

BRIEF REPORTS

**COMMUNICATION FUNCTIONS IN CHILDREN WITH SEVERE
SPEECH AND PHYSICAL IMPAIRMENT**

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ABSTRACT

Children with cerebral palsy, especially with severe speech and physical impairment (SSPI) have limited access to explore the environment and develop communication skills based on this exploration. In spite of the severe limitation imposed by the condition, these children manage to communicate. The study analyzed video recorded samples of the communication interaction of 4 children with SSPI during instructed play with their mothers. The sample was judged by 2 experienced speech language pathologists for the range and frequency of communication functions namely; request for information, request for attention, request for object, information, instruction (for action), confirmation and denial. Findings of this study revealed a higher proportion of information (58%), followed by denial (29%) and then by request for object (10%). Request for information, instruction (for action) and request for attention were found minimally and in equal proportion (1%) in their communication repertoire. The findings provide baseline information of the varied communicative functions existing in children with SSPI. Clinical implications of the same are discussed.

INTRODUCTION

Communication refers to the "transmission of meaning from one individual to another, whatever the means used" (1). Communication development in typically developing children is based on the following assumptions.

1. The development stages of language and communication is same in all typically developing children. (2, 3). However they could differ in terms of rate and quality of development (e.g., early vocabulary preferences).
2. The conceptual and linguistic development in typically developing children reflects a sequence of built-in priorities (3). A child generally acquires the simpler linguistic structures before the complicated ones are learnt.

3. During the developmental period, nonverbal and verbal language is acquired in a similar manner and runs parallel to other motor milestones. Certain communicative functions in the earlier period is attained through nonverbal or simpler linguistic ability (e.g., requests, greetings, and labels can be expressed nonverbally) whereas certain functions, for e.g. repair strategies require higher order language (4).

The major achievement in the prelinguistic stage, as Bates (5) states, is the emergence of intentional communication in which the child uses signal deliberately to have a pre-planned effect on the caregiver. Investigators such as Harding and Golonkoff, (6), Coggins and Carpenter (7), in their study observed that children used various communicative functions, namely request for object, request for action, protest, and comment on object and comment on action. Beginning at about 9 months of age, children have been found to express using a wide variety of intentions.

An important factor in the child's language development period is the contribution of primary care givers namely the mothers. Studies of parent-infant interactions have documented a sequence of activities, whereby parents carefully study their infant's facial expressions, movements and vocalisations as though they were social signals (8). It is during these early interactions that many critical language processes receive a boost and are encouraged, such as the desire to engage in playful vocalisation including vocal exploration, the emergence of turn taking and dialogue structure, and the desire to imitate vocal patterns.

Iacona and Carter (9) stressed the important role of the communication partner in distinguishing intentional from preintentional communication. They state that the communication partner's responsiveness and sensitivity plays an important role in identifying such differences. Wilcox, Kouri and Caswell (10), observed that the partner must consistently recognize a child's communicative or potentially communicative attempt and respond to these attempts in a contingent, appropriate and consistent manner.

Depending on the severity of the condition, children with cerebral palsy face limitation in speech and physical development. Physical impairment causes difficulties in attaining motor milestones and in turn causes physical limitations. Physical limitations in children with cerebral palsy, as explained by Cress, Linke, Moskal, Benal, Anderson and LaMontagne (14), diminish the opportunities for exploration and object-based play. Since most of the

early language learning involves physically acting on the environment, learning language through exploration is hindered. Thus, children with cerebral palsy acquire language in a different manner especially when the limited speech is accompanied by motor and /or sensory limitations affecting their ability to explore the environment around them (12, 13, 11).

Children with severe physical impairments often rely on vocalisations, eye-gaze, and gestures in their interactions with communication partners (14). However their ability to use the same is limited resulting in difficulty of the caregiver to read these signals (15). Pennington and McConachie (16) studied the interactions between mothers and their severely physically disabled children in the age ranges of 2-10 years of age whose speech was unintelligible out of context to their parents and were using aided communication systems. Children across the age range produced more response moves than any other type. Their responses contained more of yes/no answers and acknowledgements and to a lesser extent provisions of information. Most of their communicative attempts, especially for simple confirmations, denials, and acknowledgements were not completely understood and were usually followed by requests for clarifications by the mothers. Children produced a wider range of communicative functions in the semi- scripted elicitation conversation with the clinician than in conversation with their mothers. Though this study provides information on various forms of communication elicited by physically disabled children, with different partners namely mothers and clinicians, these findings cannot be generalised to children who do not have aided communication system. It is quite likely that such functions exist because of the presence of the devices.

