BLISSYMBOLS: AN ALTERNATE SYSTEM OF COMMUNICATION FOR THE NON-VERBAL ADULT APHASIC PATIENT

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ABSTRACT

A group of ten non-verbal aphasic patients who had not achieved any functional communication after a minimum of three months of conventional speech therapy were introduced to the Blissymbolic System. Based on their ability to learn and use this visual communication system, the subjects were divided into two groups — effective versus ineffective symbol users. Both groups were characterized by their similarities and differences on the PICA, Schuell's Minnesota test, the ITPA, and Raven's Matrices. It was found that the better Bliss symbol users were younger, had suffered their CVA more than two years ago, and had better scores on the visual subtests of ITPA, Raven's Matrices and Schuell's test. However, subjects did not appear to use the system in a functional way in their own environment.

Research is beginning to be reported in the area of alternate systems of communication for adult aphasic patients. Most of these reports are concerned with visual systems of gestural (Skelly et al., 1975), pictorial or symbolic representation. Gardiner, Zurif, Berry and Baker (1976) used a combination of abstract and pictographic symbols to depict nouns, verbs, grammatical morphemes, and punctuation. They noted that five of eight patients were able to learn and use a limited number of symbols in response to commands, questions and requests for descriptive information. Their results suggested that some cognitive operations of natural language persisted despite severe (global) aphasia. Kirby (1978) reported limited but functional use of Blissymbolics with one patient whose aphasia consisted of reduced receptive skills and severe oral apraxia. Blissymbols, developed by C. Bliss (1949), combines printed words with universally recognized symbols to form a complete visual communication system. This system has been used as an alternate system with cerebral palsied children since 1971 at the Ontario Crippled Children's Centre as reported by Kates and McNaughton (1971). (See Figure 1)

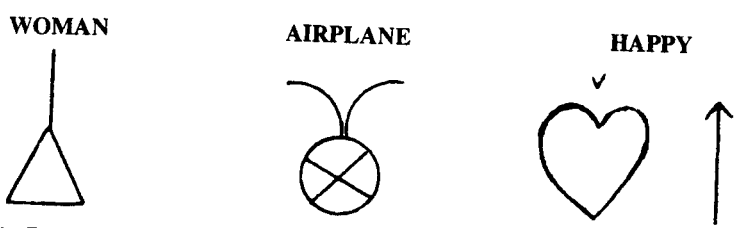

Figure 1. Examples of Blissymbols. (redrawn to scale)

This study examined the application of Blissymbols to a small group of adult aphasic patients and attempted to answer the following questions:

1. Can non-verbal aphasics learn to use symbols as a functional communication system?
2. What language, learning, or other neurological tests are predictive of patient success as a Bliss user?
3. What factors beyond neurological competence determine the degree of success in any one patient?

METHODS

Patient Selection

Ten non-verbal aphasic patients presently or recently on active treatment were selected on the basis that all had received a minimum of three months conventional speech therapy without demonstrating any significant improvement in verbal or written communication skills as judged by their therapists or primary caretakers. All had suffered a left C.V.A. resulting in aphasia.

Communication Profile

The communication profile had to reflect the many facets of communication and individual differences, but be readily quantifiable. It also needed to be sensitive to differences at low levels of functional auditory and visual comprehension skills. Therefore, each patient was administered the complete P.I.C.A. (Porch, 1967) and eight subtests from Schuell's Minnesota Test for the Differential Diagnosis of Aphasia (Schuell, 1965). These included parts A1, A2 and A5 from the Auditory Disturbances subsection which test the ability to comprehend a spoken word and yes/no questions and parts B1, B2, B3, and B4 from the Visual and Reading Disturbances subsection which test the ability to match shapes and comprehend printed words.

Blissymbol Score

The Blissymbol system was introduced in therapy to each patient in one half to one hour sessions, three to five times weekly for two months. Each session introduced one or two symbols added to a blank grid (their "talking" board). The symbol's meaning was clarified by gesture, verbal, written or pictured description. The subject then used the symbol in response to the directive "Show me the house", then to complete the phrase "You live in a _____", and finally to answer the question "Where do you live?". A new symbol was not introduced until a level of 80% accuracy was achieved at any one level. Once a week, they met in groups of two or three to use their symbols in structured and unstructured situations with the therapist and each other.

