

1995

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Communication and Behavioral Assessment of Persons
with Developmental Disabilities

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M. A. Thesis

Submitted to:

Department of Psychology

Lakehead University

March, 1995

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ISBN 0-612-09193-7

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Abstract

Communication affects many areas of daily life. Therefore, support programs to assist persons with developmental disabilities should identify individuals who would especially benefit from communication training. Forty individuals with developmental disabilities were assessed on Vineland Adaptive Behavioral Scales (VABS) (Sparrow, Balla, & Cicchetti, 1984), the Assessment of Basic Learning Abilities (ABLA) test (Kerr, Meyerson, & Flora, 1977), and a Communication Status Survey developed for this study. ABLA level was correlated with all VABS scales except gross motor skills and maladaptive behaviors. These correlations validate the use of the ABLA as a measure of cognitive ability. Ability to use formal communication modes (speech, sign language, symbols) was significantly ($p= 0.001$) related to ABLA level. Examination of individual cases suggested that the ABLA may be predictive of the ability to acquire formal communication. All persons able to pass ABLA level 2 or higher who had received previous communication training had some formal communication ability. In contrast, five individuals who were able to pass ABLA level 2 or 3 and lacked formal communication had not received communication training. The importance of formal communication is confirmed since persons without formal

communication were unable to provide information about immediate and external environments or request clarification. Training in formal communication may be of benefit in allowing clients to perform these skills.

Communication and Behavioral Assessment of Persons
with Developmental Disabilities

A main goal when working with persons with developmental disabilities is to enhance independence, daily living skills, and quality of life. One area of functioning which impacts upon quality of life is communication. Communication is a means of furthering cognitive development through testing ideas, acquiring information, and developing values and beliefs. Communication also furthers social and emotional development, through enhancing ability to relate to others, developing awareness of the feelings of others, and releasing emotional tension (Silverman, 1976). Silverman summarizes the role of communication as providing an individual with "a sense of worth, in providing the ability to exercise control over his environment, in allowing him to take responsibility for his own learning, and in making possible an appropriate educational program" (p.1). Due to the apparent importance of communication, inability to communicate effectively will have a negative effect on an individual's ability to function within society. Indeed, not only is the acquisition of social skills dependent upon communicative ability (Whelan & Speake, 1977), it has also been demonstrated that behavioral problems

in adults with developmental disabilities can be the direct consequence of communication difficulties (Leudar & Frazer, 1985).

Research on the communicative abilities of individuals with developmental disabilities has focused on verbal communication deficiencies in areas such as articulation, length of utterance, inability to deal with sentence complexity, and size of vocabulary, with emphasis on assessment and training of verbal communication skills (Baer, Paterson, & Sherman, 1967; Love, Hagerman, & Taimi, 1980; Van der Gaag, 1988). While such research on vocal communication abilities is important, it ignores persons with developmental disabilities for whom verbal communication is not an option.

Traditionally, non-verbal individuals with developmental disabilities have received many hours of physiotherapy and speech therapy, even when it is obvious to those working with the client that communication deficits are not being influenced by these interventions (Silverman, 1976). Due to the importance of effective communication, clients who have no functional speech should be provided with alternative means with which to communicate where possible (e.g., sign language and symbolic communication). Recent initiatives towards deinstitutionalization and lack of established

community support services may limit ability to provide the communication assessment and training services required by some persons with developmental disabilities. It would, therefore, be advantageous for support agencies which service nonverbal populations with developmental disabilities to have a clear, structured assessment for identification of individuals who would especially benefit from training in alternative methods of communication.

Assessment of Behavioral and Cognitive Capabilities

In determining placement of individuals with developmental disabilities into training programs, it is important to obtain a thorough description of current levels of functioning, both in communication and other daily living skills. By obtaining information on current status and modes of communication, it is possible to identify communication skills already present which can be used as a basis for further communication training. Analysis of the basic discriminatory repertoires and other behavioral skills of clients with developmental disabilities should also be performed as this information could be valuable in identifying behavioral skills, deficits, or excesses which may impact on effectiveness of communication training. In a comprehensive summary of pre-linguistic communication

assessments, Musselwhite and St. Louis (1982) have identified a number of areas which should be assessed when determining the type of communication training which will be of greatest benefit to each client. These include physical attention; sensory activity, such as auditory and visual discrimination; functional object use; expressive and receptive language; motoric control; pre-expression skills, such as imitation and hand preference; visual perceptual skills such as tracking, scanning, and matching; and expression through use of gestures and symbols. Information obtained in these skill areas can be employed in the application of a number of existing models for deciding which type of communication training would be most beneficial to each client (e.g., Chapman & Miller, 1980; Shane & Bashir, 1980).

At present there exist a number of assessment tools for use with persons with developmental disabilities which may have application for determining placement into communication training programs. Three methods which, taken together, can provide an overview of client functioning in each of the skills areas identified by Musselwhite and St. Louis (1982) include: (a) adaptive behavioral scales, (b) scales of current communication status, and (c) tests of basic learning abilities.

Adaptive Behavioral Scales. Sattler (1992) has defined adaptive behavior as the ability to perform daily activities required for personal and social sufficiency. Adaptive behavior scales measure client functioning on a variety of specific self-maintenance, interpersonal relationship, social responsibility, and communication behaviors (Reschly, 1982). As an example of the specificity of items, the Vineland Adaptive Behavior Scales includes the following as a self-maintenance item: "Puts toothpaste on toothbrush and brushes teeth without assistance" (Reynolds, 1987, p.99). Vineland Adaptive Behavioral Scales (VABS) (Sparrow, Balla, & Cicchetti, 1984) are used to assess the social competence of both disabled and nondisabled individuals. Scores obtained from this measure are often expressed in terms of mental age.

Skill areas identified as important to communication (Musselwhite & St. Louis, 1982) which are assessed by the VABS include physical attention, cognitive development, functional object use, receptive and expressive language, and motoric control. Another area assessed by the VABS which may impact on communication is the presence of maladaptive behaviors.

Maladaptive behaviors, such as temper tantrums and self-injurious behavior, may hinder educational/training programs,

and have been found to be a direct consequence of inability to communicate (Leudar & Frazer, 1985). Bird, Dores, Moniz, and Robinson (1989) found that severely aggressive and self-injurious behaviors of individuals with developmental disabilities were reduced through implementation of functional communication training. These reductions came after years of less successful nonaversive and aversive behavioral interventions and generalized across staff, new environments, and increasing task demands. As noted by Carr (1977), self-injurious behavior may be a learned response to frustration, which is an expected result of inability to communicate.

