

**TOOL FOR ASSESSMENT OF COMMUNICATIVE
COMPETENCE IN KANNADA: 2 - 3 YEAR OLD
CHILDREN (TACC - K)**

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A Dissertation Submitted in Part Fulfillment of
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University of Mysore, Mysore.

**ALL INDIA INSTITUTE OF SPEECH AND HEARING
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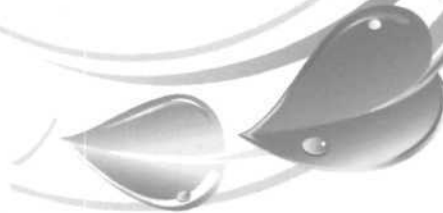
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This is to certify that this dissertation entitled "*Tool for Assessment of Communicative Competence in Kannada: 2- 3 year old children (TACC-K)*" is the bonafide work submitted in part fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student (Registration No. 06SLP019). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

I declare that this dissertation entitled "*Tool for Assessment of Communicative Competence in Kannada: 2- 3 year old children (TACC-K)*" is the result of my own study under the guidance of Dr. R. Manjula, Professor of Speech Pathology, Department of Speech Language Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted in any other university for the award of any diploma or degree.

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INTRODUCTION

As long as.....people considered my brain useless and my facial expression and sound meaningless, I was doomed to remain “voiceless”.

-Ruth Sienkiewicz- Mercer

Communication” is the process of exchanging information and ideas. It is an active process, which involves encoding, transmitting, and decoding intended messages. Communication is the transmission of information so that the recipient understands what the sender intends. It is the most essential gift which helps in leading a quality life. It is a basic human need to connect with others. It is basic human right to express ideas, thoughts and feelings freely. There are various means of communication, speech and language is only an ingredient of communication. Other aspects of communication may enhance or even eclipse the linguistic code. These aspects are paralinguistic, nonlinguistic, and metalinguistic.

The two major forms of communication are the verbal and the non verbal communication. Non verbal communication system can be divided into three main categories: manual systems, symbol systems and communication aids. Examples of manual systems include American Sign Language, Signing Exact English, Indian Sign language, and Gestures. Other symbol systems include Bliss symbols, and written words. Communication aids include communication boards and electronic devices. The rationale for the use of non verbal systems for assessment and intervention are diverse, hypothetical, and at times contradictory and generally of an anecdotal or post-hoc nature (Schuler & Baldwin, 1981). Many reasons explain why the use of non speech systems are to be promoted. Few reasons are because it is visual rather than

auditory modality, it facilitates the ease and diversity of instructional methods and it can be used to augment speech.

Gesture, speech and language are tightly coupled neurologically and developmentally (Iverson, Thelen, 1999; Bates & Dick, 2002). There is overlap in the neural control for speech and gesture such that spreading neural activation from one region of the brain to the other may underlie their co occurrence. Hence it could be understood that the development of non verbal communication and verbal communication occur simultaneously in typically developing children. Various studies have proposed that the non verbal modes of communication could be facilitators of future language development. The first intentional use of communication is via the sequence of deictic gestures, which predicts the emergence of first words. Later symbolic play schemes and representational gestures emerge and complement spoken words. By two years, preference of spoken language is evident. But gesture continues to scaffold the performance on more complex cognitive tasks including comprehension of language or to clarify their own spoken messages (Capone & McGregor, 2004). Children with language impairments also seem to benefit from the same functions that gesture serves for development of typically developing children.

Non verbal communication used by children with developmental disability may provide a vehicle for them to communicate when articulatory and language systems are not fully developed. Research evidences have revealed that development of gesture and language profiles are associated in children with language impairments as much as they are related in typically developing children. Children with Down syndrome show significantly larger repertoire of gestures than typically developing

children matched for word comprehension using the Mc Arthur communication Development Inventory (Caselli, Vicari, Longobardi, Lami, & Stella 1998). Most of the assessment tools available investigate children with developmental disability rely more on their verbal language performance than their non verbal language performance. There are very sparse standardized assessment protocols to aid in evaluating the language development in the non verbal mode in individuals with development disability.

The receptive language in children with severe expressive impairments is usually assessed on measures that rely on observation, interview and informal behavior samples within interactions (Cress, 2002). Standardized tests adaptable for assessment of receptive language in children with severe developmental disability include parent reports such as the Rosetti Infant Toddler scale (Rosetti, 1990), Mc Arthur Communicative development Inventory (Fenson, Dale, Reznick, Thal, Bates, Hartung, et al., 1993), Communication and Symbolic play Behavior Scales (CSBS) (Wethtey & Prizant, 1993), Social Communication Assessment for Toddlers with Autism (SCATA; Drew, Taylor, Milne and Baird, 2007) and Non speech test for receptive and expressive language (Heur,1983). Most of these tests are standardized on the western population hence an exact replication of the test would not be suitable for the Indian scenario.

More over, most of the assessment scales are based on parental reports. Hence there arises a need to develop a scale that is norm- referenced and performance based. The non speech test for receptive and expressive language (Heur, 1983) is a performance based test that assesses the language competence in

children with developmental disability. Hence an adaptation of the test to suit the culture of India was attempted in the present study.

NEED FOR THE STUDY:

Non-verbal language development plays a vital role in child language development. They are used as predictors of the future verbal language development. Thus, it is important to assess the non verbal language development in typically developing children. Also, Culture influences verbal and non verbal language development and assessment, thus making it difficult to use the western non speech assessment batteries on the Indian population. Most of the standardized assessment scales available in the current Indian context focus more on the verbal language development and the child's comprehension and expression skills are estimated through their verbal responses. In the Indian scenario, the non speech language assessment is not prioritized and is less researched upon on typically developing children and children with developmental disorders. Children with multiple / developmental disabilities have limited verbal expression and hence a scale which assesses their language ability solely through their verbal modality might underestimate their language ability. There is a need for an assessment scale which would assess the language ability of children in their non speech mode. The present study attempts to standardize the non speech test for the receptive and expressive language (Heur, 1983) on typically developing children in the age range of 2.0 to 3.0 years. The norm developed on these children will help in comparison the performance of children with developmental / multiple disabilities (excluding hearing impairment) on the non speech receptive and expressive tasks with that of typically developing children. This test would thus help in deriving the actual

language level of children with multiple disabilities who depend on non verbal modes of communication.

OBJECTIVE OF THE STUDY:

To establish normative data for the “Non-Speech Receptive and Expressive Language Test (Heur, 1983)” in typically developing children (Kannada) in the age range of 2-3 years

METHOD

Sixty Kannada speaking typically developing children in the age range of 2-3 years participated in the study. They were divided into 3 groups of four months interval with approximately 20 children in each group. The test material adapted from the Non speech test of receptive and expressive language, developed by Heur, (1983) was administered on these children. The test was modified by utilizing pictures and toys which were culturally sensitive to the Indian Population. The test material consists of two major domains: 1) non speech receptive and 2) non speech expressive with 50 items in each domain. Each of these domains are further divided into three sub domains viz., pre receptive, early receptive and receptive and pre expressive, early expressive and expressive. There are different sections in these sub domains forming a total of 14 sections for the non speech receptive domain and 16 sections for the non speech expressive domain. The test was administered on typically developing children in three age groups (2.0 – 2.4, 2.4 – 2.8, 2.8 – 3.0 years) for the purpose of standardization. The responses were scored as ‘1’ if the behavior was present and as ‘0’ if the behavior was absent. The raw scores and the

percentage scores were statistically analyzed and were graphically represented. The data revealed an evident developmental trend in the receptive and the expressive sub domains in the 2.0 to 3.0 year group. The tasks in the pre receptive, early receptive, pre expressive and expressive had all reached a ceiling effect in this age group. The study yielded a norm referenced standardized test to assess the communicative ability of children. Thus the standardized data could be used to compare the language ability of children with developmental disability (excluding hearing impairment) with the norm developed on typically developing children. The test can be used as a routine communication assessment tool for children with multiple or developmental disability (excluding hearing impairment) who have limited verbal expression and rely more on the non verbal modality.

IMPLICATIONS:

- A clinical tool to assess non verbal language development in young children (2-3 years) with suspected or confirmed communicative delays and disorders will be available. It will facilitate assessment of communication competency rather than verbal competency or verbal performance. Such an assessment will help to identify children at high risk of communication impairment and then help in providing early management / intervention (nonverbal communication). It will also serve to provide guidelines for intervention in children whose communication competence is not age appropriate.

- The test can be used to assess efficacy of therapy since it provides baseline for pre and post therapy comparison of the communication behavior.

LIMITATIONS

- Younger children demonstrate a larger gestural repertoire compared to older children. Hence the study could have been performed on younger children (< 2 years) for further insights into communication development in this age group.
- More number of tasks could be included in the test to tap the pragmatic and socialization issues related to communication.
- Cyclic errors / circular errors in standardization could be expected. Hence the test should be readministered on different children in the same age range who did not serve as subjects for the current study.

REVIEW OF LITERATURE

Communication is the process of exchange of information through verbal, written or non verbal modes. In humans, it is a resilient phenomenon; when prevented from coming out of mouth it emanates almost irrepressibly from fingers (Goldin-Meadow and Morford, 1985). Nonverbal communication is usually understood as the process of communication through gesture, body language or posture, facial expression, eye contact and other paralinguistic features of speech. Argyle (1996) proposes a number of channels of 'non verbal communication' like: hand gestures, eye gaze, facial expressions, touch, posture, spatial behavior, and physical appearance. Non-verbal communication is central to communication process and is an inherent and essential part of message creation and interpretation (Burgoon, 1994). Speech conveys information in a segmented, combinatorial format, whereas gesture conveys information in a global, mimetic format. In total, communication is represented as a synthesis of the analog gestural mode and the discrete speech mode. Doherty-Sneddon (2003), outlined 7 principles to capture the essence of communication with children. Among these, four refer to adult and child communication and the other three principles are characteristic of adult communication and the same is listed in Table 1.

Table 1: Principles of communication (Doherty – Sneddon, 2003)

Principles of communication	
<i>Child and adult communication</i>	<i>Adult communication</i>
1. Intentionality	5. Adults should be attentive
2. Visual cues	6. Responsiveness
3. Communication is innate	7. Scaffolding
4. Communication is learned	

Intentionality: Non verbal behavior is distinguished from non verbal communication on the basis of its intentionality. A non verbal behavior produced with intent would mean non verbal communication. Most of the information derived from babies behaviors particularly in their early months are not produced intentionally. Eg. Crying is initially reflexive; only at around 9 months, babies cry to get other’s attention or attain certain things. Response by the communication partner to the child’s early attempts to communicate intentions fosters communication development.

Visual cues: For communication, children rely mostly on visual cues. A shared visual context to interact and the non verbal signal that the context encompasses are central to children’s ability to communicate their feelings and thoughts and to understand other people. The rich repertoire of visual cues that children employ provides the communication partner a window to the child’s emotional, physiological and cognitive states.

Communication is innate: The debate on nature-nurture argument prevails in communication development. Doherty- Sneddon (2003), outline three evidences to support the innateness in communication. First, there is evidence of skills such as emotional facial expression in lower animals, which do not possess human like thinking abilities suggesting that the skill is innate. Second, if the skill is universal, then it is argued that it is derived from the genetic make-up. Third, if babies develop the skills before they learn the same, it suggests innateness of those skills.

Communication is learned: Though children are born with the genetic endowment that unfolds later to become a good communicator, their childhood experiences influence their communication development. Children learn how best to use their non verbal skills, the rules concerning them and read other non verbal cues in their late childhood.

Adults should be attentive: Not much information about children's non verbal cues can be obtained unless they are attended to effectively by the communication partners/ adults.

Responsiveness: This is an essential feature in providing quality interaction for children. The response ought to occur within a reasonable time span and in a consistent manner to children's requests to facilitate communication.

Scaffolding: It is the support given by an adult to the child in assisting their understanding. In order to scaffold effectively the adult should be able to judge accurately the child's abilities and level of knowledge in order to provide new information and also to help at appropriate times. These principles form the basis of communication development in children.

Development of Non verbal communication

Development of non verbal communication is a cumulative effect of the development occurring in different channels like eye gaze, gestures and facial expression. Intentionality forms the basis of communication and hence, development of intentionality plays a major role in the development of communication. The development of intentionality is linked with the development of gestures too. Intentional communication occurs when the child deliberately uses specific signal to affect another's behavior (Bates, 1976). Bruner (1981) identified three broad functions of communication that emerge during the first year of life: a) behavior regulation (acts used to regulate another's behavior); (b) social interaction (acts used to gain or maintain another's attention to self); and (c) joint attention (acts used to direct another's attention to an entity or an event). In an attempt to order the emergence of intentionality, Carpenter, Mastergeorge and Coggins (1983) studied 6 children at monthly intervals from 8 to 15 months of age. The median age of acquisition of "protest" was less than 8 months; for "requesting actions and objects", "commenting on actions" was around 9.5 months and "commenting on objects" and "answering to questions" begin to emerge at 10.5 and 15 months respectively. Though this was the common trend, there were individual differences in typically developing children with respect to the order of acquisition.

Eye gaze is an important source of social communication for both child and adult. It is linked to a number of aspects of social and emotional development. Eye contact and other aspects of gazing behavior play an important role in children's mental development. Very young infants (3 months of age) show preferences for

faces looking at them rather than looking away from them (Caron, Caron, Mustelin & Roberts, 1992). Normal children are aware of ‘being seen’ by the time they are around 30 months of age. Children alternate the gaze between the object and the other person as an indicator of request or comment on an object by one year of age. They begin to use gaze declaratively, accompanied by pointing gestures and head orientation by 18 months of age (Charman, Swettenham, Baron-Cohen, Cox, Baird and Drew, 2000). Around 3-4 years they begin to understand that looking away from a person could be a sign of thinking. Rules concerning the gazing behaviors are acquired around 6 years of age (Doherty-Sneddon, 2003).

The developmental milestones for the use of facial expression as a means to communicate by children are enlisted in Table 2 (Doherty- Sneddon,2003)

Table 2: Developmental milestones for the use of facial expressions (Doherty-Sneddon, 2003)

Age (in months)	Developmental milestone
Birth	<ul style="list-style-type: none"> • Babies show a number of inborn reflexive facial expressions. These include startle, crying and disgust. • They smile reflexively during rapid eye movement stage of sleep
2-4 months	<ul style="list-style-type: none"> • During the second month they show ‘true smiling’ ie; they smile when they find something pleasurable • They show anger on their faces by 4 months of age
5-8 months	<ul style="list-style-type: none"> • Expression of ‘fear’ emerges at around 6 months • ‘Surprise’ tends to emerge around 7 or 8 months but it is not accompanied by raised eyebrows. • Babies are increasingly adept at using facial and other expressions of emotion to fulfill their desire.

9-12 months	<ul style="list-style-type: none"> • By ten months, babies begin to use adult like facial expressions directed to objects as a source of information about the object. • At twelve months, children begin to use finer emotional expressions and learn to display the rules of their culture
2-4 years	<ul style="list-style-type: none"> • By two years, children begin to recognize the main expressions of emotion. • Preschool children can focus only on one feature of the facial expression
5 year and above	<ul style="list-style-type: none"> • They have deeper understanding of mixed emotions • Older children have the ability to use internal features of faces such as configuration of eye, mouth and nose.

There is abundant western literature on the development of gestures and its relation to verbal communication development. ‘Showing off’ is reported as one of the first signs that an infant gives of intentional communication (Bates, Camaioni & Voltera, 1975; Bates, Benigni, Bretherton, Camaioni & Volterra, 1979). Young infants repeat behaviors that have previously been successful in gaining adult’s attention. The ‘showing off’ behaviors precede the ‘use of objects’ as a means to obtain adult attention. The ‘use of objects’ to gain adult attention is the emergence of deictic gestures (showing, giving, pointing). These are also referred as prelinguistic gestures. They are termed prelinguistic as they occur prior to the development of spoken language, but deictic gestures continue to be used throughout the development of verbal communication. Showing, giving and pointing emerge in a predictable sequence at approximately 10 months of age (Bates, Camaioni & Voltera, 1975). These behaviors show a marked increase in occurrence after 11 months as the other primitive gestures decline.

Another gesture, ‘ritualized request’ which includes a variety of behaviors such as gesturing with an open-close grasping motion, placing adults hand on an object to request or pulling at an empty hand to obtain something (Bates, Benigni, Bretherton, Camaioni & Volterra, 1979), occur between 9 and 13 months. Around 12 months, ‘recognitory gestures’ emerge which are actions without an object and depict the object by means of its function. These behaviors illustrate the potential for *symbolic representation* which is similar to spoken language.

‘Representational gestures’ are reported to appear at around one year in children. Most of the representation gestures are used in the first half of the second year of life and is continued until a comparable word is developed (Acredolo & Goodwyn, 1988). Representational gestures emerge before the onset of 25-word milestone. They are variously termed as symbolic, iconic, empty-handed or referent gesture (Acredolo & Goodwyn, 1996; Nicoladis, Mayberry, & Genesse, 1999). During toddlerhood, typically developing children prefer verbal to gestural expression. Beginning of toddlerhood is marked by decrease in representational gestures, but deictic gestures on the other hand increase in frequency (Iverson, Capirci, Longobardi & Caselli, 1999).

Typically developing children spontaneously produce gestures along with speech. Non – verbal and verbal language development co-occurs in typically developing children. According to McNeill (1992), speech and gesture coherence is possible because gesture and speech share a common cognitive representation; that is, before the communication unfolds, gesture and speech are part of a single idea. As expression develops further, the message is parsed, with most information channeled into speech but some information channeled into gesture. The age at

which children first produce supplementary gesture-speech combinations reliably predicts the age at which they first produce two-word utterances (Ozçalışkan and Goldin-Meadow, 2005). Capirci, Iverson, Pizzuto, and Volterra (1996), found that gestures and gesture-word combinations produced at 16 months of age correlated significantly with the total vocal production at 20 months of age and they also established a significant relation between the frequency of deictic or representational gesture use with the production of representational words at 16 months and total vocal production at 20 months of age. Harris, Barlow-Brown and Chasin (1995), found that the occurrence of pointing and comprehension of object name occur at nearly identical median ages of 10 months; 21 days and 10 months; 22 days respectively. Gestures are related to the children's lexical and syntactic development. Firstly, most of the lexical items that each child produces initially in gesture later move to that child's verbal lexicon. Secondly, children who are first to produce gesture-plus-word combinations conveying two elements in a proposition (point at bird and say "nap") are also first to produce two-word combinations ("bird nap") (Iverson & Goldin-Meadow, 2005).

Early symbols, manual and spoken appear to share underlying cognitive abilities, so manual symbols can aid in advancing verbal language milestones and predict them to some extent. Gesture thus serves as predictors of language development and plays a vital role in normal language development. Gesture and language are developmentally linked in children with language impairments as much as they are related in typically developing children.

Non verbal communication in Clinical population

One of the best predictors of future language performance of children with developmental disabilities is their current language performance (Baumwell, Tamis-Le Monda & Bornstein, 1997; Facon, Facon Bollinger & Grubar, 2002). Brady, Marquis, Fleming and McLean (2004), followed the development of receptive and expressive language scores of 18 children (3-6years) with developmental disability and limited expressive language over a period of 2 years. They administered the revised version of Sequenced Communication Development Scale (Hedrick, Prather, & Tobin, 1984) to measure the language skills, and prelinguistic communication rate. Parental responsiveness was also measured for each observation. They found positive relation between pointing and other cognitive, communicative variables. The pointing skills correlated significantly with children's developmental quotients. The presence of communicative pointing and parent response contingency were considered significant predictors of language development.

Late talkers are reported to produce significantly more communicative gestures like deictic and symbolic than typically developing children and are poor at imitating isolated play schemes, which could serve as a prognostic indicator (Thal & Bates, 1988; Thal, Tobias & Morrison, 1991; Thal & Tobias, 1994). Children with Specific Language Impairment differed from typically developing children with respect to the quality of their representational gestures. For example, these children demonstrated prolonged used of 'Body part as object' gestures (BPO) and produced gestures with spatial or orientation errors (Hill, Bishop and Nimmo-Smith, 1998).

Children with Down syndrome were reported to use a variety of gestures more frequently when compared to typically developing children and differed mainly in their production with cross modal combinations (Caselli, Vicari, Longobardi, Lami, Pizzoli, & Stella, 1998). The relationship between gestures and spoken word was investigated by Iverson, Longobardi and Caselli (2003), in children with Down syndrome and typically developing children. The children were matched for language age, gender and observed expressive vocabulary size. They were analyzed for their spoken and gestural repertoire and gesture word productions. They found that both the groups used gestures to the same extent, though children with Down syndrome had lower gestural repertoire. There were no 2 word combination in children with Down syndrome but there were significant differences in the extent of use of gesture word combination in both the groups.

These studies reveal that non verbal behaviors can be a means to compensate for their limitations in verbal language especially in children with disordered development of speech. Their non verbal repertoire is comparable with typically developing children. Hence, professionals need to examine the non verbal communication patterns in these children using appropriate scales to assess and estimate their actual communication ability. Such an exercise will also help in expanding their use of alternative modalities of communication such as gesture.

Language assessments in Indian context

The two major processes that reflect a given child's language system are comprehension and expression of language. In order to comprehend and produce verbal language, the child must possess knowledge of linguistic units and rules of phonology, morphology, syntax, semantics and pragmatics. Most of the formal assessment procedures however, emphasize on the assessment of vocabulary, articulation and syntax. Chomsky's views on language acquisition and his proposed theory of Transformational Generative Grammar provided great impetus to child language studies in 1960's. The emphasis on language testing shifted from vocabulary to syntax. Most of the tests then developed were designed to measure syntactic abilities at receptive and expressive domains. Subsequently, the shift in emphasis from syntax to semantics, and more recently on pragmatics has led to the development of various language tests that included semantics and pragmatics besides syntax. The commonly used language assessment scales in India which are specifically designed for pre school children are Receptive Expressive Emergent Language Scale (REELS) by Bzoch and League (1971), Pre -school language scale (Vaidyanathan, 1984), 3 D – Language acquisition Test by Herleker (1986).

REELS (Bzoch & League, 1971) is one of the few language development scales that involves active participation of the child. It assesses the language ability in the syntactic domain only and does not consider the pragmatic or cognitive dimensions as a part of the assessment. Pre school language Scale (Vaidyanathan, 1984) assesses early communicative behavior of children in the domains of comprehension, expression and cognition using questions addressed to parents or

caregivers. This was specifically intended for children in the age of 9 months to 36 months. It consists of twenty seven items grouped under 9 different age groups depending on age at which the aspects of language and cognition emerge. Unlike other language scales, this emphasizes on the pragmatic aspects and enables to identify language delay / disorder and aids to plan appropriate intervention programmes. The items from the Pre school language scale were adapted to devise the 3 D-LAT (Herleker, 1986). The task was framed as questions and rest of the frame work was similar to Vaidyanthan's scale. These scales measure the verbal language ability of children and pay no focus on the non verbal language skills of pre school children. Assessment tools solely evaluating non verbal language development are very limited, although, some tests have included assessment of non verbal language development along with verbal language development.