All training and testing was carried out by the author. At the end of this period their skill with Blissymbols was determined by counting the total number of symbols used to describe two large cartoon drawings for five minutes each, and five black and white photos for thirty seconds each. The drawings and photos were unfamiliar to all subjects. The drawings portrayed in simple black and white lines common scenes at the beach and at the farm involving many objects, people and animals interacting in a variety of emotional, often humorous ways. The photos depicted real people in ambiguous situations (a boy in a box) allowing for the symbol user's imagination to go beyond pure description of a scene.

The ten patients were rank ordered from highest to lowest B.S.S. For statistical purposes, this list was divided into equal halves, the higher B.S.S. group and the lower B.S.S. group. Significant differences between the two groups in their communication profiles, age, and time lapse since C.V.A. onset were computed using the Student's t-Test.

B.S.S. Correlations

To determine what other learning or neurological tests were predictive of a successful Bliss user, the five patients who achieved the highest B.S.S. were administered the following subtests: — From the I.T.P.A., the tests of auditory reception, visual reception, visual association, visual closure, and manual expression; and from Raven's Colored Matrices — Tests A, Ab and B. Correlations between B.S.S. and scores on each of these subtests were computed using the Pearson's Product — Moment Coefficient of Correlation (r).

RESULTS

Blissymbol Score (B.S.S.)

Table 1 lists in decreasing order the B.S.S. achieved by each client at the end of two months of therapy. Note the differences between the upper half and lower half of this rank-order: The group with the higher averaged B.S.S. (36) was associated with younger age (53) and a longer lapse of time since the C.V.A. (6.8 years); while the lower B.S.S. average (11) was associated with an older age (68) and a more recent C.V.A. (8.8 months). These differences are statistically significant (Student's t-Test).

TABLE 1

Rank ordered Bliss Symbol Score compared with age and time lapsed since C.V.A. onset.

PT.	B.S.S.	AGE (yrs)	CVA Onset
A	41	55	24 (mo.)
E	40	73	120
J	38	40	108
I	36	45	96
M	27	50	60
AVG.	**36**	**53**	**81.6 (6.8 yrs)**
G	25	71	4
R	18	77	2
S	6	64	24
H	4	65	10
B	2	64	4
AVG.	**11**	**68**	**8.8 (mo.)**

Communication Profiles of Both Groups Compared

In comparing P.I.C.A. Scoring (Figure 2) differences between the two groups in overall score, gestural score or graphic score were not statistically significant. However, the lower B.S.S. group's performance on the verbal subtests was statistically significant.

Communication Profiles — Continued

In Figure 3, the two groups are compared on the seven subtests from Schuell's Minnesota Battery. Both groups have high auditory comprehension at the single word level (70% or more on A1 and A2), but the lower B.S.S. group only comprehended 50% of the complete sentences (A5). Although both groups could match shapes and letters with 100% accuracy, this dropped by 25% or more when matching printed word to picture or printed word to spoken word (B3, B4). The lower B.S.S. group dropped by 40% or more on these 2 tasks. The differences between both groups on A5, B3 and B4 are all statistically significant.

