

**COMPREHENSIVE LANGUAGE ASSESSMENT TOOL  
FOR CHILDREN (3- 6 YEARS)**

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**May 2009**

## *Certificate*

This is to certify that this dissertation entitled “**Comprehensive Language Assessment Tool for Children (3-6 years)**” is a bonafide work in part fulfillment for the degree of Master of Science (Speech- Language Pathology) of the student Registration No. 07SLP011. 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***

This Dissertation entitled “**Comprehensive Language Assessment Tool for Children (3-6 years)**” is the result of my own study and has not been submitted earlier to any other university for the award of any other diploma or degree.

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## CHAPTER I

### INTRODUCTION

Communication is an essential aspect of human beings. All living creatures communicate for various reasons. If they do it to satisfy their own needs it is called 'instrumental communication'. If it is meant to control others behavior, it is "regulatory" communication, to greet others, it is "interactive" communication, to convey information, it is termed as "informative" communication, and if it is meant to become aware of one's own self, it is called "intra-personal" communication (Halliday, 1975). Thus communication between two or more individuals can occur in different modalities such as using visual mode, auditory mode, touch, speech etc.

Language is unique to man especially in the form of speech. Language is the primary means people use to express ideas, learn new information, and establish and maintain social relationships. Language starts developing from birth through several years of life. The speech of the child changes with different stages of language acquisition. Child's expression through speech serves as one of the important avenue for language testing. The developmental process of language has been called as "mysterious" (Gleitman & Wanner, 1982) and "magic" (Bloom, 1983). The development of speech and language in particular is a dynamic constructive process (Thelen, 2005)

Cognition consists of mental activities involved in comprehension of perceived information, including acquisition, organization and storage, memory and use of knowledge. Cognition has historically been considered the base upon which the language develops. Cognition constitutes the foundations or underpinning for language (Bloom &

Lahey, 1978; Muma, 1978). Thus there is an intricate relationship between cognition and language, especially the cognitive processes like attention, memory and organization are important for comprehending and producing language (American Speech Language Hearing Association, 1987).

Language develops in connection with other functions. According to Piaget (1969), language is merely one particular instance of the semiotic or symbolic function, which includes imitation with a time lag, a system of gestural symbols, symbolic play, mental imagery, written or drawn picture, etc. A look into the literature suggests that symbolic play, cognition and language development tend to proceed in parallel and there is an association between the three (Bates, Benigni, Camaioni & Volterra, 1979; McCune-Nicolich, 1981; Ogura, 1991; Lyytenin & Laakso, 1997). Vygotsky placed great importance on the role of language in development and posited that a crucial and formative period in ontogenesis occurs in early childhood when children begin to use language not only for communication with others but also as a tool for thought and the self regulation of behavior (Berk & Winsler, 1995). With the internalization of language, cognitive processes are restructured and reorganized, the mind becomes mediated by language, and uniquely human, higher-order psychological functioning becomes possible (Vygotsky, 1978).

The optimal method for assessing language in infants and toddlers for both research and clinical purposes remains a matter of intense debate. A test is basically a tool available to the clinician for sampling some of the child's behavior in terms of the different dimensions. Assessment procedure reflects a clinician's definition of language (Craig, 1983). The traditional mode of language assessment has emphasized the use of

norm referenced test as a means of problem identification. Descriptive assessment methods, which are drawn from contemporary child language research, facilitate an individualistic sample of a child's communicative functioning. Although descriptive assessment methods are readily available, there continues to be a heavy emphasis on the use of norm referenced tests to assess the language functioning of language-impaired children (Craig, 1983; Muma, 1983).

Standardized clinical or laboratory assessments have the advantage of being based on observable behavior. However, such assessments must be brief to be administered within the attention span of the young child and therefore are likely to prove unrepresentative of the child's abilities. Moreover, young children may have difficulty cooperating for formal measures administered by strangers in unfamiliar clinical settings. Alternatively, language samples recorded in conversation with an examiner or a parent may be highly influenced by personality and social factors and are difficult and time consuming to analyze. For these reasons, parent reports of language and communication are an appealing option because parents have extensive experience with their children under a wide variety of naturalistic situations.

There are a number of sensitive English-language screening instruments, which use language milestones to identify children with language problems. Language milestones are appropriate indicators for detecting language problems (Hall, 1997; Stormswold, 2000). Therefore, several language and cognitive milestones from different language and cognitive tests which are suitable for Indian children were collected to create a new test for assessing language and cognitive development in preschool children from three to six years of age.

Thus, the comprehensive language assessment tool for children was designed to overcome some of the difficulties inherent in testing young children. The test is in the form of questionnaire which was answered by the parents of the children tested, in an interview with the clinician. The information about the child's language behavior was collected from the parents.

### **Need for the study**

As early as 1836, the researchers pointed out that the individual's use of language provides the most dependable criterion of his intellectual level and that it is useful in classifying the different degrees of retardation. The preschool period is one of rapid lexical and relational concept acquisition. It is estimated that a child adds approximately five words to his or her lexicon everyday between the ages of 1.6 and 5 years where as the development during the school age is reported to be slow.

A number of tests have been developed to assess the language skills of preschool and school going children in Indian context but it is very detailed and more time consuming. Many studies available in India have focused on language acquisition (Roopa, 1980; Sudha, 1981; Madhuri, 1982; Vijayalakshmi, 1981; Rukmini, 1994; Santhi, 2008) etc.

None of the Indian tests under consideration assess all the levels of the language at a time. Majority of the tests concentrate on assessing the syntactic knowledge, phonology or semantic especially in higher age groups. There are few assessment tools available for children with higher age in Indian context, but they are very restricted and



more time consuming. So there arises a need for quick and comprehensive standardized test for different age group of preschool going children.

There is a dearth of tests available for assessing the acquisition of language and cognitive abilities of the growing children especially as screening tools in the Indian context to predict the age of their performance particularly in for difficult to test population. For these reasons, the Comprehensive Language Assessment Tool for children was developed.

### **Aims of the study**

- To develop assessment tool for children in the age range of 3- 6 years for testing their language and cognitive abilities.
- To standardize the assessment tool on Indian population and to obtain normative data for the same.

## CHAPTER II

### REVIEW OF LITERATURE

*“Thought is the blossom; language the bud; action the fruit behind it” (Emerson, 1882).*

Only the human species has devised an elaborate system of shared symbols and procedures for combining them into meaningful units. Language has been defined in various ways. Language is a socially shared code or conventional system for representing concepts through the use of arbitrary symbols and rule governed combinations of these symbols (Owens, 1996).

ASHA (1983) incorporates in its definition of languages three major components such as form, content and use. According to ASHA (1983), language is a “complex and dynamic system of conventional symbols that is used in various modes for thought and communication”. Contemporary views of human language hold that (a) language evolves within specific historical, social and cultural contexts, (b) language as rule governed behavior is described by at least five parameters – phonologic, morphologic, syntactic, semantic and pragmatic, (c) language learning and use are determined by interaction of biological, cognitive, psychological and environmental factors, and (d) effective use of language for communication requires a broad understanding of human interaction including such associated factors as non – verbal cues, motivation and socio- cultural roles.

The language components are phonology, morphology, syntax, semantic and pragmatics. Phonology concerns the regularities and rules governing pronunciation of words, phrases, and sentences (Goodluck, 1991). Morphology is the study of morphemes,

which can be described as the smallest segments of speech that carries meaning (Goodluck, 1991; Mathews, 1991). Syntax refers to the order of arrangement of word which reveals a meaningful relationship within and between sentences. This is where the most important grammatical relationships are expressed (Crystal, 1987).

Semantics the study of meaning in language (Bohannon & Leubecker, 1985; Crystal, 1987). Contemporary linguistic theories of semantics have been influenced by the thinking of philosophers, logicians and cognitive psychologists (Goodluck, 1991; Crystal, 1987; Johnson-Laird, 1988). The semantist argue that semantics is primary and syntax secondary; that semantic determine syntactic representations.

Pragmatics is the study of use of language (Bates, 1978; Bloom & Lahey, 1978; Crystal, 1987). A number of pragmatic behaviors have been identified in the communicative interactions of young children and for eg, requesting, showing off, labeling, repeating, negating and so on. (Thompson, Biro, Vethivelu, Pions & Hatfield, 1987). There is also overlap between pragmatic and areas such as psycholinguistics and discourse analysis (Crystal, 1987). The analysis of conversations is within the purview of both pragmatics and discourse analysis.

Language acquisition takes place in different stages. It is explained differently by different approaches. Knowledge of language acquisition is essential to differentiate normal from deviant language. It helps in language testing and in planning therapy.

Skinner (1957) describes language as a verbal behavior. It's a learned behavior like any other, subject to all the rules of operant conditioning. Language can be modified

by the environment. A child acquires language or verbal behavior when parents provide modeling and reinforcement and, as a result, establish the child's repertoire of sounds.

Chomsky's (1957), a nativist perspective proposed a language acquisition device (LAD) containing a universal grammatical grammar, or storehouse of rules that apply to all language. The LAD permitted children, as soon as they had sufficient vocabulary, to speak grammatically and comprehend sentences in any language to which they are exposed. The major element of these theories is that the child's learning language is very much like a small linguist working in the field (Mc Neil, 1970). Linguist's theories argue that because this process is accomplished with such relative ease at a time when seem unable to use sophisticated inductive reasoning for other purposes, some aspects of grammar must be pre programmed. Mc Neil (1970) held that children come equipped with such innate linguistics universals as concepts of sentences, grammatical classes and some aspect of phonology constraints on language acquisition.

Slobin (1973) proposed that children function with a special set of 'operating principles' which helps them to do some things such as to pay attention to the end of the words (allowing children to acquire inflectional morpheme), recognize the linguistic elements and code the relationship between words, ways they relate sentences, analyzing the utterance, comprehend smaller units and construct a unique sentence by selecting and rearranging pieces and prefer to work with principle of maximum generalizabilty thus allowing children to induce the rules but also leading them to produce such errors of over generalization.

Chomsky (1995) attempted to formulate a theory of language to account for all and all well formed acceptable sentence and the mental machinery necessary to form & comprehend these sentences and to make judgments of acceptability. The results, called the government binding theory attempts to describe the way in which the human mind represents the autonomous system of language. Therefore, a theory that accounts for great diversity of human languages and that can explain the development of grammars by children on the basis of limited input was formulated (Leonard, 1988).

Interactionist theories stressed that innate ability, a strong desire to interact with others, and a rich language and social environment combine to promote language development. But debate continues over the precise nature of children's innate abilities. In reality, cognition and social experiences may be operating in different balances for each component of language. Because genetic and environmental contributions vary across children, the Interactionist perspective predicts individual differences in language learning (Chapman, 2000).

Language acquisition is one of the central topics in cognitive science. Every theory of cognition has tried to explain it; probably no other topic has aroused such controversy. Possessing a language is the quintessentially human trait: all normal humans speak, no nonhuman animal does.

## **Language and Cognition**

Cognition in simple words can be described as understanding of our experiences through mental processes such as perception, recall, and reasoning, and it provides an

important element for the development of language. The cognitive theory of language acquisition emphasizes the sequence and rate of cognitive development as influencing the rate of language development.