Physical impairment along with limitation in speech permits a different exposure to children during developmental period. This study aims to analyse communication functions in children who are dependent on naturally available nonverbal communication system to view the different kinds of functions used while they interact with their mothers.

METHOD

The aim of the study was to analyse the communication functions in SSPI children between 2 to 3 years of age using unaided communication strategies, while interacting with their mothers. Typically, developing children around the age of 2 to 3 years attain most of the motor milestones including speech and have fairly good language ability (7, 17, 18). But

children with SSPI lag behind their typically developing counterparts due to their inherent physical and communicative ability. This study attempts to explore the communicative functions that are observed in this population, in the absence of speech and concurrent physical impairment.

The communication functions studied are as follows:

1. Request: a. Request for information, b. Request for attention, c. Request for object
2. Information
3. Instruction (for action)
4. Confirmation
5. Denial

The sample was selected from centres providing to services for children with special needs. Children within the age ranges of 2 to 3 years with the primary diagnosis of cerebral palsy confirmed by the medical professionals and physiotherapist/occupational therapist were selected. The demographic details of the children are presented in Table 2. None of them had undergone any formal speech and language intervention. All the subjects were quadriplegic (four limbs involvement) and were not independently mobile. Their peripheral hearing and vision were normal (as per the reports available) and had age appropriate receptive language based on Receptive Expressive Emergent Language Scale, (19). They were exposed at home to the local language. Expression was primarily through non-verbal modalities and none of them had meaningful speech in their expressive vocabulary. Since there are no standardised tools available for measuring non-verbal expressions, expressive language was mainly profiled based on clinical observation and parental interview. Expression was mainly through use of unaided communication strategies such as gestures, pointing, facial expression and/or voicing.

Table 2. Demographic data of the subjects

Subject	Age/Sex	Diagnosis
A	3.0 yrs/F	Spastic Quadraplegic
B	2.10 yrs/M	Spastic Quadraplegic
C	2.6 yrs/M	Spastic Quadraplegic
D	2.11yrs/M	Dyskinetic Quadraplegic

Mothers were selected as communication partners, as they accompanied most of the children attending the intervention programme. Mothers were in the age range of 21-25 years and they were literate with a primary education of higher secondary grade. They had no speech, language or other sensory deficits.

Procedure

The four dyads were familiarised with the clinical settings. The principal investigator built a rapport with the mother-child dyad. They were instructed to interact with the child using an available set of materials/toys, as they would normally do at their homes. Few sessions of feeding, physiotherapy/infant stimulation and play were video recorded to familiarize the dyad with the recording procedure and to desensitise them to the physical presence of the investigator during video recording, and to help overcome shyness/fear. Informed consent was obtained from mothers for video recording, prior to their inclusion in the study. The actual procedure consisted of 3 audio-video taped sessions of 15 minutes of each dyad interacting with the selected toys and suggested activities.

Before the recording, mothers were instructed on how to use the material and the activity that was required to be carried out with the child. A semi-structured interaction mode was chosen primarily to increase the chances of occurrence of communicative function, which were intended to be studied. The toys were selected such, that it suited the age, physical condition of the child and that which provided better communication interaction in the dyad. The same toys were provided to all the dyads. The material included ball, building blocks, car, noisemakers, marker pens, kitchen set, doll and accessories of doll, cars, papers,

flash cards and picture books. Three sessions were chosen to provide maximum opportunity for a communicative function to occur, and to rule out the contextual limitation (as in selection of a particular toy). Three audio-video recordings were carried out on separate days, within a period of one month, with a gap of a week between consecutive recordings.

Phase1: Mothers used both verbal and nonverbal strategies to communicate. Due to the inherent difficulty in transcribing the verbal and nonverbal behaviours of the mothers separately and since the aim of the study was to analyse mothers' overall communication strategies; only the verbal behaviours of mothers were transcribed. Child's communication strategies were not noted down in this transcription. Taxonomy of the communicative functions was based on review of literature on mother child communicative interaction (15, 20). Two judges, who were postgraduates in speech-language pathology with a minimum of 2 years of experience in intervention of childhood language impairment, were selected. A list of communicative functions, along with the definition and examples were coded for training the judges. A sample video recorded clip of a 6-year-old child meeting all the criteria as specified for subject selection in this experiment except for the age, was selected for practise purpose. This recording was used to familiarise and train the judges with respect to the terminology and coding procedure. Both the judges were trained for a period of 4 hours. The judges were given enough opportunity and practice along with ample discussion to familiarise them with the actual rating procedure.