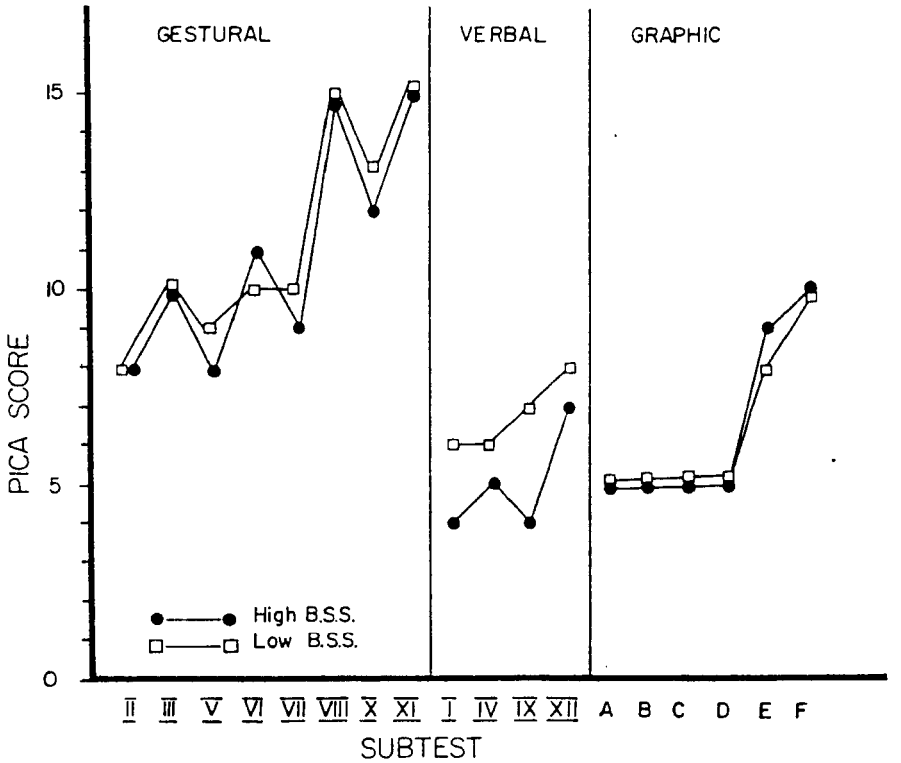

Figure 2. P.I.C.A. Subtest scores for the high and low B.S.S. groups.

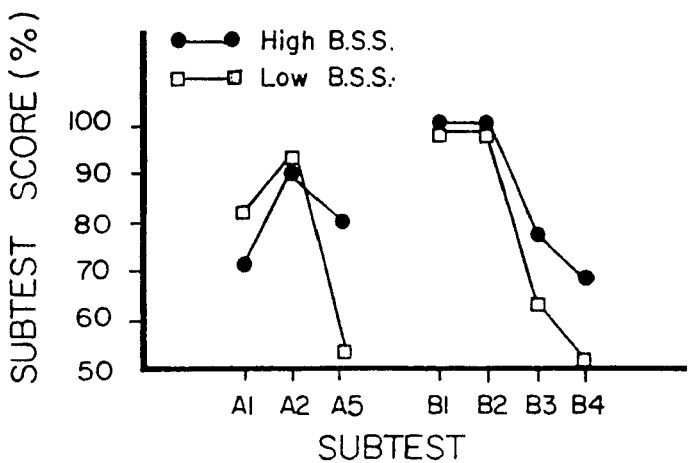

Figure 3. Auditory (A) and Visual (B) Subtests of Schuell's Minnesota Battery Comparison for the high and low B.S.S. groups.

Correlation between the High B.S.S. and I.T.P.A. Subtests Scores and Raven's Matrices

Coefficients of Correlation (r) were calculated for B.S.S. paired with individual I.T.P.A. subtest scores. A high positive correlation was noted with the tests of visual association (.95) and visual closure (.78). Lower correlations were determined for manual expression (.44), visual reception (.36) and auditory reception (.19). The Coefficient of Correlation of B.S.S. with Raven's Colored Matrices (A, AB, B) was also high and positive (.91).

DISCUSSION

Non-verbal aphasic patients can learn to use symbols to communicate in a controlled situation, i.e. in therapy. However, it was apparent that some patients learned and used the system more quickly and efficiently than others. By rank ordering them in terms of Blissymbol skill we were able to characterize those differences.

A higher B.S.S. is likely when the subject is younger. There was a statistically significant difference of 15 years between the average ages of each group. Similarly, the higher group had suffered the C.V.A. two years ago or more, while the lower and older group averaged only 8 or 9 months since onset. We cannot say which of these — age or time of onset — contribute more to the higher B.S.S. The younger age is often a major factor in the success of any form of rehabilitation. However, it is not so obvious why a lapse of time would benefit learning processes. Several explanations are possible. It is hypothesized that the recent C.V.A. patient and his family are still experiencing a series of adjustments and learning what new limitations exist physically, emotionally and mentally. It is still too early to recognize which skills and abilities, including communication, are plateauing and which are continuing to improve. The higher verbal score on the P.I.C.A. suggests this group is still attempting verbal communication despite the many errors. By contrast, the long term C.V.A. patient may be more willing to consider an alternate system of communication because of a longer past history of verbal communication failure. Their verbal P.I.C.A. scores were significantly lower than the recent C.V.A. patients.