Cognition refers to all the mental processes by which information is transformed, reduced, elaborated, stored, recovered and used (Neisser, 1997). Cognition involves a wide range of mental processes such as attention, pattern recognition, memory, organization of knowledge, language, reasoning, problem solving, classification, concept and categorization (Best, 1999).

Piaget's theory has emphasized the importance of the developing cognitive abilities of the child (Piaget, 1969). In Piaget's view, language is dependent on and shaped by underlying cognitive structures, and it reflects the thought processes made possible by those structures at different stages of development. Chomsky (1957) described language on the psychological perspective of a language user's ability to produce and comprehend language. By the nature of cognitive hypothesis, language development is rooted in early cognitive development, prior to the appearance of the first word. A particular level of cognitive achievement is necessary before language can be used expressively.

Whorf (1956) mentioned, in his "Linguistic Determinism," that "Every language has its own structural properties such as lexical, syntactic, etc. These structural properties can determine our perception of the real world. According to his theory, people being raised in different cultures with a different language being spoken in each culture, can have a different perception even about the same phenomena.

Bowerman (1974) proposed that there are several cognitive factors that must be present for a child to acquire language which would include ability to represent objects and events not perceptually present, ability to derive linguistic –processing strategies from general cognitive structures and processes and ability to formulate concepts and strategies to serve as structural components for the linguistic rules.

Vygotsky (1978) claimed that linguistic growths are facilitated by cognitive development. A child's development of language is dependent upon his knowledge of concepts, which in turn is dependent upon his level of cognitive development. As a result, there is a positive correlation between the degree of retardation and the level of language development in the retarded child. The correlation is found to be higher in the less severely retarded child, with the language deficit becoming greater as the degree of retardation increases (Karin & Strazzula, 1952).

The view of language as something that transforms all human cognitive processes dates back as early as the 1930s, with the work of Russian scholar Lev Vygotsky (Vygotsky, 1978). According to Vygotsky, the most important moment in child development is that in which the child begins to use language not only as a social communication system but also as a tool for controlling her own actions and cognitive processes. When the child is challenged by a particularly difficult task he/she is often given help by an adult or a more skilled peer, and this help typically takes a linguistic form. Later on, when the child is facing the same or a similar task all alone, he/she can rehearse the social linguistic aid which helped them to succeed in the problem. This is called 'private speech', which, according to Vygotsky, plays a fundamental role in the development of all human psychological processes.

The cognitive grammar model by Johnson-Laird (1983) would assume that language is neither self-contained nor describable without an essential reference to cognitive processing. Grammatical structures do not constitute an autonomous formal system. They are claimed instead to be inherently symbolic, providing for the structuring and conventional symbolization of conceptual content. Lexicon, morphology, and syntax form a continuum of symbolic units, divided only arbitrarily into separate components.

Recently, the idea of language as a cognitive tool has been given increasing attention within the cognitive-science-oriented philosophy of mind (Carruthers and Boucher, 1998). Dennett (1993 & 1995) has argued that the human mind, including its most striking and hard to explain property, namely consciousness, depends mostly not on innate cognitive abilities, but on the way human plastic brains are substantially “re-programmed” by cultural input coming, principally, through language. "Conscious human minds are more-or-less serial virtual machines implemented inefficiently on the parallel hardware that evolution has provided for us" (Dennett, 1995).

Clark (1997, 2006) has further developed these Dennettian ideas by providing several arguments about how animal-like, embodied, situated, and sub-symbolic cognitive processes can be augmented by the learning and use of linguistic signs. According to Clark, language is not only a communication system, but also a kind of "external artifact whose current adaptive value is partially constituted by its role in re-shaping the kinds of computational space that our biological brains must negotiate in order to solve certain types of problems, or to carry out certain complex problems" (Clark, 1997). Apart of the interesting philosophical ideas of Dennett and Clark, the Vygotskian view of language as a cognitive tool has recently been raising increasing



interest also in empirical cognitive science (Gentner & Goldin-Meadow, 2003). Indeed, a growing body of empirical evidence demonstrates the importance of language for a number of cognitive functions including learning (Nazzi & Gopnik, 2001), memory (Gruber & Goschke, 2004), analogy making (Gentner & Goldin-Meadow 2003), cross-modal information exchange (Spelke 2003), problem solving (Diaz & Berk, 1992), abstract reasoning (Thompson et al., 1997).

Cognitivists argue that individuals do not just react to or perform in the world; they possess minds, and these minds contain mental representations images, schemes, pictures, frames, languages and ideas. Some of the mental representations that individuals are born with or form at an early age prove enduring, but many other representations are created, transformed, or dissolved over time as the result of experiences and reflections upon those experiences. The mind, like a computer, processes and transforms information, and it is vital to understand the nature of this computing machinery or, perhaps more aptly, these types of computing machinery. If we believe that the mind is neither singular nor revealed in a single language of representation, our use of technologies should reflect that understanding (Gentner & Goldin-Meadow, 2003).

### **Language and Cognitive development**

The study of cognitive development, especially in preschool-age children has been one of the central focuses of developmental research over the last 25 years. There is an enormous research literature, with thousands of studies investigating cognitive change from scores of specific perspectives. Stages of Cognitive Development as identified by Piaget (1969) would include four stages in cognitive development which are as follows:

1. Sensorimotor stage (Birth till 2 years): In this period (which has 6 stages), intelligence is demonstrated through motor activity without the use of symbols. Knowledge of the world is limited (but developing) because it's based on physical interactions or experiences. Children acquire object permanence at about 7 months of age (memory). Physical development (mobility) allows the child to begin developing new intellectual abilities. Some symbolic (language) abilities are developed at the end of this stage.
2. Pre-operational stage (2-7 years): It has two sub stages. In this period intelligence is demonstrated through the use of symbols, language use matures, and memory and imagination are developed, but thinking is done in a nonlogical and a nonreversible manner. Egocentric thinking predominates in this period.
3. Concrete operational stage (7-11 years): This stage is characterized by 7 types of conservation such as number, length, liquid, mass, weight, area and volume. Intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects. Egocentric thought diminishes where as operational thinking develops (mental actions that are reversible) in the concrete operational stage.
4. Formal operational stage (11 years onwards): In this stage, intelligence is demonstrated through the logical use of symbols related to abstract concepts. Early in the period there is a return to egocentric thought. Only 35% of high school graduates in industrialized countries obtain formal operations; many people do not think formally during adulthood.

Shared understanding is such a critical factor because normal language development 'is a comprehension driven process that involves much more than the learning of syntactic patterns (Macnamara, 1972; Nelson, 1973), even though it is sometimes discussed as a pure exercise in pattern' learning (Kiss, 1972). Comprehension involves both isolating new patterns and making sense of them by finding a way to articulate them with what is already understood (Clark, 1997). In guided reinvention the child and adult share an understanding of their joint situation, and the adult's speech takes that understanding as a point of departure while heeding developmental and contextual constraints. As a result of this support, the child stands a good chance of being able to comprehend the adult's utterance the first time he or she hears it, even when it contains novel components (Clark, 1997).

Child language researchers working within the usage-based approach claim that language development involves the segmentation of units from the input rather than the activation of pre-given linguistic knowledge (Tomasello 2000, 2003; Lieven et. al. 1997; Theakston et. al. 2003). This claim brings with it a host of issues pertaining to the types of units segmented by the child and how the units are represented in a child's linguistic system. A number of researchers over the years have suggested that the early stages of linguistic development are function-based (Bates, 1976; Bloom, 1970; Dore, 1975; Halliday, 1975; Ninio and Bruner, 1978; Snow 1979; Ninio, 1992) and thus it would appear logical to suggest that the units segmented and used by young children reflect form-function mappings in their ambient language.

An important characteristic of human language, which distinguishes it from the communication systems of other animals, is that human language is used not only for

communicating with others but also for communicating with oneself. Indeed, the use of language for oneself starts as soon as language is acquired, and represents a significant proportion of the child's linguistic production. Empirical studies demonstrate that 3 to 10 year old children use language for themselves for about 20-60% of the time (Berk, 1995). Using language as a cognitive tool may have had a fundamental impact not only on categorization and memory. Research done on neural network simulations has shown that language can improve the learning of categories (Schyns, 1991).

Language is a developmental process in the sense that there is progressive emergence or learning of the structures of language. Children learn language effortlessly and at their own pace. From birth onwards the child begins to experiment with the sounds of language. The development of language is a progression from signal to symbol. A signal is an object or action that elicits an action in which there is no differentiation between action and its content (Thirumalai, 1977).

At around 12–18 months of age, children embark on learning the language of their community, whether this turns out to be Korean, English, Hindi, French etc. Languages differ in how they represent experience, so the language children learn will affect how they talk about objects and events. Some languages offer more terms than others for particular domains. Some indicate whether information comes directly from the observer or through hearsay. Some assign every noun a gender (masculine, feminine or neuter), and might also assign cases to nouns to mark grammatical roles (e.g. agent, location, instrument) and speakers of different languages learn different sets of grammatical elements that must be used in every utterance.

Children get their information about language from their caretakers and the adults around them. Infants are remarkably sensitive to statistical regularities they hear in language, in sound patterns, grammatical inflections on words, patterns for coining new words, and constructions in adult speech. They tend to pick up on the most frequent nouns, verbs and adjectives first, and then extend their range. In doing this, they depend on social interaction. They attend to what is in the joint focus of attention for adult and child, to what is physically and conversationally present, and hence to the language directed to them as addressees.(Owens, 2005).

Indeed, social interaction is essential to the process of acquisition .At the same time, people can identify, sort, and remember objects and events without using language and the sorting they do without language does not always match what they do in response to language. This suggests people must set up multiple representations of experience, representations based not only on representations linked to specific languages for encoding experience, but also on their cognitive development, for categorization, identification, sorting and remembering.

Children's earliest conceptual representations of objects, relations and events provide a general underpinning for linguistic categories and are one source for universals in language. First, humans represent experiences gathered from perceptual input, along with information from inferences in context. In the first 12 months, infants start to organize what they know about entities and events before they gain access to the representational properties of language. But as they start to learn particular languages, their paths diverge. Languages differs selective, schematic maps of the events talked about. That is, the grammatical and lexical options available in any one language do not

express every detail of the conceptual categories available. Words draw attention to some elements and leave others aside, with a different selection available for each language.

Children with normal language development begin to acquire language at approximately their first birthday. Most surprising is the rate at which new words are acquired. Children begin to produce single words at around 12 months. At approximately 18 months, they undergo a vocabulary spurt, during which their existing lexicon of roughly 50 words increases dramatically. It is also during the latter stages of their second year that children graduate to using basic word combinations. Naturally, these multiword utterances increase in complexity as their understanding of the semantic and syntactic structure of language develops. Five stages in language development given by Brown (1973) are depicted below in table 1

Table 1:

Five stages in language development according to Brown (1973).

Stage	MLU range	Description
	1.00	One word stage: Single words with no grammatical knowledge
I	1.00-1.99 early 1.00-1.49 late 1.50-1.99	Semantic roles and syntactic relations: Thematic roles: agent, patient Word order as first acquisition.
II	2.00-2.49	Inflections, function words
III	2.50-2.99	Modals in simple sentences. Auxiliaries
IV	3.00-3.99	Embedding, indirect questions, relative clauses.