Non verbal language assessments

Development of gestures has been addressed in various standardized assessment tools such as Rosetti Infant Toddler scale (Rosetti, 1990), Mc Arthur Communicative development Inventory (Fenson, Dale, Reznick, Thal, Bates, Hartung, et al., 1993), Communication and Symbolic play Behavior Scales (CSBS) (Wetherby & Prizant, 1993), Social Communication Assessment for Toddlers with Autism (SCATA; Drew, Baird, Taylor, Milne and Charman, 2007), Scales of Early Communication Skills (SECS; Moog & Geers, 1975) and Non speech test for receptive and expressive language (Heur,1983).

The Rosetti Infant- Toddler scale (Rosetti, 1990) assesses the preverbal and verbal domains of language development (interaction attachment, pragmatics, gesture, play, and language comprehension and language expression). It is designed

for children from birth to 36 months. It is administered based on child's age in 3 month groupings with approximately 30 items in each age group. The items are a compilation of author observation, descriptions from developmental hierarchies and behaviors recognized and used by leading authorities in the field of infant and toddler assessment. The scale is criterion referenced and measures the child's communicative behaviors on direct observations and parental reports obtained through a questionnaire. Mc Arthur Communicative development Inventory (CDI) (Fenson, Dale, Reznick, Thal, Bates, Hartung, et al., 1993) was designed to yield information on the course of language development from child's gestural signs, the expansion of early vocabulary to the beginning of grammar. There are 2 main inventories of CDI, viz, words and gestures (8-16 months) and words and sentences (16-30 months). Words and gestures section assesses the vocabulary comprehension, production and the use of gestures. The gestural assessment is organized into 5 sections (first communicative gestures, games and routines, actions with objects, imitation, and pretend play). The items are scored on the basis of parental observations of child's comprehension and production of communicative behaviors.

The communication and symbolic behavior scales (Wetherby & Prizant, 1993) is a norm referenced, standardized instrument used to assess infants, toddlers and preschool children. It is an interactive assessment designed to provide opportunities for children to communicate non - linguistically with gestures and vocalizations during play routines and adult-child interactions. It is administered on children with functional communication age of 6-24 months to 72 months. The test comprises of 22 rating scales grouped under 7 heads namely; communicative functions, gestural communicative means, verbal communicative means, vocal communicative behaviors, reciprocity, social-affective signaling and symbolic

behavior. The social communication assessment for toddlers with autism (SCATA; Drew, Baird, Taylor, Milne and Charman, 2007) was designed to assess non verbal communication including early and atypical communication, in young children with autistic disorders in a semi structured situation with an unfamiliar adult. The communicative behaviors are elicited in the context of free play and structured context (turn taking, bubbles, activated musical toys and prompts). Each child's communication act is scored under four dimensions like function, form, communicative role and complexity.

Ross & Cress (2006) in their longitudinal study over a period of 18 months compared the estimates of receptive language development in children with complex communication needs using Batelle developmental inventory (Newborg, Stock, Wnek, Guidibaldi & Svinicki, 1984) and Mc Arthur Communication developmental inventory. These tests were administered on 41 children (12-24 months) with severe expressive language impairments and they found better receptive language scores than expected from the cognitive or developmental age.

These assessment scales do not provide an exact picture of the child's current level of functioning in terms of his/ her language comprehension and performance by non speech means. The Non speech test for receptive and expressive language (Heur, 1983) assesses solely the non verbal language behavior in terms of non speech reception and expression in 0- 5 year old children. It was standardized on a large population of typically developing children and children with various developmental disabilities. The scoring is based on direct observation of the child's performance. This scale could be used to assess the child's current language level in

the non speech mode and it also helps to develop individualized education program for children with developmental disorders.

Non verbal language & culture

Culture is the product of the interaction between universal biological needs and functions, universal social problems created to address those needs, and the context in which people live (Matsumoto,2006). Language in a multi cultural and multi lingual population is diverse. Culture affects the language lexicon (Caroll, 1956; Stigler & Baranes, 1988), thought (Abel & Kandel, 1998; Ervin, 1964; Hull, 1987; Matsumoto & Assar, 1992) and pragmatics [children's personal narratives (Minami & McCabe, 1995), self-disclosure (Chen, 1995), compliments (Barnlund & Araki, 1985), and interpersonal criticism (Nomura & Barnlund, 1983)]. This is not only limited to verbal but also to the non verbal aspects of language (Matsumoto,2006).

Cultures are classified as contact and non contact cultures depending on certain features of non verbal behavior (Watson, 1970). Efron (1941) described cultural differences in terms of use of gestures and found that there were distinct gestures among traditional Jews and Italians, but that their traditional gestures disappeared as people were more assimilated into the larger American culture. Cultural differences were documented in emblematic gestures between Japanese, American, and New Guinean individuals (Ekman, 1976; Friesen, Ekman, & Wallbott, 1979).The American A-OK sign, for example, is an obscene gesture in many cultures of Europe (Morris, Collett, Marsh, & O'Shaughnessy, 1980). Studies on eye gaze and its cultural impact have revealed that people from Arabic cultures; for example are reported to gaze much longer and more directly at their communication partners than do Americans (Hall, 1963; Watson & Graves, 1966). Differences are also reported in

the spaces attributed between the speakers. Arab males, for example, tend to sit closer to each other than American males, with more direct, confrontational types of body orientations (Watson & Graves, 1966). Studies have documented cultural differences in other nonverbal behaviors as well, such as in the semantic meanings attributed to body postures (Matsumoto & Kudoh, 1987), vocal characteristics, hand and arm movements (Vrij & Winkel, 1992).

The cultural differences pertaining to non verbal communication may affect the usage of assessment batteries at varied cultural contexts. Carter, Lees, Murira, Gona, Neville and Newton (2005) investigated the issues in the development of cross cultural assessments in speech and language for children and they found that culture influences the performance, the familiarity of testing situation and picture recognition. Most of the language assessments utilize picture stimuli. Cross cultural studies have found that recognition and interpretation of pictures are culture specific. Serpell and Deregowski (1980) consider picture recognition as culturally restricted perceptual skill. Western children learn to perceive pictures in the functional contexts of learning to speak and listening to stories with help of picture books. These are unavailable to rural children of Africa.

Similar differences could be expected in a multicultural country like India. Even gestures as simple as head nodding can be different. Eg. Indian head wobble (which, depending on the state/region in India can mean either yes or no). There is sparse literature on culture and non verbal language in India. Therefore, it is essential to examine the influence of native language/culture on the development of non verbal language. Hence, assessment tools should be specific to the individual's nativity and mother tongue speakers of the assessment language. All aspects of

adapted assessment tools including pictures should be piloted on a representative sample of the target population in order to make them culturally appropriate.

Non verbal language assessments in Indian context

The language scales reviewed were developed for the western populations and such non-verbal language assessment scales are seldom used in Indian context. The Scale of Early communication Skills for hearing Impaired (Moog & Geers, 1975) was designed to evaluate the speech and language development of children with hearing impairment in the age range of 2 years to 8 years; 11 months. The test is subdivided into four scales- the receptive language skills, the expressive language skills, the nonverbal receptive language skill and the non verbal expressive language skill. There are two levels specified in the receptive and the expressive domains. 'A' level items describe the use of skill within a structured situation and 'B' level represents use of the skills spontaneously. The child is rated as '+' if he/ she demonstrates the behavior and '-' if he/ she does not demonstrate the behavior and '±' if the behavior is inconsistent. The test was standardized on 372 hearing impaired children who were attending special school.

The Scales of Early communication skills has been standardized on Indian population of Hearing Impaired (Swati, 1993). The test was normalized on 76 children with hearing impairment in the age range of 2 years to 8 years; 11 months. The test was designed exclusively for individuals with hearing impairment and was standardized on children with hearing impairment who were native speakers of Kannada and Telugu. Hence, it may not be appropriate for administration on any other non verbal children with developmental disorders.

Most of the standardized tests administered on the Indian population are seldom adequate in identifying language development in children who are non verbal. Non verbal language assessment derives greater importance in the language assessment battery of children with disability. These assessment tools provide an insight into the cognitive precursors of language and level to be considered in communication training. It also provides information which is rarely transmitted through words. Hence, there arises a crucial need for a developmental scale which measures the non- verbal language skills in the Indian perspective.

There is a crucial need to develop a norm referenced assessment tool suitable for the Indian population which does not restrict itself to any particular mode of non verbal communication like gestures. An assessment tool which has a provision to tap the communicative skills via any mode would aid in the estimation of a child's actual language ability. The present study therefore attempts to standardize assessment tool for communicative competence (Non speech receptive and expressive language scale by Heur, 1983) on typically developing children. Such a scale would help to compare the performance of children with various developmental disabilities (excluding hearing impairment) with that of typically developing children.

METHOD

There is an immense need for an appropriate assessment battery in the Indian scenario, to evaluate the language level of children with developmental disability (excluding hearing impairment) who rely on non verbal communication with or without verbal communication. The present study attempted to standardize an assessment tool which would further help to estimate the overall language competence of children with severe expressive impairments. The Non speech test for receptive and expressive language (Huer, 1983) in English has been standardized on Kannada speaking typically developing children in the age range of 2.0 – 3.0 years.

Aim of the study:

To establish normative data for the non-speech receptive and expressive language test (Heur, 1983) in typically developing children (Kannada) in the age range of 2-3 years.

Subjects

Sixty Kannada speaking typically developing children in the age range of 2-3 years were randomly selected. They were further subdivided into three exclusive age intervals with almost similar number of subjects in each group as shown in Table 3.

Table 3: Subject details of the present study

Age interval	No: of Subjects		Total
	M	F	
> 2 years -< 2 yrs 4months	11	8	19
> 2yrs 4 months - < 2 yrs 8months	10	9	19
> 2yrs 8 months - < 3 years	10	12	22
Total	31	29	60

Children belonging to the middle socio economic status as assessed by the socioeconomic assessment tool (Venkatesan, 2004; Appendix A), with native language being Kannada were involved in the study. Children were screened for any associated problems like motor, visual impairments and speech and language delay / disorder based on an informal questionnaire (Appendix B).

Test Material

Most of the assessment tools used to evaluate language level of children with severe expressive impairments or children with developmental disability rely on parental report or are performance based which can tax the motor abilities. Hence, an assessment tool which assesses the language skills of children with developmental disability based on observation and through tasks which do not impose any motor demands is the need of the hour. For this purpose the Non speech test for Receptive and expressive language was adopted in the current study. The details of the tool are presented under two headings:

- 1) The original test- The Non-Speech Test for Receptive Expressive Language (NSTREL; Huer, 1983) developed in English

2) The NSTREL by Huer (1983) was adopted in this study and modified to suit the Kannada speaking population. In this study henceforth it is referred to as the “Tool for Assessment of Communication Competence – Kannada” (TACC - K).

1) Non-Speech Test for Receptive Expressive Language (NSTREL; Huer, 1983)

The Non-Speech Test for Receptive Expressive Language (NSTREL) by Heur (1983) was adapted in the study as the test material. The details of the NSTREL (Heur, 1983) test including the tasks, instructions and scoring are presented in Appendix C. This test was designed to provide a systematic means for observing, recording and describing the modes through which children communicate. The objective of the test as proposed by Heur (1983) was to developmentally order the prelinguistic, linguistic and adaptive communication skills from 0 months to 48 months in typically developing children and children with multiple disabilities. The salient features of the NSTREL (Heur, 1983) are its flexibility of administration to a wide variety of developmental disorders, efficient administration, easy scoring procedure and standardized data established with different variety of populations. The test was standardized on a total of 285 children (Alabama, Wisconsin and New Mexico, United States) in four different groups as illustrated in Table 4.

Table 4: Details of subjects involved in the standardization of NSTREL (Huer, 1983)

Type of Population	No. of participants
Typically developing preschool children	80
Preschool children with mental and physical disability	23
Public school children with severe multiple disabilities	77
Residential school children with severe multiple disabilities	104

The NSTREL (Huer, 1983) test consists of 50 items each to test the non speech receptive and the expressive domains. The domains are further divided into three sub domains in both the non speech receptive and non speech expressive scale. The sub domains are further classified into sections, to form a total of 14 sections in the non receptive and 16 sections in the non speech expressive domain. the details are depicted in 5 and 6.

Table 5: Sub domains of the non speech receptive domain

Pre receptive	GA	General Awareness	Receptive	AQ	Answer questions
	LSB	Localization and searching behavior		IPF	Identification of pictures and functions
	AME	Attention and maintenance of eye contact		IP	Identification of possessives
Early receptive	RS	Responds to stimuli		RNCP	Reception of number concept and plurals
	AAPB	Appropriateness of play behavior		RCSA	Reception of concept of size and adjectives
	FC	Follows commands		IAP	Identification of actions and preposition
	IOP	Identification of objects and pictures		FCS	Follows commands in sequence

Table 6: Sub domains of the non speech expressive domain

Pre expressive	Vlz	Vocalizations	Expressive	MS	Meaningful signs
	BAB	Babbling		IID	Initiation of interaction and description
Early expressive	RS1	Responds to stimuli		AQ	Answering Questioning
	RS2			ISS	Imitation of signal sequences
	PVP	Participates in vocal play		CS	Combination of signals
	CSP	Consonant and syllable production		EP	Expression of possessions
	Ges	Gestures		ExQ	Expression of quantifiers
	Imt	Imitation		AsQ	Asking questions

The responses from each child are recorded on a response sheet and supplementary remarks and observations are also made. A score of '1' is provided for the appropriate behavior (semantically related) and a score of '0' for the incorrect responses (Eg. In the receptive domain, the task of identification of pictures would be given a score of '1' if the child demonstrates a pointing or eye gaze response where as no attempt to respond or other incorrect responses, are scored as '0'). The total score obtained in each of the domain (raw score) is provided with the corresponding non verbal age equivalent in months. The qualitative description in the response form also offers an insight into the type of non verbal behaviors exhibited by the child. The test is comprised of a) a picture book, b) a manual, c) a set of objects and d) response forms.

a) Picture Book

Sixty photographs and four numbers are positioned in a set of two or four on each page. The pictures are well alienated so that gross hand pointing or eye pointing

can be easily observed by the tester. Each vocabulary is represented in a developmental order. The photographs generally well recognized by the preschoolers as depicting the vocabulary are included in the final picture book. Distractions within the photographs are controlled by modifying the background if necessary. A list of the vocabulary depicted in NSTREL is included in Appendix D.

b) Object Sets

Eleven objects (miniature toys) which are easily recognized by young children and which provide visual or auditory stimulation are included in the set of objects. The list of objects as in NSTREL is mentioned in Appendix E.

c) Test Manual

The manual as proposed in NSTREL includes a list of specific tasks with step by step direction for administration of the receptive and expressive subtests (Appendix C). It also describes criteria for recording the responses and determining the age equivalencies. The manual also consists of standardized data for estimating the performance of individuals with developmental disorders. The items are divided as pre receptive, early receptive and receptive skills in the receptive domain, and in the expressive domain they are further divided as pre expressive, early expressive and expressive. This classification was attempted by Heur (1983) as a consequence of the standardization procedure. The details of the sub domains are as shown in Appendix C (1 and 2).

d) Response Forms

Two separate response forms are provided in NSTREL (Appendix F 1 & 2) for the receptive and the expressive subtests. It includes 50 items each in the receptive

and expressive domains respectively, which are developmentally ordered. The responses are scored in these forms during the testing.

The test is a valid tool to assess the non verbal receptive and expressive language in typically developing children as well as children with developmental disabilities.

2) *Tool for assessment of Communication Competence in Kannada Speaking (Typically developing children) [TACC-K]- modified from NSTREL of Huer (1983)*

The NSTREL (Huer, 1983) was standardized on western population; hence, an exact replication of the test would not be suitable for the Indian population due to its cultural variations. Therefore, in TACC- K, certain modifications in the items were made to accommodate the cultural differences in Indian context. The structure of the test is similar to the NSTREL. The TACC-K consists of: a) a picture book, b) set of objects, c) test manual and d) score sheets.

a) Picture Book

The pictures used in the test were culturally inappropriate for the Indian population. For instance, in the picture book of NSTREL by Huer (1983) the 'toilet' was depicted in the westernized style which was unfamiliar for the young Indian children. Other pictures were also revised based on their cultural sensitivity and familiarity with children. For instance, the verbs like 'kick' were also replaced as they were less frequently used/ unfamiliar to the younger children. The pictures substituted and modified in TACC-K are highlighted in bold fonts in the Appendix D.

b) Set of objects

Some of the items in the NSTREL test by Huer (1983) were culturally sensitive (Eg. 'Maraca' is a musical instrument popularly used in the country of Morocco and the word originates from Tupi language of Brazil). Hence, in TACC –K, 'Maraca' was replaced by a 'Noise Maker'. Rest of the objects were retained as in original test and then were recognized by Indian children.

c) Test manual

The test manual of TACC-K (Tool for assessment of Communication Competence in Kannada) is presented in the latter half of the chapter on 'Results and Discussion' and the standardized data is also presented. The score sheets in TACC-K are similar to that of NSTREL (Huer, 1983).

Procedure

Validity

Since most of the items were adopted and few were modified for their cultural limitations, the validity of the items was estimated. The validity of the test items was carried out by three experienced speech language pathologists prior to the administration of the test. The familiarity of the items and the pictures was also assessed by administering the test on a sample of ten typically developing children prior to the study. The items and the pictures which were easily recognized by the children were retained in the study and the rest were discarded.

Administration

The teachers of the play home from where the subjects of the study were selected were briefed about the purpose of the study and a filled consent form for participation in the study was obtained from parents and or teachers of these typically developing children prior to their participation in the study. The entire test material (receptive and expressive domain) was administered on each child in a natural environment like home or play school. The duration of testing for each child was from 15-20 minutes.

Recording of responses and scoring

The appropriate non verbal behaviors demonstrated by the child were scored. The scoring procedure was similar to the NSTREL (Huer, 1983). Each appropriate (semantically related) behavior was given a score of '1' and the inappropriate (incorrect) behavior was scored as '0'. The description of the type of non verbal behavior exhibited by the child was recorded as supplementary responses. The responses were scored during the testing as '1' or '0'. The recorded responses were then analyzed using statistical measures.

Reliability

To establish the intra-rater reliability the entire test was repeated on 10% of the population. For the inter-rater reliability check, video recording of the testing 10% of the population was carried out and presented to an experienced speech language pathologist who served as the second judge. Responses which were consistent and which were judged as correct by both the investigator and the second

judge more than 90% of the times were considered. An intra and inter rater reliability of 90% was considered.

Analysis

The responses were analyzed by the principal investigator. The total scores for each task in the receptive and the expressive domain was calculated for each age group by using the tally bars and percentage was calculated for response. The tasks which were attained by 60% of the children in the particular age group were considered for that age - interval and the rest of the tasks were eliminated. The data was then analyzed using descriptive statistical procedure. The mean scores and their mean percentage scores for each task which surpassed the 60% criteria was calculated

RESULTS AND DISCUSSION

The study aimed to develop normative data for the Non speech receptive and expressive language test (Heur, 1983) in Kannada speaking typically developing children of 2.0 – 3.0 years. The data obtained from sixty subjects in this age group (with 3 subgroups; 2.0 - 2.4, 2.4 – 2.8, 2.8 – 3.0 years) were analyzed and subjected to descriptive statistical procedure using SPSS 10.0. The total mean and mean percentage score, for each task in the receptive and the expressive domain was calculated for each age group. The tasks which were attained by 60% of the children in a particular age group were considered for that age – interval in both the receptive and the expressive domains and the tasks which did not fulfill the 60% cut off criteria were excluded from each age group. The mean, mean percentage, standard deviation, maximum and minimum scores for the tasks in the non speech receptive and non speech expressive domains were tabulated for individuals from which the group mean were derived.

The results are presented and discussed under two sections: 1) receptive and 2) expressive domain. The non speech receptive domain was broadly classified into pre receptive, early receptive and receptive. The mean scores were calculated for each of the 14 sections in the receptive domain. The sub domains and their abbreviations are enlisted in Table 7.

Table 7: Sub domains and their abbreviations of the non speech receptive domain

Pre receptive	GA	General Awareness	Receptive	AQ	Answer questions
	LSB	Localization and searching behavior		IPF	Identification of pictures and functions
	AME	Attention and maintenance of eye contact		IP	Identification of possessives
Early receptive	RS	Responds to stimuli		RNCP	Reception of number concept and plurals
	AAPB	Appropriateness of play behavior		RCSA	Reception of concept of size and adjectives
	FC	Follows commands		IAP	Identification of actions and preposition
	IOP	Identification of objects and pictures		FCS	Follows commands in sequence

Table 8 and 9 represent the mean score and the mean percentage score respectively of the 14 sections in the receptive domain. The mean percentage score was calculated to facilitate comparison across age groups, as the total number of items for each domain varied across groups. Marked differences across age groups are noticed in the tasks of identification of pictures and functions, recognition of number concept and plurals. The performance tends to show a developmental trend marked by increase in the mean percentage score from 2.0 - 2.4 to 2.8 - 3.0 age group. Identification of possessives, actions and prepositions and reception of concept of size and adjectives are not performed by 60% of the children in the 2.0 - 2.4 age group. Though the task of following sequential commands (FCS) shows subtle difference in the mean percentage score, where the mean % of 2.0 - 2.4 year group (FCS – 89%) is greater than the 2.4 - 2.8 age group (84%), the variability in the performance of the younger age group is greater than the variability in the older age group which is evident from the standard deviation values, suggesting that the behavior was more stable in the older age group. Thus the tasks in these domains show a developmental trend. The initial tasks in the scale were outperformed by 2.0 - 3.0 year old children.