Communication Status. Implementation of both verbal and non-verbal communication training programs is normally preceded by an assessment of current communicative abilities. While assessment of current communicative function can follow either formal or informal protocols, information obtained from both assessment methods normally focuses on ability to express needs and wants and ability to participate in social interactions. These two skills areas are believed to encompass the two main motivations for communication (Light, McNaughton, & Parnes, 1986). Information on client ability to express needs and wants often includes

communication of choice, rejection of items or indication of displeasure, and requests for assistance. Social functioning items often include client attention to partner, requests for attention, greetings and closings, and ability to both provide and request clarifications and information. These skills are commonly assessed by a speech pathologist through use of facilitator questionnaires and direct observations in order to determine the type of communication training that will be most beneficial to each client. Client observations are normally carried out in both natural contexts and in situations specifically designed to elicit certain behaviors from clients.

Representative of most formal assessment procedures, the Protocol for the Assessment of Communicative Interaction (Light, McNaughton, & Parnes, 1986) takes approximately 8 hours to complete. This includes 1-1 1/2 hours to gather background information; 2 hours to videotape, review, and score the client in naturally occurring contexts; 1 1/2 hours to review videotapes of client-facilitator interactions; 2 hours to plan elicited contexts and complete them with the client; and 1 1/2 hours to set goals for client intervention. While this type of assessment provides an abundance of descriptive information for each client, the amount of time

required to complete the assessment creates problems such as expense and long waiting lists. It may be possible to elicit similar information from primary care workers in a less time consuming format.

Basic Learning Abilities. After an examination of tasks commonly taught to persons with developmental disabilities (e.g., sorting tasks) Kerr, Meyerson, and Flora (1977) determined that all tasks were based on ability to perform one or more of six basic two-choice discriminations. In light of this determination, Kerr et al. developed the Assessment of Basic Learning Abilities (ABLA) test to assess degree of difficulty experienced by clients with developmental disabilities while learning these basic discrimination tasks. The ABLA consists of six diagnostic tasks which parallel Piaget's stages of sensory motor intelligence (Kerr & Meyerson, 1977).

In ABLA level 1, Imitation, the tester demonstrates placing a piece of foam into a red box and the examinee is required to imitate the response. Imitation trials also include placing a red cube into the red box, placing the foam into a yellow can, and placing a yellow cylinder into the yellow can. ABLA level 1 corresponds to Piaget's genuine imitative behavior. ABLA level 2, Position Discrimination,

involves presentation of both the yellow can and red box in fixed positions. The client is required to consistently place the foam into the container on the left (the yellow can). This ABLA level corresponds to Piaget's stage during which "searching mindlessly in a particular place" occurs (Kerr & Meyerson, 1977). In ABLA level 3, Visual Discrimination, the two containers are presented with their positions randomly alternated over trials. The client is required to consistently place the piece of foam into the yellow can regardless of position. This task requires what Piaget termed object constancy. ABLA level 4, Visual Match-to-Sample, also involves random presentation of the two containers. The client is presented with either the red cube or the yellow cylinder, and must consistently place the red cube into the red box and the yellow cylinder into the yellow can. The skills used in this task again correspond to Piaget's object constancy. In ABLA level 5, Auditory Discrimination, the client is presented with the yellow can and red box in stable positions. The client is required to place the foam into the appropriate container when presented with the auditory cue red box! or yellow can!. In ABLA level 6, Auditory-Visual Combined Discrimination, the client must again place the foam into the appropriate container when given the auditory cues

of level 5, but with the positions of the containers randomly alternated over trials. ABLA levels 5 and 6 parallel Piaget's Preoperational sub-period, which is characterized by rapid development of symbolic thought.

In the original study, Kerr, Meyerson, and Flora (1977) found that as age increases, so does auditory-visual discrimination skill, even among adults with moderate and severe developmental disabilities. In addition, the percentage of individuals passing each task was found to decrease as level of developmental disability increased. Research into the utility of the ABLA as an assessment tool have been consistent in several areas: (a) predictive validity, (b) hierarchical ordering of ABLA tasks, and (c) verbal communication skills.

Predictive Validity of the ABLA. Wacker, Kerr, and Carroll (1983) assessed twelve persons with developmental disabilities with the ABLA test. For 11 of the 12 participants, ABLA performance allowed prediction of performance on vocational analogue tasks. Wacker et al. also predicted performance of nine persons with developmental disabilities on a sorting task on the basis of ABLA assessment. Performance was predicted without error for all nine subjects.

In predicting performance on common classroom learning tasks Wacker, Steil, and Greenbaum (1983) assessed several children with developmental disabilities using the ABLA. ABLA results were used to predict performance on classroom tasks requiring visual, sign, and auditory discriminations 77/84 = 92% of these predictions were confirmed. The majority of children tested were able to perform only those tasks which required discrimination skills the children were shown to possess through ABLA assessment.

Hierarchical Ordering of ABLA Tasks. ABLA task difficulty increases in accordance with the order in which the tasks were previously described (level 1 is the easiest task and level 6 is the most difficult). This hierarchical structure can be seen in the pass/fail patterns of ABLA performance. In the great majority of cases, subjects who pass a certain ABLA level will also pass all lower levels, and when a level is failed all higher levels of the test will also be failed (Kerr & Meyerson, 1977; Martin, Yu, Quinn, & Patterson, 1983). It has also been demonstrated that, once a certain ABLA level is learned, generalization to tasks requiring the same discrimination skills occurs quite rapidly (Meyerson, 1977). This hierarchical nature allows easy identification of the next step which should be taken by

those who train the persons with developmental disabilities in order to increase clients' level of functioning. Specifically, level of functioning may be effectively ameliorated by training a client to perform at an ABLA level which that client was previously unable to master.

ABLA as a Predictor of Length of Utterance. In a study of children aged 13-35 months, Casey and Kerr (1977) found that regardless of age there is a clear association between ABLA skills and mean length of utterance and a vocabulary (in a 30-minute speech sample) of more than 75 words. While correlational, their study allowed the tentative hypothesis that ABLA level 5 and 6 are prerequisite for meaningful speech production. Data collected from persons with developmental disabilities in the same study show that while individuals who spoke readily and in sentences also passed ABLA level 6, failure of ABLA levels 5 and 6 did not mean that no speech was present.

Hierarchical ordering and generalizability of ABLA task performance, the ease with which ABLA scores can be used in the development of training programs, and the relationship between ABLA task performance and verbal communication skill may bear on the use of the ABLA in assessment of skills required by formal communication systems (speech, sign

language, symbols). If competence in the use of a particular communication method was found to relate to performance at or above a certain ABLA level, ABLA task performance could be used to identify those individuals who would especially benefit from training programs in that communication method. This application of the ABLA could provide front line workers with a relatively quick and easy means to identify those clients most likely to benefit from communication training.