Phase 2: After the training phase, the actual experiment involved the judges viewing the transcribed version of each session along with the recording of each dyadic session completely for 2-3 times. Once the judges were comfortable and were familiarised with the dyadic sessions, each transcribed utterance of the mother was coded based on the taxonomy of communicative functions provided to the judges. Similarly the recording was viewed again for coding communicative function elicited by the child. Finally, the recording was viewed in total, to reconfirm and check the coding offered for the mother and the child's communicative functions. Both the judges carried out this procedure separately, with the principal investigator helping them with the technical aspects of the recorded samples like switching off the sample at a particular point so that they could code the utterance. No discussion regarding the coding, with the principal investigator was entertained during this process. Both the judges rated the sample separately.

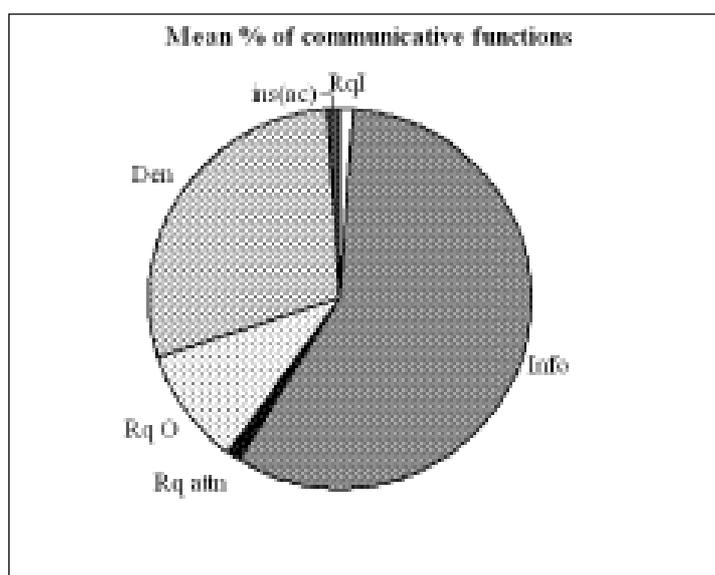
Scoring and reliability

The frequency of occurrence of communicative function of the child was calculated. The percentage ratio was calculated as child elicited function to total child function. Inter-judge reliability using alpha co-efficient, for the communicative functions of the child was found to be 80%. Mean percentages for the three recordings were calculated for each judge. Since the inter-judge reliability of the total of the frequency functions was high (99%), the mean percentages of each judge were further tabulated to provide a composite mean rating for each communicative function, for all the 4 subjects.

RESULTS AND DISCUSSION

The mean percentage of various functions is represented in Graph 1.

Graph 1: Mean percentage of communicative functions in children with SSPI



(**RqI**: Request for information; **RqO** Request for object; **Rq attn**: Request for attention; **Ins (ac)**: Instruction for action; **Info**: Information; **Den**: Denial)

In spite of the conditional limitations (21), children with SSPI also showed a wide range of communicative functions like their verbal counterparts. Most of the functions elicited by the children with SSPI were basic communicative functions that could be achieved with unaided strategies and ones which did not necessarily require verbal ability. This supports the findings of Bloom and Lahey (4), that certain communicative functions in the early development period is attained through nonverbal means. Cress et al. (11) observed that parents tend to engage more frequently in social play than object based play and they used fewer directives as compared to object play tasks, while interacting with their children with SSPI. This could be one of the reasons for a wide range of communicative function to exist, in spite of the conditional limitation.

Requests: Requests had a total mean of 11%, which included 1% of request for information and request for individual attention, whereas request for object had the highest mean percentage of 10% in this category. A higher mean percentage for request for object reflects the ability of the child to choose an activity or material of interest in the presence of severe conditional limitations. Presence of request for information during communication interaction with children with SSPI reflects their curiosity in exploring the environment, which again is fairly low. Among these, a poorer percentage of requests for attention warrants serious attention, as it seems to be a crucial aspect of language learning. Subtle, unconventional, slow, effortful and inconsistent strategies used by these individuals are often missed out and affect contingent responses by significant partners. Such situations could be eliminated by requesting for attention before initiating communication.

