.5) and performance IQ (WAIS: 35-98, mean 54.3, s.d.19.5). One aim of the research was to evaluate not simply the number of signs learned, but whether this form of sign language provided them with a communication medium through which they could express language concepts. To this end an adapted form of the Reynell Developmental Language Scales (some sections omitted, and used with signs) was used to assess understanding and expression of SIGN + SPEECH; pre and post-training. The clients' use and understanding of the vocabulary taught was also assessed by means of flash cards. Some pre-training scores were recorded on the assessments, the reasons being twofold. Three subjects had prior exposure to signs, and the similarity between some signs and familiar natural gestures meant that subjects knew, or could easily infer them. To ensure that the effects of training could be separated from incidental learning, 25% of the signs used by the teachers were not actually trained.

A second aim of the research was to identify factors which were important for the acquisition of sign language.

Teaching was once weekly for a two hour period, in groups. The social, communicative function of signing was emphasised. Flash cards were used initially: once signs were acquired they were generalised to real objects and actual activities.

## Results

### Sign Language Vocabulary Test

Large gains were observed in both comprehension (where a ceiling was reached - the subjects might well have learned more signs, given the opportunity) and expression. Comprehension was in advance of expression. Learning seemed to follow normal patterns.

### Adapted form of Reynell Developmental Language Scales (RDLS)

Gains were observed in comprehension and expression. A detailed account is given of the responses to the specific sections used of the test. Nearly half the group were able to cope with the complex language concepts tested in the more advanced sections of the comprehension test (involving colour, size and position). Expressively, the naming of objects and pictures presented few problems for the group, but response to word definitions and picture description proved more difficult.

### Factors Correlated with Success in Learning to Sign

Performance IQ and social maturity (Vineland), chronological age and hearing were not correlated significantly with scores on the sign language assessment.

Socialisation, as measured by a test based on Gunzburg PAC charts, natural gesture and lip reading were significantly positively correlated with success in sign language expression. For comprehension, the only significant result was obtained

for socialisation, although the results for natural gesture and lip reading approached significance.

### Critical Points

There is no control group to separate out the effects of using sign from increased training and staff interaction. Although it seems safe to assume that the hearing losses of the subjects would have precluded success with verbal training and socialisation programmes, there is no information given (for example on rates of failure in previous programmes) which allows us to be certain of this.

This research has been the subject of critical correspondence between Bailey & Walker (in Apex 1978, 1979, see references below). Of Bailey's criticisms, the most pertinent relate to the interpretation put on the results from the adapted Reynell Developmental Language Scales; and the validity of correlations based on data from non-standardised assessments. Walker interprets the improvement in scores on the adapted Reynell Developmental Language Scales as showing that her subjects had not only learned a sign vocabulary, but were able to put their knowledge to use in following commands and in communicating expressively. Bailey argues, more parsimoniously, that the subjects' increased scores on the comprehension section of the Reynell Developmental Language Scales could be due simply to their knowing more of the signs used in the assessment, and to "repeated exposure to the training situation". Note that Walker does not claim, as Bailey alleges, "an actual increase in the level of cognitive functioning"; she implies that teaching her subjects sign language gave them access to language concepts, and to a system of communication. The results on the adapted Reynell Developmental Language Scales comprehension test, at least, seem to indicate that this assumption was correct. Here her work is in line with the "suppressed ability" hypothesis put forward by Hall & Talkington 1970, This Issue.

The relationship between an assessment of comprehension such as the Reynell Developmental Language Scales, which taps skills taught in training programmes such as colour, size, position, following commands, and understanding in the "real world", can be questioned, as Bailey implies. Walker's claims about her subjects' increased communicative skills would have been strengthened by more specific details about their behaviour outside the training situation. This, as we have seen, is a stricture which applies to nearly all the early work done in this field, and plenty of more recent work.

### Correlations from "Ad Hoc" Tests

Many of Walker's assessments involved ad hoc, non-standardised adaptations (RDLS, PAC) and rating scales (lip reading, natural gesture) for which no inter-rater agreement was established. Hence the validity, both external and internal, of the significantly positive correlations obtained is in question, and the results cannot reliably be generalised. Once again this is a criticism which applies to much of the research into signing by the mentally retarded; all the assessments of sign vocabularies are non-standardised, and the many variables which differentiate one study from another mean that factors which seem to be predictive in some situations, appear not to be so in others. Prognostic factors need to be more rigorously researched before genuine conclusions can be reached.

## Clinical Applications

The MVDP teaching programmes are based on the findings of this research.

1. With experienced teachers, groups who have regular teaching of as little as 2 hours a week, can make progress in learning and using signs.
2. Flash cards can be used effectively as a basis for teaching signs, with clients who have adequate picture recognition skills.

Bailey queries this procedure and would prefer teaching to begin with real objects, following the pattern of normal development. Walker's reasons for beginning with pictures, where mental age is appropriate, are pragmatic and clinical, since it is easier to focus attention initially on a picture, which offers less distraction than a large real object in situ. For full details of this debate, the reader is referred to the Apex correspondence. Further research needed!

### 3. Social Communication

The social function of communication was emphasised in training. This differs from much research, which concentrates on individual teaching of object names (e.g. Kotkin, Simpson & Desanto 1978; Smeets & Striefel 1976; Hobson & Duncan 1979; This Issue). It is easier to control extraneous variables in such teaching programmes, but, one may hypothesise, more difficult to ensure that signs are generalised communicatively. The social context of the training may be a factor in the relationship found by Walker between PAC profiles and success in signing. MVDP Workshops stress the importance of establishing and maintaining social communication, through signing.

### 4. Assessment

The validity of the PAC as a predictive measure for success in signing has not been firmly established in this research (see Critical Points, above), but there is evidence to suggest that complete PAC Gunzburg charts are more appropriate in assessment than performance IQ's or the Vineland (see Bailey & Tait 1979, This Issue, for a different perspective on PAC charts).

## References

### Bailey, R. (1978)

Makaton Success: Fact or Artefact  
Apex, Vol.6, No.2, 1978, 18-19

### Bailey, R. (1979)

The Makaton: In Perspective (letter)  
Apex, Vol.7, No.2, 1979, 69

### Walker, M. (1979)

The Makaton: In Perspective (letter)  
Apex, Vol.7, No.1, 1979, 12-14

Mein, R. & O'Connor, N. (1960)

A Study of the Oral Vocabularies of Severely Subnormal Patients  
Journal of Mental Deficiency Research 4, 130-147

Mein, R. (1961)

A Study of the Oral Vocabularies of Severely Subnormal Patients. II: Grammatical  
Analyses of Speech Samples  
Journal of Mental Deficiency Research 5, 52-62

Cross-Reference

MENTAL HANDICAP: A BACKGROUND READING LIST MVDP Research  
Information Service (Issue 4)

See also:

THIS ISSUE:

Bailey & Tait (1979)

Cornforth, Johnston & Walker (1974)

Hall & Talkington (1970)

Hobson & Duncan (1979)