Present Study

The main purpose of the present study was to explore the value of the ABLA test for predicting clients' ability to benefit from communication training. A second purpose was to examine the value of the Communication Status Survey designed for this study. Information provided by this survey was examined in an attempt to identify communication deficits associated with the absence of formal communication.

Method

Participants

Consent was obtained for 42 individuals, of whom 2 did not wish to participate in ABLA assessment. Specifically, one client shook his head to indicate 'no' and left the room in which assessment was to be conducted. The second client showed no interest in the testing procedures and would not

allow the tester to complete guided trials of the correct response.

The remaining participants in this study included 24 male and 16 female individuals with developmental disabilities. Clients' chronological ages ranged from 21 to 64 years with a mean age of 37.9 years. Physical disabilities within the subject group varied, with the only prerequisites for participation being ability to maintain a seated position, and ability to grasp and manipulate test materials.

Participants were obtained by seeking consent from three agencies providing service to persons with developmental disabilities in Thunder Bay. It was made clear that participants with poor communication skills were being sought. The majority of participants had very low communication abilities, although a few had somewhat higher communication levels. These individuals were not excluded from the sample as they provided a greater range of communication ability.

The primary care worker of each client was also asked to participate. Primary care workers are those individuals who interact with the client on a daily basis, and who ensure that the client's needs are being met. Primary care workers included in this study were identified by clients'

parents/legal guardians or supervisors as that care worker who had been in closest contact with the client for the longest length of time. All care workers had been in contact with the client to be assessed for a minimum of six months.

Materials

The ABLA. Materials required for ABLA assessment included a large red box measuring 15 cm x 15 cm x 10 cm, a large yellow can 16.5 cm in height with a diameter of 13 cm, an irregularly shaped piece of white foam with a diameter of approximately 5 cm, a yellow cylinder with a diameter of 3.8 cm and a height of 9 cm, and a red cube measuring 3.8 cm x 3.8 cm x 3.8 cm. Data sheets used during this assessment approximated those of Hazen, Szendrei, and Martin (1989) (see Appendix A).

Communication Status Survey. Three speech pathologists from Winnipeg and Thunder Bay were consulted to examine communication skills commonly assessed, both formally (Light, McNaughton, & Parnes, 1986) and informally, in populations of persons with developmental disabilities. Each speech pathologist provided a listing of items commonly used to summarize client information. Items from these listings were compiled. The compiled items were reviewed by a speech pathologist and those items which were considered redundant

were dropped. The resulting twenty-six items covered three broad areas of communication ability: expressing needs and wants, participation in social interactions, and modes of communication.

Information on client ability to express needs and wants and participation in social interactions were rated in terms of the frequency with which the activity occurred (0 = never, 1 = with prompt, 2 = sometimes, and 3 = always). Modes of communication were rated in terms of the frequency with which clients used each mode (0 = never, 1 = sometimes, 2 = often, and 3 = always). The assessment form included both the 26 survey items and a number of statements to clarify the meanings of these items. Questions designed to elicit information on previous communication training were included (see Appendix B).

Vineland Adaptive Behavioral Scales (VABS). The VABS provides an estimate of level of functioning even for persons with severe developmental disabilities. There are three versions of the VABS: an Interview Edition, Survey Form; and Interview Edition, Expanded Form; and a Classroom Edition. Each version measures adaptive behavior in four domains: communication, daily living skills, socialization, and motor skills. Survey and expanded forms also include optional items

to assess maladaptive behavior. In the present study the Interview Edition, Expanded Form of the VABS was used.

The Expanded Form of the VABS contains 577 items which are administered in a semi-structured interview with the parent or caregiver of the client. Materials required include an item booklet, a score summary and profile booklet, and a manual.

Maladaptive behavior items may be a relevant component when discussing the performance of persons with developmental disabilities in terms of non-compliance and interference of specific behaviors with individuals' performance. In order to gain information about this aspect of client performance maladaptive behavior items were administered in the form of 36 additional questionnaire items.

The mean estimated reliability coefficient for VABS scales is 0.93, while internal consistency of VABS scales for adults with developmental disabilities in nonresidential facilities ranged from 0.90 to 0.99. The validity of the VABS is supported by correlations between VABS scores and scores from other adaptive behavior scales and intelligence scales (Sparrow, Balla, & Cicchetti, 1984, p 49-51).

Procedure

Written consent was obtained from the parent, legal

guardian, or protective services worker of each client. Consent forms were accompanied by a cover letter explaining the purpose of the study (see Appendix C). As some clients could provide their own consent, a simplified version of the cover letter was read to these clients. These clients were then given the opportunity to provide written acknowledgment that the study had been explained to them. Clients were able to withdraw from the study at any time. For clients unable to communicate the wish to withdraw, apparent level of enjoyment of the assessment procedures was used to determine client assent to participate.

Once consent was obtained, cognitive, behavioral, and communication skills of each client were assessed using the ABLA, VABS, and Communication Status Survey.

The ABLA. During ABLA assessment, the participant sat at a table directly across from the tester. All assessments took place in the clients' residence, in an area void of distracting materials.

All ABLA assessments were administered according to the procedures of Kerr et al. (1977). In accordance with these procedures, each task began with the tester demonstrating a correct response, physically guiding the client in a correct response, and then providing the client with an opportunity

to perform a correct response without aid. A correct response was said to occur if the client placed the manipulandum into the correct container, as denoted on the record form. An incorrect response was recorded if the client placed the manipulandum into the incorrect container. All other responses, such as throwing of the test materials, were not scored. These inappropriate responses were extinguished through removal of test materials and removal of the tester's attention.

Correct responses were reinforced with praise. Incorrect responses were followed by a correction procedure involving the same demonstration, guided, and unaided trials which occurred at the beginning of each task. If a client corrected his/her error when given the opportunity to perform without aid, the response was not scored and testing proceeded to the next trial. If the client repeated his/her error, a second error was scored. Demonstration, guided, and unassisted trials continued until the client corrected his/her error or until the failing criterion was met. Trials for each task level continued until eight consecutive correct responses (passing criterion) or eight cumulative errors (failing criterion) were performed.

Communication Status Survey. Communication status for

each client was assessed in the form of a checklist completed by each clients' primary care worker. Completion of the checklist took approximately 25 minutes. Care workers were asked to indicate, with a checkmark, the frequency with which their client is able to perform a number of communication skills (e.g., always, sometimes, with prompt, never). Respondents provided similar information on the frequency with which their client uses various modes of communication. Respondents were instructed to complete all items in terms of what their client has been observed to do, rather than what they believe their client can do. Care workers were also asked to provide information on any past or current communication training which the client had received. It should be noted that information on previous communication training may be limited by the length of contact between the client and the respondent, and by the availability of this information in agency files. Completion of the survey was followed by a general inquiry during which the care worker was asked to estimate the extent of their client's communication ability (e.g., number of signs known), and to provide any other information they felt was relevant to their client's current communication status.