Table 8: Mean Scores of 3 age groups for the 14 sections in the receptive domain

	Age Groups											
	2.0 - 2.4				2.4 - 2.8				2.8 - 3.0			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
GA	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
LSB	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
AME	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
RS	6.00	0.00	6.00	6.00	6.00	0.00	6.00	6.00	6.00	0.00	6.00	6.00
AAPB	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
FC	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
IOP	4.94	0.22	4.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
AQ	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
IPF	3.73	0.65	2.00	4.00	4.94	0.22	4.00	5.00	5.00	0.00	5.00	5.00
IP	*	*	*	*	.73	0.45	.00	1.00	0.95	0.21	.00	1.00
RNCP	0.78	0.41	.00	1.00	1.00	0.00	1.00	1.00	1.72	0.45	1.00	2.00
RCSA	*	*	*	*	0.84	0.37	.00	1.00	1.86	0.35	1.00	2.00
IAP	0.94	0.22	.00	1.00	0.89	0.31	.00	1.00	1.72	0.45	1.00	2.00
FCS	1.78	0.41	1.00	2.00	2.52	0.51	2.00	3.00	2.95	0.21	2.00	3.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group]

Table 9: Mean percentage scores of 3 age groups for the 14 sections in the receptive domain

	Age Groups											
	2.0 - 2.4				2.4 - 2.8				2.8 - 3.0			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
GA	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
LSB	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
AME	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
RS	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
AAPB	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
FC	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
IOP	98.94	4.58	80.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
AQ	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
IPF	93.42	16.33	50.00	100.00	98.94	4.58	80.00	100.00	100.00	0.00	100.00	100.00
IP	*	*	*	*	73.68	45.24	0.00	100.00	95.45	21.32	0.00	100.00
RNCP	78.94	41.88	0.00	100.00	100.00	0.00	100.00	100.00	86.36	22.79	50.00	100.00
RCSA	*	*	*	*	84.21	37.46	0.00	100.00	86.36	22.79	50.00	100.00
IAP	84.73	22.94	0.00	100.00	89.47	31.53	0.00	100.00	86.36	22.79	50.00	100.00
FCS	89.47	20.94	50.00	100.00	84.21	17.09	66.67	100.00	98.48	7.10	66.67	100.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group and Numbers in bold fold represent the scores of tasks which depicted a developmental trend across three group]

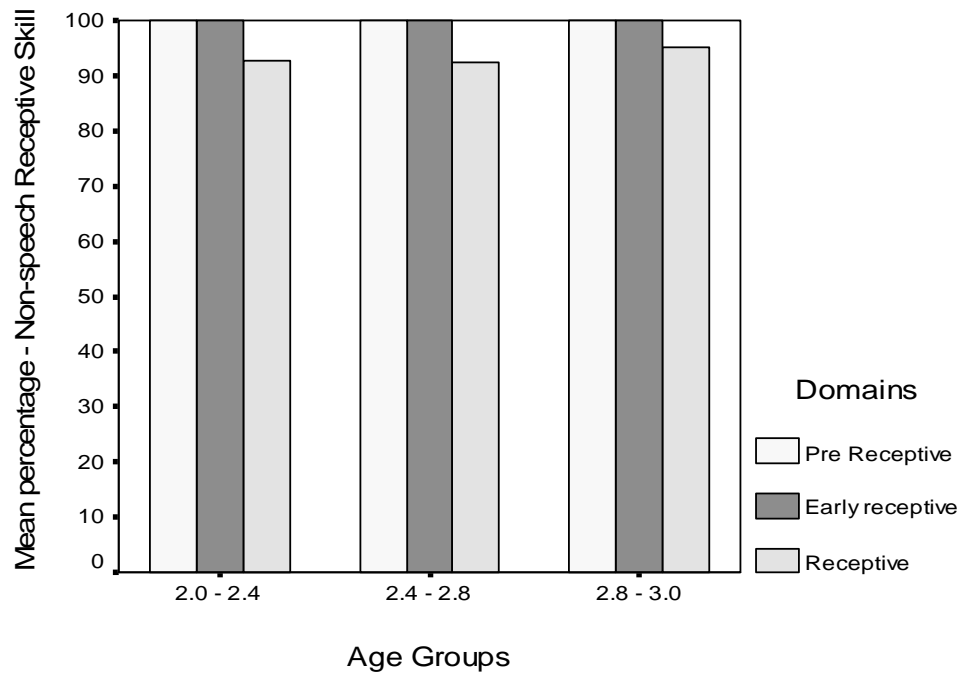
Overall, the differences in the performance across the 3 age groups were evident in the receptive rather than the pre receptive or the early receptive sub domain. This is reflected in table 8 which represents the mean scores across the three age groups. It is seen from the table that there is small increment seen in the receptive domain from 2 to 3 years. Similar effects are also obvious in the mean % values represented in Graph 1.

Table 10: Mean score for the sub domains (Pre receptive, early Receptive and receptive) of the Non speech Receptive domain

Age group	Domains	Mean	S.D	Min	Max
2.0-2.4	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	9.26	0.95	7.00	10.00
2.4-2.8	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	12.94	0.84	11.00	14.00
2.8-3.0	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	16.18	0.79	15.00	17.00

[Note: Numbers in bold font represent the mean scores of domains which depicted a developmental trend across three groups]

Graph 1: Mean % score of the three sub domains in the Non speech receptive domain.



The mean percentage scores of the three age groups for the pre receptive (PR), early receptive (ER), and Receptive (R) are illustrated in the Graph 1 above. It is seen that there exists no difference in the performance of the three age groups in the tasks of the pre receptive and the early receptive domains. Whereas, there is a subtle increment in the performance from the 2.0 - 2.4 age group to 2.8 -3years for tasks in the receptive domain. The trend observed suggests that the tasks in the pre receptive and early receptive domain are accomplished by typically developing children by 2 years of age. This also give rise to an impression that the items in the pre receptive and early receptive domains, probably, may not be sensitive enough to tap the non speech receptive skills in the 2-3 year old typically developing children. This notion could be further validated by administering the test on typically developing children less than 2.0 years of age with graded age intervals.

Similar developmental trend was observed in the expressive domain. The non speech expressive domain, analogous to the non speech receptive domain is classified majorly into pre expressive, early expressive and expressive domains. The mean and the mean percentage scores are calculated for the 16 sections of the non speech expressive scale. The sections and their abbreviations are represented in table 11.

Table 11: Representation of sub domains of the non speech expressive scale

Pre expressive	Vlz	Vocalizations	Expressive	MS	Meaningful signs
	BAB	Babbling		IID	Initiation of interaction and description
Early expressive	RS1	Responds to stimuli		AQ	Answering Questioning
	RS2			ISS	Imitation of signal sequences
	PVP	Participates in vocal play		CS	Combination of signals
	CSP	Consonant and syllable production		EP	Expression of possessions
	Ges	Gestures		ExQ	Expression of quantifiers
	Imt	Imitation		AsQ	Asking questions

Table 12 and 13 represent the mean score and the mean percentage score respectively of the 15 sections in the non speech expressive scale. The mean percentage was calculated since the total number of items was different for different age groups akin to the receptive domain. It is evident from the tables that there is an apparent increment in the performance of children from 2.0 - 2.4 to 2.8-3.0 years.

Table 12: Mean Scores of the 3 age groups for the 16 sections in the expressive domain

	Age Group											
	2.0-2.4				2.4-2.8				2.8-3.0			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Vlz	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
BAB	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
RS1	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
RS2	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
PVP	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
CSP	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
Ges	2.00	0.0000	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
Imt	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
MS	11.47	0.61	10.00	12.00	12.47	0.61	11.00	13.00	13.00	0.00	13.00	13.00
IID	2.94	0.22	2.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
AQ	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
ISS	1.89	0.31	1.00	2.00	1.94	0.22	1.00	2.00	2.00	0.00	2.00	2.00
CS	0.84	0.37	0.00	1.00	1.73	0.45	1.00	2.00	3.40	0.73	2.00	4.00
EP	*	*	*	*	0.78	0.49	0.00	1.00	1.00	0.00	1.00	1.00
EQP	*	*	*	*	*	*	*	*	0.90	0.29	0.00	1.00
AsQ	*	*	*	*	*	*	*	*	0.90	0.29	0.00	1.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group and Numbers in bold fold represent the scores of tasks which depicted a developmental trend across three groups]

Table 13: Mean percentage scores of 3 age groups for the 16 sections in the expressive domain

	Age Group											
	2.0 - 2.4 years				2.4-2.8 years				2.8-3.0 years			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Vlz	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
BAB	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
RS1	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
RS2	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
PVP	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
CSP	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
Ges	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
Imt	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
MS	95.61	5.09	83.33	100.00	95.95	4.70	84.62	100.00	100.00	0.00	100.00	100.00
IID	98.24	7.64	66.67	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
AQ	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	100.00
ISS	94.73	15.76	50.00	100.00	97.37	11.47	50.00	100.00	100.00	0.00	100.00	100.00
CS	84.21	37.46	0.00	100.00	86.84	22.62	50.00	100.00	85.23	18.35	50.00	100.00
EP	*	*	*	*	78.94	41.88	0.00	100.00	100.00	0.00	100.00	100.00
EQP	*	*	*	*	*	*	*	*	90.91	29.42	0.00	100.00
AsQ	*	*	*	*	*	*	*	*	90.90	29.42	0.00	100.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group and Numbers in bold fold represent the scores of tasks which depicted a developmental trend across three groups]

The developmental pattern is proportional with task complexity. As the linguistic complexity increased older children performed better than the younger

group. Distinct differences across age groups were observed in the tasks of meaningful signs, initiation of interaction, description about experiences and imitation of signal sequences. The task under the section of expression of possessives, expression of quantifiers and asking questions were deficient (< 60%) in the younger age group (2.0 - 2.4 years), where as a developmental trend can be observed in these tasks as the age increases until 3 years. The differences could also be acknowledged by the variations in the number of sections under each age group suggesting a developmental pattern.

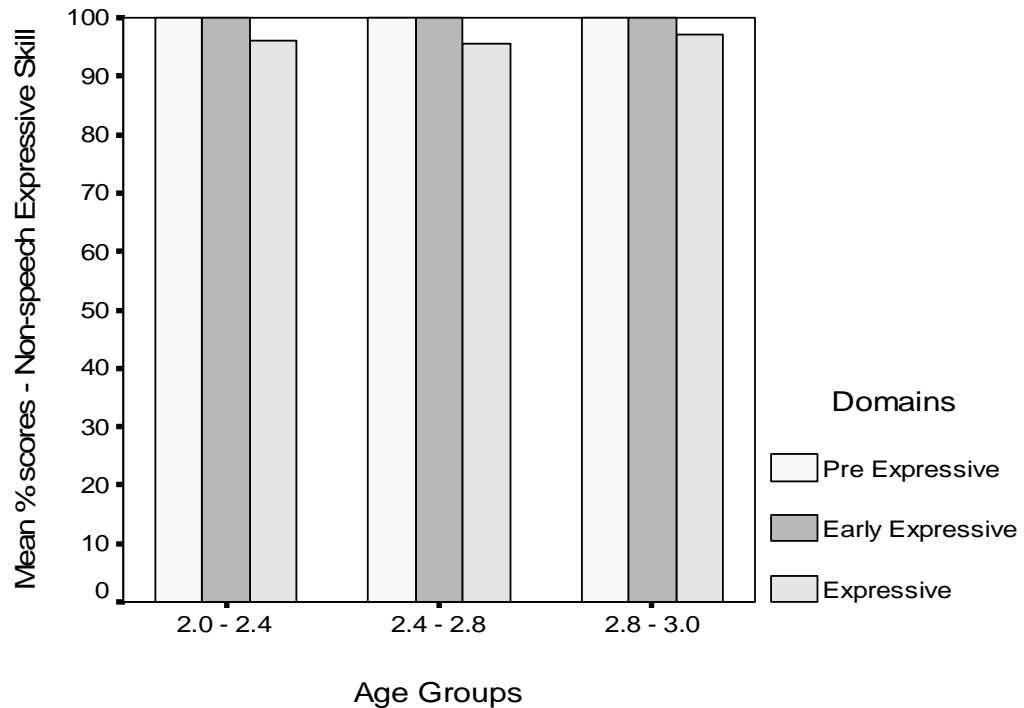
Table 14, represents the mean scores of the three groups. It is evident from the table that there were subtle differences in the expressive domain across the three age groups.

Table 14: Mean score for the sub domains (Pre expressive, Early Expressive and Expressive) of the Non speech Expressive domain

AGE GRP	DOMAINS	Mean	S. D	Min	Max
2.0-2.4	Pre Expressive	3.00	0.00	3.00	3.00
	Early expressive	17.00	0.00	17.00	17.00
	Expressive	20.15	0.95	17.00	21.00
2.4-2.8	Pre expressive	3.00	0.00	3.00	3.00
	Early expressive	17.00	0.00	17.00	17.00
	Expressive	22.94	1.12	20.00	24.00
2.8-3.0	Pre expressive	3.00	0.00	3.00	3.00
	Early expressive	17.00	0.00	17.00	17.00
	Expressive	27.18	1.18	23.00	28.00

[Note: Numbers in bold fold represent the scores of domain which depicted a developmental trend across three groups]

Graph 2: Mean % score of the three sub domains in the Non speech expressive domain.



Graph 2 illustrates the mean percentage score of the three age groups across the domains of pre expressive, early expressive and expressive. It is evident from the graph that there is no difference in the pre expressive and the early expressive domains for the three age groups. Subtle differences could be observed in the expressive domain where in the older group (2.8-3 years) surpassed the performance of the younger group.

The results of the standardization procedure has been included in the revised or the modified version of the Non speech test of Receptive and Expressive language (Huer, 1983) which is supplemented in the later part of this chapter. The section on the ‘Tool for Assessment of Communication Competence in Kannada (TACC-K) has been structured as a) general instructions, b) test materials and c) the tester’s manual.

The scoring and interpretation has also been included. (Refer to pages 1 to 48 of the manual).

During the testing, there were also minimal gestures evident as the children had begun using more verbal utterances rather than gestures. Few non verbal modes which were observed included deictic gestures (pointing), recognitory gestures (action in the absence of object), eye gaze to the appropriate picture, and alternation of eye gaze to pictures when the child is in dilemma, and facial expressions. The mode of the response is not discussed to a greater extent as it was not the focus of the study. The current study only attempted to standardize the tool for the Indian population with the aim of using this on the clinical population which rely more on non verbal mode of communication. Further studies could be attempted to investigate on the category of non verbal modes used by typically developing children.

From the above findings it could be derived that the test employed for the current study is sensitive to tap the smallest increments in the non speech receptive and the expressive skills in typically developing children. The age level (in months) at which each skill is developed /acquired is in consonance with the age range suggested in other language tests (Bzoch & League, 1971; Herleker, 1986). This also probably supports the notion that non verbal and verbal communication develops simultaneously (McNeill, 1992). The test assesses the language abilities through the available communication modes rather than verbal mode. Hence an assessment tool which has a provision to investigate the receptive and the expressive skills in the non verbal mode would estimate the language level of children with developmental disability better than a test that approximates the language level based on mere verbal performance. Delay in development of intentional communication through any non

verbal mode, especially gestures could be a strong predictor of delay in language production (McCathren, Warren, & Yoder, 1996).

Various other studies also suggest that non verbal communication can be the predictors of future language development in typically developing children and also in children with developmental disability. Studies by Smith and von Tetchner (1986) and Mundy, Kasari, Sigman, and Ruskin (1995) found that children who frequently use gestures and vocalizations to request had higher language scores a year later than children who requested less frequently. This supports the belief that non verbal requests are moderately strong predictors of expressive language. Mundy, Kasari, Sigman and Ruskin (1995) also found that prelinguistic commenting, or joint attention, was significantly related to later language outcomes in their sample of children with Down syndrome. Hence assessments and interventions aimed at increasing the children's use of prelinguistic/ non verbal communication may have long term language benefits (Brady, Marquis, Fleming & McLean, 2004). Hence, it may be supported that assessment of communication competence on the scale proposed in this study would provide a better index of child's actual language ability rather than assessments on their verbal performance.

Most of the tasks used in the current study were achieved by 2.0 – 3.0 year old children implying that the test is sensitive enough to tap the receptive and expressive language skills of these children. Also, the test would find its implication in the assessment of the language ability in children with expressive impairments. The common assessment tools utilized to investigate the language ability in children with developmental disability rely on verbal performance. Various studies have also revealed discrepancies between the cognitive scores and the receptive language scores

in individuals with severe expressive impairments (Ross & Cress, 2006). Hence, assessment tools designed for individuals with developmental disability using non verbal mode should focus on their physical limitations, limitations in their verbal expression and available communication mode of the child.

The clinical relevance of the results can be seen across both assessment and intervention of children with developmental disability (excluding hearing impairment). Although, the results need further validation, especially, with younger infants (< 2 .0 years) and also through inclusion of more items sensitive to record other non linguistic or cognitive functions, they can provide preliminary guidelines for clinicians seeking a developmental model for both the range of expected receptive and expressive age in the non verbal mode and their hierarchy in typically developing children so that it could be compared with the performance of children with developmental disability.

The test is also based on direct observation and performance of the child rather than parental reports or observation. It has been reported that parents under or over represent the child's language abilities. Roberts, Burchinal, and Durham (1999) in their study found that parents' over estimated of their children's vocabulary scores of Sequenced Inventory of Communication Development – Revised (SICD; Hedrick et al., 1984). Children with severe expressive impairments may not be able to independently express the words they comprehend, and parents may not be able to interpret abstract vocabulary comprehension from children's observable behaviors. Hence assessment tools which are based on direct observation of child's performance by the examiner would yield reliable score of their language ability rather than test

**TOOL FOR ASSESSMENT OF
COMMUNICATIVE COMPETENCE IN
KANNADA: 2-3 YEAR OLD CHILDREN
(TACC-K)**

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INTRODUCTION

... If all of my possessions were taken from me with one exception, I would choose the power of communication, for by it I would regain all the rest.

- Daniel Webster

Communication is the essence of life. When an individual glances or gestures to share feelings with a communication partner or a family member, there are two major purposes of communication accomplished- one is socialization and other is information transfer. This is achieved not only through speech but also through other non verbal modalities like gestures, facial expressions and others. The non verbal modalities can be broadly grouped into manual systems, other symbol systems and communication aids. The Tool for assessing communicative competence in Kannada (TACC-K) is adapted from the 'Non speech test for receptive and Expressive skills (Huer, 1983)'. This test provides a systematic means to assess the communicative competence in children with developmental disorders who are non verbal, as it focuses on the assessment of non verbal as well as verbal performance. The features of the test include:

- a) Its flexibility in administration and scoring
- b) Modalities which are client oriented
- c) Assessment which is based on direct observation of child's performance rather than mere parental interview.

d) Standardization of the test items on typically developing Kannada speaking children (2.0 - 3.0 years)

Objectives and Development of the Test

The test has been adopted from the Non speech test of receptive expressive language (Huer, 1983). This test was designed to provide a systematic means for observing, recording and describing the modes through which children communicate. The original test consisted of 50 items each to test the non speech receptive and the expressive domains. The objective of the test was to developmentally order the prelinguistic, linguistic communication skills and adaptive skills from 0 months to 48 months in typically developing children and children with multiple disabilities. The salient features of the test are its flexibility of administration to a wide variety of developmental disorders, efficient administration, easy scoring method and data was standardized on different variety of populations. The test was standardized on a total of 285 children (Alabama, Wisconsin and New Mexico, United States) in four different groups as illustrated in the table below:

Table A: Details of subjects involved in the standardization of NSTREL (Huer, 1983)

Type of Population	No. of participants
Typically developing preschool children	80
Preschool children with mental and physical disability	23
Public school children with severe multiple disabilities	77
Residential school children with severe multiple disabilities	104

The test was standardized on the western population. Hence, the test cannot be used directly on Indian population as culture influences non verbal language akin to

verbal language. Therefore, this test was been adopted with the rationale of constructing a non verbal assessment tool to evaluate the receptive and expressive language ability of atypical children in the Indian scenario. It is named as the Tool for assessment of communicative competence in Kannada (TACC-K). The test attempts to developmentally order the prelinguistic and linguistic tasks for Kannada speaking children in the age range of 2- 3 years. The test also captures subtle increments in the receptive and expressive skills. It can be used to devise therapeutic guidelines for children with developmental disability who are non verbal. The test includes items which are sensitive to tap the limitations experienced by children with developmental disability (excluding hearing impairment). The test has been standardized on 60 Kannada speaking typically developing children in the age range of 2-3 years. The test consists of 48 items each in the receptive and the expressive domains. The receptive and the expressive domains are further divided into pre receptive, early receptive, receptive and pre expressive, early expressive and expressive respectively. Such a classification into sub domains was a consequence of the standardization of the population in Huer's (1983) study. The sub domains are enlisted in the table below.

Table B: The domains and sub domains of the Tool for assessment of Communication Competence in Kannada speaking Children.

	SUB DOMAIN	EXPLANATION/DEFINITION
RECEPTIVE	Pre Receptive	It focuses on prelinguistic behaviors such as general awareness, localization, attention and maintenance of eye contact
	Early Receptive	More advanced tasks of reception are focused. Response to stimuli, play behaviors, identification of pictures/objects and following of commands are underscored.

	Receptive	The domain consists of linguistic tasks such as comprehension of object functions, possessives, pronouns, size, numbers, plurals, tenses, answering questions and sequential commands.
EXPRESSIVE	Pre Expressive	Emphasis is laid on prelinguistic tasks such as vocalization and babbling.
	Early Expressive	Vocal play behaviors, imitation, production of gestures, consonant and syllables are stressed in early expressive section.
	Expressive	Production of meaningful signals, initiation of communicative interactions, imitation of sequential signals and answering questions. More linguistic concepts such as combining signal, signaling of prepositions, quantifiers and demonstrators are also incorporated.

The various sections under these sub domains for both the receptive and expressive domains and their abbreviations are provided in the Table 14 and 15 respectively (below) and specific tasks under these sections are provided in the manual.

Table C: Main sections in the three sub domains of Pre receptive, Early receptive and Receptive

Pre receptive	GA	General Awareness	Receptive	AQ	Answer questions
	LSB	Localization and searching behavior		IPF	Identification of pictures and functions
	AME	Attention and maintenance of eye contact		IP	Identification of possessives
Early receptive	RS	Responds to stimuli		RNCP	Reception of number concept and plurals
	AAPB	Appropriateness of play behavior		RCSA	Reception of concept of size and adjectives
	FC	Follows commands		IAP	Identification of actions and preposition
	IOP	Identification of objects and pictures		FCS	Follows commands in sequence

Table D: Main sections in the three sub domains of Pre receptive, Early receptive and Receptive

Pre expressive	Viz	Vocalizations	Expressive	MS	Meaningful signs
	BAB	Babbling		IID	Initiation of interaction and description
Early expressive	RSI	Responds to stimuli		AQ	Answering Questioning
	RS2			ISS	Imitation of signal sequences
	PVP	Participates in vocal play		CS	Combination of signals
	CSP	Consonant and syllable production		EP	Expression of possessions
	Ges	Gestures		ExQ	Expression of quantifiers
	Imt	Imitation		AsQ	Asking questions

Test materials

The test is comprised of a) a picture book, b) a set of objects, c) test manual and d) score sheet for recording the responses.

a) Picture Book

Sixty photographs and four numbers are positioned in a set of two or four on each page. The pictures are well alienated so that gross hand pointing or eye pointing could be easily observed by the tester. Each stimulus is selected based on a developmental order. The photographs recognized by normal children (preschoolers) as depicting the vocabulary are included in the picture book. Distractions within the photographs are controlled by modifying the background if necessary. A list of the vocabulary elicited through the picture book is provided in Appendix III. (Refer pages I to XX for the pictures).

b) Object Sets

Eleven objects (miniature toys) which are easily recognized by young children and which provide visual or auditory stimulation are included in the set of objects. The list of objects is mentioned in the Appendix IV

c) Test Manual

The manual includes a list of specific tasks enlisted along with step by step directions for administration of the receptive and expressive subtests. It also describes criteria for recording the responses and determining the age equivalencies. Manual also consists of items which are divided as pre receptive, early receptive and receptive skills in the receptive domain, and in the expressive domain they are further divided as pre expressive, early expressive and expressive. This classification was attempted by Heur (1983) as a consequence of the standardization procedure. The details of the sub domains are explained in the Manual.

d) Response Forms

Two separate response forms are provided for the receptive and the expressive subtests. It includes the listing of 48 items each in the receptive and expressive domains respectively, which are developmentally ordered. The responses are scored in these forms during the testing. (See Appendix II)

General instructions

- The test is recommended as a diagnostic tool for professionals working with infant stimulation programs, and preschool programs. It could be appropriately used for children with developmental disabilities who have very limited verbal repertoire.
- The examiner should be preferably a speech language pathologist, or a professional with knowledge of Augmentative and Alternative Communication strategies.
- The examiner ought to be familiar with the test materials and task instructions prior to the administration of the test.
- Professionals who have not had a formal training in speech language pathology are cautioned against the use of the test.
- The testing should be carried out in a comfortable and distraction-free environment such as home or classroom/play home
- In case of children using augmentative or alternative modes of communication systems, their communication board, pointer or typewriter should be readily available during the testing. Consult professionals in the multidisciplinary team prior to the positioning during the testing, so that improper or less than optimal positioning could be avoided.
- The receptive domain of the test should be administered first. The testing could be completed in multiple sittings if necessary. The initiation and termination point of the testing is flexible. Rest period could be given if the child loses interest or gets distracted.