V	4.00 and up	Coordination, resultatives.
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From 2 to 5 years of age, preschoolers explore more, interact with a greater variety of people, and experience their world extensively. These intermingled developments are reflected in preschoolers' language. During the preschool years, preschoolers' language learning accelerates across several dimensions. They communicate in an expanding array of settings and situations, but only gradually come to understand the nuances of doing so completely. Preschoolers will learn to manage the flow of conversations better and to consider their listeners' abilities and knowledge. They will become increasingly sophisticated storytellers. Preschoolers will begin the process of understanding the range of meanings represented by the array of words they are learning. (Cited in Owens, 2005)

By 3.6 years of age, a majority of preschooler' utterances are on the topic established in their partner's previous utterance (Bloom, 1978). Furthermore, with additional experience, many 5 years –olds can maintain a topic for 10 or more turns. The most basic form of stories develops in preschoolers after 2 years of age and occurs frequently by the time they are 3.6 years of age. Most often than not, preschoolers' earliest stories deal briefly and simply with some recent event that made a strong impression on them. The earliest stories have been called "protonarrative" (Miller & Sperry, 1988) or "prenarratives" (Westby, 1990).

The protonarrative emerges around 3 years of age which is called as 'sequences' or 'chaining' where the preschoolers' produces a collection of story elements just as in

heaps (an early form of children narrative in which unrelated elements are told in unorganized collections) and the primitive narrative or centering emerges around 4 years of age. Like sequencing, primitive narratives also generally have an identifiable theme that provides some overall organization. However, whereas the elements in sequence stories resemble each other in some perceptual ways, the elements in primitive narratives are connected to the core topic in a conceptual manner. Although preschoolers telling primitive narratives do see the relationship between circumstances and inner states, they do not yet fully understand cause- effect relationships (Westby, 1990).

Semantics, the study of meaning, takes into account individual meanings of words, or their lexical meaning. It also encompasses the relationships between words, their semantic roles. Preschool children will evidence significant developments in both of these dimensions.

Preschoolers' semantic development is closely coupled with developments in motor, social, and cognitive abilities. The interrelationships among these domains should be apparent. The growth of preschoolers' vocabularies is nothing short of striking. From 18 to 24 months, toddlers' expressive vocabularies expand from 50 to 200- 300 words. By end of the next years, 3 years old preschoolers' vocabularies will triple to 900- 1,000 words. By the time they head for kinder garden, usually at 5 years of age, their vocabularies will more than double to 2,100 – 2, 200 words ( Owens, 2005).

By about 4 or 5 years of age, preschoolers can name blue, green, yellow, and red. This however, seems to represent only a basic connection between the concept of colors and their names. Naming subtle color differences with different names will be acquired



later. Girls will tend to surpass boys in this proceed and, as always, there will be individual differences in the rate of mastery (Bornstein, 1985).

Spatial words indicate the location of a referent, typically in relation to some item. Spatial words can refer to relationships that are quite simple. For example, the spatial relation *in* is pretty obvious when a container is involved. The other hand, some relationships are more complex. Whether something is *in front of* another item may depend on the speaker's point of view or whether the item has an identifiable front, as an automobile does, for example. Children generally begin to comprehend spatial words before they use them expressively. However, they will continue to rely on the caregiver's gestures for additional cues for some time. By 4 years of age, most children have mastered the meanings of *in*, *inside*, *on*, and *under* (Clark, 1980). By the time preschoolers approach 5 years of age, they have generally mastered most spatial relations (Cox & Richardson, 1985).

Temporal word refers to how events are related in time is more abstract relationship. Children's ability to understand how event relate to each other in time develops slowly. Young preschoolers' limited cognitive abilities and experiences cause them to tend to live in the 'here' and 'now' they have yet to develop clear concepts for relating what has come before or what will happen later, after their present experience. Research suggests that children only begin to use temporal words for time relations that they have begun to understand (Cromer, 1981). Temporal words address three basic time relationships between events. All events, no matter how brief, evidence duration. Events that follow other events illustrate order or sequence. And events that occur at the same point in time represent simultaneity. Preschoolers tend to first master words used to

indicate order, such as *after* and *before*. Generally, words indicating duration, such as *since* and *until*, are mastered later. And, finally, terms that indicate simultaneously occurring events, such as *while* and *at the same time*, are understood by the time the child reaches 5 years of age. This overall order has been viewed by some as fitting with children's cognitive development as described by Piaget.

Even before Brown's study was published, a partial replication of his research was already underway. One of the limitations of Brown's longitudinal study was that it was based on observations of three children only. By contrast, de Villiers and de Villiers (1973) elicited spontaneous first language speech data from 21 children in a cross-sectional study and compared the accuracy order they obtained with the acquisition order found by Brown for his three subjects. In their study, de Villiers and de Villiers (1973) used Brown's 14 functions and his coding rules to identify obligatory contexts. Their analysis yielded results very similar to those of Brown (1973). The result of the study on the acquisition of grammatical word order by de Villiers and de Villiers (1973) is given in the below table 2.

Table 2:

Acquisition of grammatical word order (de Villiers and de Villiers, 1973).

Rank	Stage	Months	Morpheme
1	II	27-30	Present progressive ( <i>-ing</i> )
2	II	27-30	Preposition <i>in</i>
3	II	27-30	Preposition <i>on</i>

4	II	27-30	Plural (-s)
5	II	27-30	Past irregular ( <i>ate</i> )
6	III	31-34	Possessive (-'s)
7	III	31-34	Uncontractible copula ( <i>is, am, are</i> )
8	III-V	31-46	Articles ( <i>a, the</i> )
9	V	41-46	Past regular (-ed)
10	V	41-46	Third person singular (-s) (She bakes <u>es</u> cakes).
11	V	41-46	Third person irregular ex: He <i>has</i> come. She <i>does</i> , too
12	V	41-46	Uncontractible auxiliary ( <i>is, am, are</i> )
13	V	41-46	Contractible copula ex', Tommy's tall! They <i>are</i> all tall?
14	V	41-46	Contractible auxiliary (she's reading. They <i>are</i> reading).

In a study with 2-year-old children learning novel verbs, Olguin and Tomasello (1993) demonstrated that productivity with morphological syntactic marking of arguments was limited. Indeed, children at this age were non-productive, using the novel verb only in the form and the argument structure in which it was presented to them. Thus, lack of productivity in the spontaneous use of novel verbs suggested that children learned novel verbs on a lexically specific basis. In the case of children with normal language, this ability begins to develop by approximately 3.5 years (Leonard et al, 1999).

Olguin and Tomasello (1993) demonstrated that children aged 2 years cannot use word order as a syntactic cue in the interpretation of transitive sentences, whereas children age 3.6 years could. Reasonably, these studies suggest that children with normal language which is also supported by Akhtar and Tomasello (1997). Quigley et al (1974)

reported that by the age of eight years almost all the aspects of negation are acquired and they are stabilized by the age of ten years.

Wode (1977) proposed 4 early stages for the acquisition of negation where stage 1 include one word negation such as 'no', stage 2 include two or more word negation such as 'no more', stage 3 include anaphoric negation such as 'no, outside, no, I want to go outside' and nonanaphoric negation – 'no close I can't close the box' and stage 4 includes intrasentential negation such as 'I can't open it'.

The acquisition studies reported in India are mainly of the naturalistic descriptive type (Thirumalai, 1977; Sreedevi, 1976; Prema, 1979; Roopa, 1980). Prema (1979) reported that the structure of the negative sentences in 5-6 year old Kannada speaking children is similar to the adult form. Negative particles like /illa/, /alla/, /beda/ are used in adult form, but found forms are very few.

Roopa (1980) reported that the negative marker /nahi/ in hindi in the preverbal position of a sentence is indicative of negation in 4-5 year old hindi speaking children, but word negations were not found. Vijayalakshmi (1981) reported the occurrence of "illa" at 2-2.6 years, be:da at 3.6 years and markers "—kolde" and "—a:gde:iro:" at 4-4.6 years develop some knowledge of a general category of verb between 2.0 and 3.5 years of age.

The knowledge of the lexical semantic properties of verbs (e.g. verb alternation) is also critical in the development of a grammatical category of verb, albeit more indirectly. Knowing the lexical semantic properties (e.g. verb alternation, direction or location of action) of verbs directly contributes to the meaning of a verb (Naigles, 1990).

Logically, children must first appreciate particular qualities of the verb, such as how many arguments a verb requires for 'well-formedness' (Oetting, 1999), before they can develop an understanding of word order, or where these arguments should be placed around the verb (agent in preverbal position, patient in post-verbal position). Reasonably, then, an understanding of the lexical semantic property of verbs is a necessary precursor to children's understanding of the syntactic structures of English, such as word order.

Rukmini (1994) reported the performance of syntactic and semantic ability in children in the age range of 4 to 7 years. The result indicated that the children scores increased with increasing age. Children performed better in the reception tasks than on expression task. Also, they performed better on syntactic tasks than on semantic tasks.

### **Assessment of Speech, Language and Cognition**

At a general level, assessment involves forming impressions and making judgments about others. It carries an evaluative flavor while dealing with the whole person ( Fike & Pearson, 1970).The key element in assessment is the act of acquiring and analyzing information (Hammill,1987).The purpose of assessment varies from screening, identification, classification, placement and programming to certification and research (Venkatesan, 1991). The valid assessment of language is somewhat of an enigma for clinicians. Eventhough there are multitude of resources available still assessment of language continues to be one of the most challenging.

Normative approaches to assessment have historically evolved in the context of the need to screen, identify, isolate and diagnose low achieving children from others. To this effect, they help decide whether a given child is similar or different from other

children of his age or class. They help labeling children as ‘exceptional’, ‘special’, ‘sub-normal’, etc. The law and administration frequently require normative decisions to certify children for social or economic benefits (Mash and Terdall, 1976). Parent or caregivers also find it easy to understand normative comparisons of their children against age peers. Frequently telling parents that their child is in the lower 5 per cent of the general population with respect to an ability makes more sense than providing individual- based performance scores (Singh, 1986).

Owens (1999) recommended four sequential stages of assessment. Analysis of the findings at the completion of each stage determines the focus of assessment for the case history questionnaire and caregiver interviews, observation of the client in a variety of naturalistic settings, direct setting, including formal assessment and conversational language sampling. A number of tests have been developed to assess the language skills of children. Some of these tests are grouped, as under. Those tests which test a particular language skill are grouped together for e.g. tests testing the comprehension under “Comprehension Tests”, test testing expression are grouped together and so on. There are lists of few tests described below in both the western and Indian context.

### **1. Comprehension Tests:**

These tests aim to measure auditory comprehension of language; word classes and relations, grammatical morphemes and elaborated sentences constructions and to determine areas of receptive linguistic difficulties. These tests are efficient in testing children in age range 3 to 18+ years.

For eg. – Tests for Reception of grammar (Bishop, 1989).

**Test for Reception of Grammar (TROG):** It assesses children's understanding of grammatical contrasts in English and compares their comprehension of individual structures with that of their peers. It is a useful test in assessment of children with speech and language disorders, deafness, and severe / moderate learning difficulties and cerebral palsy and adults with acquired dysphasia. It aims to provide a profile pattern of errors.

Each test stimuli is presented in a four picture multiple-choice format with lexical and grammatical foils. The difficulty range has been increased to effectively tap into the receptive grammar of secondary aged school children and young adults. The administration of the test would take around 20 minutes. The scoring is given as correct and wrong response.