Vineland Adaptive Behavioral Scales. The Vineland

Expanded Form was administered in an informal interview to the primary care worker of each client. Completion of the VABS took approximately 90 minutes. Prior to the interview, it was established that the purpose of the assessment was to describe what the individual does for him/herself, as opposed to what the respondent or others do for the individual. It was also established that there were no right or wrong answers and that the focus was not on what the individual can do, but on what he or she actually does. Scoring for individual items occurred as follows: activities which the individual habitually or usually performs (score 2); skills which are performed sometimes or with partial success (score 1); skills which are never performed (score 0); skills which are not performed because of limiting circumstances (score N for 'no opportunity'); and skills of which the respondent has no knowledge (score DK for 'don't know'). Upon completion, each respondent was thanked for their participation.

Data Analysis. Once assessment procedures were completed the raw scores for each client, on each VABS scale administered, were entered into an SPSS file. Highest ABLA level attained by each client was entered as a measure of ABLA performance. Communication Status Survey scores for each item were entered separately (always = 3, sometimes = 2, with

prompt = 1, never = 0).

Results

Assessment of Basic Learning Abilities

Individual performance on the ABLA test ranged from 0 (inability to pass any ABLA level) to 6 (ability to pass all ABLA levels). Of the forty participants in this study two were unable to pass any ABLA levels, five participants were at ABLA level 1, 14 individuals attained ABLA level 2, six individuals attained ABLA level 3, seven participants attained ABLA level 4, and six individuals passed all six ABLA levels. None of the forty individuals assessed was at ABLA level 5.

Vineland Adaptive Behavioral Scales

Cumulative raw scores over all VABS scales ranged from 102 to 729 out of a possible maximum score of 1154. Individual scores on the VABS placed the performance of 38 individuals in the below average range and 2 individuals in the average range when compared to norms for adults with developmental disabilities in nonresidential facilities (Sparrow, Balla, & Cicchetti, 1984, p.252).

ABLA level (0 to 6) was significantly correlated with all but 2 VABS scales (see Table 1). Persons demonstrating higher levels of cognitive ability on the ABLA also had a

greater level of competence on items from the following VABS scales: receptive communication, expressive communication, writing, personal care, domestic living skills, community living skills, interpersonal relationships, leisure, coping skills, and fine motor skills. The same was not true for VABS scales of gross motor ability and maladaptive behaviors. High levels of gross motor ability and maladaptive behavior were not related to increased levels of cognitive ability, as measured by the ABLA.

Communication Status Survey

This survey included 26 items which represent three broad aspects of communication: ability to express needs and wants, participation in social interactions, and modes of communication used. Responses to each item denoted the extent to which that item applied to the participant.

Relationships between these 26 items and the ABLA are presented in Table 2. Persons demonstrating higher cognitive abilities, as measured by the ABLA, were rated with higher proficiency on communication items regarding requests for objects and actions, communication of choice, requests for assistance, use of greetings and closings, provision of information and clarification, requests for information and clarification, and the use of speech.

Table 1 Correlations between VABS scales and the ABLA (n= 40)

VABS Scales	r
Receptive Subdomain	0.662 ^{**}
Expressive Subdomain	0.541 ^{**}
Written Subdomain	0.268 ^{**}
Personal Subdomain	0.523 ^{**}
Domestic Subdomain	0.436 ^{**}
Community Subdomain	0.399 [†]
Interpersonal Relationships	0.538 [†]
Leisure Time	0.474 ^{**}
Coping Skills	0.532 ^{**}
Fine Motor Skills	0.585 [†]
Gross Motor Skills	0.182
Maladaptive Behaviors	0.193

Note * p< 0.05
** p< 0.01

Table 2 Correlations between communication items and the ABLA 28 (n= 40)

<u>Communication Items</u>	<u>r</u>
<u>Expressing Needs and Wants</u>	
Requests Object/Action	
-Immediate Environment	0.340 [†]
-External Environment	0.401 [†]
Communicates Choice	0.473 ^{**}
Denial/Protest	0.176
Confirmation/Acceptance	0.091
Indicates Interruption	0.219
Requests Assistance	0.475 ^{**}
<u>Social Interactions</u>	
Attention to Partner	0.233
Greeting/Closing	0.342 [†]
Requests Attention	0.148
Provides Information	
-Immediate Environment	0.558 ^{**}
-External Environment	0.644 ^{**}
Provides Clarification	0.476 ^{**}
Requests Information	0.524 ^{**}
Requests Clarification	0.310 [†]
Expresses Emotions	
-Positive Emotions	0.037
-Negative Emotions	-0.026
<u>Modes of Communication</u>	
Speech	0.503 ^{**}
Sign Language	-0.112
Symbols	0.297
Spelling	0.124
Eye Gaze	-0.064
Pointing	0.274
Vocalizations	0.055
Facial Expression	-0.053
Body Language	-0.003

Note * p < 0.05

** p < 0.01

Relationships between survey items and eleven VABS scales are presented in Table 3. The VABS scale of maladaptive behaviors was not included in this Table as it was not significantly related to any of the items from the Communication Status Survey, indicating that presence of maladaptive behaviors was not significantly related to level of communicative competence. Presence of maladaptive behaviors was also not significantly related to performance on VABS scales of receptive ($r = -0.249$) and expressive ($r = -0.199$) communication.

The findings presented in Table 3 indicate that as communication ability increased (i.e., higher proficiency on individual items), so did cognitive ability, as measured by the VABS. This was particularly true for requesting objects/actions, denial/protest, requests for assistance, use of greetings and closings, provision of information, provision of clarification, and requests for information and clarification. Increased competence in performing these communication behaviors was related to increased performance on the following VABS scales: receptive communication, expressive communication, personal living skills, domestic living skills, community living skills, interpersonal relationships, leisure, and fine motor skills. Increased