- The examiner should determine the mode of response which is most efficient for communicating with the child. The positioning of the objects and the pictures could be altered according to the access mode of children with developmental disability.
- The objects and the pictures should be placed within the direct line of vision of the child and he/she should be instructed to look at the picture/ stimulus.

Recording responses

The tester/ examiner should record the child's response to each item and score as '0' or T depending of the accuracy of the response. A score of 'T' is provided if the child demonstrates the particular skill and a score of '0' is given if the child does not demonstrate the particular behavior. Supplementary remarks/ notations on child's behaviors could also be made in the scoring sheet.

Scoring and interpretation

The Tool for Assessment of Communication Competence (TACC- K) was standardized on Kannada speaking typically developing children. The test was intended to be used with children with developmental disability who communicate using the non verbal mode. The TACC-K is designed to provide the examiner with two kind of information upon completion of the testing: a) the age equivalent mean scores, and b) a description of particular skills which the child demonstrates in the three domains of the expressive and the receptive domain. The descriptive information provided under the remarks or observation during the testing could be utilized during the intervention.

To determine the Age Equivalency Scores

On completion of the testing the examiner should compute the total score obtained in each domain. The total score thus obtained in both the domains is compared with the mean score corresponding to each age interval in the Kannada speaking typically developing children. The standardized data in the receptive and expressive domain is represented in Table 16 and 17 respectively. The scores obtained by children with developmental disability could be compared with these scores to derive at their language age equivalencies in both the domains. The scores for each section could also be compared with the standardized data to derive domain specific information represented in Table 18 and 19. The raw scores which are within the range of maximum and minimum values are considered to determine the language age equivalencies for each domain. The description of the skills depicted by each age group is included in the Appendix I.

Table E: Mean scores of the three domains and corresponding age equivalencies in typically developing children in receptive domain

AGE Equivalencies	DOMAINS	Mean	S.D	Min	Max
2-2.4	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	9.26	0.95	7.00	10.00
2.4-.8	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	12.94	0.84	11.00	14.00
2.8-3	Pre receptive	10.00	0.00	10.00	10.00
	Early receptive	21.00	0.00	21.00	21.00
	Receptive	16.18	0.79	15.00	17.00

[Note: Numbers in bold fold represent the scores of domain which depicted a developmental trend across three groups]

Table F: Mean score for the sub domains (Pre expressive, Early Expressive and Expressive) of the Non speech Expressive domain

AGE Equivalencies	DOMAINS	Mean	S.D	Min	Max
2-2.4	Pre Expressive	3.0000	0.0000	3.00	3.00
	Early expressive	17.0000	0.0000	17.00	17.00
	Expressive	20.1579	0.9582	17.00	21.00
2.4-2.8	Pre expressive	3.0000	0.0000	3.00	3.00
	Early expressive	17.0000	0.0000	17.00	17.00
	Expressive	22.9474	1.1291	20.00	24.00
2.8-3	Pre expressive	3.0000	0.0000	3.00	3.00
	Early expressive	17.0000	0.0000	17.00	17.00
	Expressive	27.1818	1.1807	23.00	28.00

[Note: Numbers in bold fold represent the scores of domain which depicted a developmental trend across three groups]

Table G: Mean Scores of the 3 age groups of 14 sections in the receptive domain

	AGE GROUPS											
	2.0-2.4				2.4-2.8				2.8-3.0			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
GA	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
LSB	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
AME	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
RS	6.00	0.00	6.00	6.00	6.00	0.00	6.00	6.00	6.00	0.00	6.00	6.00
AAPB	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
FC	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
IOP	4.94	0.22	4.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
AQ	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
IPF	3.73	0.65	2.00	4.00	4.94	0.22	4.00	5.00	5.00	0.00	5.00	5.00
IP	*	*	*	*	.73	0.45	.00	1.00	0.95	0.21	.00	1.00
RNCP	0.78	0.41	.00	1.00	1.00	0.00	1.00	1.00	1.72	0.45	1.00	2.00
RCSA	*	*	*	*	0.84	0.37	.00	1.00	1.86	0.35	1.00	2.00
IAP	0.94	0.22	.00	1.00	0.89	0.31	.00	1.00	1.72	0.45	1.00	2.00
FCS	1.78	0.41	1.00	2.00	2.52	0.51	2.00	3.00	2.95	0.21	2.00	3.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group and Numbers in bold fold represent the scores of tasks which depicted a developmental trend across three groups]

Table H: Mean score of the 3 age groups for the 16 sections in the expressive domain

	AGE GROUP											
	2-2.4				2.4-2.8				2.8-3			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Vlean	SD	Min	Max
Viz	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
BAB	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
RSI	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
RS2	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
PVP	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
CSP	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00
Ges	2.00	.0000	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
Imt	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00
MS	11.47	0.61	10.00	12.00	12.47	0.61	11.00	13.00	13.00	0.00	13.00	13.00
IID	2.94	0.22	2.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
AQ	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00
ISS	1.89	0.31	1.00	2.00	1.94	0.22	1.00	2.00	2.00	0.00	2.00	2.00
CS	0.84	0.37	0.00	1.00	1.73	0.45	1.00	2.00	3.40	0.73	2.00	4.00
EP	*	*	*	*	0.78	0.49	0.00	1.00	1.00	0.00	1.00	1.00
EQP	*	*	*	*	*	*	*	*	0.90	0.29	0.00	1.00
AsQ	*	*	*	*	*	*	*	*	0.90	0.29	0.00	1.00

[Note: * -denotes tasks for which 60% cut off criteria was not attained by the group and Numbers in bold fold represent the scores of tasks which depicted a developmental trend across three groups]

**TOOL FOR ASSESSMENT OF COMMUNICATION COMPETENCE IN KANNADA SPEAKING
TYPICALLY DEVELOPING CHILDREN (2.0 - 3.0 YEARS)
NON SPEECH RECEPTIVE SCALE**

		BEHAVIOR	PROCEDURE	SCORING KEY
PRE - RECEPTIVE	General awareness	Changes behavior as examiner approaches	Approach the child and observe the response. Stand or sit near him or her, but do not speak	Look for responses like an increase or decrease in crying; eye movement to right, left, up or down, bodily movements or a smile. Score 1 if any of these responses are observed
		Changes behavior as examiner speaks	Speak to the child and observe the response	Look for responses similar to the above task
		Glances momentarily towards sound source	Ring the bell or squeeze the noise maker in the child's line of vision.	Looking towards the sound for less than one second or a change in eye movement or opening. Score 1 if any of these responses are observed.
	Localization and searching behavior	Attends, listens momentarily to sound source	Speak, ring a bell or shake the noise maker out of the child's line of vision.	Cessation of body activity for 1-3 seconds, eye movements, or change in facial expression. Score 1 if any of these responses are observed

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Attends, looks momentarily at visual stimulation	Squeak a toy or present visual stimuli (a picture) in the child's line of vision	Looks at the stimulus for 1-3 seconds; or reaches towards the stimulus. Score 1 if any of these responses are observed
	Looks at, attends to examiner's face	Ask the child to look at you as you speak, clap or make soft repetitive noises.	If the child continues to look and attend for at least 3 seconds a score of 1 is given.
	Turns head towards sound source	Speak, ring the bell or squeak the toy out of child's line of vision. Vary the sound stimulus which is presented near the child's ear on alternate sides. Allow adequate time for response.	If the child turns towards the sound stimulus for 2 out of 3 trials in both the sides then a score of 1 is given
	Searches for sound source	Speak, ring the bell or squeak out a toy out of child's line of vision. Vary the sound stimulus which is presented near the child's ear on alternate sides. Increase the distance to 3-6 feet away from the child. Encourage the child to search the source of the sound.	Turning or looking towards the source or finding the source for 2 out of 3 trials obtains a score of 1

Note: Score '1' - child demonstrates a particular behavior
Score "0" - child does not demonstrate a particular behavior

	Attention and maintenance of eye contact	Maintains eye contact	Encourage the child to maintain eye contact with you until you count seven. Hold the child's head if necessary. As you interact with the child note if he / she looks at you and attends to demonstrate an interest in you.	If the child maintains eye contact with you for at least 7-8 seconds then score of 1 is given
		Localizes, attends, looks at sound source with accuracy	Speak, ring the bell or squeak out a toy out of child's line of vision. Vary the sound stimulus which is presented near the individual's ear on alternate sides. Increase the distance to 3-6 feet away from the child. Ask the child to search the source of the sound.	Responds with accuracy, attend for longer duration (5 or more seconds) and finds the stimulus in 3 out of 4 trials, a score of 1 is given
EARLY RECEPTIVE	Responds to stimuli	Smiles as the examiner speaks	Play, tease or give compliments to the child or interact with the child as appropriate as possible to elicit a smile.	A score of 1 is given if the child smiles
		Responds inconsistently to own name	Say the child's name and note the response. Also say others name and observe the response	Looks up, ceases bodily movements, and smiles etc. in response. If the child responds differently to his/ her name than when others names are called, a score of 1 is given. The responses may be inconsistent ie, 3 out of 6 trials

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Changes reactions to different intonation patterns	Observe the child as you act angry, sad, happy, or firm.	Change in facial expression, head lowering or eye drooping etc. if such responses are observed then a score of 1 is given.
		Changes response to 1 to 3 spoken words	Say words which are familiar to the child and note the response. Say familiar words like mummy. Daddy, bye - bye and also, say words which are not familiar to the child and observe the response. *	Signs of word recognition like change in facial expression, smiling, vocalization, gesturing, pointing or imitating the word are noted. If the child responds differently indicating word recognition, a score of 1 is given.
		Changes response to 1 to 3 spoken names	Name the child's family member, teachers, or friends and observe the response. Say names which are not familiar to the child and observe the response.	If the child responds differently indicating word recognition, a score of 1 is given.
		Responds consistently to own name	Say the child's name and note the response. Also say others name and observe the response. Look for consistency of responses.	Looks up, ceases bodily movements, smiles etc. If the child responds, consistently in 3 of 4 trials, to his or her name a score of 1 is given
	Attention and appropriateness of play behavior	Attends to, shows interest in objects for 30 seconds	Present and describe each object (ball, telephone etc.) to the child. Demonstrate appropriate play with each object encouraging the child to participate in the play.	If the child looks at the objects, attends or participates in the play for at least 30 seconds without losing interest, a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Attends to, shows interest in pictures for 30 seconds	Present the picture book slowly by turning the pages and describing each picture. Encourage the child to touch the pictures or attend as you name them.	If the child looks at the pictures and attends to you as you describe each without losing interest for at least 30 seconds a score of 1 is given
	Attends to conversation of examiner for one minute	Present the objects and picture book slowly by turning the pages and describing each picture / object. Encourage the child to touch the pictures or objects or attend as you name them.	If the child looks at the pictures, objects and attends to you for a minute with limited distraction then a score of 1 is given.
	Plays with, manipulates objects appropriately for one minute	Present an object (ball, blocks or telephone) to the child. Observe the child as she/ he manipulates the object.	Rolls the ball; hits the ball as you roll against their arm, arranges the blocks etc. If the child plays with the object appropriately for at least a minute give a score of 1. Inappropriate play like throwing or destroying the object is scored 0.
	Attends to naming of pictures for more than one minute	Present the picture book slowly by turning the pages and describing each picture. Encourage the child to touch the pictures or attend as you name them.	If the child demonstrates interest in the pictures with limited interruption for a minute or longer, then a score of 1 is given
Follows commands	Reacts inconsistently to 'no'	Request the child to stop playing with the toy, stop any distracting activity done by the child, stop her/ him getting out of the chair, and stop any self stimulating behavior during testing by saying 'NO' and observe the response.	If the child stops an activity upon request in 2 out of 4 trials a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior
Score *0' - child does not demonstrate a particular behavior

		Gestures to 1 -3 actions plus verbal requests	Ask the child to wave bye bye, come, look up, look down, raise hand, or clap. Gesture to the child, encouraging him / her to respond.	Score of 1 is given if the child tries to gesture at least one time following your prompt
		Responds consistently to 'No'	Request the child to stop playing with the toy, stop any distracting activity done by the child, stop her/ him getting out of the chair, and stop any self stimulating behavior during testing. When such behaviors emerge say 'NO' and observe the consistency of response.	If the child consistently stops an activity upon request in 3 out of 4 trials then a score of 1 is given
		Follows 1 -3 verbal plus gesture requests	Ask the child to wave bye-bye, come, look up, look down, raise hand, or clap. Gesture to the child, encouraging him / her to respond. Score if the child responds to one or more requests.	If the child follows one or more commands then a score of 1 is given
		Follows 1 -3 verbal commands without gestures	Ask the child to sit down, come, look up, look down, pick up a named object, or wave bye- bye. Do not gesture or prompt the child to respond.	Child completely follows one or more commands only on verbal request. Score of 1 is then given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

Identification of objects and pictures	Identifies 1-3 objects named	Select two objects (like car and book) and place them in front of the child without identifying either object. Ask the child to look at or touch the 'book'. Present other objects and note the responses.	If the child correctly identifies the named object a score of 1 is given.
	Identifies 3-5 objects named from a response set of two	Present two objects to the child and request him or her to look at or touch the object. Continue to present two objects at a time, randomly varying the order of presentation, and request that the child identify each object named.	Score 1 for correct identification of 3 or more named objects.
	Identifies 1-3 pictures named from a response set of two	Present the pages I and II in the picture book. Say "look at or touch ball/ book/ baby/dog". Name the pictures in random order.	Score 1 for correct identification
	Identifies one body part	Present the picture book (page III). Say "look at or touch eyes/ mouth". Name body parts in random order.	If the child correctly identifies one picture or identifies their own body part then a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Identifies 3-5 objects named from a response set of four	Place four objects (Eg. rattle, book, telephone, blocks) in front of the child. Say "look at or touch—". Continue the same procedure until all objects are identified. Present other objects in set of four. Follow the same procedure	If the child correctly identifies three or more of the objects from a response set of four then score of 1 is provided. Look for eye pointing or any other responses also.
RECEPTIVE	Answers questions	Responds appropriately to 1 -3 questions	Ask the individual simple questions, e.g., " where is the —?" Where is your mother? Where is your teacher?	If the child correctly responds by looking at mother or teacher in response to the question or searching the correct direction of teacher or mother then a score of 1 is given.
		Responds appropriately to 3 or more simple questions	Ask the individual simple questions, e.g., Are you— -? Do you have.? Where is —?	If the child provides answers to three or more different questions then a score of 1 is given.
	Identification of pictures and functions	Identifies 3-5 pictures named from a response set of four	Present the picture book. (Page III and IV). Say "look at or touch...(For eg. Ear/ eyes/ television) " name the pictures in random order	If the child identifies 3 or more pictures correctly, a score of 1 is given.
		Identifies 3-5 body parts	Present the picture book (page III). Say "look at or touch—". Name body parts in random order. Also ask the child to point to his or her foot/hand.	If the child correctly identifies 3 or more body parts named,, a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

**TOOL FOR ASSESSMENT OF COMMUNICATION COMPETENCE (TACC - K) IN
TYPICALLY DEVELOPING KANNADA SPEAKING CHILDREN (2.0 - 3.0 YEARS)**

NON SPEECH EXPRESSIVE SCALE

		BEHAVIOR	PROCEDURE	SCORING KEY
PRE -EXPRESSIVE	<i>Vocalizations</i>	Vocalizes vowel like sound/sounds	Listen and observe during interaction with the child. Present objects (Eg. Ball, telephone, block, noise makers) and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Allow adequate time for the child to respond to your requests and to the play. Observe and record the sounds the child produces	If the child vocalizes (other than crying) a score of 1 is given.
		Vocalizes playfully	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Observe and record the sounds the child produces	If the child vocalizes playfully like cooing, squealing, laughing, or making noises during play, a score of 1 is given.
	<i>Babbling</i>	Babbles same sound repeatedly	Listen and observe during interaction with the child. Encourage the child to speak to you by presenting objects and pictures to the child and entertaining her or him by demonstrating appropriate play with each object. Record the responses.	If the child repeats one sound at least two times in sequence during play activity then it is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object Encourage the child to speak to you.	If the child vocalizes at, talks to, or tries to talk to or initiates an interaction with the examiner or an object at least one time then the response is scored as 1.
		Smiling during play	Same as above procedure.	If the child smiles during interactive play score of 1 is given.
		Expresses feelings differentially	Ask the child to look happy, mad, sad, or angry. Observe the individual's response following your requests. Observe the child as the various objects are presented or removed during testing. Observe the child as you act angry, sad, happy or firm.	If the child indicates a change in feeling, like the child's expression changes from happy to sad, the child displays variety of facial expressions on request.
		Babbles same syllables repeatedly	Observe the child during play. Ask the child to imitate following your model.	If the child repeats one syllable two or more times in a sequence during play with the examiner or when playing alone with the objects, then a score of 1 is given.
		Stops vocalizing in response to sound momentarily	Speak to the child or present one of the objects which produce sound when she/he is vocalizing, babbling, or speaking. Observe the response.	If the child stops vocalizing, babbling or speaking upon hearing another stimulus then the response is scored as 1
	<i>Responds to stimuli</i>	Vocalizes directly at the examiner or the object	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Allow adequate time for the child to respond to your requests and to the play. Encourage the child to speak to you. Observe and record the sounds the child produces. Ignore the child or remove the objects from his or her reach.	If the child looks directly at the examiner or at an object two times during the testing and vocalizes then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Identifies 6-10 pictures named from a response set of four	Present pages (IV, V and VI) in the picture book. Say "look at or touch—" (For eg. Telephone/ bottle/ he /she) Name the pictures in random order.	If the child correctly identifies 6 or more pictures named, a score of 1 is given
		Identifies 10 to 20 pictures named from a response set of four	Present pictures from page IV to page IX. Say look at or touch—. Name the pictures in random order.	If the child correctly identifies 10 or more named pictures, a score of 1 is given
		Identifies the function of 5-7 objects	Present the pages (XII and XIII) in the picture book (Eg. Chair, food, brush, milk). Name the function of each object, and encourage the child to identify the object by its function.	If the child correctly identifies 5 or more objects by its function then a score of 1 is given
	Identification of possessives	Demonstrates understanding of possessives	Present page VI of picture book and ask the child to identify which is the man's book and which is the woman's book etc.	If the child correctly identifies each book by the owner in all the trials, score of 1 is given.
	Reception of number concept and plurals	Demonstrates understanding of concept of "one"	Present the pages XIV and XV in the picture book. Say "look at or touch—" (For eg. One/ three/ one block/ two blocks)'. Name the vocabulary depicted in each picture in random order. Present a stack of two blocks and another stack of one block. Encourage the child to identify which stack has one and which one has two.	If the child demonstrates the understanding of the concept one in 2 out of 3 trials at least then a score of 1 is provided.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Demonstrates understanding of plural forms	Present the picture book (page XV and XVI). Ask the child to indicate / point to the picture of shoes- shoe, block- blocks etc.	If the child correctly identifies each plural form in all the trials, score of 1 is given
	Reception of concept of size and adjectives	Demonstrates understanding of concept "size"	Present pictures in the picture book (page XII). Ask the child to identify the big ball- small ball, big block and the small block.	If the child correctly demonstrates understanding of the concept of size in all the trials, score of 1 is given
		Demonstrates understanding of 5-7 adjectives	Present pictures (page XIV and XV) from the picture book. Say "look at or touch—(Big block / small block)". Name the vocabulary in random order.	If the child correctly identifies five or more pictures then a score of 1 is given.
	Identification of actions and prepositions	Identifies 3 prepositions	Present pictures in the picture book (page V and VIII). Say 'show me— (For eg. Picture with book under table). Name the vocabulary depicted in each picture in random order.	If the child correctly identifies 3 or more prepositions correctly then a score of 1 is given.
		Identifies 5-7 actions in pictures from a response set of four	Present pictures in the picture book (Page IX and X). Say 'show me—'(eating/ playing/ running). Name the action in the picture in random order.	If the child correctly identifies 5 or more actions correctly then a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

Follows commands in sequence	Follows 3 or more verbal directions	Ask the child to sit down, come, look up, look down, pick up a named object, or wave bye- bye. Do not gesture or prompt the child to respond.	If the child can follow 3 directions (not in sequence) correctly then score of 1 is given.
	Follows two simple commands in sequence	Ask the child to follow commands in sequence following the model provided by the examiner. If the child follows your model, then select two different tasks and ask the child to perform the tasks in sequence with out providing a model or prompt.	If the child correctly performs 2 tasks in sequence, without prompt or any interruption from the tester/ observer then a score of 1 is given
	Follows three simple commands in sequence	Select three different tasks and ask the child to perform the tasks in sequence. Do not provide a model or prompt.	If the child correctly performs 3 tasks in sequence, without prompt or any interruption from the tester/ observer then a score of 1 is given

[Note: The items in the **italicized font** were eliminated in the TACC-K post standardization].