The two groups of subjects did not differ in their P.I.C.A. communication profiles except in verbal scores; therefore, these tests cannot be used to differentiate effective (high B.S.S.) Bliss users from ineffective (low B.S.S.) Bliss users. However, it can be said that an effective Bliss user must achieve a minimum 70% or better on tasks of auditory comprehension and unimpaired ability to match visually. Both groups had only limited graphic skills (impaired copying of words and shapes with a P.I.C.A. score of 8-10). The Schuell visual subtests also suggest the minimum need for unimpaired matching skills, but 70% accuracy in recognizing printed words. Among the effective Bliss users, strong correlations were noted with the I.T.P.A. Subtests of visual association (.95) and visual closure (.78). These, according to Osgood's model (Osgood, 1957) indicate levels of cognitive functioning for concrete and abstract problem solving using visual information, as well as levels of visual attention, concentration, motivation, and visual searching pattern. The ability to efficiently locate specific figures relates directly to the scanning abilities required for a Blissymbol board. However, an overly meticulous search will impede progress and, therefore, decrease the efficiency of communicating in a visual mode. The visual reception subtest does not require refined skills of discrimination. Its low correlation with B.S.S. suggests it is a poor predictor of success with Blissymbols. The Manual Expressions subtest, which requires some form of conceptual organization before producing the gesture, showed a moderate correlation of .44 suggesting that both better gestural skills and a better Blissymbol score rely on good conceptual and verbal (thought) organization.

A high Raven's score is predictive of a high B.S.S. ($r = .91$). Research by Basso (Basso, DeRenzi, Faglioni, Spinnler, 1973) in the testing of aphasic patients' intelligence indicated that their low performance is due to a reduced capacity to adopt a "categorical attitude" in

abstract thinking. It was shown that low scores are not related to a degree of auditory comprehension deficit, length of illness, etiology, or age, but are correlated with years of schooling. The study proposes that left C.V.A. patients are using, in the intact right hemisphere, an area adjacent to that of discrimination of visual information. This area would be involved in the eduction of logical relationships existing among different patterns. The inference can be made that better performance on several different intellectual tasks depends on this area whether it be non-verbal (Raven's) or verbal (Blissymbolics). In view of their skill in learning Blissymbolics, perhaps the Raven's Test is also assessing their ability to adapt to a new code.

It is not clear whether or not good auditory skills are essential to learning this visual system. The P.I.C.A. subtests (V1, X) and Schuell's Auditory subtests suggest that some auditory deficiency would not interfere. The I.T.P.A. Auditory Reception subtest has little or no correlation with B.S.S. (.19). However, it is not known at the present time what minimum level of auditory comprehension is required.

This study did not take into consideration several other relevant factors such as premorbid medical, educational and work experience, or pre and postmorbid family and social environment. These may be important in view of motivation required to learn and use the system in a functional way. It was generally observed that the low B.S.S. group did not recognize the value of the system as an alternate system of communication. In fact, two subjects rejected the system outright.

The experience of training subjects to use this system resulted in additional information useful in predicting effective Bliss users and ineffective Bliss users. Patients with good potential are motivated to communicate (show signs of frustration, and use gestures), use symbols spontaneously early in the training period, and can organize and search efficiently for symbols.

Making the system functional in the patient's own living environment is an entirely different problem. At present, even the subject who achieved the highest B.S.S. uses the system as a last resort after gesture and yes/no questions have failed to complete the communication. A separate program must be developed to train both the user and the "listener" to make the system functional.

This study has prompted many more questions for research. What significance is the use of the word under the symbol? What strategies can the aphasic patient manipulate (opposite, action, combine)? Which symbols are most useful and easy to learn? What is the maximum number of symbols that can be learned by this population? How can the concept of "category" be used to increase efficiency of scanning for symbols? What methods will prove most effective in making the system functional in the patient's living environment? Can the use of Blissymbols be applied to therapy for anomia or apraxia?

SUMMARY

The three questions posed initially are addressed below.

1. Some non-verbal aphasic patients can learn to use symbols to communicate. However, merely learning the system does not guarantee its functional use in the communicator's environment.

2. P.I.C.A. testing does not differentiate effective from ineffective Bliss users. However, both P.I.C.A. and Schuell profiles suggest minimum skills required. Better visual subtest scores on the Schuell test predict better B.S.S. A better B.S.S. is also strongly and positively correlated with the apparent level of reasoning on the Raven's Colored Matrices, and with the I.T.P.A. Test of Visual Association, and Visual Closure. Minor auditory comprehension deficits do not appear to interfere with Blissymbol skill. However, moderate to severe auditory deficits were typical of the lower B.S.S. subjects.

3. The high B.S.S. group was younger, had suffered a C.V.A. more than two years ago, and was motivated to communicate (attempted to use any other form of communication). However, the system will become functional only if both the patient and the "listener" accept the system. To date, none of these subjects uses the system except as a last resort when their habitual methods have failed.

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