Table 3 Correlations between communication items and VABS scales

Communication Items	Receptive	Expressive	Written	Personal	Domestic	Community	Interpersonal	Leisure	Coping	Fine Motor	Gross Motor
Requests object/action	0.609**	0.429**	0.020	0.480**	0.435**	0.276	0.501**	0.434**	0.305	0.480**	0.278
-immediate environment	0.559**	0.471**	0.039	0.391*	0.313*	0.340*	0.534**	0.485	0.378*	0.426**	0.196
-external environment	0.462**	0.347*	0.185	0.321*	0.311	0.090	0.240	0.262	0.256	0.340**	0.216
Communicates Choice	0.439**	0.320*	0.071	0.390*	0.456**	0.282	0.423**	0.290	0.289	0.346*	0.043
Denial/Protest	0.287	0.208	-0.035	0.194	0.348*	0.204	0.355*	0.279	0.197	0.293	0.045
Acceptance/Confirmation	0.084	0.141	0.152	0.002	0.057	0.183	0.171	0.166	0.210	0.084	-0.096
Indicates Interruption	0.547**	0.348**	-0.011	0.492**	0.453**	0.182	0.450**	0.379*	0.289	0.580**	0.371*
Requests Assistance											
Social Interactions											
Attends Partner	0.031	0.356**	-0.123	-0.018	0.190	0.379*	0.389*	0.362*	0.159	0.039	-0.113
Greeting/Joining	0.400*	0.422**	0.214	0.280	0.349**	0.280	0.502**	0.510**	0.481**	0.320*	0.064
Requests Attention	0.283	0.354**	-0.257	0.180	0.134	0.139	0.373*	0.320*	-0.023	0.206	0.052
Provides Information											
-immediate environment	0.596**	0.666**	0.063	0.448**	0.502**	0.408**	0.523**	0.499**	0.410**	0.450**	0.068
-external environment	0.691**	0.744**	0.119	0.412**	0.436**	0.502**	0.625**	0.567**	0.501**	0.440**	-0.014
Provides Clarification	0.481**	0.382*	0.141	0.504**	0.466**	0.416**	0.448**	0.450**	0.376*	0.458**	0.178
Requests Information	0.506**	0.607**	0.246	0.349**	0.408**	0.581**	0.564**	0.573**	0.524	0.453**	0.032
Requests Clarification	0.329*	0.313*	0.474**	0.231	0.361*	0.428**	0.245	0.339*	0.436	0.261	0.150
Expresses Emotion											
-positive emotion	0.052	0.126	-0.117	0.042	0.085	0.143	0.145	0.158	0.034	0.002	0.055
-negative emotion	0.156	0.111	-0.446**	0.106	0.137	0.085	0.243	0.158	-0.171	0.123	0.030
Modes of Communication											
Speech	0.519**	0.778**	0.098	0.238	0.290	0.439**	0.608**	0.495**	0.551**	0.238	-0.132
Sign Language	0.176	0.134	0.089	0.350*	0.317*	-0.052	0.017	0.004	0.013	0.291	0.241
Symbols	0.258	-0.070	0.077	0.273	0.256	0.127	0.132	0.190	0.103	0.408**	0.184
Spelling	0.061	-0.094	0.835**	-0.005	0.030	0.213	-0.118	0.046	0.545**	-0.034	-0.119
Eye Gaze	0.126	0.135	-0.045	0.199	0.363*	0.234	0.162	0.350*	-0.053	0.174	0.118
Pointing	0.380*	0.313*	0.238	0.566**	0.523**	0.260	0.339*	0.404**	0.209	0.447**	0.259
Vocalizations	0.178	0.084	0.267	0.007	0.263	0.316*	0.237	0.335*	0.339*	-0.043	-0.039
Facial Expressions	0.172	0.129	0.205	0.106	0.192	0.316*	0.271	0.336*	0.271	0.080	-0.175
Body Language	-0.053	-0.039	0.855**	-0.146	-0.114	0.066	-0.184	-0.050	0.568**	-0.244	-0.114

Note * p < 0.05
** p < 0.01

performance on VABS scales of gross motor ability, written communication and coping skills was not related to increased performance on these communication behaviors. This is particularly true of gross motor ability, which was only related significantly to one communication item, requests assistance ($r = 0.371$, $p < 0.05$).

Individual Performances

One major purpose of this study was to explore the value of the ABLA test for predicting clients' ability to benefit from communication training. Significant relationships observed between the ABLA and communication scores justifies further examination of this issue. To do so, individuals at each ABLA level were evaluated for their use of formal communication methods (e.g., sign language, speech, symbols) and whether they had received previous communication training (see Table 4).

In Table 4, level of communication was represented by using criteria of having no formal communication method (neither speech, sign language, nor symbol; a total of eight persons), having minimal formal communication (having fewer than 20 words, signs, or symbols; a total of 11 persons), or having proficient formal communication (having greater than 20 words, signs, or symbols; a total of 21 persons). Eight of

these individuals used speech exclusively, three used symbols exclusively, and one used sign language exclusively. The criterion of 20 is also used by the VABS as an index of minimal expressive vocabulary.

Formal communication was significantly related to ABLA level. The mean ABLA level for those with no formal communication was 1.6, the mean ABLA level of those with minimal formal communication was 2.1, and the mean for those with proficient formal communication was 3.8. The difference among these ABLA levels was highly significant, $F(2, 37) = 8.64, p < .001$. All individuals who achieved ABLA level 6, and all but one individual who achieved ABLA level 4 were proficient in at least one formal communication method. At ABLA levels 1, 2, and 3 a greater number of individuals were found who used formal communications methods minimally or not at all. Neither of the two individuals unable to complete ABLA level 1 used any formal means of communication. This relationship was strongest at extreme ends of the ABLA hierarchy, while results were mixed for ABLA levels 1-4.

Proficiency in the use of formal communication methods (having a vocabulary of greater than 20 words, signs, or symbols) was found to occur in $0/2 = 0\%$ of persons unable to complete any ABLA level, $2/5 = 40\%$ of persons at ABLA level 1,

Table 4 ABLA levels and formal communication methods

	<u>Communication Mode</u>				<u>Ability Level</u>			
	ABLA	Speech	Sign	Symbol	Training	None	Minimal	Proficient
1	0	-	-	-	-	*		
2	0	-	-	-	-	*		
3	1	-	p	Y	Y			*
4	1	Y	-	-	-			*
5	1	-	p	-	-		*	
6	1	-	p	-	Y		*	
7	1	-	-	-	Y	*		
8	2	Y	-	-	-			*
9	2	-	-	p	Y		*	
10	2	-	p	-	-		*	
11	2	-	p	-	-		*	*
12	2	-	-	-	-	*		
13	2	-	p	-	-		*	
14	2	-	-	-	-	*		
15	2	-	p	-	Y		*	
16	2	-	p	p	-			*
17	2	-	p	Y	Y			*
18	2	-	-	-	-	*		
19	2	-	p	Y	Y			*
20	2	-	-	Y	Y			*
21	2	-	p	Y	-		*	
22	3	Y	-	-	-			*
23	3	Y	Y	-	-			*
24	3	-	-	-	-	*		
25	3	-	-	-	-	*		
26	3	-	p	p	Y		*	*
27	3	Y	-	-	-			*
28	4	-	Y	-	-			*
29	4	-	p	Y	Y			*
30	4	-	p	-	Y		*	
31	4	-	-	Y	Y			*
32	4	-	-	Y	Y			*
33	4	Y	Y	Y	Y			*
34	4	Y	-	-	-			*
35	6	Y	-	-	-			*
36	6	Y	-	-	-			*
37	6	-	Y	Y	Y			*
38	6	Y	-	-	-			*
39	6	Y	-	p	-			*
40	6	Y	Y	Y	Y			*

Note Speech: Y= vocabulary over 20 words
 Sign/Symbol: Y= use of over 20 signs/symbols
 p= use of less than 20 signs/symbols
 Training: Y= have recieved previous communication training

4/14= 29% of persons at ABLA level 2, 3/6= 50% of persons at ABLA level 3, 6/7= 86% of persons at ABLA level 4, and 6/6= 100% of individuals at ABLA level 6. Thus it appears that for persons in the middle categories (ABLA levels 1-3) approximately 30-50% had proficient formal communication. These findings are presented in Figure 1.