Note: Score T - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

TOOL FOR ASSESSMENT OF COMMUNICATION COMPETENCE (TACC - K) IN
TYPICALLY DEVELOPING KANNADA SPEAKING CHILDREN (2.0 - 3.0 YEARS)

NON SPEECH EXPRESSIVE SCALE

		BEHAVIOR	PROCEDURE	SCORING KEY
PRE -EXPRESSIVE	Vocalizations	Vocalizes vowel like sound/sounds	Listen and observe during interaction with the child. Present objects (Eg. Ball, telephone, block, noise makers) and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Allow adequate time for the child to respond to your requests and to the play. Observe and record the sounds the child produces	If the child vocalizes (other than crying) a score of 1 is given.
		Vocalizes playfully	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Observe and record the sounds the child produces	If the child vocalizes playfully like cooing, squealing, laughing, or making noises during play, a score of 1 is given.
	Babbling	Babbles same sound repeatedly	Listen and observe during interaction with the child. Encourage the child to speak to you by presenting objects and pictures to the child and entertaining her. or him by demonstrating appropriate play with each object. Record the responses.	If the child repeats one sound at least two times in sequence during play activity then it is scored as 1.

Note: Score '1" - child demonstrates a particular behavior
Score "0" - child does not demonstrate a particular behavior

EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object Encourage the child to speak to you.	If the child vocalizes at, talks to, or tries to talk to or initiates an interaction with the examiner or an object at least one time then the response is scored as 1.
		Smiling during play	Same as above procedure.	If the child smiles during interactive play score of 1 is given.
		Expresses feelings differentially	Ask the child to look happy, mad, sad, or angry. Observe the individual's response following your requests. Observe the child as the various objects are presented or removed during testing. Observe the child as you act angry, sad, happy or firm.	If the child indicates a change in feeling, like the child's expression changes from happy to sad, the child displays variety of facial expressions on request.
		Babbles same syllables repeatedly	Observe the child during play. Ask the child to imitate following your model.	If the child repeats one syllable two or more times in a sequence during play with the examiner or when playing alone with the objects, then a score of 1 is given.
		Stops vocalizing in response to sound momentarily	Speak to the child or present one of the objects which produce sound when she/he is vocalizing, babbling, or speaking. Observe the response.	If the child stops vocalizing, babbling or speaking upon hearing another stimulus then the response is scored as 1
	<i>Responds to stimuli</i>	Vocalizes directly at the examiner or the object	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Allow adequate time for the child to respond to your requests and to the play. Encourage the child to speak to you. Observe and record the sounds the child produces. Ignore the child or remove the objects from his or her reach.	If the child looks directly at the examiner or at an object two times during the testing and vocalizes then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Responds appropriately to 1-3 verbal requests	Ask the child to indicate a yes or no response, to touch one of the objects, to look at one of the objects or to perform a physical activity.	If the child correctly completes one or more tasks then the response is scored as 1. Imitation of the examiner is scored as 0.
	<i>Participation in vocal play</i>	Participates in vocal play with sounds in own repertoire	Note the vowels, consonants, or syllable which the child produces. Imitate these vocalizations, encouraging the child to vocalize immediately following your model. Allow adequate time for a response.	If the child imitates your vocalizations or vocalizes any sound/ sounds at least two times immediately following your model, then it is scored as 1. There must be exchange of vocalizations and random vocalizations are scored as 0.
	<i>Consonant and syllable production</i>	Vocalizes 2 or 3 consonant like sounds	Encourage the child to talk to you or imitate some sounds following your model. Record some of the spontaneous sounds, words, or sentences which the child produces.	If the child produces at least two different consonant like sounds then the response is scored as 1.
Babbles 2 or more different syllables in series		Observe the child during play. Encourage the child to imitate following your model.	If the child produces a combination of two or more different syllables one or more times in sequence during play with the examiner or when playing alone with the objects a score of 1 is given	
Vocalizes word like syllables		Present the objects and the picture book. Interact with the child with the stimulus materials.	If the child produces two or more vocalizations which sound like familiar words then the response is scored as 1.	

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Vocalizes 3 or more consonant like sounds	Encourage the individual to talk to you or imitate some sounds following your model. Record some of the spontaneous sounds, words, or sentences which the child produces.	If the child produces three or more different consonant like sounds give a score of 1
		Vocalizes longer expression	Present the objects and the picture book. Interact with the individual with the stimulus material.	If the child produces two or more vocalizations which are composed of several different syllables then the response is scored as ' V.
	<i>Gestures</i>	Participates in gesture games prompted by the examiner	Play 'pat-a - cake' or 'peak- a- boo' with the younger children and with the older child through several manual signs, e.g. washing, drinking, or book.	If the child participates and produces gestures give the score of 1.
		Uses 1 to 3 simple gestures in response to examiner	During the testing record the child's use of gestures. Determine if the child uses gestures spontaneously to initiate the interaction. Observe the child's use of gestures when responding to your requests, e.g., answering yes/no questions, waving bye- bye; pointing to the object which the child desires; imitating manual signs following a model.	If the child uses one or more gestures it is scored as 1.
	<i>Imitation</i>	Imitates sounds and gestures in own repertoire	Note the vowels, consonants, syllables and gestures which are in the child's repertoire. Produce several of those sounds and gestures, asking the child to imitate your model.	If the child imitates three vocalization or gestures following the model, then the response is scored as 1

Note: Score ' 1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Imitates new behaviors/ signals	Produce several sounds, gestures or physical movements which you have not observed in the child's repertoire, and encourage the child to imitate several of these communicative behaviors following the model.	If the child imitates two or more of the behaviors then the response is scored as 1.
EXPRESSIVE	<i>Meaningful signals</i>	Uses 1-3 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the child's gestures during the interaction.	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. If the child uses one signal meaningfully during the testing then a score of 1 is given. Eg.(naming objects or pictures, reaching for an object, pulling the examiner's arm toward a desired object, eye movement for yes or no, finger movement for yes or no, smiling consistently for yes).
		Signals 1-3 object names	Present the objects (Eg. Ball, telephone, car, bell, squeaky toys) to the child and ask him or her to name them.	If the child correctly signals one or more object names then the response is scored as 1.
		Uses 3-7 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. If the child uses three signals meaningfully during testing, score the response.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Uses 7 - 12 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. Encourage the child for communication. If the child uses 7 signals meaningfully during the testing then a score of 1 is given.
	Signals 3-5 familiar object names	Present the objects to the child and ask him or her to name them. Encourage the child to name or signal the names for other objects in the room.	If the child can signal more than 3 or three objects, the response is scored as 1.
	Uses 12 - 20 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, discuss the pictures and objects and focus the conversation with reference to the object (what is present in the child's communication board). Record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and / or finger movements during the interaction. If the child consistently uses 12 or more expressive communication signals, then a score of one is given.
	Signals 3 -5 picture names	Present the picture book (Page I and II) and encourage the child to name each of the pictures.	If the child correctly signals 3 picture names then a score of '1' is given
	Signals 3 body parts	Present the pictures in the picture book (page III) and encourage the child to name each picture. Promote the child to touch / gaze at his / her body part, or the examiner's body part which matches the picture.	If the child signals the names of three body parts then a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Uses 20 - 30 signals meaning fully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, discuss the pictures and objects and focus the conversation with reference to the object (what is present in the child's communication board). Record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and / or finger movements during the interaction.
	Expresses own name upon request	Encourage the individual to indicate (signal) his or her own name.	If the child signals his or her name(first/last/nick name) then a score of 1 is given
	Signals 5 - 10 picture names	Present the pictures in the picture book and Encourage the child to name several of the pictures.	Score ' 1 * if child can signal 5 pictures
	Uses 30 - 50 signals meaningfully	Interact with the child and note down if the child can use more than 30 meaningful signals, (use child's communication system)	If the child consistently uses 30 or more meaningful signals, a score of 1 is given.
	Signals 20 or more picture names	Present the pictures in the picture book and ask the individual to name several of the pictures.	Score ' 1' if child can signal 20 or more pictures

Note: Score ' 1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

<i>Initiation of interaction and description</i>	Initiates at least one communicative interaction with the examiner	Interact with the child and ignore the child intermittently. Determine who initiates communicative interaction and who responds to whom during each interaction.	If the child spontaneously initiates at least one communicative interaction then a score of 1 is given.
	Spontaneously signals 1 to 3 desires to the examiner	Observe the child's use of signals during the interaction.	If child can spontaneously signal his or her desire. A score of 1 is given
	Describes experiences using 2 or 3 signal combination	Ask several questions to the child, for example; what did you do today in the ...? Tell me about your trip to —?? What did you do play at the park? Select age appropriate questions and allow adequate time for the response.	If the child spontaneously combines two or more signals when describing personal experiences, then the response is scored as 1.
<i>Answering questions</i>	Answers 1 to 3 simple questions non verbally	Present objects and pictures and encourage the child to name an object or picture. Ask simple question like where is the—	Attend to the child's eye movements, head movements during interaction. If the child signals answer to one or more question the response is scored as 1. Random responses are not scored
	Answers yes or no questions consistently	Ask the individual yes or no questions, randomly alternating between questions requiring yes and questions requiring no responses.	If the child answers correctly in 3 out of 4 trials then a score of 1 is given
	Answers Wh questions of physical needs	Ask several questions for example: what should you do if you are hungry? When do you sleep?? What did you have for lunch??	If the child can answer two questions or describe two physical needs then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

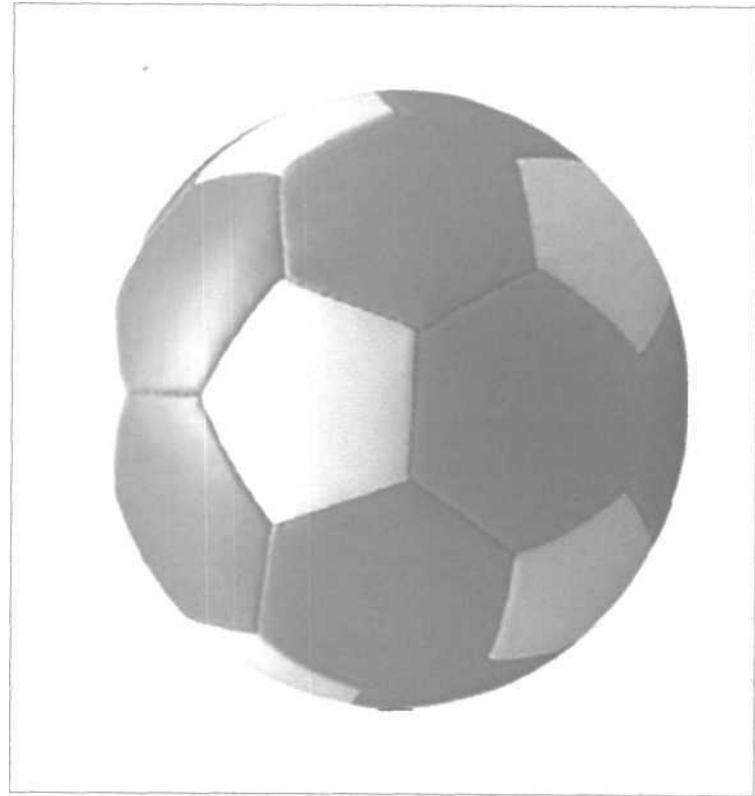
<i>Imitation of signal sequences</i>	Imitates 3 -5 two signal combinations	Note the type of signal which the child uses meaningfully for expression. Select only those signals which are in the individual's repertoire and combine those into two signal combinations. Encourage the child to imitate each combination, following your model.	If the child imitates 3 different two-signal combinations without any prompt from the examiner then the response is scored as 1.
	Repeats 3 digits in sequence	Present the picture in the picture book (page XX). Encourage the child to repeat a sequence of digits following a model. Say 'five, three, four,' or a random combination of digits on the page. Record the child's response.	If the child imitates three digits in sequence following the model then the response is scored as 1. Eg. (speech, eye pointing, touches three digits in sequence, pointing to the digits on a communication board or typing of responses)
<i>Combination of signals</i>	Spontaneously combines 2 signals	Encourage the individual to use longer expressions when responding to the examiner or initiating conversation. Record the signal combinations which the child produces.	If the child combines two signals spontaneously without a model or prompt from the examiner, at least once during the testing then a score of 1 is given
	Spontaneously combines 3 signals	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction. Encourage the individual to use longer expressions when responding to the examiner or initiating conversation. Record the signal combinations which the child produces.	Attend to the child's eye movements, head movement, and / or finger movements during the interaction. If the child combines three signals spontaneously without a model or prompt from the examiner, at least once during the testing then a score of 1 is given
	Spontaneously combines nouns with verbs	Present the picture book (page IX, X and XI). Encourage the child to describe what is in each picture.	If the child combines a noun like signal with a verb like signal (action), at least once during the testing then a score of 1 is given.

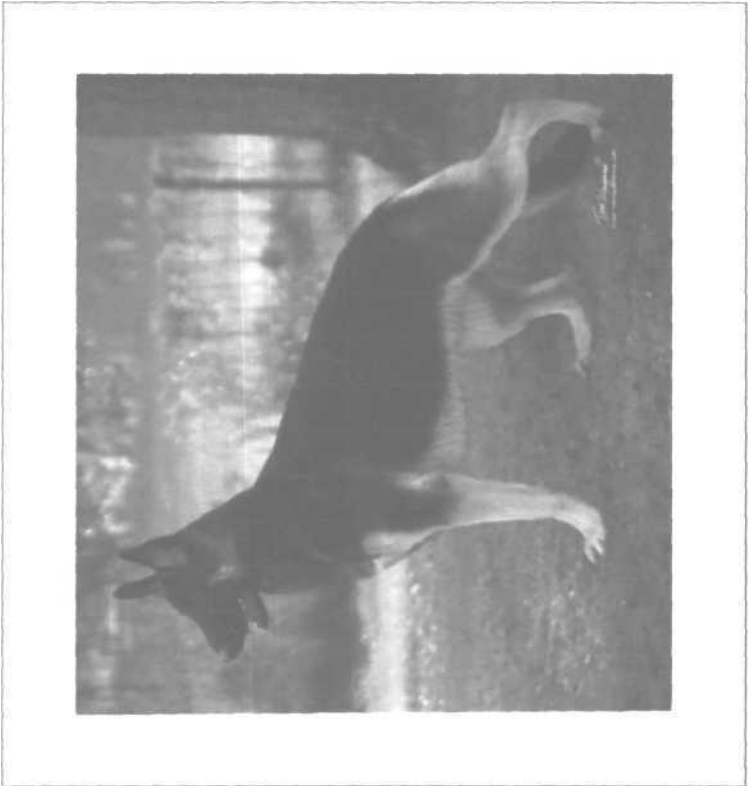
Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

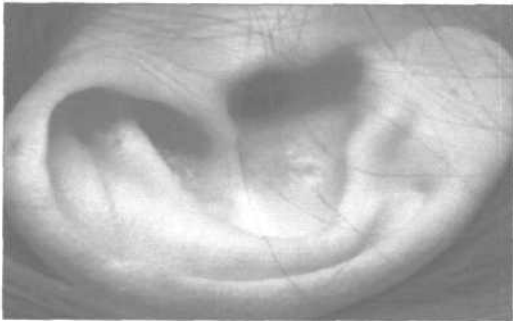
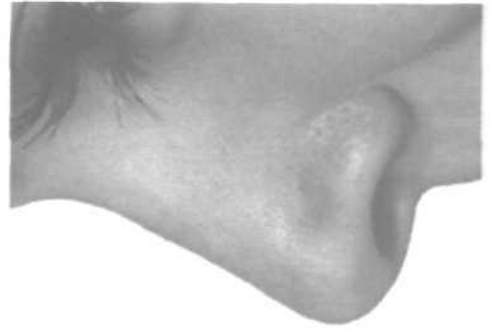
		Spontaneously combines nouns and adjectives	Present picture book (page XII, XIII and XIV) and Encourage the child to describe each picture. Prompt the child by asking questions which require that the child be descriptive when responding, like, ask questions on colors, size, sensation and feelings.	If the child combines two signal sequence combining a noun like signal with an adjective like signal then the response is scored as 1.
	<i>Expression of possessions</i>	Combines signals to express possession	Present pictures (page VI) like man holding a book, and ask the child questions like whose book is this? etc.	If the child signals possession a score of 1 is given.
	<i>Expression of quantifier and demonstrator</i>	Uses quantifiers or demonstrator	Interact with the child, ask which picture she/ he likes, wants and so forth. Present pictures (page XIV) indicating more or less. Ask the child which picture has more blocks. And ask how many blocks are there. Encourage child to use signals for 'no' more', this', 'that' etc..	If the child signals quantifiers or demonstrators correctly then a score of 1 is given
	<i>Ask questions</i>	Spontaneously ask Wh- questions	Spontaneous conversation between the examiner and the child.	Give a score of 1 for each correct response when the child uses when, where and what, and who questions.

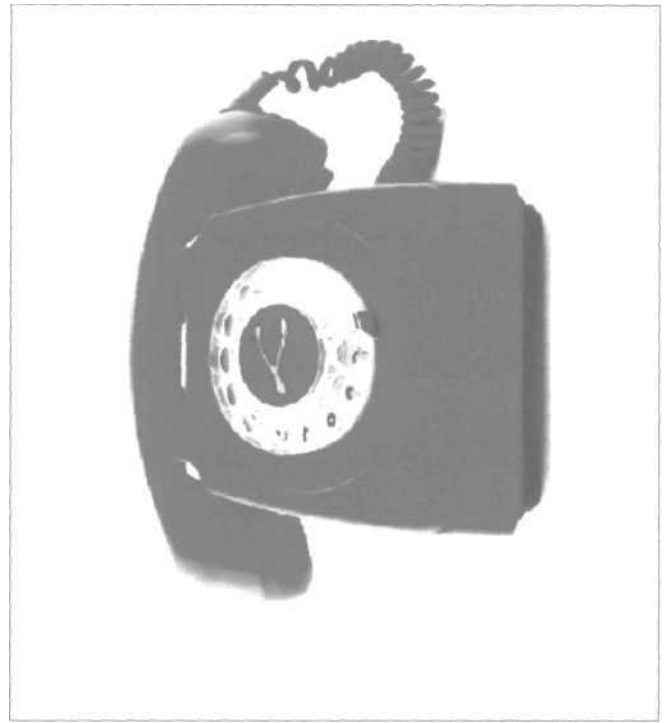
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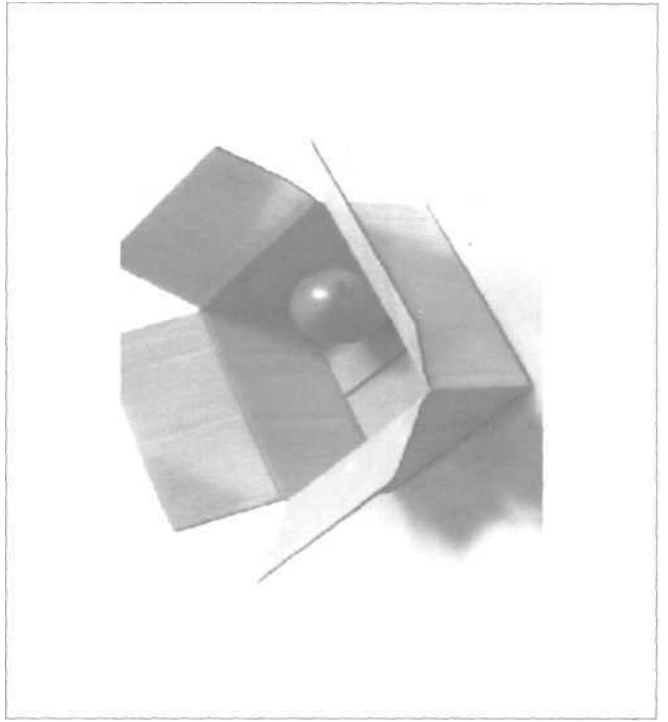
Note: Score '1' - child demonstrates a particular behavior
Score "0" - child does not demonstrate a particular behavior



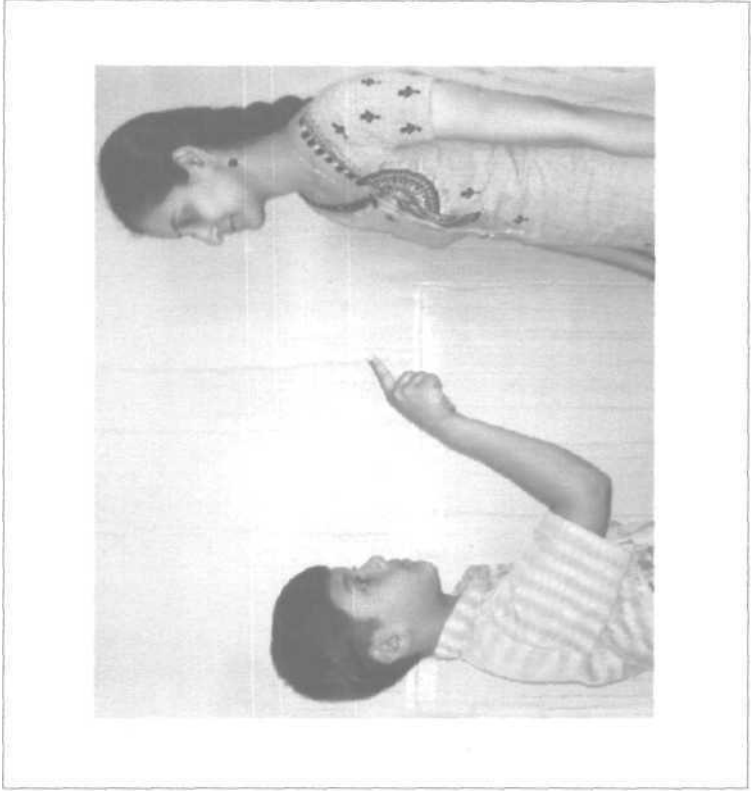


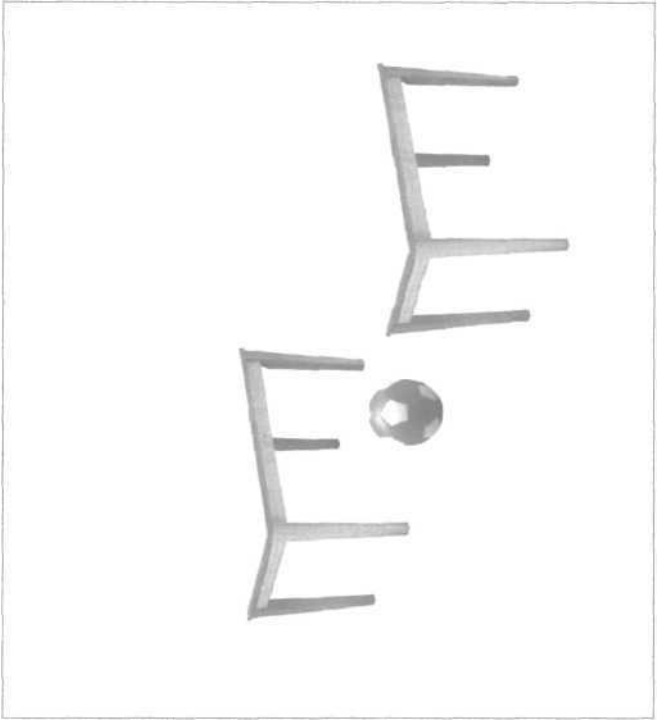
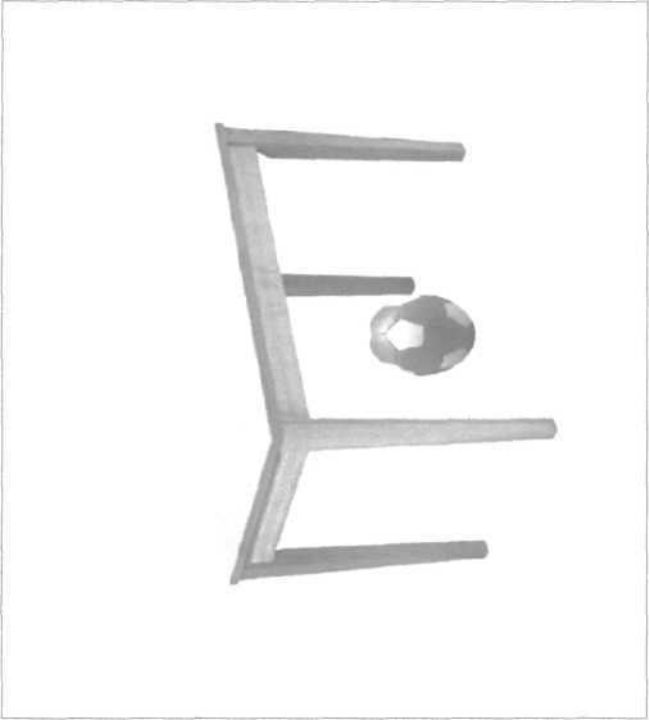