## 2. **Expression Tests:**

These tests obtain short sample of spoken language which may then be evaluated in terms of information given and the grammatical forms used. They usually tests children in the age range 3- 16 years.

For eg. - Test of Language Development (TOLD) (Hammill & Newcomer, 1997).

For eg. **Test of Language Development (TOLD) (Hammill & Newcomer, 1997).**

**Purpose:** The rationale for the Test of Language Development (TOLD) as reported by the authors serves four purposes: 1) to identify children who are significantly below their peers in language, 2) to determine children's specific strengths and weaknesses, 3) to document children's language progress as a consequence of special intervention programs and 4) to serve as a measurement device in research involving language behavior.

**Age range:** 4-8 years.

**Test design:** The Test of Language Development (TOLD) is an individually administered oral-response test that assesses the spoken language skills of children ages. The 170-item test involves a variety of activities including defining words, pronunciation, word/picture identification, and sentence imitation. It include seven subtests which cover the following areas: Picture Vocabulary (25 questions), Oral Vocabulary (20 questions), Grammatical Understanding (25 questions), Sentence Imitation (30 questions), Grammatical Completion (30 questions), Word Articulation (20 questions), and Word Discrimination (20 questions). The test is untimed but usually takes 40 to 60 minutes.

**Scoring:** The TOLD yields five different types of scores: raw scores, language ages, percentiles, standard scores, and quotients for composite scores. Results are reported in terms of standard scores, percentile rankings, age equivalents, and a language quotient. Subtest scores are combined to produce assessments in the following areas such as overall spoken language; listening (receptive language); speaking (expressive language); semantics (word meanings); and syntax (grammar).

### **3. Comprehension and Expression Tests:**

These tests provide a quantitative and qualitative analysis of a child's receptive and expressive language skills in order to distinguish normal and language impaired children, to indicate language problems and suggest possible approaches to remediation.

e.g - Receptive Expressive Emergent Language Scale (REEL): (Bzoch and League, 1971).



**The Receptive Expressive Emergent Language Scale (REELS) by Bzoch and League (1971).**

**Purpose:** Early differential diagnosis of major disorders affecting language development can be facilitated by the use of this scale. The scale also reveals any differences that may exist between the infants chronological age and his or her (1) Receptive language age (RLA) (2) Expressive language age (ELA) (3) Combined Language age (CLA).

**Age group:** 0 month to 36 months

**Test design:** The scale is an implicit of tri-dimensional model of linguistic behavior which emphasizes the process of receptive language, expressive language and inner language. Receptive language refers to the unified activity of all the sensory- neural and auditory- perceptual process that are involved in the decoding and understanding of oral language. Expressive language refers to all of the process and skills that are involved in the encoding of meaning into oral language for communicating with others. Inner language refers to the relationship between the concepts as experienced through the mediation of linguistic symbols by the central auditory recall and memory systems. The test takes around 30- 40 minutes if the child is co operative.

**Scoring:**

“+” – only when the informant indicates the behavior is typical.

“-“- only when the informant indicates the behavior is not observed.

“+/-“- only when the informant indicates the behavior is emergent or only partially exhibited.

**Advantage:**

- Identification of language delay at an early stage.
- Interview method, needs no child co operation.
- Time taken for administration of test is less
- Can be administered to different languages.

**Limitation:**

- Age range considered is less.
- Does not tell about different aspects of language.

**4. Phonology tests:**

These tests are used to elicit spontaneous and representative speech samples of the child's habitual speech patterns which may be used for screening/ assessment purposes. Most of these tests are used to assess children of any age.

For eg, - Edinburg Articulation Test (Anthony, Boagley, Ingram & Issac, 1971).

**Edinburg Articulation Test (Anthony, Boagley, Ingram & Issac, 1971)**

**Purpose:** The aim of the test is to present a balanced and comprehensive picture of the consonants and consonantal clusters occurring in the English at various positions in the word structures in monosyllabic, bisyllabic and few polysyllabic words.

**Age range:** 3-6 years

**Test Design:** The test is a sensitive and economic instrument which studies 9 context such word initial consonants, monosyllabic word final consonant, word initial consonant clusters, monosyllabic word final consonant clusters, medial consonantal clusters between accented vowels and unaccented vowels in bisyllabic vowel, final consonants following an unaccented vowel in disyllabic word, medial consonant and possible syllabic consonant in disyllabic words, medial consonant clusters between accented and unaccented vowel in a disyllabic word and consonants in possible bisyllabic words. The test stimuli consist of 68 English words, polysyllabic, disyllabic and monosyllabic with consonants and consonantal clusters in various positions. The test is designed to be administered by the form of a playing game. The time taken varies from 30 to 40 minutes if the child is co operative.

**Scoring:** Response are noted as 'P' and no response are noted 'NR'.

## **5. Pragmatics and Social Skills Tests**

These tests are used with children whose use of conversational intentions are limited or are impaired. They aim to provide a standardized/ norm referenced assessment measuring a specific set of conversational behaviors and intentions. These tests are intended for children in the age range 3-16 years

e.g – Test of Pragmatic Skills (Shulman, 1985).

**Test of Pragmatic Skills (Shulman, 1985).**

**Purpose:** The aim of the test is to provide information on communicative intention expressed by the children. It allows the clinician to examine to interpret child conversational stimuli in order to maintain dyadic socio communicative interaction.

**Age Range:** 3- 8 years.

**Test Design:** The test contains ten conversational intentions such as requesting information, requesting action, rejection, and naming, answering, informing, reasoning, summoning, greeting and closing conversation. It consists of a test manual, manipulative kit and task score booklet with normative data summary sheet. The manipulative kit contains ten colored blocks, two toy telephones and two puppets ( 1 male and 1 female). There are four assessment tasks and the examiner probes should be read verbatim in order to maintain consistency in administration and also to elicit appropriate conversational intentions. The test takes around 60 minute approximately.

**Scoring:** It consists of 0-5 rating scale. It rates the appropriateness and sophistication of the child's response to the specific examiner probe.

### **Tests used in Indian Context**

The examples of few language tests and description of few tests used in the Indian context with their advantage and limitations are as follows:

- Syntax screening test in Tamil: (Sudha, 1981).
- Test of acquisition of syntax in Kannada (TASK): (Vijayalakshmi, 1981).
- A language test in Kannada for expression in children: (Kathyayani, 1984).

- Three Dimensional Language Acquisition Test (3D-LAT): (Geetha Harlekhar, 1986).
- Tests of pragmatics in Tamil: (Priya, K. S., 1994)
- Linguistic Profile Test (LPT) Normative Data for children in Grades I to X: (Suhasini.G, 1997) - Telugu.
- Kannada Language Test: (Shymala K.C, 2003).
- Cognitive linguistic assessment protocol for children: (Anuroopa, 2006).

**Test for Acquisition of syntax in Kannada (TASK) (Vijyalakshmi, 1981).**

This test assesses the syntactic aspects of language acquisition in Kannada speaking children between 1-5 yrs of age, through performance. It yields the acquisition profiles from one to five years of normal language development. Its application extends to linguistically deviant populations of any age. The test comprises of 19 subtest and 323 items in all. It tests the comprehension and expression of a wide spectrum of grammatical categories and sentence types. It is a power test (no time limit imposed for completion). Toy and pictures are used as a complimentary material to the test sentence. The test usually takes 30- 40 minutes approximately if the child is co operative.

**Advantages :**

- The test assesses both the receptive and expressive aspect of an idea spectrum of grammatical categories.
- It is applicable to deviant populations of any age.

**Limitations:**

- It is applicable only to a limited age range.
- The test is valid only when administered to children when mother tongue is Kannada and who reside in Kannada speaking environment.

**A syntax screening test in Tamil ( SST) by Sudha K. Murthy (1981).**

**Purpose:** This test has been constructed to assess the syntactic development in children and to identify specific areas of syntactic deficits in language disordered children.

**Age Range:** 2-5 years

**Test design:** It consists of the following ten subtests which include negation, definite determiners, wh questions, yes- no questions, persons, adjectives, tenses, post positions, comparative-superlatives and pronominal terminations. Each subtest has a comprehension and expression category. The performance on the comprehension items indicates the understanding of a syntactic form and the expressive demands that the subject express the syntactic form verbally. The SST was administered to 56 normal children who were grouped into six groups. It takes an average time of approximately 35 minutes for each child.

**Scoring:** The scoring of the performance of the subjects on the test is based on a 5 point scale. The reliability of the test was established by computing the split half reliability test. The validity of the test was established by administering it to a sample of 3 language disordered children.

**Advantages:**

- It gives a detailed insight into child syntactic development.

**Limitation:**

- Age range is limited.
- Can only be administered to Tamil language speakers.

**A Language Test in Kannada for expression in children (Kathyayini, 1984):**

**Purpose:** The test aims to evaluate the use of various concepts in expression in terms of nouns, verbs, numbers, genders, tenses, place markers, and persons. The testing material consists of picture stimuli depicting daily activities and has 30 pictures cards in all. It was administered to 30 normal children (5-8 years), 6 hearing impaired and 2 mentally retarded and the responses of these groups with respect to the categories mentioned are given. It gives no cut off point for differentiating the deviant, or scoring procedure as such for the test.

**Advantages:**

- It helps in testing various aspect of expression.

**Limitation:**

- Age range is limited.
- Validity is poor.
- No receptive skills are tested.

- The scoring procedure is not clearly defined and hence it is difficult to differentiate normal and abnormal.

**Three Dimensional Language Acquisition Test (3D-LAT) by Geetha Harlekhar (1986).**

**Purpose:** The test aims at early differential diagnosis of major childhood disorders affecting language development can be facilitated by the use of this scale.

**Age Range:** 9 months to 36 months.

**Test design:** This scale assesses three main dimensions such as reception, expression and cognition. According to the age at which various aspects of language emerge, they have been divided into 9 age groups, which cover the age range from 9 months to 36 months. Each age group has a range of 3 months except for the last group which has a range of four months. The test included 27 items under each section i.e. reception, expression and cognition with three items from these for every age group. The test administration usually takes around 30- 40 minutes approximately.

**Scoring:** “+” – only when the informant indicates the behavior is typical.

“-“- only when the informant indicates the behavior is not observed.

“+/-“- only when the informant indicates the behavior is emergent or partially exhibited.



The examiner starts the administration with the age level which is equal to the chronological age of the child. By moving up or down the age level, find out the highest age level at which the child gets two positive responses out of three. This levels at which at least two item are present should be recorded for receptive, expressive and cognitive skills.

**Advantages :**

- It is very helpful in clinical diagnosis as it emphasizes on the cognitive aspects
- It reveals any differences that may exist between the child's chronological age and the child receptive, expressive and cognitive language age.
- Less time consuming.
- Not language specific.
- Easy scoring and administration.

**Limitations :**

- Age range limited.
- Standardized to very small population.
- Poor validity.

**Tests of pragmatics in Tamil (Priya, K. S., 1994)**

This test serves as a clinical tool to identify the pragmatically disordered children. This test is based on test design given by Shulman (1986) in the 'Test of pragmatic skills' which consists of 4 tasks with examiner probes.