Previous communication training of the eight individuals with no formal communication is reported in Table 4. Individuals 1 and 2, who were unable to perform any of the ABLA levels, had not received previous communication training. Individual 7, who had passed only ABLA level 1 and who had no formal communication had received previous communication training. Individuals 12, 14, 18, 24, and 25, who had no formal communication and passed ABLA level 2 or higher, had not received any previous communication training.

Of the 17 individuals who had received communication training, all but one had some formal communication ability, that individual was at ABLA level 1. However, individuals 3 and 6, who had passed only ABLA level 1 did benefit from previous communication training. These findings suggest that level 1 may be on the boundary of ability to acquire formal communication.

For those performing at ABLA level 2 and above a strong

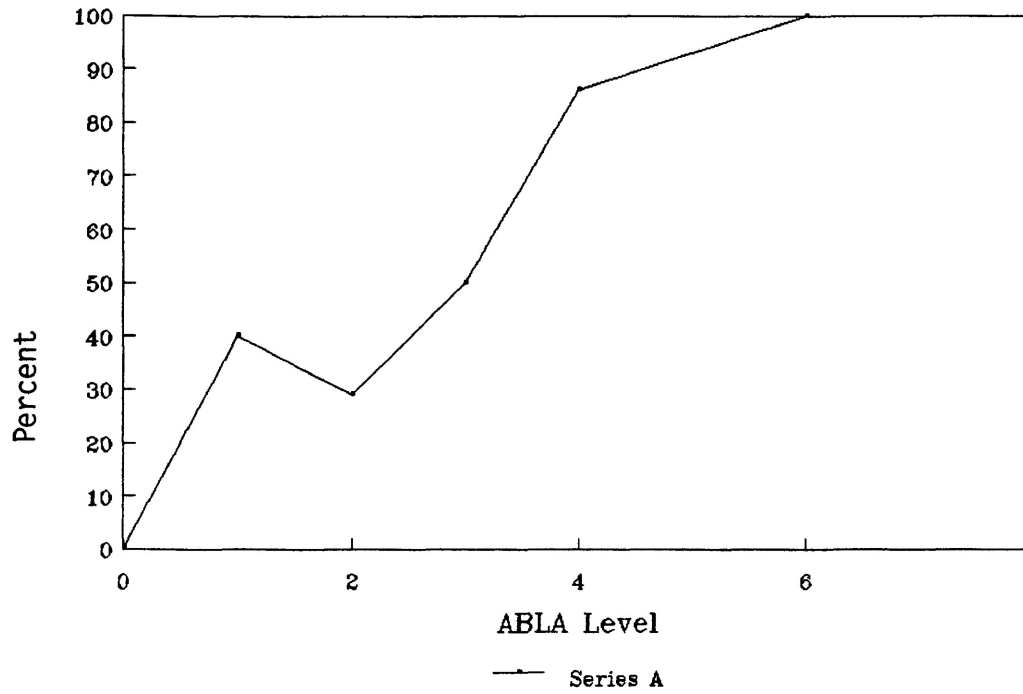


Figure 1 Percentage of persons using a formal vocabulary greater than 20 words, signs, or symbols by ABLA level.

link was found between absence of formal communication and absence of formal communication training. None of the five individuals at ABLA levels 2 and 3 with no formal communication skills had received communication training. Of those at levels 2 and above who had received communication training, every individual had at least minimal formal communication skills. This relationship between presence of formal communication and having received communication training was significant, Fisher's exact probability = 0.025.

Communication Status Survey

Data from the Communication Status Survey were examined to evaluate the relationship between the presence of formal communication and the communication skills measured by that survey. It was found that individuals with no formal communication were significantly lower in their abilities to communicate choice, $t(38) = -2.45$, $p = 0.019$, request assistance, $t(38) = 2.02$, $p = 0.008$, use greetings and closings, $t(38) = -3.3343$, $p = 0.002$, provide information about their immediate environment, $t(38) = -3.06$, $p = 0.004$, and provide information about their external environment, $t(38) = -2.71$, $p = 0.010$.

It is particularly important to note that all of those who lacked formal communication were unable to provide

information about their immediate and external environments or to request clarification even when prompted to do so. In contrast 72% of those who had at least some formal communication were able to perform these communication skills. The difference in these proportions (0% versus 72%) was highly significant, $\chi^2 (1) = 13.53, p < 0.001$.

Maladaptive Behaviors

VABS maladaptive behavior scale scores for persons with high levels of formal communication ranged from 3 to 39, with a mean of 20. Scores for persons with minimal use of formal communication ranged from 11 to 32, with a mean of 21. For persons with no formal communication skills, VABS maladaptive behavior scores ranged from 11 to 37, with a mean of 22. Average performance on maladaptive behavior items was not significantly related to communication ability $F(2,37) = 0.049$. Overlap of individual maladaptive behavior scores across the three levels of communicative competence indicates that presence or absence of maladaptive behaviors is not strongly linked to use of formal communication methods.

Discussion

The results of this study show that performance on the ABLA test is related to level of communicative competence, and use of formal communication methods (speech, sign language, symbols). Significant correlations between ABLA level, Communication Status Survey and VABS receptive and expressive communication scales indicate that individuals at higher ABLA levels also have higher levels of communicative functioning. In comparing ABLA level to proficiency with formal communication methods (speech, sign language, symbols) it was found that neither of persons unable to complete any ABLA level, and all 6 of individuals completing all ABLA levels had formal communication abilities. For persons in the middle categories (ABLA levels 1-3) approximately 30-50% had formal communication abilities. This relationship between proficiency in the use of formal communication and ABLA level was significant. It should be noted that links between ABLA performance and communicative ability were strongest for verbal communication abilities.