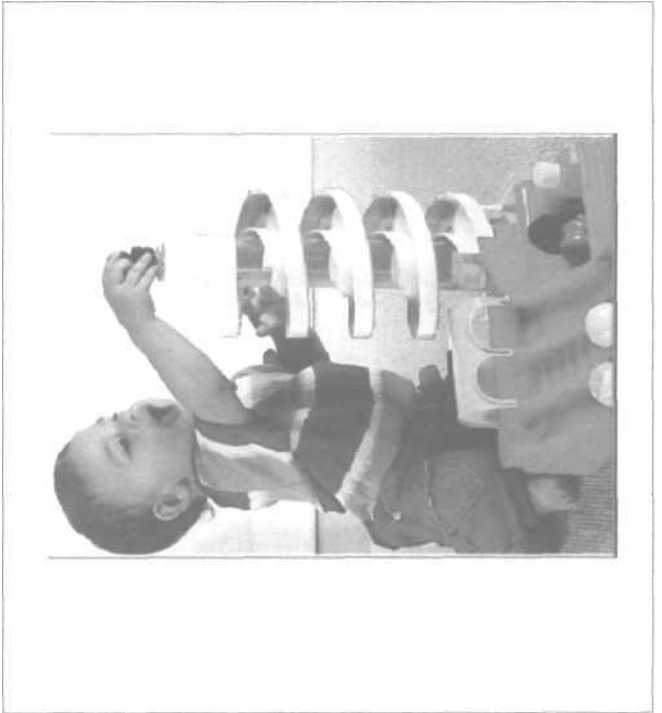
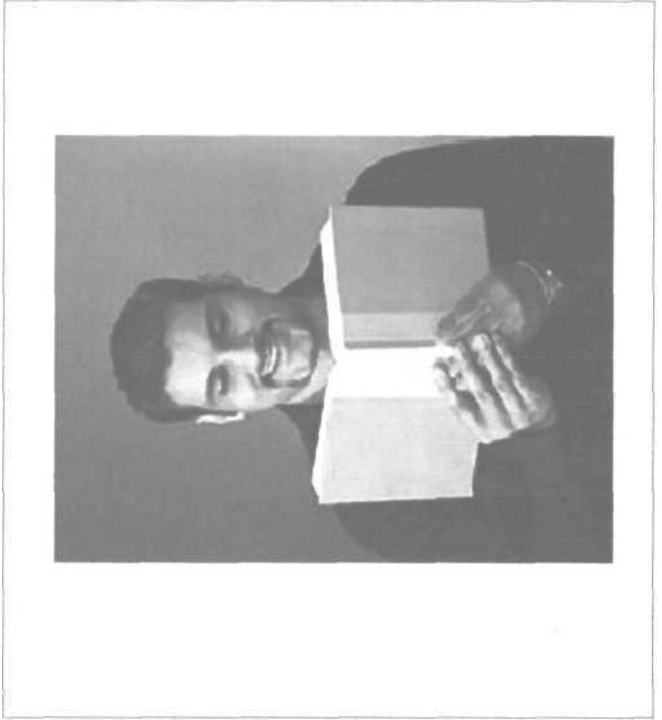






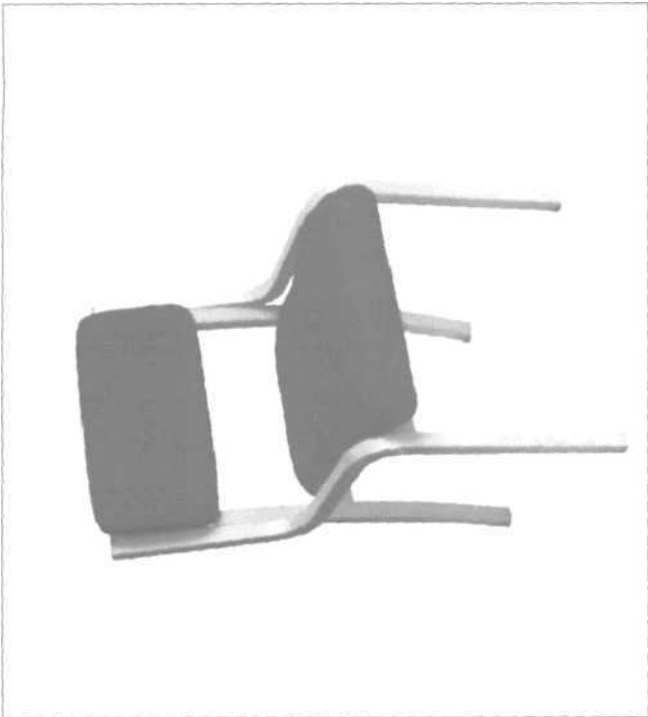








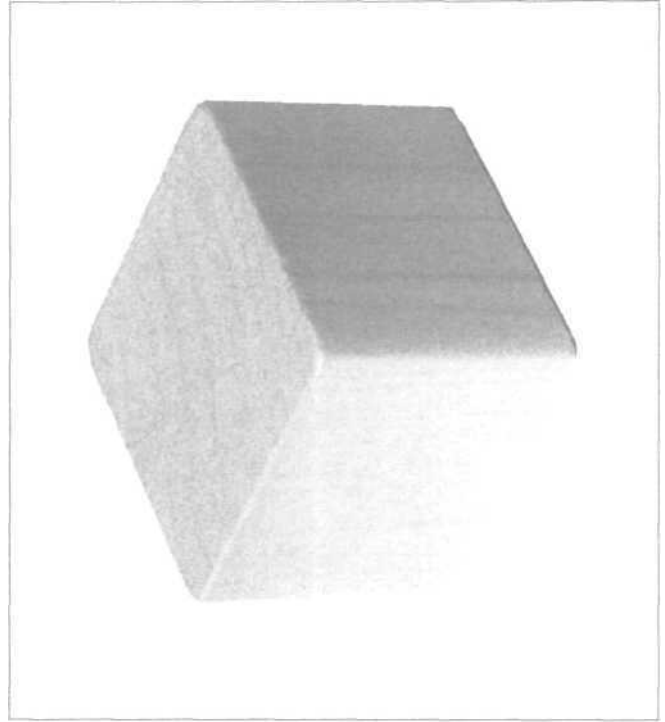
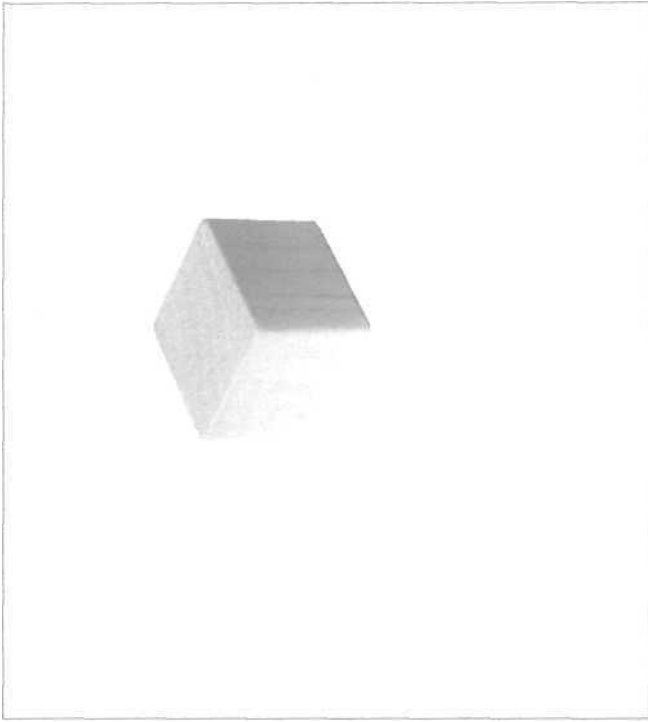


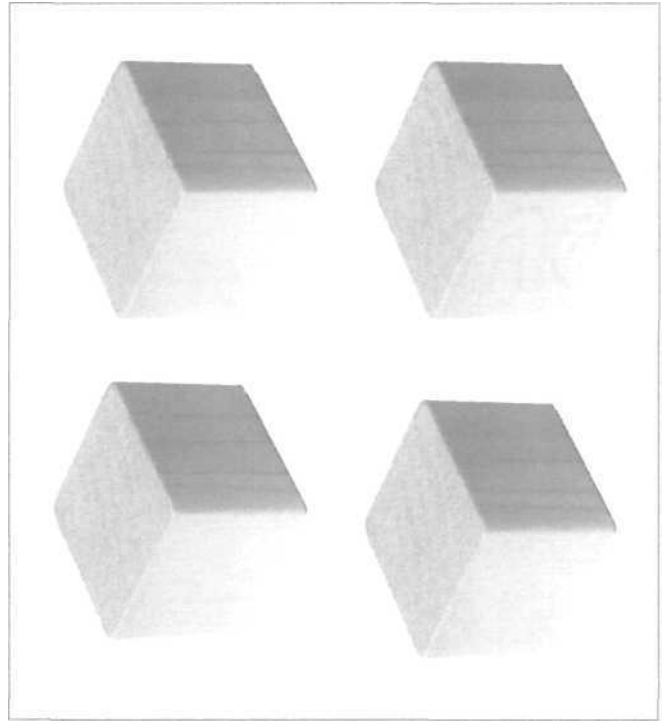




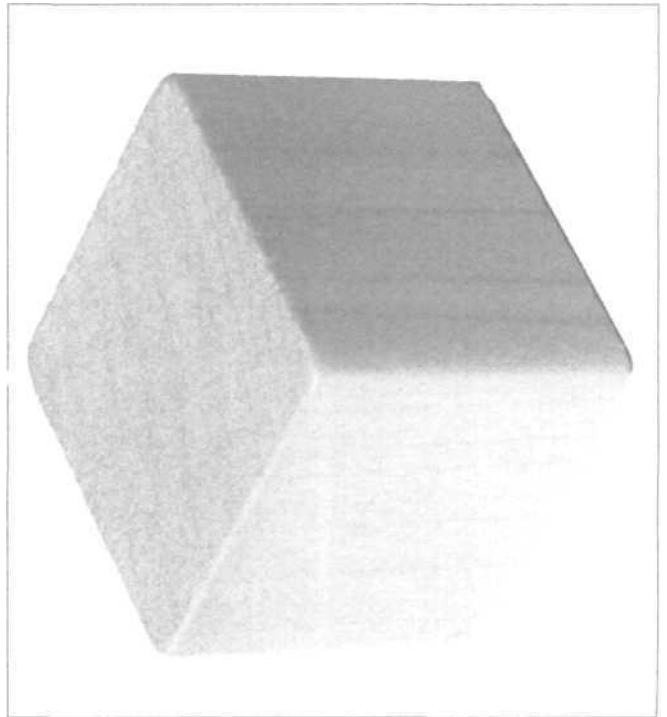
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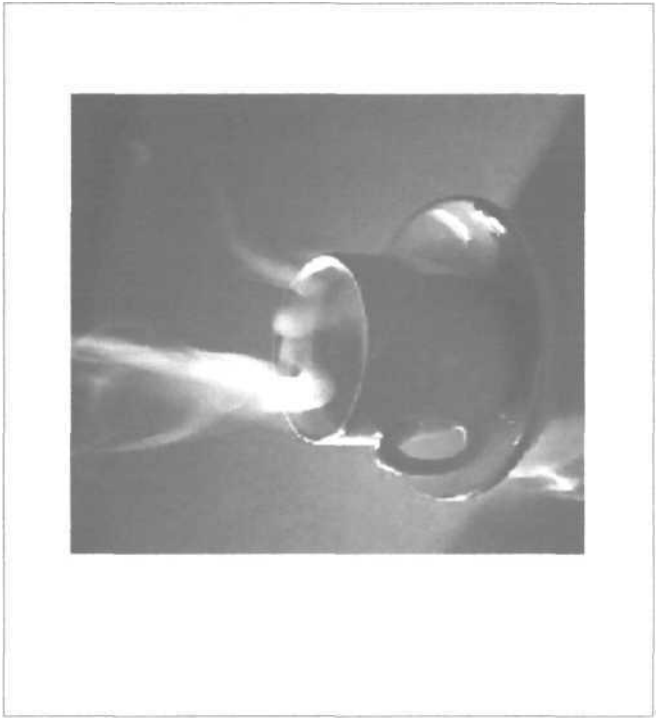
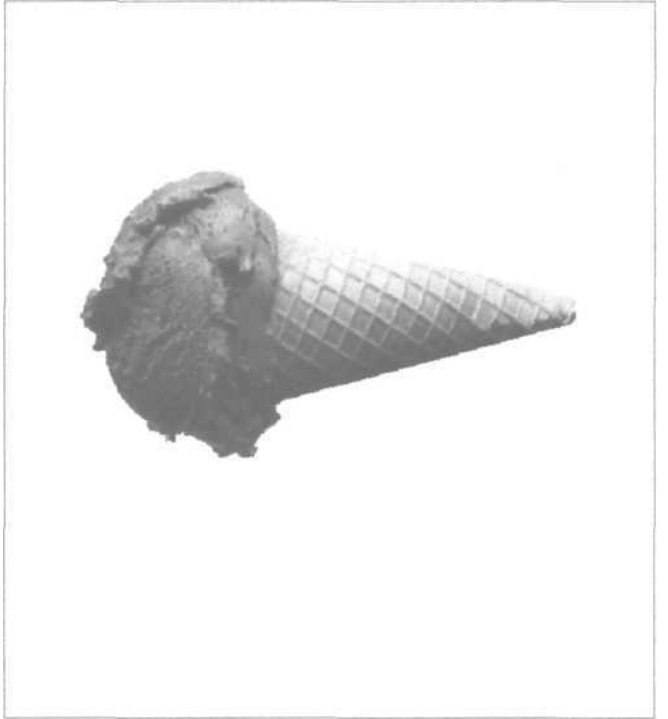
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APPENDIX I
NON SPEECH RECEPTIVE SCALE
2.0 - 2.4 YEARS

		BEHAVIOR
PRE - RECEPTIVE	General awareness	Changes behavior as examiner approaches
		Changes behavior as examiner speaks
		Glances momentarily towards sound source
	Localization and searching behavior	Attends, listens momentarily to sound source
		Attends, looks momentarily at visual stimulation
		Looks at, attends to examiner's face
		Turns head towards sound source
		Searches for sound source
	Attention and maintenance of eye contact	Maintains eye contact
		Localizes attends looks at sound source with accuracy
EARLY RECEPTIVE	Responds to stimuli	Smiles as the examiner speaks
		Responds inconsistently to own name
		Changes reactions to different intonation patterns
		Changes response to 1 to 3 spoken words
		Changes response to 1 to 3 spoken names
		Responds consistently to own name
	Attention and appropriateness of play behavior	Attends to, shows interest in objects for 30 seconds
		Attends to, shows interest in pictures for 30 seconds
		Attends to conversation of examiner for one minute
		Plays with, manipulates objects appropriately for one minute
Attends to naming of pictures for more than one		

Note: score of 'T' - child demonstrates a particular behavior
Score of '0' - child does not demonstrate a particular behavior

RECEPTIVE		minute
	Follows commands	Reacts inconsistently to 'no'
		Gestures to 1 -3 actions plus verbal requests
		Responds consistently to 'No'
		Follows 1 -3 verbal plus gesture requests
		Follows 1-3 verbal commands without gestures
	Identification of objects and pictures	Identifies 1-3 objects named
		Identifies 3-5 objects named from a response set of two
		Identifies 1-3 pictures named from a response set of two
		Identifies one body part
		Identifies 3-5 objects named from a response set of four
	Answers questions	Responds appropriately to 1 -3 questions
		Responds appropriately to 3 or more simple questions
	Identification of pictures and functions	Identifies 3-5 pictures named from a response set of four
		Identifies 3-5 body parts
		Identifies 6-10 pictures named from a response set of four
		Identifies the function of 5-7 objects
	Demonstrates concept of one	Demonstrates understanding of concept of "one"
	Identification of 5 - 7 actions	Identifies 5-7 actions in pictures from a response set of four
Follows commands in sequence	Follows 3 or more verbal directions	
	Follows two simple commands in sequence	

Note: score of T - child demonstrates a particular behavior
Score of '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

2.4 - 2.8 YEARS

	SUB DOMAIN	BEHAVIOR
RECEPTIVE	Identification of pictures and functions	Identifies 10-20 pictures named from a response set of four
	Identification of possessives	Demonstrates understanding of possessives
	Reception of concept of size	Demonstrates understanding of concept 'size'
	Follows command in sequence	Follows three simple commands in sequence

2.8-3.0 YEARS

	SUB DOMAIN	BEHAVIOR
	Reception of concept plurals	Demonstrates understanding of plural forms
	Reception of adjectives	Demonstrates understanding 5 - 7 adjectives
	Identification of prepositions	Identifies 3 prepositions

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

NON SPEECH EXPRESSIVE SCALE

2.0-2.4 YEARS

		BEHAVIOR
PRE EXPRESSIVE	<i>Vocalizations</i>	Vocalizes vowel like sound/ sounds
		Vocalizes playfully
	<i>Babbling</i>	Babbles same sound repeatedly
EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source
		Smiling during play
		Expresses feelings differentially
		Babbles same syllables repeatedly
		Stops vocalizing in response to sound momentarily
		Vocalizes directly at the examiner or the object
		Responds appropriately to 1 -3 verbal requests
		Participates in vocal play with sounds in own repertoire
	<i>Consonant and syllable production</i>	Vocalizes 2 or 3 consonant like sounds
		Babbles 2 or more different syllables in series
		Vocalizes word like syllables
		Vocalizes 3 or more consonant like sounds
		Vocalizes longer expression
	<i>Gestures</i>	Participates in gesture games prompted by the examiner
		Uses 1 to 3 simple gestures in response to examiner

Note: score of '1*' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

EXPRESSIVE	<i>Imitation</i>	Imitates sounds and gestures in own repertoire
		Imitates new behaviors/ signals
	<i>Meaningful signals</i>	Uses 1-3 signals meaningfully
		Signals 1-3 object names
		Uses 3-7 signals meaningfully
		Uses 7-12 signals meaningfully
		Signals 3-5 familiar object names
		Uses 12-20 signals meaningfully
		Signals 3-5 picture names
		Signals 3 body parts
		Uses 20-30 signals meaning fully
		Expresses own name upon request
		Signals 5-10 picture names
		Signals 20 or more picture names
	<i>Initiation of interaction and description</i>	Initiates at least one communicative interaction with the examiner
		Spontaneously signals 1 to 3 desires to the examiner
		Describes experiences using 2 or 3 signal combination
	<i>Answering questions</i>	Answers 1 to 3 simple questions non verbally
		Answers yes or no questions consistently
		Answers Wh questions of physical needs
	<i>Imitation of signal sequences</i>	Imitates 3-5 two signal combinations
		Repeats 3 digits in sequence
	<i>Combination of signals</i>	Spontaneously combines 2 signals

Note: score of '1' - child demonstrates a particular behavior
Score of '0' - child does not demonstrate a particular behavior

2.4 - 2.8 YEARS

EXPRESSIVE	SUB DOMIAN	BEHAVIOR
	Meaningful signs	Uses 30 - 50 signs meaningfully
	Combination of signals	Spontaneously combines nouns with verbs
	Expression of possession	Combines signals to express possession

2.8-3.0 YEARS

EXPRESSIVE	SUB DOMAIN	BEHAVIOR
	Combination of signals	Spontaneously combines 3 signals
		Spontaneously combines nouns and adjectives
	Expression of quantifiers and demonstrators	Uses quantifiers or demonstrators
Asks questions	Spontaneously asks wh- questions	

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

APPENDIX II (A)
SCORE SHEET
NON SPEECH RECEPTIVE SCALE

		BEHAVIOR	SCORING		REMARKS OR OBSERVATION
			0	1	
PRE - RECEPTIVE	General awareness	Changes behavior as examiner approaches			
		Changes behavior as examiner speaks			
		Glances momentarily towards sound source			
	Localization and searching behavior	Attends, listens momentarily to sound source			
		Attends, looks momentarily at visual stimulation			
		Looks at, attends to examiner's face			
		Turns head towards sound source			
		Searches for sound source			
	Attention and maintenance of eye contact	Maintains eye contact			
		Localizes attends looks at sound source with accuracy			
	EARLY RECEPTIVE	Responds to stimuli	Smiles as the examiner speaks		
Responds inconsistently to own name					
Changes reactions to different intonation patterns					
Changes response to 1 to 3 spoken words					
Changes response to 1 to 3 spoken names					
Responds consistently to own name					

Note: Score "1" - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

RECEPTIVE	Attention and appropriateness of play behavior	Attends to, shows interest in objects for 30 seconds			
		Attends to, shows interest in pictures for 30 seconds			
		Attends to conversation of examiner for one minute			
		Plays with, manipulates objects appropriately for one minute			
		Attends to naming of pictures for more than one minute			
	Follows commands	Reacts inconsistently to 'no'			
		Gestures to 1 -3 actions plus verbal requests			
		Responds consistently to 'No'			
		Follows 1 -3 verbal plus gesture requests			
		Follows 1-3 verbal commands without gestures			
	Identification of objects and pictures	Identifies 1-3 objects named			
		Identifies 3-5 objects named from a response set of two			
		Identifies 1-3 pictures named from a response set of two			
		Identifies one body part			
		Identifies 3-5 objects named from a response set of four			
	Answers questions	Responds appropriately to 1 -3 questions			
		Responds appropriately to 3 or more simple questions			