**Test design:** The test assesses 3-8 years old children's use of language to signify conversational intent. A set of 4 guided play interactions (tasks) serve as the medium through which these pragmatic behaviors are assessed. Each task is administered using the material and dialogue (examiner probes) provided. The test usually takes 60 minutes approximately if the child is cooperative. The test is designed to provide information on 10 categories of communication intentions expressed by the children. They are as follows:

- 1) Requesting information
- 2) Requesting action
- 3) Rejection / denial
- 4) Naming/labeling
- 5) Answering/ responding
- 6) Informing
- 7) Reasoning
- 8) Summoning/calling
- 9) Greeting

10) Closing conversation.

**Scoring:** The responses are scored on a rating scale ranging from 0 to 5 according to the appropriateness and linguistic sophistication of the child's responses to probes.

**Advantages:**

- The test assesses pragmatic skills in different contexts and as the materials and probes used are constant, it makes the test more objective and reliable.
- Test uses a five point rating scale to give more accurate and quantitative outcome. This contributes to better inter-professional communication which is essential for successful rehabilitation of the child.
- Helps to quantify the improvement seen after therapy.
- Since it is more objective, it has better face validity.

**Limitations:**

- It is applicable to only those children whose mother tongue is Tamil and reside in Tamil speaking environment.
- Age range is limited.
- Number of subjects under each age group is only 5, i.e., small sample size.

## **Kannada Language Test (Shymala K.C, 2003).**

**Purpose:** It measures the children receptive and expressive language ability. It acts as screening device.

**Age range:** It tests children in the age range of 3-7 yrs.

**Test design:** It consists of two parts such as the part I include semantics which is major branch of linguistic devoted to the study of meaning in a language and semantic section contains 12 categories and 66 test items (naming, semantic discrimination, lexical category, semantic similarity, semantic anomaly semantic contiguity, paradigmatic relations, syntagmatic relations, polar questions, antonym, synonymy and homonymy and part II would include syntax which is a branch of linguistic which study the word structure, morphophonemic structures, plurals, tenses, personal number gender marker, case marker, conditional clauses, transitive/intransitive/ causative, sentence type, conjunctive & quotatives, comparatives, participial construction. The test administration usually takes more than 60 minutes.

**Scoring:** It was done in the following manner, for all others except lexical category and paradigmatic relation under Part I, semantic, plurals under part II syntax.

- Correct response= 1
- Partially Correct response= 1/2
- Incorrect or no response= 0

For lexical category, the scoring was as follows:

- Naming of all the five items =1
- Naming of two or more or less than 5 items- ½
- Naming of a single item or no response or incorrect response =0

For paradigmatic relations, the scoring was as follows:

- Identification of all the 4 pictures =1
- Identification of less than 4 pictures=0

For plural forms, the coring was as follows:

- Correct identification of plural form=1
- No response or incorrect response=0

**Advantages:**

- It tests both comprehension and expression.
- The test assesses a wide spectrum of linguistic structures.
- It serves as a baseline and monitor for therapy.

**Limitations:**

- Age group tested is limited.
- Time consuming.
- The test is language dependent.

## **Cognitive linguistic assessment protocol for children by Anuroopa (2006).**

**Purpose:** The test aimed to develop an assessment protocol to assess the cognitive linguistic abilities in Kannada speaking children.

**Age range:** 4-8 years

**Test design:** The development of the protocol included total 24 normal children which were divided into 4 groups with the gap of one year, 3 males and 3 females under each subgroup. The test administration takes more than one hour. The items were broadly classified into three main sections i.e. attention, memory and problem solving. Each section includes two subsections such as auditory and visual section.

I) Attention/discrimination includes two main subsections:

- Auditory (digit count test, sound count test, auditory word discrimination test)
- Visual (odd one out, letter cancellation and visual word discrimination).

II Memory

- Auditory (digit forward span, word recall, digit backward span).
- Visual (alternate sequence, picture counting and story sequencing).

III Problem solving

- Auditory (predicting outcome, predicting the cause and compare and contrast).
- Visual (association task, overlapping test and mazes).

**Scoring:** Every correct responsive was given a score of 1 and every wrong response was given a score of 0.

**Advantages :**

- Tests different cognitive aspects.
- Easy scoring

**Limitations:**

- Time consuming
- Needs child attention to be maintained for a long duration.

**Parent Reports on Language Development**

Direct language testing with children for young children is difficult, expensive and time-consuming. In addition, it may not yield valid results, because toddlers may be reluctant to interact with an examiner and because the testing situation is highly artificial. Play-based behavioral assessments are a more ecologically valid method clinicians use to assess language skills in young children. However, such play-based assessments require considerable professional time. Thus, both direct testing and play-based assessment have limited utility for general screening.

A screening instrument should be simple, quick, and easy to interpret. Furthermore, the use of parental report in tests for young children is very practical, as the language of young children primarily refers to concepts that can be found in the environment at home. A child's language abilities may therefore be difficult to observe in

an artificial testing situation. Moreover, the use of parental report eliminates the need to involve children in the screening, thus facilitating the screening process by removing the necessity of scheduling and transporting children.

Parents could identify their preschool children's language skills. The literature has reported of high correlation between the language ages obtained from a parental interview and those obtained from the tests administered directly on the preschool children. An interview method of obtaining information could be used by speech-language pathologists with confidence when information could not be obtained by directly testing the child due to physical, emotional, or intellectual disabilities (Luinge, Post, Wit & Brouwer, 2006). Obtaining information from an informant could be an easier, quicker way of screening large numbers of children. Review of different tests in the past few decades's standardized tests and language development scales have been developed to assess language acquisition in children.

Parents of children who exhibit rapid language development actively work to maintain shared understanding over long stretches of interaction. They do this in several ways. They introduce objects to serve as bases for joint activities, and they closely monitor their child's apparent goals or intentions. During most of their interactive turns, they attempt to modulate, correct, or elaborate their child's behavior rather than redirect it. And they construct an internal model of their child's current preferences skills, and world knowledge, which they continuously updates and check (Nelson, 1973; Snow, 1977).



Available research on the validity of the Communication developmental inventory and other parent report measures has been generally encouraging. In the toddler age group (18 to 30 months), studies have reported substantial correlations between scores on a variety of parent-report measures and scores on measures from concurrent language samples and structured tests (Dale, 1991, 1996; Fenson et al., 1994; Rescorla & Alley, 2001). This finding has been replicated in children speaking different languages (Thal, Jackson-Maldonado, & Acosta, 2000), and children who stutter (Ratner & Silverman, 2000). However, other studies have called into question the accuracy of parental report, particularly in under-represented minority groups. Less information is available about the predictive validity of the parent-report measures. Strong predictive validity has been reported for children around age 2 years who are developing typically (Bornstein & Haynes, 1998; Reese & Read, 2000).

Children who score very low on parent-report measures (“late talkers”) are at substantially elevated risk for continuing language impairments (Rescorla & Alley, 2001), although many low-scoring children catch up in the later preschool years (Thal, Tobias, & Morrison, 1991). Given the challenges of assessing language in toddlers and the importance of careful evaluations of early intervention for children with language delays, further studies of concurrent and predictive validity are warranted. Most studies have concerned parent reports for children below age 2.5 years (or this developmental level for children with language delays). Investigators have assumed that as the child's language becomes more extensive and complex, it will become increasingly more difficult for parents to monitor it accurately.

Suma (1985) have reported that the parents of normal children have reported Wh-question usages at 3 years of age. Roopa (1980) reported, use of “what”, “where”, “who”, “why”, “how” and “whose” in four year old children. Vijayalakhmi (1981) reported “why” and “who” in the 3 1/2 – 4 years age group and “what” and “how much” in the 4 1/2 -5 years old children. It should be noted that Roopa (1980) used spontaneous speech elicitation method and Vijayalakshmi (1981), used the test TASK to find out the acquisition age for the Wh- questions. Even though in the study by Suma (1985) was purely based on the parents responses to the questions which indicated that the results were in agreement with the reports of other investigations where the professionals did the evaluations

Roman (1980) compares mother’s description of their preschool children’s language with the child’s demonstrated skill. Results indicated that parents could identify their preschool children’s language skill. The correlation was found between the language ages derived from a parent informant scale and language ages derived from tests administered directly on children. It is evident from the review that there a limited studies that has been reported in India which involve the parents in the assessment programme of their child’s speech. The acquisition studies reported in India are mainly based on spontaneous speech samples (Thirumalai, 1977; Sreedevi, 1976; Prema, 1976; Roopa, 1980).

It is assumed that parents are better able to report on language production than they are on comprehension (Goorhuis & Schaerlaekens, 2000). Bishop (1997), cited in (Luinge, Post, Wit & Brouwer, 2006) presumes that parents and teachers are easily able to detect language problems that involve reduced intelligibility or immature-sounding

sentence structures, but that they are less sensitive to language problems that affect comprehension, vocabulary size, or verbal memory. This assumption was not confirmed by the data gathered in the study done by Luinge, Post, Wit & Brouwer, (2006). Both types of items (language production and language comprehension) were scaled. Parent reports concerning language production may be more reliable; however, than are their reports about language comprehension, as language production is more overt.

It is feasible to collect information from parents, about their children's speech development through the questionnaire method. It is possible for the professionals to know the child's level of speech based on the information given by parents. Based on the parent's responses it was possible to differentiate the speech of disordered and normal children.

Thus the review indicates that there are several research carried out related to language and cognitive development in children. In the past few decades many language tests have been developed. However very few language tests were seemed to have been developed which assess language and cognition in India, for example; 3DLAT (3-Dimensional Language Acquisition Device), Cognitive linguistic assessment protocol for children etc. Therefore, it is necessary to develop a test which is suitable for assessing cognition and language for preschool going children specific to our society. Thus, the present study will make an attempt in developing a comprehensive language tool in Indian context where language does not act as an obstacle.

## **CHAPTER III**

### **METHOD**

The main objectives of the current study were to develop and standardize an assessment tool for young children in the age range of 3- 6 years for evaluating their language and cognitive abilities.

#### **PARTICIPANTS**

The participants in the present study were the parents or the caretakers of typically developing preschool going children in the age range of 3-6 years. The study was carried out in three different phases. Phase I consisted of test construction, Phase II included the pilot study and Phase III consisted of the standardization procedure. Two groups of participants were involved in the present study. The first group included a total of twenty five participants who served as subjects for the pilot study. The second group included a total of one hundred and fifty participants, who served as subjects for the standardization of the test material with 30 subjects per age group. Hence, a total of 175 parents whose children were in the age range of 3-6 years were considered. Language was not considered as criteria for the selection of the subjects. Based on the report obtained from the school teachers, the children with an average or above average performance were considered. The inclusion criteria for the selection of the participants also included children with no history of any known organic and sensory deficits. Both males and females were considered. The details of the number of male and female subjects in each age group for phase I (pilot study) and phase III (standardization) are listed in the following tables.

Table 3:

Number of male and female children in each age group included in Phase II.

Age groups in years	Number of subjects		
	Males	Females	Total
3-3.6 years	2	3	5
3.6-4 years	3	2	5
4-4.6 years	2	3	5
4.6-5 years	3	2	5
5-6 years	2	3	5

Table 4:

Number of male and female children in each age group included in Phase III.