The results of this study also suggest that ABLA test performance may be predictive of ability to benefit from training in alternative methods of communication. Of the 17 individuals who had received communication training, all but

one had some formal communication ability. That individual was at ABLA level 1. However, individuals 3 and 6, who had passed only ABLA level 1 did benefit from previous communication training. These findings suggest that level 1 may be on the boundary of ability to acquire formal communication. For those performing at ABLA level 2 and above, a perfect relationship was found between absence of formal communication and absence of formal communication training. None of the five individuals at ABLA levels 2 and 3 with no formal communication skills had received communication training. Of those at levels 2 and 3 who had received communication training, every individual had some formal communication skills.

This finding of a strong relationship between absence of formal communication and absence of communication training at ABLA level 2 and above suggests two hypotheses with respect to the five persons at ABLA levels 2 and 3 who have received no communication training and have no formal communication. The first, and most plausible, hypothesis is that each of these five individuals is capable of benefitting from training in alternative communication methods but may have fallen through the service gap, receiving no training. Alternatively, it is possible that these individuals are not

capable of benefitting from alternative communication training and this is why they have not received training.

While the present findings should be interpreted with caution due to the small sample sizes at each ABLA level, the data suggest that the five individuals at ABLA levels 2 and 3 who lack formal communication might be particularly likely to benefit from training, since all others at these levels who had been given training now had some formal communication abilities. These findings also suggest that level 1 might be at the boundary for ability to acquire formal communication.

The results of the present study do not confirm that the discrimination ability required by ABLA level 2 is necessary in order to benefit from alternative communication training. The results do raise a number of possibilities which should be examined in future research. One possibility relates to provision of training to those persons at ABLA levels 2 and 3 who have not received previous communication training, and who have no formal communication abilities. If provided with communication training would these individuals be capable of benefitting from that training? If capable of benefitting from training would individuals at ABLA level 3 benefit to a greater extent (e.g., learn more symbols; need fewer training trials) than individuals at ABLA level 2? If unable to

benefit from training, what specific factors differentiate these individuals from those individuals at ABLA levels 2 and 3 who have received communication training and have benefitted from that training?

A second research question relates to the accuracy of the ABLA test. Was the person at level 1 who could use symbols falsely categorized? Would this person perhaps have been able to pass level 2 on a retest, or if tested under different circumstances? Would training this individual to perform at ABLA level 2 prove less difficult than training the individual at ABLA level 1 who had not benefitted from communication training?

A third possibility is that the tasks used by the ABLA test do not 'capture' the skills required for alternative communication. It may be possible to develop a different task, similar to ABLA level 2, which is aimed at persons on the level 1-level 2 boundary, and which more directly evaluates the basic abilities required for learning to use symbols. Development of an alternative task could follow the procedures used by Stubbings (1993) in breaking down tasks into their component skills. One possibility is to develop a task which is similar to level 2, but which uses the actual materials of a symbol board. Such a task might approximate

the simplest of the skills required for using symbols (e.g., a symbol for 'yes' and a symbol for 'no'). The advantage of such a task would be in the specificity of the skill being evaluated (i.e., instead of assessing a general ability, it would assess the actual component involved in acquiring symbol skills).

The present study allowed identification of specific behavioral deficits present in those who do not use formal communication methods. As proficiency in the use of formal communication methods increased so did ability to communicate choice, request assistance, use greetings and closings, provide information about immediate and external environments, and request clarification. It is of particular importance to note that none of those who lacked formal communication were able to provide information about their immediate or external environments or to request clarification, even when prompted to do so, while 72% of those with formal communication abilities were able to perform these communication behaviors. These data indicate that ability to use formal communication methods does impact on performance of specific communication behaviors. Formal communication training, through improvement in these specific skills areas, may therefore improve client interactions with

and understanding of others.

There are several limitations to the present data. The present study should be viewed as preliminary, both because of the small sample size and because communication training programs would have to be administered in order to confirm that the five individuals at ABLA levels 2 and 3 who currently have no formal communication would in fact be able to acquire such skills. However, the findings provide some indication of the potential of the ABLA for identifying such individuals. It is particularly useful to contrast the information provided by the ABLA and the VABS. The VABS includes three scales which specifically measure communication skills. However, VABS scales which do not explicitly measure communication ability are, in some cases, confounded by the presence of items which reflect formal communication skills. For example the Community subdomain contains the following item "States current day of week when asked". In contrast, the ABLA test for skills that do not require communication ability. Thus the ABLA provides a measure of cognitive potential which is less affected by current level of communication ability. As well, the ABLA yields a smaller number of discrete categories, which are easier for identifying anomalies than are the continuous

scores provided by the VABS.

Musselwhite and St. Louis (1983) identify physical attention and motoric control as skills to be assessed prior to communication training. However, in the present study gross motor ability, as measured by the VABS, was not found to correlate with either VABS communication scales or the majority of items from the Communication Status Survey. That motor skills were not related to communication raises questions about those skills previously thought to be essential to the use of formal communication. That maladaptive behavior, as measured by the VABS, was unrelated to VABS communication scales or Communication Status Survey items contradicts Leudar and Frazer's (1985) contention that maladaptive behaviors can be a direct consequence of inability to communicate.

A final point concerns the value of the Communication Status Survey designed for the present study. It provided information about the same communication skills as is generally obtained by the more time consuming and costly assessments done by a speech pathologist. For the purposes of the present study, this information showed the nature of the communication deficits associated with the absence of formal communication. The value of this scale for the design of

communication training programs will await further research.

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Appendix A

Data Form for ABLA Tasks

Learning To Learn

Name _____ Time Start _____
 Teacher _____ Finish _____
 Date _____

Instructions: If response is correct, circle trial number. If response is incorrect, place X on trial number. The task is complete when eight (8) consecutive correct trials are made. Discontinue when eight (8) errors have accumulated. Errors that occur as part of correction trial (see procedures) should be underlined, X. If a child corrects an error during a correction trial do not record a correct trial.

Task #1 (Demonstration)
 Present one container at a time
 Trials: Red Box
 1 2 3 4 5 6 7 8
 9 10 11 12 13 14 15 16
 Yellow Can
 1 2 3 4 5 6 7 8
 9 10 11 12 13 14 15 16

Task #2 (Position)
 Correct stimulus is yellow can (Can & Box remain stable)
 Trials:
 1 2 3 4 5 6 7 8
 9 10 11 12 13 14 15 16
 17 18 19 20 21 22 23 24
 25 26 27 28 29 30 31 32

Task #3 (Visual)
 Correct stimulus is yellow can (or same as Task #2) positioned as indicated below.
 Trials:
 L R L L R L R R
 1 2 3 4 5 6 7 8
 R L L R L R R L
 9 10 11 12 13 14 15 16
 L L R L R R L R
 17 18 19 20 21 22 23 24
 R R L R L L R L
 25 26 27 28 29 30 31 32
 L R R L R L L R
 33 34 35 36 37 38 39 40