Note: Score '1' - child demonstrates a particular behavior
 Score '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

Follows commands in sequence Identification of actions and prepositions Reception of size concept and adjectives Reception of number concept and plurals Identification of possessives Identification of pictures and functions	Identifies 3-5 pictures named from a response set of four			
	Identifies 3-5 body parts			
	Identifies 6-10 pictures named from a response set of four			
	Identifies 10 to 20 pictures named from a response set of four			
	Identifies the function of 5-7 objects			
	Demonstrates understanding of possessives			
	Demonstrates understanding of concept of "one"			
	Demonstrates understanding of plural forms			
	Demonstrates understanding of concept "size"			
	Demonstrates understanding of 5-7 adjectives			
	Identifies 3 prepositions			
	Identifies 5-7 actions in pictures from a response set of four			
	Follows 3 or more verbal directions			
	Follows two simple commands in sequence			
	Follows three simple commands in sequence			

Note: Score '1' - child demonstrates a particular behavior
 Score '0' - child does not demonstrate a particular behavior

APPENDIX II (B)

SCORE SHEET

NON SPEECH EXPRESSIVE SCALE

		BEHAVIOR	SCORING		REMARKS / OBSERVATION
			0	1	
PRE-EXPRESSIVE	<i>Vocalizations</i>	Vocalizes vowel like sound/sounds			
		Vocalizes playfully			
	<i>Babbling</i>	Babbles same sound repeatedly			
EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source			
		Smiling during play			
		Expresses feelings differentially			
		Babbles same syllables repeatedly			
		Stops vocalizing in response to sound momentarily			
	<i>Responds to stimuli</i>	Vocalizes directly at the examiner or the object			
		Responds appropriately to 1-3 verbal requests			
	<i>Participation in vocal play</i>	Participates in vocal play with sounds in own repertoire			
	<i>Consonant and syllable production</i>	Vocalizes 2 or 3 consonant like sounds			
		Babbles 2 or more different syllables in series			
		Vocalizes word like syllables			
		Vocalizes 3 or more consonant like sounds			
		Vocalizes longer expression			

Note: score of T - child demonstrates a particular behavior
 Score of "0" - child does not demonstrate a particular behavior

APPENDIX II (B)

NON SPEECH EXPRESSIVE SCALE

	<i>Initiation of interaction and description</i>	Initiates at least one communicative interaction with the examiner			
		Spontaneously signals 1 to 3 desires to the examiner			
		Describes experiences using 2 or 3 signal combination			
	<i>Answering questions</i>	Answers 1 to 3 simple questions non verbally			
		Answers yes or no questions consistently			
		Answers Wh questions of physical needs			
	<i>Imitation of signal sequences</i>	Imitates 3 -5 two signal combinations			
		Repeats 3 digits in sequence			
	<i>Combination of signals</i>	Spontaneously combines 2 signals			
		Spontaneously combines 3 signals			
		Spontaneously combines nouns with verbs			
		Spontaneously combines nouns and adjectives			
	<i>Expression of possessions</i>	Combines signals to express possession			
	<i>Expression of quantifier and demonstrator</i>	Uses quantifiers or demonstrator			
	<i>Ask questions</i>	Spontaneously ask Wh-questions			

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

APPENDIX III

PICTURE BOOK: VOCABULARY LIST

Page Nos.	Vocabulary Representation	
1	Ball	Book
2	Dog	Baby
3.	Eyes	Nose
	Ears	Mouth
4	Bottle	Television
	Telephone	Pen
5.	His book	Her book
	You	Me
6.	He	She
	In	Out
7.	Tables	Between
	Under	On
8.	Sleeping	drawing
	Reading	Playing
9.	Eating	Drinking
	Sitting	Standing
10.	For sitting	For drinking
	For brushing	For sleeping
11.	For combing	For eating
	One block	Four block
12.	Big ball	Small ball
	Big block	Small block
13.	Sad	Happy
	Hot	Cold
14.	Shoes	Shoe
	Pens	Pen
15.	Combed	Combing
	Comb	Will comb
16.	Climbed	Climbing
	Stairs	Will climb
17.	Four	One
	Three	five

APPENDIX IV

OBJECT LIST

S. No.	Objects
1	Baby
2	Squeaky toy
3	Telephone
4	Ball
5	Bell
6	Noise maker
7	Book
8	Car
9	Blocks(4)

based only on parental observations especially in case of children with developmental disability who are non verbal (excluding hearing impaired population).

It is proposed that the ‘Tool for assessment of communication competence in Kannada (TACC-K) can serve as a valid tool in assessing the communication competence in children with developmental disability (excluding hearing impairment) who are non verbal. The data has been standardized on a smaller group of typically developing children and the same could be replicated with younger age group (< 2.0 years) and on children with developmental disorder other than hearing impairment who communicate using the non verbal mode.

SUMMARY AND CONCLUSION

Communication is a resilient phenomenon; when prevented from coming out of mouth it emanates almost irrepressibly from fingers (Goldin-Meadow and Morford, 1985). There are two major forms of communication – verbal and non verbal. Non verbal communication is an area which is less researched upon when compared to verbal communication. Verbal and non verbal communication occurs simultaneously in typically developing children. In case of children with developmental disability, due to limitations in their expressive language ability they rely more on non verbal modes of communication.

Assessments and intervention in children with developmental disability focus on their verbal language performance than on their non verbal language competence. Tests to assess verbal language reveal the language age children. Any test which assesses for verbal language abilities alone does not focus on non verbal communication behavior. Communication competence in children is a resultant of verbal and non verbal components of communication. Hence, use of verbal language tests alone may often result in underestimation of the actual language ability or communication competence of the child. There are very few assessment tools put forth for the assessment of communication competence and most of these are developed and standardized on western population. A direct adoption of western assessment tool on Indian population is not recommended as various cultural issues influence non verbal language performance akin to its effect on verbal language. There is an immense need to develop a standardized assessment tool in the Indian context which would aid in the evaluation of the communication competence of children with developmental disability.

In the present study, this issue was considered and an assessment tool, basically developed and standardized on western population was used to develop standardized data on typically developing Kannada speaking children (2.0 -3.0 years). The study aimed to establish normative data for the ‘Non-speech receptive and expressive language test developed by Heur (1983)’ in typically developing children (Kannada) in the age range of 2-3 years. The Non Speech Test of receptive and Expressive Language (Huer, 1983) was designed to provide a systematic means for observing, recording and describing the modes through which children communicate. The objective of the test was to enlist developmentally ordered skills as prelinguistic, linguistic communication skills and adaptive skills from 0 months to 48 months in typically developing children and children with multiple disabilities. The test was standardized on western population and few test materials were culturally sensitive. Hence, a revised or modified version of NSTREL was attempted and named as ‘Tool for assessment of Communicative Competence in Kannada (TACC-K) which was administered on typically developing children between 2.0 -3.0 years (in 3 age intervals viz., 2.0-2.4, 2.4-2.8, and 2.8-3.0 years). This was done in order to establish norm for the receptive and expressive communication skills, to facilitate comparison of the communication skills of children with various developmental disabilities (excluding hearing impairment) who are at risk for delayed or deviant communication.

The test was standardized on sixty children in the age range of 2.0 – 3.0 years. They were equally distributed into three age groups (2.0-2.4, 2.4-2.8 and 2.8 – 3 years). Screening tools were used to rule out any motor, speech / language or hearing impairments in these children. The TACC- K consists of two main domains – non

speech receptive and the non speech expressive. These domains are further classified into three sub domains in both receptive and expressive domains. They are the pre receptive, early receptive and receptive in the receptive domain and pre expressive, early expressive and expressive in the non speech expressive domain. The three domains in both receptive and expressive domains are further divided into different sections which form a total of 14 sections in the non speech receptive and 16 domains in the non speech expressive domains (Refer pages 1 to 48 of the manual). The test consists of a) a picture book with sixty pictures, b) a set of 11 objects and c) response sheet. The test was administered on each child and a score of 1 was given if the child demonstrates the specific behavior and a score of 0 was given if the child did not demonstrate a particular behavior. The responses of the groups were analyzed and a criteria of 60% cut off was derived for each task and the data thus obtained was statistically analyzed using the descriptive statistical procedure.

The mean and the mean percentage scores were computed for each section and for each sub domain for both the non speech receptive scale and non speech expressive scale. The mean score and their percentage scores for each section under the receptive sub domain demonstrated a developmental trend. The developmental aspect could also be attributed to the difference in the total number of task included under each age group. As the age group increased, the number of tasks appropriate for each group increase. This proportionate increase could be related to the developmental pattern. The tasks in the pre receptive and the early receptive scale were completely achieved by children in the age range of 2.0 – 3.0 years. Similar trend was seen in the expressive domain where the variability in the performance was seen only in the expressive sub domain of the non speech expressive scale. A developmental trend was observed in few tasks in both the domains which suggests

that the test sensitive to tap subtle differences in the receptive and expressive skills in any of the non verbal mode.

The study emphasizes the need to use an assessment scale which would help to estimate the actual communicative competence of children with severe limitations in their verbal expression. The assessment tools designed for individuals with developmental disability using non verbal mode should focus on their physical limitations, limitations in their verbal expression and available communication mode of the child.

The study is clinically relevant in terms of its application to both assessment and intervention of children with developmental disability (excluding hearing impairment). They can provide preliminary guidelines for clinicians seeking a developmental model for both the range of expected receptive and expressive age in the non verbal mode and their hierarchy in typically developing children so that this can be further compared with the performance of children with developmental disability. The results however need to be further validated by including infants and children of younger age groups (< 2.0 years) and through inclusion of more items to tap their pragmatic and cognitive abilities in children.

Future Recommendations

- The study could be replicated on children below 2 years to look for the variety of non verbal forms of communication that emerge in the developmental order.
- The study needs to be replicated on children with developmental disabilities to have a better comparison.
- More items within sub domains and domains may be included in order to measure the pragmatic and cognitive issues which are closely linked with the communication development in children.

To conclude,

“Behind the eyes full of life

Thinking many thoughts

Thinking if just....

If just these thoughts could become words...”

- Danhoff (2000)

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Appendix A

Socio Economic Status Assessment Scale (Venkatesan, 2004)

Child's name:

Age:

Class:

Parents name:

Home address:

Phone number:

	Child's Father	Child's Mother
1 .Pooled monthly income		
2.Highest education		
3.Occupation		
4.Property		
5.Status of ration card a)White card		
b)Pink card		
c)Yellow card		

Appendix B

INFORMAL QUESTIONNAIRE FOR PARENTS

Name of the child:

Age (in months):

Male/ Female:

Name of the school or play home:

Contact address:

Phone No.:

Language spoken at home:

Father's occupation

Mother's occupation:

Birth History:

- Type of delivery:
- Birth cry:

At which age did he / she start walking? A) < a year B) 1 year C) > 1 year

Does he/she respond when his name is called and turn towards the sound source? Y/N

Does your child look at/attend to you when you speak? Y/N

Does he / she understand when you speak to him / her? Y/N

When did your child begin to speak (first word)? A) < a year B) 1 year C) > 1 year

Does your child repeat sound or words while speaking? Y/N

Does he / she have any difficulty to suck, chew and bite appropriately? Y/N

Does he/ she show interest to play with other children? Y/N

Does he have any other medical problems? Y/N

Do any of your family member have any speech related problems or hearing loss? Y/ N

Is your marriage Consanguineous? (Marriage within relatives) Y/ N

APPENDIX C (1)

THE NON SPEECH TEST FOR RECEPTIVE AND EXPRESSIVE LANGUAGE (HUER, 1983)

NON SPEECH RECEPTIVE SCALE

		BEHAVIOR	PROCEDURE	SCORING KEY
PRE -RECEPT W	General awareness	Changes behavior as examiner approaches	Approach the child and observe the response. Stand or sit near him or her, but do not speak	Look for responses like an increase or decrease in crying; eye movement to right, left, up or down, bodily movements or a smile. Score 1 if any of these responses are observed
		Changes behavior as examiner speaks	Speak to the child and observe the response	Look for responses similar to the above task
		Glances momentarily towards sound source	Ring the bell or squeeze the noise maker in the child's line of vision.	Looking towards the sound for less than one second or a change in eye movement or opening. Score 1 if any of these responses are observed.
	Localization and searching behavior	Attends, listens momentarily to sound source	Speak, ring a bell or shake the noise maker out of the child's line of vision.	Cessation of body activity for 1-3 seconds, eye movements, or change in facial expression. Score 1 if any of these responses are observed

Note: Score '1' - child demonstrates a particular behavior
 Score '0' - child does not demonstrate a particular behavior

	Attends, looks momentarily at visual stimulation	Squeak a toy or present visual stimuli (a picture) in the child's line of vision	Looks at the stimulus for 1-3 seconds; or reaches towards the stimulus. Score 1 if any of these responses are observed
	Looks at, attends to examiner's face	Ask the child to look at you as you speak, clap or make soft repetitive noises.	If the child continues to look and attend for at least 3 seconds a score of 1 is given.
	Turns head towards sound source	Speak, ring the bell or squeak the toy out of child's line of vision. Vary the sound stimulus which is presented near the child's ear on alternate sides. Allow adequate time for response.	If the child turns towards the sound stimulus for 2 out of 3 trials in both the sides then a score of 1 is given
	Searches for sound source	Speak, ring the bell or squeak out a toy out of child's line of vision. Vary the sound stimulus which is presented near the child's ear on alternate sides. Increase the distance to 3-6 feet away from the child. Encourage the child to search the source of the sound.	Turning or looking towards the source or finding the source for 2 out of 3 trials obtains a score of 1

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Attention and maintenance of eye contact	Maintains eye contact	Encourage the child to maintain eye contact with you until you count seven. Hold the child's head if necessary. As you interact with the child note if he / she looks at you and attends to demonstrate an interest in you.	If the child maintains eye contact with you for at least 7-8 seconds then score of 1 is given
		Localizes, attends, looks at sound source with accuracy	Speak, ring the bell or squeak out a toy out of child's line of vision. Vary the sound stimulus which is presented near the individual's ear on alternate sides. Increase the distance to 3-6 feet away from the child. Ask the child to search the source of the sound.	Responds with accuracy, attend for longer duration (5 or more seconds) and finds the stimulus in 3 out of 4 trials, a score of 1 is given
EARLY RECEPTIVE	Responds to stimuli	Smiles as the examiner speaks	Play, tease or give compliments to the child or interact with the child as appropriate as possible to elicit a smile.	A score of 1 is given if the child smiles
		Responds inconsistently to own name	Say the child's name and note the response. Also say others name and observe the response	Looks up, ceases bodily movements, and smiles etc. in response. If the child responds differently to his/ her name than when others names are called, a score of 1 is given. The responses may be inconsistent ie, 3 out of 6 trials

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Changes reactions to different intonation patterns	Observe the child as you act angry, sad, happy, or firm.	Change in facial expression, head lowering or eye drooping etc. if such responses are observed then a score of 1 is given.
		Changes response to 1 to 3 spoken words	Say words which are familiar to the child and note the response. Say familiar words like mummy. Daddy, bye - bye and also, say words which are not familiar to the child and observe the response.	Signs of word recognition like change in facial expression, smiling, vocalization, gesturing, pointing or imitating the word are noted. If the child responds differently indicating word recognition, a score of 1 is given.
		Changes response to 1 to 3 spoken names	Name the child's family member, teachers, or friends and observe the response. Say names which are not familiar to the child and observe the response.	If the child responds differently indicating word recognition, a score of 1 is given.
		Responds consistently to own name	Say the child's name and note the response. Also say others name and observe the response. Look for consistency of responses.	Looks up, ceases bodily movements, smiles etc. If the child responds, consistently in 3 of 4 trials, to his or her name a score of 1 is given
	Attention and appropriateness of play behavior	Attends to, shows interest in objects for 30 seconds	Present and describe each object (ball, telephone etc.) to the child. Demonstrate appropriate play with each object encouraging the child to participate in the play.	If the child looks at the objects, attends or participates in the play for at least 30 seconds without losing interest, a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior

Score '0' - child does not demonstrate a particular behavior

		Attends to, shows interest in pictures for 30 seconds	Present the picture book slowly by turning the pages and describing each picture. Encourage the child to touch the pictures or attend as you name them.	If the child looks at the pictures and attends to you as you describe each without losing interest for at least 30 seconds a score of 1 is given
		Attends to conversation of examiner for one minute	Present the objects and picture book slowly by turning the pages and describing each picture / object. Encourage the child to touch the pictures or objects or attend as you name them.	If the child looks at the pictures, objects and attends to you for a minute with limited distraction then a score of 1 is given.
		Plays with, manipulates objects appropriately for one minute	Present an object (ball, blocks or telephone) to the child. Observe the child as she/ he manipulates the object.	Rolls the ball; hits the ball as you roll against their arm, arranges the blocks etc. If the child plays with the object appropriately for at least a minute give a score of 1. Inappropriate play like throwing or destroying the object is scored 0.
		Attends to naming of pictures for more than one minute	Present the picture book slowly by turning the pages and describing each picture. Encourage the child to touch the pictures or attend as you name them.	If the child demonstrates interest in the pictures with limited interruption for a minute or longer, then a score of 1 is given
	Follows commands	Reacts inconsistently to 'no'	Request the child to stop playing with the toy, stop any distracting activity done by the child, stop her/ him getting out of the chair, and stop any self stimulating behavior during testing by saying 'NO' and observe the response.	If the child stops an activity upon request in 2 out of 4 trials a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Gestures to 1 -3 actions plus verbal requests	Ask the child to wave bye bye, come, look up, look down, raise hand, or clap. Gesture to the child, encouraging him / her to respond.	Score of 1 is given if the child tries to gesture at least one time following your prompt
		Responds consistently to 'No'	Request the child to stop playing with the toy, stop any distracting activity done by the child, stop her/him getting out of the chair, and stop any self stimulating behavior during testing. When such behaviors emerge say 'NO' and observe the consistency of response.	If the child consistently stops an activity upon request in 3 out of 4 trials then a score of 1 is given
		Follows 1-3 verbal plus gesture requests	Ask the child to wave bye-bye, come, look up, look down, raise hand, or clap. Gesture to the child, encouraging him / her to respond. Score if the child responds to one or more requests.	If the child follows one or more commands then a score of 1 is given
		Follows 1 -3 verbal commands without gestures	Ask the child to sit down, come, look up, look down, pick up a named object, or wave bye- bye. Do not gesture or prompt the child to respond.	Child completely follows one or more commands only on verbal request. Score of 1 is then given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

Identification of objects and pictures	Identifies 1-3 objects named	Select two objects (like car and book) and place them in front of the child without identifying either object. Ask the child to look at or touch the 'book'. Present other objects and note the responses.	If the child correctly identifies the named object a score of 1 is given.
	Identifies 3-5 objects named from a response set of two	Present two objects to the child and request him or her to look at or touch the object. Continue to present two objects at a time, randomly varying the order of presentation, and request that the child identify each object named.	Score 1 for correct identification of 3 or more named objects.
	Identifies 1 -3 pictures named from a response set of two	Present the pages I and II in the picture book. Say "look at or touch ball/ book/ baby/dog". Name the pictures in random order.	Score 1 for correct identification
	Identifies one body part	Present the picture book (page III). Say "look at or touch eyes/ mouth". Name body parts in random order.	If the child correctly identifies one picture or identifies their own body part then a score of 1 is given.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Identifies 3-5 objects named from a response set of four	Place four objects (Eg. rattle, book, telephone, blocks) in front of the child. Say "look at or touch—". Continue the same procedure until all objects are identified. Present other objects in set of four. Follow the same procedure	If the child correctly identifies three or more of the objects from a response set of four then score of 1 is provided. Look for eye pointing or any other responses also.
RECEPTIVE	Answers questions	Responds appropriately to 1 -3 questions	Ask the individual simple questions, e.g., " where is the — ? " Where is your mother? Where is your teacher?	If the child correctly responds by looking at mother or teacher in response to the question or searching the correct direction of teacher or mother then a score of 1 is given.
		Responds appropriately to 3 or more simple questions	Ask the individual simple questions, e.g., Are you— -? Do you have.? Where is —?	If the child provides answers to three or more different questions then a score of 1 is given.
	Identification of pictures and functions	Identifies 3-5 pictures named from a response set of four	Present the picture book. (Page III and IV). Say "look at or touch.. .(For eg. Ear/ eyes/ television) " name the pictures in random order	If the child identifies 3 or more pictures correctly, a score of 1 is given.
		Identifies 3-5 body parts	Present the picture book (page III). Say "look at or touch—". Name body parts in random order. Also ask the child to point to his or her foot/hand.	If the child correctly identifies 3 or more body parts named,, a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Identifies 6-10 pictures named from a response set of four	Present pages (IV, V and VI) in the picture book. Say "look at or touch—" (For eg. Telephone/ bottle/ he /she) Name the pictures in random order.	If the child correctly identifies 6 or more pictures named, a score of 1 is given
		Identifies 10 to 20 pictures named from a response set of four	Present pictures from page IV to page IX. Say look at or touch—. Name the pictures in random order.	If the child correctly identifies 10 or more named pictures, a score of 1 is given
		Identifies the function of 5-7 objects	Present the pages (X and XI) in the picture book (Eg. Chair, food, brush, milk). Name the function of each object, and encourage the child to identify the object by its function.	If the child correctly identifies 5 or more objects by its function then a score of 1 is given
Identification of pronoun and possessives	<i>Identifies distinction between 3-5 persons!</i>	<i>Present the picture book (Page V and VI). Say 'look at or touch——' (For e.g. me/you/ he/she). Name the pictures in random order.</i>	<i>If the child correctly identifies 3 or more pictures then a score of 1 is given.</i>	
	Demonstrates understanding of possessives	Present page V of picture book and ask the child to identify which is the man's book and which is the woman's book etc.	If the child correctly identifies each book by the owner in all the trials, score of 1 is given.	
Reception of number concept and plurals	Demonstrates understanding of concept of "one"	Present the pages XI and XII in the picture book. Say "look at or touch—" (For eg. One/ three/ one block/ two blocks)'. Name the vocabulary depicted in each picture in random order. Present a stack of two blocks and another stack of one block.	If the child demonstrates the understanding of the concept one in 2 out of 3 trials at least then a score of 1 is provided.	