Age groups in years	Number of subjects		
	Males	Females	Total
3-3.6 years	14	16	30
3.6-4 years	15	15	30
4-4.6 years	13	17	30
4.6-5 years	16	14	30
5-6 years	12	18	30

Thus, the current study which was conducted in three phases are discussed below:

Phase I: Construction of the test material for Comprehensive Language Assessment Tool

Phase II: Pilot study.

Phase III: Standardization for normative data

### **Phase I: Construction of the test material**

**Selection of test items:** The assessment tool was designed to elicit systematic information based on the skills present in typically developing preschool children. The construction started with the formation of a comprehensive item pool of activities related to children below the age of seven years. An indulgent list of approximately ten to fifteen items in each section for each age group was selected from various sources used for the assessment of children. Majority of the items selected were obtained from the checklist developed by Venkatesan (2004) entitled “Activity Checklist for Preschool Children with Developmental Disability”. During initial formation of the item pool, care was taken to see that the test items were placed in a hierarchical order of increasing performance difficulty according to the chronological ages of the children. The easier and lower chronologically aged test items were placed at the beginning of the checklist, and the more difficult and higher- aged items were placed towards the end of the checklist.

The specific domains included under Comprehensive Language Assessment Tool for children were reception, expression and cognition. Receptive section consisted of items which dealt with the ability to comprehend spoken language; expression section checked the production aspect of speech and the cognitive section checked on activities involving thinking, reasoning etc. Further it was seen that the domains included in the test were both exhaustive and mutually exclusive. In order to check for the content validity of the question selection, the selected questions were given to five speech language

pathologists who had a clinical experience of greater than five years. They were asked to rate as R – if the question comes under reception, E – if under expression, and C – if under cognition section. This was to eliminate the repetition of test items within a domain as well as between domains. Thus, the modified questions consisted of fifty items in reception, fifty in expression and fifty five in cognition section. It was also seen whether the selected test items were ‘teachable’. ‘Teach ability’ or ‘trainability’ of test items is an important prerequisite for an intervention programme. Unless the assessed items can be taught to the child, the assessment becomes meaningless.

## **Phase II: Pilot study**

### **Initial field trial of selected items:**

The initial field trial of selected items was carried out with 25 parents of the typically developing preschool children based on interview session and direct observation. A minimum of five subjects were considered in each age group which consisted of both males and females. The entire item from each section such as reception, expression and cognition were administered for the 25 parents of the children. An appropriate example was provided for each age item and was explained in a simpler form in their native language to further clarify the question for the parent. Therefore, based on the information obtained from the parents regarding the performance of the children, the questions in which the respective age group children performed well were considered for the development of the test in tune with the suggestions of a psychologist and speech language pathologists. Thus, after addition, deletion and modification of the test item appropriate for each age group, the test finally contained six items in each section of

Reception, Expression and Cognition. The types of changes incorporated as a result of this pilot study where several test items which were non-functional or age- inappropriate for each age group were deleted and these questions, if appropriate for the other age group was added in that particular group. The ambiguous words and phrases were simplified and thus a final modified test material was made with a total of 90 items, six items in each section under each age group.

### **Phase III: Standardization for normative data**

It is essential to obtain normative data on the test constructed. Standardization can be explained with respect to

- a) The population on which standardization was done.
  - b) Age groups
  - c) Procedure used.
- 
- a) **The population for standardization:** The subject population included 150 parents of normal children between 3 years – 6 years. The native language of the child was not considered in grouping as the test was meant for all language groups. Only those parents whose children had no history of any complications, either pre-, natal or peri- natal and free from any known functional or organic disabilities were taken for the study.
  - b) **Age groups:** Totally five age groups were considered. The first four age groups covered a time span of six months each, since this is considered as the most crucial period of language and cognitive development ( 3-3.6, 3.6-4, 4-4.6 & 4.6-5 years ). The last group covered an age range of one year (5-6 years).



c) **Procedure:** The parents of the children or a care taker (familiar with the child's behavior) were interviewed to obtain the data. Parental meetings were carried out for the same by arranging parental meetings in the school. The interview was carried out in a closed and noise free environment free from distractors. They were told about the purpose of the study in brief and about the kind of information that was required regarding their children. The parents were distributed the scoring sheet and were initially asked to fill the details of their child. The chronological age of the child in terms of both years and months was noted along with the date of birth. All the ethical considerations were met.

The instruction for each task was given differently based upon the type of ability tested such as reception, expression and cognition. Items from the corresponding age groups were asked first and their performance on other items above their age group and below was also evaluated under each section. The parents were provided with appropriate examples when they did not understand the purpose of the question.

Responses of the child were checked for two consecutive age groups above and below that of the child's chronological age. It was continued in the lower age groups till 3 '+' was recorded and in the higher ones till 3 '-' was obtained within the age group.

### **Scoring**

The responses were recorded in the response sheet. The informants were instructed to mark the response on each item as a 'plus' (+) when they feel that the behavior of the child was established, a 'minus' (-) when it had not yet emerged and a

'plus-minus (+/-) whenever the given language behaviors were only partially exhibited or inconsistently noted (Remarks were also noted).

Depending on the age of the child and mass gathered in the parental meeting, the time required for evaluating varied. The data for the entire sample was collected.

### **Reliability**

The Reliability of test scores was examined, in part, using test – retest reliability. In this case, the consistency of performance as a function of test administration was investigated.

The test – retest reliability was conducted for 10% of the subjects in the age range of 3-6 years selected randomly from each age group and tested using the same tool within a span of 3 days.

### **Analysis of data**

The data obtained from the above procedures was subjected to quantitative analysis using Statistical Package for the Social Sciences (SPSS) (16.0 version) software for both the pilot study and standardization population. The following statistical tools were used to analyze the data:

- Descriptive statistics was done to calculate the mean and standard deviation.
- Kruskal Wallis test was carried out for the pilot study to compare the responses across the five groups for the items in the three sections (reception, expression and cognition).

- Friedman test was done for the pilot group to compare the reception, expression and cognition within each age group.
- Independent t-test was done to study the gender effects.
- Pearson's Rank correlation was performed to check for the correlation between reception, expression and cognition.
- Repeated measure ANOVA was done for the standardization population to compare the performance of children in each of the age group across the three different section i.e., reception, expression and cognition.

The results obtained based on the above methodology and statistical analyses are discussed in the following chapter.

## CHAPTER IV

### RESULTS AND DISCUSSION

The present study was conducted with the aims of developing a comprehensive language assessment tool for children and standardization of the same. Initially a pilot study was carried out where the test constructed during the phase I was administered to parents of twenty five typically developing children in the age range of three to six years. Based on the performance of the participants in the pilot study, the final test form was made. Thus the data obtained from standardization (i.e phase III) was based on the performance of 150 normal preschool going children whose age ranged from 3 to 6 years. Five age groups were considered consisting of 30 children in each age group (3-3.6, 3.6-4, 4-4.6, 4.6-5& 5-6 years), having both males and females. The children were tested within each age group using the informant interview approach.

The raw scores were obtained by scoring the performance of every child on the test items. A credit of one point for a response (+) and zero for no response (-) was given and the total scores for each child on the test within each dimension (Reception, Expression and Cognition) were obtained. The data, subjected to statistical analysis, are discussed for both phase II (pilot study) and phase III (standardization process).

**Mean scores and standard deviations:** The raw scores obtained were used to determine the mean and standard deviations. The scores achieved by each child through the above scoring method were cumulated to calculate a total for each age group along each dimension. The total score for the boys and girls of different groups were also found

separately. Thus, the mean and standard deviation scores for both Phase II and III in each group were calculated from the total score.

**Phase I: Pilot study**

Table 5:

Mean and Standard deviation for the pilot group in each section of Reception, Expression and Cognition for different age groups.

Age	Reception		Expression		Cognition	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
3-3.6 yrs	8.00	0.71	8.40	0.89	10.20	0.84
3.6-4 yrs	16.40	1.14	16.00	1.22	15.80	0.84
4-4.6 yrs	25.00	0.71	23.20	0.84	27.80	4.44
4.6-5 yrs	30.20	1.30	29.20	1.30	34.40	0.55
5 - 6 yrs	41.60	1.14	41.20	1.64	45.80	0.84

Table 6:

Mean and Standard deviation scores in terms of percentage for the pilot group in each section such as Reception, Expression and Cognition for different age groups.

Age	Reception %		Expression%		Cognition%	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
3-3.6 yrs	16.00	1.41	16.80	1.79	18.55	1.52
3.6-4 yrs	32.80	2.28	32.00	2.45	28.73	1.52
4-4.6 yrs	50.00	1.41	46.40	1.67	50.55	8.07
4.6-5 yrs	60.40	2.61	58.40	2.61	62.55	.995
5 - 6 yrs	83.20	2.28	82.40	3.29	83.27	1.52

The above data represented in table 5, gives the overall mean and the standard deviation scores and table 6 gives mean percentage and standard deviation scores which were obtained by considering the raw scores. It indicated that there was not much difference present between reception, expression and cognition within each group, but cognition was found to be better when compared with reception and expression. The mean and standard deviation was greater for the higher age group when compared with the lower age group. The difference in the skills increased as the age progressed which could be interpreted from the increase in mean score and standard deviation with increase in age group.

Kruskal Wallis test was carried out to compare the responses across the five groups for the items in the three sections (reception, expression and cognition). It

revealed that there was a significant difference present between age groups in reception, expression and cognition, reception at ( $\chi^2(4) = 23.175, p < 0.001$ ), expression at ( $\chi^2(4) = 23.166, p < 0.001$ ) and cognition at ( $\chi^2(4) = 23.166, p < 0.001$ ). From Mann Whitney U test, significant differences were found to exist across all the age groups for all the three sections at 0.001 level of significance.

Friedman test was done to compare the scores of reception, expression and cognition within age groups in the pilot study and the following results were achieved. If significance was found to exist, then Wilcoxon signed rank test was done to compare items in each section of each age group.

**a) Within age group 1 (3-3.6 years):**

It was ascertained that significant difference existed between reception, expression and cognition at ( $\chi^2(2) = 6.000, p < 0.05$ ). Wilcoxon test revealed that there was no significant difference found between reception and expression, expression and cognition but there was a significant difference present between cognition and reception at 5% level of significance.

The present research is in agreement with the study done by Ogura (1991) who found a significant relationship between young normal children's play and language comprehension, but not expressive language. McCune-Nicolich (1981) reported play act as one of the primary need for the child learning tool and thus it serves as a platform for social, emotional, motor, and cognitive and language development.

**b) Within age group 2 (3.6-4 years):**

Friedman test showed a significant difference in three sections such as reception, expression and cognition within age group 2 at ( $\chi^2 (2) = 7.600, p < 0.05$ ) and thus Wilcoxon signed rank test was carried out. This also showed that there was a significant difference present between cognition and expression ( $z = 2.03, p < 0.05$ ) and cognition and reception ( $z = 2.02, p < 0.05$ ) but no significant difference was found between reception and expression.

Tomasello, Striano and Rochat (1999) suggested that there were strong correlations between symbolic play, symbolic comprehension, language and nonverbal measures (apart from symbolic comprehension and non-verbal functioning, which were unrelated). Most observations of 2-4 year-old children show that play activities are based on the child's ability to think and express verbally and non-verbally.