Information: From the graph, it is evident that information as a function had a mean percentage of 58%, which is the highest mean among the functions listed. A higher mean percentage of information probably reflected the choice of the task in the interaction process, wherein the subjects were expected to provide information. It is likely that certain functions used by the mother especially a higher frequency of request for information could have forced the child to provide a higher frequency of information as compared to any other functions.

Denial: Denial had a mean percentage of 29%. A fairly higher occurrence of denial function emphasises the individual's ability to decline what he did not prefer to do or his inability to perform a task which the mother expected him to carry out. This highlights the dominance

of the partners in choosing an activity or material that is not primarily the subject's liking or which is physically not possible for the individual to perform. If the former is true, then one can infer that partners tended to provide an object, which was not asked for by the subjects leading to higher proportion of denial by them.

Instruction (for action): Instruction for action had a low mean percentage of 1%. It is possible that children with SSPI are probably not aware that they can manipulate their environment/conversational partner by instructing them to carry out an activity which they prefer and in a fashion that they like. The presence of low mean of instruction (for action) could also be indicative of the passivity of children in terms of manipulating the environment to their preference and following to some extent, the lead offered by mothers. There is a high probability that children actually instructed the mothers to carry out an action, but the non-verbal strategies were, subtle, unconventional or ambiguous, causing a likelihood of being missed out by the mothers. It is also likely that instruction for action is a difficult function for which nonverbal ability is not sufficient enough.

The lower occurrences of some of the functions such as requests for attention, or requests for information or instruction for action could be a result of limited interaction possibilities with the environment due to motor dysfunction. This, in turn might prevent acquisition of communication skills necessary to take part in more complex communicative interaction later in life. Reduced percentage of request for information and instruction for action, again highlights the passivity of the subjects either forced on them due to the condition or the communicative pattern.

CONCLUSION

The study found a varied and fairly high proportion of communication function in the SSPI children in the absence of speech. This study supports the notion that basic communicative functions exist in children in spite of the limitations imposed by their conditions and that such functions are acquired in a different manner (13, 21) as compared to typically developing children. These functions can be well elicited with naturally available nonverbal communicative strategies.

The credit can also probably be attributed to a great extent to the partners who are sensitive and responsive to children's communicative attempt. Partners, especially the mothers tend

to respond to children's communicative attempt in a contingent, consistent and appropriate manner. Since the initial period of communication development is dominated by non verbal communication and it is only later that the verbal component develops, parental responses basically strengthen the belief that speech will develop over time. Parents tend to interact in a fashion that is appropriate to children at the lower age range and who are using non-verbal communication in the developmental period. Since communication is context based, the higher prevalence of certain functions over the others could be strongly linked to the context in which it occurs. Context with reference to communication generally includes not just the situation of occurrence, but also the partner involved in the interaction. These functions were evident during interactions with the mothers and generalisation of these findings to other communicative partners, needs, further studies involving varied partners such as mothers along with other primary caregivers, teachers and peer groups. Though these children do not communicate at par with their verbal counterparts, the findings of this study provide preliminary information about the communicative functions elicited by these children. The findings of this study could be used for deciding the rehabilitation strategies for further communication development.

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ANNOUNCEMENT FOR THE WELLESLEY BAILEY AWARDS 2009
The Leprosy Mission International

The Leprosy Mission International (TLMI) invites nominations for the sixth round of Wellesley Bailey Awards. The Awards will be presented in the first week of June 2009 at a unique awards ceremony in Canada. The Awards are presented to people who have had leprosy and who have made an outstanding contribution to society. The person nominated must have shown courage and achievement in overcoming the challenges faced through leprosy.

Two separate awards will be given, preferably to one male and one female. Unsuccessful nominations from previous years can also be submitted for reconsideration. Whether or not the nominee is informed is at the discretion of those making the nomination. Self-nominations will not be accepted. The deadline for nominations is **Monday 1st December 2008**.

Further information and background information can be obtained from the following website: <http://www.leprosymission.org/web/pages/leprosy/awards2009.html>

or from : Glynis Forbes, The Leprosy Mission International, 80 Windmill Road, Brentford, Middlesex TW8 0QH, United Kingdom, Tel: +44 (0)20 8326 6767, Fax: +44 (0)20 8326 6777, Email: WellesleyBaileyAwards2009@tlmint.org