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

			Encourage the child to identify which stack has one and which one has two.	
		Demonstrates understanding of plural forms	Present the picture book (page XIV). Ask the child to indicate / point to the picture of shoes- shoe, block- blocks etc.	If the child correctly identifies each plural form in all the trials, score of 1 is given
Reception of concept of size and adjectives		Demonstrates understanding of concept "size"	Present pictures in the picture book (page XII). Ask the child to identify the big ball- small ball, big block and the small block.	If the child correctly demonstrates understanding of the concept of size in all the trials, score of 1 is given
		Demonstrates understanding of 5-7 adjectives	Present pictures (page XII and XIII) from the picture book. Say "look at or touch—(Big block / small block)". Name the vocabulary in random order.	If the child correctly identifies five or more pictures then a score of 1 is given.
Identification of actions and prepositions		Identifies 3 prepositions	Present pictures in the picture book (page VI and VII). Say 'show me— (For eg. Picture with book under table). Name the vocabulary depicted in each picture in random order.	If the child correctly identifies 3 or more prepositions correctly then a score of 1 is given.
		Identifies 5-7 actions in pictures from a response set of four	Present pictures in the picture book (Page VIII and IX). Say 'show me—'(eating/ playing/ running). Name the action in the picture in random order.	If the child correctly identifies 5 or more actions correctly then a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

Follows commands in sequence	Understanding of verb tense	<i>Demonstrates understanding of verb tense</i>	<i>Present pictures from the picture book (page XV and XVI). Say "look at or touch— "(boy is brushing/ boy brushed). Name the vocabulary in random order</i>	<i>If the child correctly identifies 6 to 8 pictures named correctly, then a score of 1 is given</i>
		Follows 3 or more verbal directions	Ask the child to sit down, come, look up, look down, pick up a named object, or wave bye- bye. Do not gesture or prompt the child to respond.	If the child can follow 3 directions (not in sequence) correctly then score of 1 is given.
		Follows two simple commands in sequence	Ask the child to follow commands in sequence following the model provided by the examiner. If the child follows your model, then select two different tasks and ask the child to perform the tasks in sequence with out providing a model or prompt.	If the child correctly performs 2 tasks in sequence, without prompt or any interruption from the tester/ observer then a score of 1 is given
		Follows three simple commands in sequence	Select three different tasks and ask the child to perform the tasks in sequence. Do not provide a model or prompt.	If the child correctly performs 3 tasks in sequence, without prompt or any interruption from the tester/ observer then a score of 1 is given

[Note: The items in the italicized font were eliminated post standardization in the TACC-K post standardization].

Note: Score T - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

APPENDIX C (2)
THE NON SPEECH TEST FOR RECEPTIVE AND EXPRESSIVE LANGUAGE (HUER, 1983)

NON SPEECH EXPRESSIVE SCALE

		BEHAVIOR	PROCEDURE	SCORING KEY
PRE -EXPRESSIVE	<i>Vocalizations</i>	Vocalizes vowel like sound/sounds	Listen and observe during interaction with the child. Present objects (Eg. Ball, telephone, block, noise makers) and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Allow adequate time for the child to respond to your requests and to the play. Observe and record the sounds the child produces	If the child vocalizes (other than crying) a score of 1 is given.
		Vocalizes playfully	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Encourage the child to speak to you. Observe and record the sounds the child produces	If the child vocalizes playfully like cooing, squealing, laughing, or making noises during play, a score of 1 is given.
	<i>Babbling</i>	Babbles same sound repeatedly	Listen and observe during interaction with the child. Encourage the child to speak to you by presenting objects and pictures to the child and entertaining her or him by demonstrating appropriate play with each object. Record the responses.	If the child repeats one sound at least two times in sequence during play activity then it is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object Encourage the child to speak to you.	If the child vocalizes at, talks to, or tries to talk to or initiates an interaction with the examiner or an object at least one time then the response is scored as 1.
		Smiling during play	Same as above procedure.	If the child smiles during interactive play score of 1 is given.
		Expresses feelings differentially	Ask the child to look happy, mad, sad, or angry. Observe the individual's response following your requests. Observe the child as the various objects are presented or removed during testing. Observe the child as you act angry, sad, happy or firm.	If the child indicates a change in feeling, like the child's expression changes from happy to sad, the child displays variety of facial expressions on request.
		Babbles same syllables repeatedly	Observe the child during play. Ask the child to imitate following your model.	If the child repeats one syllable two or more times in a sequence during play with the examiner or when playing alone with the objects, then a score of 1 is given.
		Stops vocalizing in response to sound momentarily	Speak to the child or present one of the objects which produce sound when she/he is vocalizing, babbling, or speaking. Observe the response.	If the child stops vocalizing, babbling or speaking upon hearing another stimulus then the response is scored as 1
	<i>Responds to stimuli</i>	Vocalizes directly at the examiner or the object	Listen and observe during interaction with the child. Present objects and pictures to the child and entertain her or him by demonstrating appropriate play with each object. Allow adequate time for the child to respond to your requests and to the play. Encourage the child to speak to you. Observe and record the sounds the child produces. Ignore the child or remove the objects from his or her reach.	If the child looks directly at the examiner or at an object two times during the testing and vocalizes then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Responds appropriately to 1-3 verbal requests	Ask the child to indicate a yes or no response, to touch one of the objects, to look at one of the objects or to perform a physical activity.	If the child correctly completes one or more tasks then the response is scored as 1 .Imitation of the examiner is scored as 0.
	<i>Participation in vocal play</i>	Participates in vocal play with sounds in own repertoire	Note the vowels, consonants, or syllable which the child produces. Imitate these vocalizations, encouraging the child to vocalize immediately following your model. Allow adequate time for a response.	If the child imitates your vocalizations or vocalizes any sound/ sounds at least two times immediately following your model, then it is scored as 1. There must be exchange of vocalizations and random vocalizations are scored as 0.
	<i>Consonant and syllable production</i>	Vocalizes 2 or 3 consonant like sounds	Encourage the child to talk to you or imitate some sounds following your model. Record some of the spontaneous sounds, words, or sentences which the child produces.	If the child produces at least two different consonant like sounds then the response is scored as 1.
		Babbles 2 or more different syllables in series	Observe the child during play. Encourage the child to imitate following your model.	If the child produces a combination of two or more different syllables one or more times in sequence during play with the examiner or when playing alone with the objects a score of 1 is given
		Vocalizes word like syllables	Present the objects and the picture book. Interact with the child with the stimulus materials.	If the child produces two or more vocalizations which sound like familiar words then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Vocalizes 3 or more consonant like sounds	Encourage the individual to talk to you or imitate some sounds following your model. Record some of the spontaneous sounds, words, or sentences which the child produces.	If the child produces three or more different consonant like sounds give a score of 1
		Vocalizes longer expression	Present the objects and the picture book. Interact with the individual with the stimulus material.	If the child produces two or more vocalizations which are composed of several different syllables then the response is scored as '1'.
	<i>Gestures</i>	Participates in gesture games prompted by the examiner	Play 'pat-a - cake' or 'peek- a- boo' with the younger children and with the older child through several manual signs, e.g. washing, drinking, or book.	If the child participates and produces gestures give the score of 1.
		Uses 1 to 3 simple gestures in response to examiner	During the testing record the child's use of gestures. Determine if the child uses gestures spontaneously to initiate the interaction. Observe the child's use of gestures when responding to your requests, e.g., answering yes/no questions, waving bye- bye; pointing to the object which the child desires; imitating manual signs following a model.	If the child uses one or more gestures it is scored as 1.
	<i>Imitation</i>	Imitates sounds and gestures in own repertoire	Note the vowels, consonants, syllables and gestures which are in the child's repertoire. Produce several of those sounds and gestures, asking the child to imitate your model.	If the child imitates three vocalization or gestures following the model, then the response is scored as 1

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

		Imitates new behaviors/ signals	Produce several sounds, gestures or physical movements which you have not observed in the child's repertoire, and encourage the child to imitate several of these communicative behaviors following the model.	If the child imitates two or more of the behaviors then the response is scored as 1.
EXPRESSIVE	<i>Meaningful signals</i>	Uses 1-3 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the child's gestures during the interaction.	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. If the child uses one signal meaningfully during the testing then a score of 1 is given. Eg.(naming objects or pictures, reaching for an object, pulling the examiner's arm toward a desired object, eye movement for yes or no, finger movement for yes or no, smiling consistently for yes).
		Signals 1-3 object names	Present the objects (Eg. Ball, telephone, car, bell, squeaky toys) to the child and ask him or her to name them.	If the child correctly signals one or more object names then the response is scored as 1.
		Uses 3-7 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. If the child uses three signals meaningfully during testing, score the response.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Uses 7 - 12 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and/ or finger movements during the interaction. Encourage the child for communication. If the child uses 7 signals meaningfully during the testing then a score of 1 is given.
	Signals 3-5 familiar object names	Present the objects to the child and ask him or her to name them. Encourage the child to name or signal the names for other objects in the room.	If the child can signal more than 3 or three objects, the response is scored as 1.
	Uses 12 - 20 signals meaningfully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, discuss the pictures and objects and focus the conversation with reference to the object (what is present in the child's communication board). Record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and / or finger movements during the interaction. If the child consistently uses 12 or more expressive communication signals, then a score of one is given.
	Signals 3 -5 picture names	Present the picture book (Page I and II) and encourage the child to name each of the pictures.	If the child correctly signals 3 picture names then a score of '1' is given
	Signals 3 body parts	Present the pictures in the picture book (page III) and encourage the child to name each picture. Promote the child to touch / gaze at his / her body part, or the examiner's body part which matches the picture.	If the child signals the names of three body parts then a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	Uses 20 - 30 signals meaning fully	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, discuss the pictures and objects and focus the conversation with reference to the object (what is present in the child's communication board). Record the individual's gestures during the interaction.	Attend to the child's eye movements, head movement, and / or finger movements (luring the interaction).
	Expresses own name upon request	Encourage the individual to indicate (signal) his or her own name.	If the child signals his or her name(first/last/nick name) then a score of 1 is given
	Signals 5 - 10 picture names	Present the pictures in the picture book and Encourage the child to name several of the pictures.	Score '1' if child can signal 5 pictures
	Uses 30 - 50 signals meaningfully	Interact with the child and note down if the child can use more than 30 meaningful signals, (use child's communication system)	If the child consistently uses 30 or more meaningful signals, a score of 1 is given.
	Signals 20 or more picture names	Present the pictures in the picture book and ask the individual to name several of the pictures.	Score '1' if child can signal 20 or more pictures

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

	<i>Initiation of interaction and description</i>	Initiates at least one communicative interaction with the examiner	Interact with the child and ignore the child intermittently. Determine who initiates communicative interaction and who responds to whom during each interaction.	If the child spontaneously initiates at least one communicative interaction then a score of 1 is given.
		Spontaneously signals 1 to 3 desires to the examiner	Observe the child's use of signals during the interaction.	If child can spontaneously signal his or her desire. A score of 1 is given
		Describes experiences using 2 or 3 signal combination	Ask several questions to the child, for example; what did you do today in the—? Tell me about your trip to —?? What did you do play at the park? Select age appropriate questions and allow adequate time for the response.	If the child spontaneously combines two or more signals when describing personal experiences, then the response is scored as 1.
	<i>Answering questions</i>	Answers 1 to 3 simple questions non verbally	Present objects and pictures and encourage the child to name an object or picture. Ask simple question like where is the— 0	Attend to the child's eye movements, head movements during interaction. If the child signals answer to one or more question the response is scored as 1. Random responses are not scored
		Answers yes or no questions consistently	Ask the individual yes or no questions, randomly alternating between questions requiring yes and questions requiring no responses.	If the child answers correctly in 3 out of 4 trials then a score of 1 is given
		Answers Wh questions of physical needs	Ask several questions for example: what should you do if you are hungry? When do you sleep?? What did you have for lunch??	If the child can answer two questions or describe two physical needs then the response is scored as 1.

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

<i>Imitation of signal sequences</i>	Imitates 3 -5 two signal combinations	Note the type of signal which the child uses meaningfully for expression. Select only those signals which are in the individual's repertoire and combine those into two signal combinations. Encourage the child to imitate each combination, following your model.	If the child imitates 3 different two-signal combinations without any prompt from the examiner then the response is scored as 1.
	Repeats 3 digits in sequence	Present the picture in the picture book (page XVII). Encourage the child to repeat a sequence of digits following a model. Say 'five, three, four,' or a random combination of digits on the page. Record the child's response.	If the child imitates three digits in sequence following the model then the response is scored as 1. Eg.(speech, eye pointing, touches three digits in sequence, pointing to the digits on a communication board or typing of responses)
<i>Combination of signals</i>	Spontaneously combines 2 signals	Encourage the individual to use longer expressions when responding to the examiner or initiating conversation. Record the signal combinations which the child produces.	If the child combines two signals spontaneously without a model or prompt from the examiner, at least once during the testing then a score of 1 is given
	Spontaneously combines 3 signals	Present the objects and the picture book. Encourage the child to name an object or picture. Ask questions, record the individual's gestures during the interaction. Encourage the individual to use longer expressions when responding to the examiner or initiating conversation. Record the signal combinations which the child produces.	Attend to the child's eye movements, head movement, and / or finger movements during the interaction. If the child combines three signals spontaneously without a model or prompt from the examiner, at least once during the testing then a score of 1 is given

Note: Score '1' - child demonstrates a particular behavior
Score "0" - child does not demonstrate a particular behavior

		Spontaneously combines nouns with verbs	Present the picture book (page VIII and IX). Encourage the child to describe what is in each picture.	If the child combines a noun like signal with a verb like signal (action), at least once during the testing then a score of 1 is given.
		Spontaneously combines nouns and adjectives	Present picture book (page XII, XIII and XIV) and Encourage the child to describe each picture. Prompt the child by asking questions which require that the child be descriptive when responding, like, ask questions on colors, size, sensation and feelings.	If the child combines two signal sequence combining a noun like signal with an adjective like signal then the response is scored as 1.
<i>Expression of pronouns and possessions</i>	<i>Signals 3-5 personal pronouns correctly</i>	<i>Present pictures in the picture book (page V and VI). And encourage the child to tell what each picture is depicting. E.g Whose book is this? What is the boy saying? Etc.</i>	<i>If the child signals or uses three different personal pronouns correctly when responding to the examiner then a score of 1 is given</i>	
	Combines signals to express possession	Present pictures (page V) like man holding a book, and ask the child questions like whose book is this? etc.	If the child signals possession a score of 1 is given.	

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

<i>Expression of prepositions, quantifier and demonstrators</i>	<i>Signals 3 prepositions correctly</i>	<i>Present pictures (page VI and VII) or set models like placing the book on the table, or placing the doll at various positions. Encourage the child to tell you where the ball is in each instance or in each picture. Adapt the task if necessary for non speakers i.e. demonstrate with your hands or with the objects, models which match the preposition depicted in each picture.</i>	<i>If the child signals at least three prepositions correctly then a score of 1 is given</i>
	Uses quantifiers or demonstrator	Interact with the child, ask which picture she/ he likes, wants and so forth. Present pictures (page XIV) indicating more or less. Ask the child which picture has more blocks. And ask how many blocks are there. Encourage child to use signals for 'no' more', this', 'that' etc..	If the child signals quantifiers or demonstrators correctly then a score of 1 is given
	<i>Ask questions</i>	Spontaneously ask Wh- questions	Spontaneous conversation between the examiner and the child.

[Note: The items in the italicized font were eliminated in the TACC-K post standardization].

Note: Score '1' - child demonstrates a particular behavior
Score '0' - child does not demonstrate a particular behavior

APPENDIX D

LIST OF VOCABULARY REPRESENTED IN PICTURE BOOK

Page Nos.	Vocabulary Representation	
1	Ball	Book
2	Dog	Baby
3.	Eyes	Nose
	Ears	Mouth
4	Bottle	Television
	Telephone	Toilet
5.	His book	Her book
	You	Me
6.	He	She
	In	Out
7.	Tables	Between
	Under	On
8.	Sleeping	Going (Drawing)
	Reading	Playing
9.	Eating	Drinking
	Washing (Sitting)	Coming (Standing)
10.	For sitting	For drinking
	For brushing	For sleeping
11.	For combing	For eating
	One block	Four block
12.	Big ball	Small ball
	Big block	Small block
13.	Sad	Happy
	Dry (hot)	Wet (cold)
14.	Shoes	Shoe
	Pens	Pen
15.	Brushed (Combed)	Brushing (Combing)
	Brush (Comb)	Will brush (Will comb)
16.	Kicked (Climbed)	Kicking (Climbing)
	Ball (Stairs)	Will kick (will climb)
17.	Four	One
	Three	five

[Note: Words in bold fonts represent the items which were substituted or modified in TACC-K]

modified items used in TACC-K are denoted in parentheses

APPENDIX E

LIST OF OBJECTS IN NSTREL

S. No.	Objects
1	Baby
2	Squeaky toy
3	Telephone
4	Ball
5	Bell
6	Maraca
7	Book
8	Car
9	Blocks(4)

[Note: Words in bold fonts represents the item which was substituted or modified in TACC-K]

APPENDIX F

RESPONSE FORM FOR RECEPTIVE SCALE NON SPEECH RECEPTIVE SCALE

		BEHAVIOR	SCORING		REMARKS OR OBSERVATION
			0	1	
PRE - RECEPTIVE	General awareness	Changes behavior as examiner approaches			
		Changes behavior as examiner speaks			
		Glances momentarily towards sound source			
	Localization and searching behavior	Attends, listens momentarily to sound source			
		Attends, looks momentarily at visual stimulation			
		Looks at, attends to examiner's face			
		Turns head towards sound source			
		Searches for sound source			
	Attention and maintenance of eye contact	Maintains eye contact			
		Localizes attends looks at sound source with accuracy			
EARLY RECEPTIVE	Responds to stimuli	Smiles as the examiner speaks			
		Responds inconsistently to own name			
		Changes reactions to different intonation patterns			
		Changes response to 1 to 3 spoken words			
		Changes response to 1 to 3 spoken names			

Note: score of T - child demonstrates a particular behavior
Score of '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

		Responds consistently to own name			
Attention and appropriateness of play behavior		Attends to, shows interest in objects for 30 seconds			
		Attends to, shows interest in pictures for 30 seconds			
		Attends to conversation of examiner for one minute			
		Plays with, manipulates objects appropriately for one minute			
		Attends to naming of pictures for more than one minute			
Follows commands		Reacts inconsistently to 'no'			
		Gestures to 1 -3 actions plus verbal requests			
		Responds consistently to 'No'			
		Follows 1-3 verbal plus gesture requests			
		Follows 1-3 verbal commands without gestures			
Identification of objects and pictures		Identifies 1-3 objects named			
		Identifies 3-5 objects named from a response set of two			
		Identifies 1 -3 pictures named from a response set of two			
		Identifies one body part			
		Identifies 3-5 objects named from a response set of four			

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

RECEPTIVE	Questions	Responds appropriately to 1 -3 questions				
		Responds appropriately to 3 or more simple questions				
	Identification of pictures	Actions	Identifies 3-5 pictures named from a response set of four			
			Identifies 3-5 body parts			
		Identification of pictures	Identifies 6-10 pictures named from a response set of four			
			Identifies 10 to 20 pictures named from a response set of four			
			Identifies the function of 5-7 objects			
	Identification of pronoun and possessives	Identifies distinction between 3-5 personal pronouns				
		Demonstrates understanding of possessives				
	Reception of number concept and plurals	Demonstrates understanding of concept of "one"				
		Demonstrates understanding of plural forms				
	Reception of concept of size and adjectives	Demonstrates understanding of concept "size"				
		Demonstrates understanding of 5-7 adjectives				
	Identification of actions and prepositions	Identifies 3 prepositions				
		Identifies 5-7 actions in pictures from a response set of four				

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

NON SPEECH RECEPTIVE SCALE

Follows commands in sequence	Understanding of verb tense	Demonstrates understanding of verb tense			
	Follows commands in sequence	Follows 3 or more verbal directions			
		Follows two simple commands in sequence			
		Follows three simple commands in sequence			

Note: score of '1' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

APPENDIX F (2)
RESPONSE FORM FOR EXPRESSIVE SCALE

NON SPEECH EXPRESSIVE SCALE

		BEHAVIOR	SCORING		REMARKS / OBSERVATION	
			0	1		
PRE-EXPRESSIVE	<i>izations</i>	Vocalizes vowel like sound/sounds				
		Vocalizes playfully				
	<i>Babbling</i>	Babbles same sound repeatedly				
EARLY EXPRESSIVE	<i>Responds to stimuli</i>	Vocalizes sometimes at sound source				
		Smiling during play				
		Expresses feelings differentially				
		Babbles same syllables repeatedly				
		Stops vocalizing in response to sound momentarily				
	<i>Responds to stimuli</i>	Vocalizes directly at the examiner or the object				
		Responds appropriately to 1-3 verbal requests				
	<i>Participation in vocal play</i>	Participates in vocal play with sounds in own repertoire				
	<i>onsonar pro</i>	<i>liable</i>	Vocalizes 2 or 3 consonant like sounds			
			Babbles 2 or more different syllables in series			
		Vocalizes word like syllables				
		Vocalizes 3 or more consonant like sounds				

Note: score of '1' - child demonstrates a particular behavior
Score of '0' - child does not demonstrate a particular behavior

NON SPEECH EXPRESSIVE SCALE

		Vocalizes longer expression			
	<i>Gestures</i>	Participates in gesture games prompted by the examiner			
		Uses 1 to 3 simple gestures in response to examiner			
	<i>Imitation</i>	Imitates sounds and gestures in own repertoire			
		Imitates new behaviors/ signals			
EXPRESSIVE	<i>Meaningful signals</i>	Uses 1-3 signals meaningfully			
		Signals 1-3 object names			
		Uses 3-7 signals meaningfully			
		Uses 7 - 12 signals meaningfully			
		Signals 3-5 familiar object names			
		Uses 12 - 20 signals meaningfully			
		Signals 3 -5 picture names			
		Signals 3 body parts			
		Uses 20 -30 signals meaningfully			
		Expresses own name upon request			
		Signals 5-10 picture names			
		Uses 30 -50 signals meaningfully			
		Signals 20 or more picture names			

Note: score of 'V' - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior

NON SPEECH EXPRESSIVE SCALE

<i>Initiation of interaction and description</i>	Initiates at least one communicative interaction with the examiner			
	Spontaneously signals 1 to 3 desires to the examiner			
	Describes experiences using 2 or 3 signal combination			
<i>Answering questions</i>	Answers 1 to 3 simple questions non verbally			
	Answers yes or no questions consistently			
	Answers Wh questions of physical needs			
<i>Imitation of signal sequences</i>	Imitates 3 -5 two signal combinations			
	Repeats 3 digits in sequence			
<i>Combination of signals</i>	Spontaneously combines 2 signals			
	Spontaneously combines 3 signals			
	Spontaneously combines nouns with verbs			
	Spontaneously combines nouns and adjectives			
<i>Expression of pronouns and possessions</i>	Signals 3 – 5 personal pronouns correctly			
	Combines signals to express possession			
<i>Expression of prepositions, quantifier</i>	Signals 3 prepositions correctly			
	Uses quantifiers or demonstrator			
<i>Ask questions</i>	Spontaneously ask Wh-questions			

Note: score of T - child demonstrates a particular behavior
 Score of '0' - child does not demonstrate a particular behavior