Thus symbolic play competences are seen as being among the most influential predictors of early language development (McCathren, Warren, & Yoder, 1996). Casby (2003) proposed that the local homologue, the shared basis or structure or system from which different domains emerge is the child's capacity for mental representation and symbolic functioning. Therefore parallel developments in play and language could be explained as deriving from a common underlying capacity for cognitive representation.

**c) Within age group 3 (4-4.6 years):**

For the group of children who participated in the age range of 4-4.6 years, Friedman test revealed no significant difference across the three sections such as reception, expression and cognition at 5 % level of significance.



Cognitive skills and language abilities are associated; they develop in parallel fashion. New and increased cognitive ability may enable a child to function differently, but it does not cause language change. Rather, cognition and language are strongly related with underlying factors. Attainment of a skill in either area is reflected in the other (Gopnik & Meltzoff, 1986).

Although no direct overall relationship exists, specific relationships are evident during development. For example, cognitive development in infants and toddlers is strongly related to increased memory and to the ability to acquire symbols in many areas, including language and gestures (Gopnik & Meltzoff, 1987). Thus the current study is in agreement with the above studies.

**d) Within age group 4 (4.6-5 years):**

It was determined from the Friedman test that there was significant difference prevailing between all the section at ( $\chi^2 (2) = 7.111, p < 0.05$ ). Hence pair wise analysis using Wilcoxon signed ranks test was used to find the significant pairs between items. Results demonstrated that there was significance differences existing for cognition and expression and for reception and expression at 5% level of significance but no such significant difference were found for reception and cognition.

The present study is in accordance with the research done by Chapman (2000) where the authors studied the comprehension and production of reversible active sentences in children. In the comprehension task, the children were instructed to act out sentences produced by adult. In the production task, the children were instructed to describe an action produced by an adult. The author found that the children performed

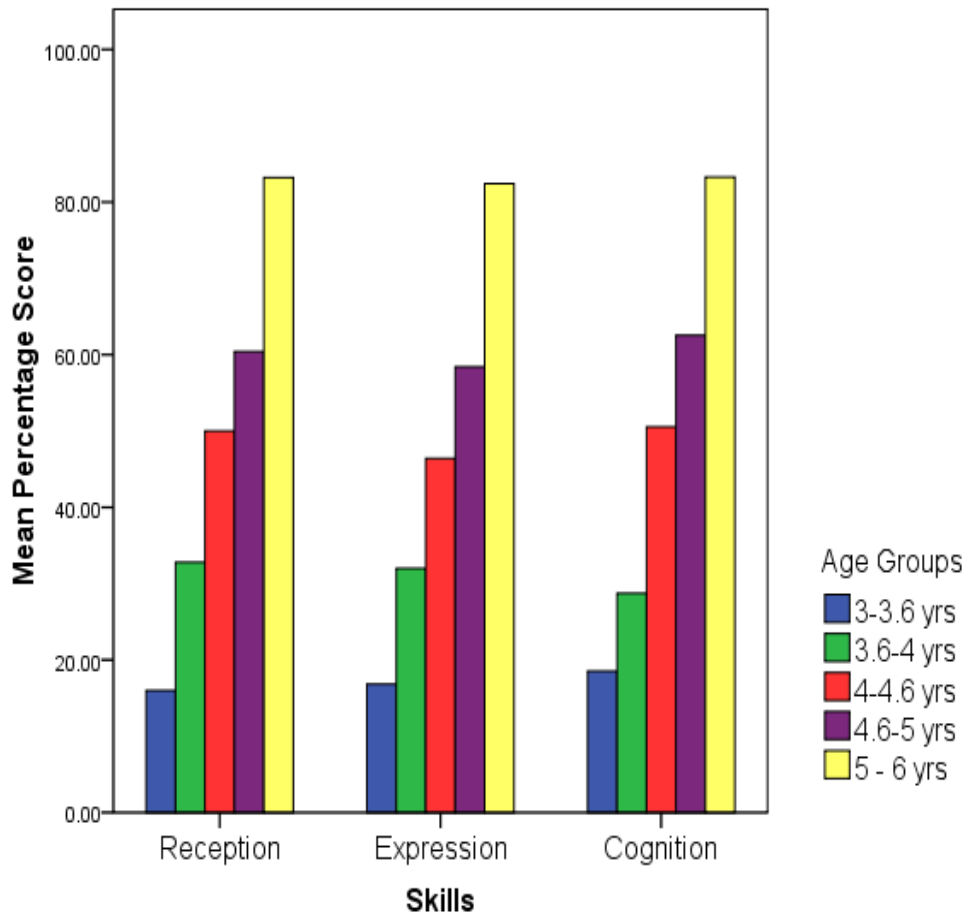
better in the production task than in the comprehension task, leading to conclusion that production precedes comprehension. Their conclusions were also supported by later research done by Gleitman & Wanner (1982).

**e) Within age group 5 (5-6) years.**

The statistical analysis using Friedman test showed that there was no significant difference found between all the three sections at ( $\chi^2(2)=0.73, p>0.05$ ).

Thus the present study supports one such research where it was found that language-play correlations were strongest in early language development, and that the domains did not develop in parallel as the child matured (Kennedy, Sheridan Radlinski & Beeghly, 1991; Ogura 1991).

Ogura (1991) also highlight that cognitive domains become increasingly modular with development and may not be strictly 'innate' from birth, which is in line with the neuroconstructivist approach to development. Thus, by 5-6 years the children develop most skills when compared to younger children.



*Figure 1: Graphical representation shows the mean percentage scores of Reception, Expression and Cognition across different level of age groups (3-6 years).*

From the graph, it's observed that there is an increasing pattern in all the sections (Reception, Expression and Cognition). Thus, it can be clearly interpreted that with an increase in age, the performance on language and cognitive abilities are also found to be increased.

The results for the pilot study across the age groups and their performance can be summarized as:

- Differences in performances were observed across the groups with increase in age of the children. There was a clear pattern of hierarchy noticed. The items with more difficulty were found to be performed better by higher age group children when compared with lower age group children.
- Result based on the statistical analysis highlights that there was a well defined difference found on the performance of cognitive items when compared with reception and expression.

According to the above results, receptive as well as expressive language skills and cognitive skills found to be improved across the years; seemingly there are highly significant differences in the skills acquired between 3-6 years of age. This could be attributed to the fact that language acts as another form of behavior which is acquired as a response to the stimuli in the environment and then it is learnt. Children's creativity with language and level of linguistic alignment help them in learning language. Learning is a voluntary response which is strengthened or weakened depending on positive or negative consequence. These aspects seem to be increasing in the present generations. Parental stimulation and environment exposure are seemingly the important factors for the increased linguistic development for the present generation.

Vijayalakshmi (1981), Sudha (1981) and Santhi (2008) reported "significantly better performance in the older age group compared to the younger age group particularly for the expression of children in the age range of 1 to 5 years and 2 to 5 years, which supports the present study. This could be attributed to the fact that with increase in age there was advancement in neuromuscular maturity and motor skills as well as the linguistic and cognitive abilities.

Several researchers studied the temporal relationship between play and expressive language, where play has a major role in the development of cognition. Bates (1976) demonstrated that children begin to produce their first words at the same time that they begin to produce nonlinguistic symbols such as play gestures. Report by Westby (1980) stated that children's ability to use language in a functional or flexible manner coincides with the emergence of predictable symbolic play routines which is the influence of cognition. McCune- Nicolich (1981) also reported that language and symbolic play relationship is parallel, with transitions in a more advanced stage of development.

A number of studies also suggest strong correlation between play, cognition and language during the early stage of language acquisition by both the normal and children with communication disorders (Bates, Benigni, Bretherton, Camaioni & Volterra, 1979; Casby & Ruder, 1983; Ogura, 1988; McCune, 1995; Stanely & Konstantareas, 2007). Other researchers like Lyytenin and Laakso (1997) and O'Toole & Chiat (2006) have also reported a correlation between play, cognition and language in German, Finnish and Cantonese-speaking typically developing children.

Many researchers have also found a correlation between various aspects of language with play. Ogura (1991) found a significant relationship between young normal children's play and language comprehension, but not expressive language. This indirectly supports the fact that play acts as the basis for cognitive and linguistic development especially in preschool children. Thus, the above mentioned studies are in accordance with the present findings thereby highlighting the importance of play on cognition and language acquisition during the preoperational stage in the preschoolers.

### Phase III: Standardization

The statistical analysis done for the standardization population for typically developing children from 3-6 years is as follows:

**a) Age group 1(3-3.6 years):**

Table 7:

Mean and Standard deviation for the age group 3-3.6 years according to gender for three sections (Reception, Expression and Cognition).

Subject		Number of subjects	Mean	Std. Deviation
Reception	Males	13	5.00	0.913
	Females	17	4.88	1.27
Expression	Males	13	4.31	1.25
	Females	17	5.00	1.37
Cognition	Males	13	4.69	1.32
	Females	17	5.29	1.16

The above table 7 gives the mean and standard deviation for children in the age range of 3- 3.6 years, which included 13 males and 17 females, obtained by quantitative analysis of the raw scores. On comparison of the performance of the male and female children across the items, it was found that there was a wide difference between males and females children within the age group and across the items too. The present findings

contrasted with the study done by Griffin & Norris (1967) which showed no significant differences in speech of boys and girls.

Table 8:

Pearson Correlation Coefficients between reception, expression and cognition for the age range of 3-3.6 years.

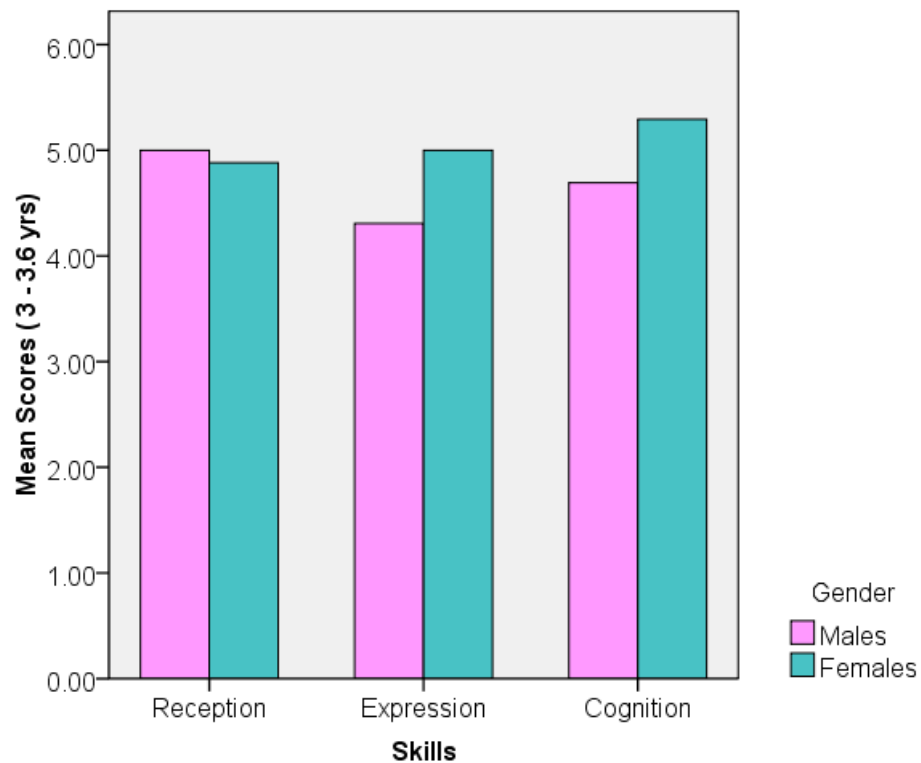
		<b>Expression</b>	<b>Cognition</b>
<b>Reception</b>	Pearson Correlation	-0.083	-0.148
	Sig. (2-tailed)	0.662	0.436
	N	30	30
<b>Expression</b>	Pearson Correlation	-	0.810**
	Sig. (2-tailed)		0.000
	N		30

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The independent t- test was carried out to find differences between males and females on three sections such as reception, expression and cognition. Results revealed that there was no significant difference between the male and female groups. Further, Pearson's Product Moment correlation was applied on the data to study the relationship between reception, expression and cognition scores. The data in the table 8 indicates that there was a positive correlation between expression and cognition ( $r=0.810$ ,  $p<0.01$ ), but reception was not significantly correlated with cognition and expression. Repeated measure ANOVA was done to compare the performance of children in the age range of 3-3.6 years across the three different sections such as reception, expression and cognition.