Task #4 (Matching-to-Sample)
 Red Box and Yellow Can alternate as indicated. Present Red Cube (box) or Yellow Cylinder (can) as indicated below.
 Trials:
 R R L R L L R L
 C B B C C B B C
 1 2 3 4 5 6 7 8
 L L R R R L L R
 B C B C B B C B
 9 10 11 12 13 14 15 16
 L L R L R R L R
 B C C C B C B B
 17 18 19 20 21 22 23 24
 L R L L R R L L
 B B C C C B B C
 25 26 27 28 29 30 31 32
 L R L L R R L L
 B B C C C B B C
 33 34 35 36 37 38 39 40

Task #5 (Auditory)
 Correct stimulus is the one you ask for as indicated below. (Containers remain stable.)
 Trials:
 B B C B C C B C
 1 2 3 4 5 6 7 8
 C B C C B C B B
 9 10 11 12 13 14 15 16
 C B B C B C C B
 17 18 19 20 21 22 23 24
 B C B B C B C C
 25 26 27 28 29 30 31 32
 B C C B C B B C
 33 34 35 36 37 38 39 40

Task #6 (AVC)
 Correct stimulus is what you ask for as indicated below. Containers alternate as indicated below.
 Trials:
 R R L L R R L L
 B C C B C B C B
 1 2 3 4 5 6 7 8
 L L R R L L R R
 C C B C B B B C
 9 10 11 12 13 14 15 16
 L L R L R R L L
 C C B C B C C B
 17 18 19 20 21 22 23 24
 R L R R L L R R
 B C B B C C B C
 25 26 27 28 29 30 31 32
 L L R L L R R L
 C B B C C B B C
 33 34 35 36 37 38 39 40

Appendix B

Communication Status Survey

Client Name: _____ Date of Birth: _____

Evaluator: _____ Present Date: _____

Physical Limitations: _____

Communication Background

Please describe any communication training/interventions which this client has received in terms of:

- 1) Has the client received communication training?
(yes, no, don't know)
- 2) How long ago did training occur? (years, months, weeks)
- 3) What was the duration of training?
- 4) What mode of communication was being trained?

Current Communication Behaviors

Please indicate with a checkmark how often each of the following is performed by the client with whom you work. Clarification of item meanings appear on page 3.

<u>Expressing Needs/Wants</u>	Always	Sometimes	With Prompt	Never
Requests object/action				
-immediate environment	_____	_____	_____	_____
-external environment	_____	_____	_____	_____
Communicates Choice	_____	_____	_____	_____
Denial/Protest	_____	_____	_____	_____
Confirmation/Acceptance	_____	_____	_____	_____
Indicates Interruption	_____	_____	_____	_____
Requests Assistance	_____	_____	_____	_____

<u>Social Interactions</u>	Always	Sometimes	With Prompt	Never
Attention to Partner	_____	_____	_____	_____
Greeting/Closing	_____	_____	_____	_____
Requests Attention	_____	_____	_____	_____
Provides Information				
- immediate environment	_____	_____	_____	_____
- external environment	_____	_____	_____	_____
Provides Clarification	_____	_____	_____	_____
Requests Information	_____	_____	_____	_____
Requests Clarification	_____	_____	_____	_____
Expression of Emotions				
- positive emotions	_____	_____	_____	_____
- negative emotions	_____	_____	_____	_____

Modes of Communication

Please indicate the frequency with which the modes of communication below are used by the client being assessed.

<u>Modes</u>	Always	Often	Sometimes	Never
Speech	_____	_____	_____	_____
Sign Language	_____	_____	_____	_____
Symbols	_____	_____	_____	_____
Spelling	_____	_____	_____	_____
Eye Gaze	_____	_____	_____	_____
Pointing	_____	_____	_____	_____
Vocalizations	_____	_____	_____	_____
Facial Expression	_____	_____	_____	_____
Body Language	_____	_____	_____	_____

Clarification of Item Meanings

Expressing Needs and Wants

1. Does the client ask for objects/activities he/she wants in the immediate environment? outside that environment?
2. Does the client show that he/she has made a choice between two objects?
3. Does the client reject or indicate displeasure of an item/activity? Does the client indicate 'no' in some way?
4. Does the client confirm or have a 'yes' response?
Does the client reach for or otherwise accept items that are offered?
5. Does the client look at you when an activity has been interrupted, or show in some way that he/she wishes for the activity to continue?
6. Does the client request your assistance when he/she needs help?

Social Interactions

1. Does the client watch you during an interaction?
2. Does the client indicate hello/good-bye to others?
3. Does the client have some means of getting your attention?
4. Does the client label, describe or provide other information when asked?
5. Does the client provide clarification when their partner does not understand what they are trying to communicate?
6. Does the client ask for information about people, activities or objects?
7. Does the client indicate when he/she does not understand a partner's intended message?
8. Is the client able to express positive and/or negative emotions effectively?

Comments/Clarification

If the client currently utilizes an alternative means of communication (sign, symbols) please indicate the approximate extent of their ability (ie., number of signs or symbols used).

Please indicate any other information which you feel is relevant to the client's current communication abilities (e.g., modes or abilities which are not presented here).

Communication
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Appendix C

Ms. Suzanne Barker
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Thunder Bay, Ontario
P7B 5E1

Dear Parent,

My name is Suzanne Barker. I work with developmentally disabled children and adults. I am presently completing a Master's degree at Lakehead University and am conducting a thesis under the supervision of Dr. John Jamieson, and in collaboration with Shuan Boo, Manager of the Community Resource Team at the Centre for the Developmentally Challenged.

The title of my thesis is "Communication and Behavioural Assessment of Persons with Developmental Disabilities". For further details, please see the attached abstract.

I am requesting your permission to include your son/daughter child's name in this study. This study will focus on gathering information concerning communication skills, daily living skills, and cognitive abilities, and will attempt to identify factors which may augment ability to benefit from communication training.

The study will benefit your child as information gathered will assist in the implementation of any personal planning process.

If you would like to request further information about this study, please feel free to contact me in Thunder Bay at 768-2459, or in Winnipeg at (204) 233-8459.

Sincerely,

Ms. Suzanne Barker



Consent Form

My signature on this form indicates that my son/daughter has my permission to participate in a study by Suzanne Barker-Collo on identifying current communication and behavioural skills in persons with developmental disabilities. I also agree to allow his/her primary care worker to provide information about his/her behavioural and communication skills. I have read and understood the cover letter of the study entitled "Communication and Behavioural Assessment of Persons with Developmental Disabilities", and I understand the following:

1. Participation in this study is voluntary and I can withdraw my consent at any time.
2. The data obtained will remain confidential.
3. Training programs will not be altered solely on the basis of information derived from this study.
4. I can obtain a summary of the findings of this project, upon request, following the project's completion.

Signature of Parent/Guardian

Date

Signature of Witness

Date