It was found that there was no significant difference across the tasks. Bonferroni's pair – wise comparison also revealed that there was no significant difference.

However, the result obtained in the present study contrasts with the result obtained by Vijayalakshmi (1981) which revealed performance of females to be better than the males.



*Figure 2: Graphical representation of the mean scores for the age range 3-3.6 years for Reception, Expression and Cognition between males and females.*

From the graph i.e. figure: 2, it can be construed that the performance of males and females is almost same for reception whereas expression and cognition illustrates difference, though not statistically significant.



Researchers have found that children demonstrate certain cognitive abilities at the approximate time as corresponding language behavior emerges (Clark, 1980). For example, children begin to express basic reflexive relations (appearance, nonexistence, disappearance), producing a word for a missing object at about the time that they demonstrate the concept of object permanence. Similar relationships have been found between developing language and related cognitive abilities.

However, Clark (1980) opines that correlation is not the same as causation; because if two events occur at about the same time does not necessarily mean that one caused the other. The present study concurs with the same.

**b) Age group 2 (3.6- 4) years**

The computation of the scores resulted in the below table 9 depicts the mean and standard deviation for children in the age range of 3.6-4 years for both males and females (15 males and 15 females). The result revealed that there was no significant difference found between male and female children within the age group as observed from the mean and standard deviation scores.

Table 9:

Mean and Standard deviation for the age group 3.6- 4 years according to gender for three sections (Reception, Expression and Cognition).

<b>Subject</b>		<b>Number of subjects</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Reception</b>	Males	15	4.53	1.46
	Females	15	4.87	1.36
<b>Expression</b>	Males	15	5.07	1.16
	Females	15	5.27	0.96
<b>Cognition</b>	Males	15	4.93	1.44
	Females	15	4.67	1.18

Table 10:

Pearson Correlation Coefficients between reception, expression and cognition for the age range of 3.6-4 years.

		<b>Expression</b>	<b>Cognition</b>
<b>Reception</b>	Pearson Correlation	0.811**	0.443*
	Sig. (2-tailed)	0.000	0.014
	N	30	30
<b>Expression</b>	Pearson Correlation		0.530**
	Sig. (2-tailed)		0.003
	N		30

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

The Independent t- test which was done to compare the performance of male and female children also showed no significant difference between them. Further, Pearson's

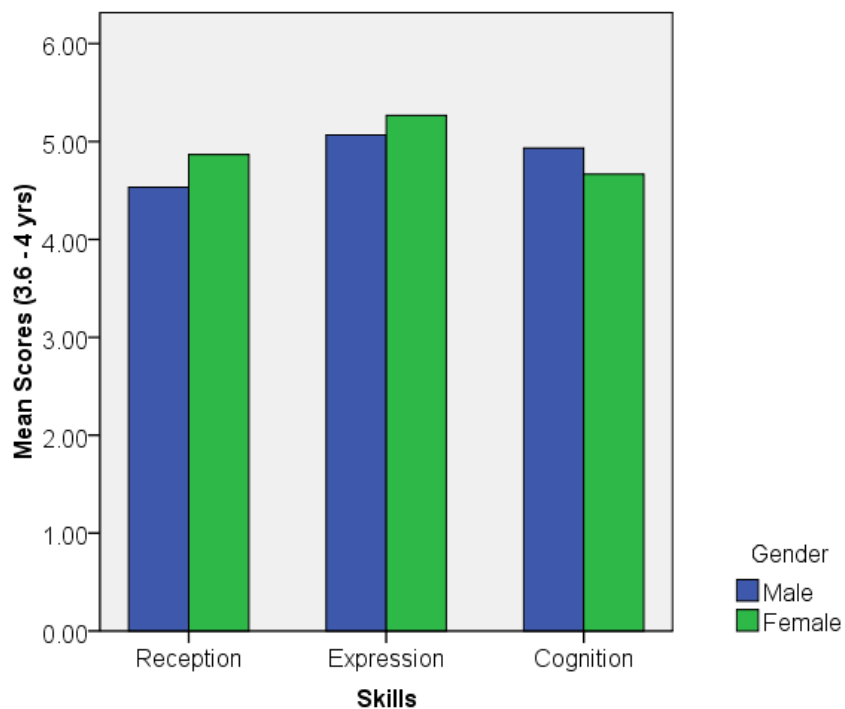
product moment correlation applied on the data to study the relationship between language (reception and expression) and cognition scores, as indicated in the table 10, exemplified that there was a high positive correlation existing between reception and expression ( $r=0.811$ ,  $p=0.01$ ), whereas a low positive correlation existed between reception and cognition ( $r=0.443$ ,  $p=0.01$ ) when compared with expression. On the other hand, cognition and expression also showed statistically significant correlation ( $r=0.530$ ,  $p=0.01$ ). Hence, overall it can be inferred from the data that there was a significant correlation existing between reception, expression and cognition leading to language development in a preschooler.

Repeated measure ANOVA was done to compare the performance of children in the age range of 3.6-4 years across the three different sections such as reception, expression and cognition. No significant difference was present across the sections.

The present findings are in support with the study done by Gopnik and Meltzoff (1997), where the author reported a relationship between cognitive mechanisms and language through analysis of linguistic components.

Another study by Happe (1995) which was carried out on normal and disordered children also holds support for the present study. The author reported that about 25 percent of normally developing children pass multiple theory of mind tasks by a verbal mental age of 3.5 years, and this rises to 80 percent at 4.5 years. No autistic subject passes with a verbal mental age of 5.5 years or less, and even at a verbal age of 9.00 years, a pass rate of only 50 percent is achieved. On the other hand, the autistic subjects with verbal mental ages above 11.50 years pass both tasks. This suggests that the theory

of mind concepts that normal developers acquire between verbal and chronological ages of 3 and 4 years are eventually mastered by a highly functioning minority of individuals with autism, though at significantly more advanced levels of chronological and linguistic maturity than those required for normal acquisition. Thus, it could be derived that there is great influence of cognition on language development during the preschool duration, particularly when the child is around 3 to 4 years of age.



*Figure3: Graphical representation of the mean scores for 3.6-4 years for reception, expression and cognition between males and females.*

From the above graph it can be interpreted that the performance of males is better when compared to females though not statistically significant. Additionally, the performance expression was considerably better followed by cognition and then reception.

Recent advances in cognitive psychology, neuroscience and linguistics support an embodied view of cognition, i.e. the fact that cognitive functions (perception, categorization, reasoning and language) are strictly intertwined with sensorimotor and emotional processes (Ogura,1991). This is particularly evident in recent studies on the grounding of language in action and perception (Casby, 2003).

A study conducted by LeNormand (1986) examined four levels of language accompanying symbolic play in 2-4-year-old normal children. It explored the emergence, functioning and development of language production within a cognitive and pragmatic framework. This indirectly supports the relationship between cognition and language, as observed in the present study.

**A) Age group 3 (4-4.6 years) :**

The below table indicates the mean and standard deviation for children in the age range of 4-4.6 years which included 12 males and 18 females for all the three sections i.e. reception, expression and cognition. The score obtained by descriptive statistical procedure reveals that there were no evident differences noticed between from the scores.

Table 11:

Mean and Standard deviation scores for the age group 4-4.6 years for both male and female children.

<b>Subject</b>		<b>Number of subjects</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Reception</b>	Males	12	4.50	1.09
	Females	18	4.72	1.02
<b>Expression</b>	Males	12	4.92	1.08
	Females	18	5.00	1.14
<b>Cognition</b>	Males	12	5.00	1.04
	Females	18	4.78	1.22

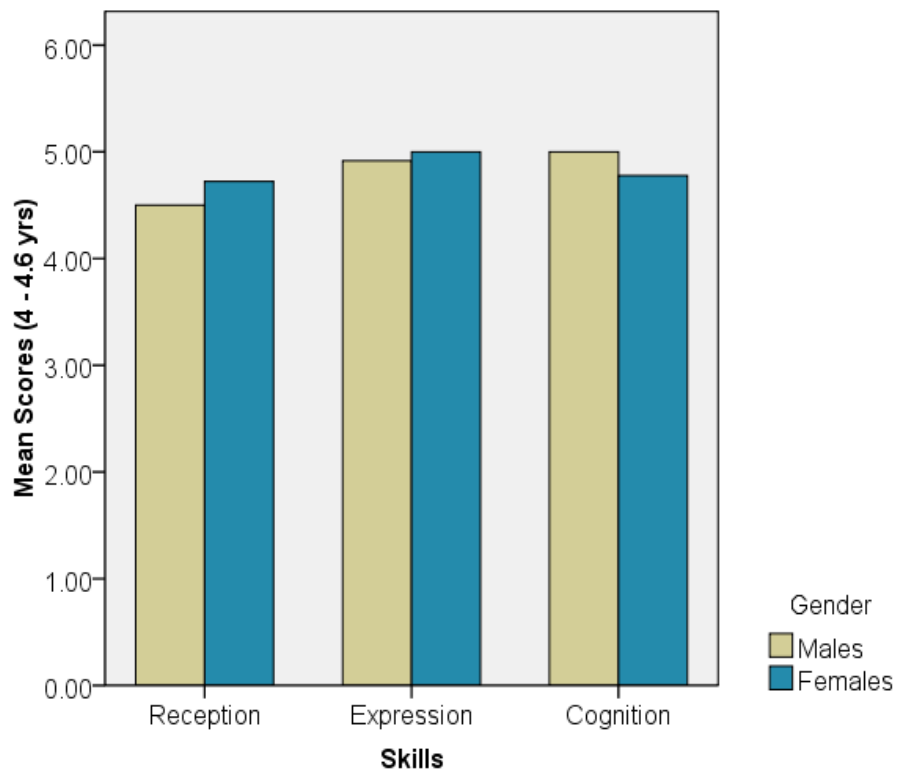
Table 12:

Pearson Correlation Coefficients between reception, expression and cognition for the age range of 4-4.6 years.

		<b>Expression</b>	<b>Cognition</b>
<b>Reception</b>	Pearson Correlation	0.293	0.339
	Sig. (2-tailed)	0.116	0.067
	N	30	30
<b>Expression</b>	Pearson Correlation		0.300
	Sig. (2-tailed)		0.107
	N		30

There was no significant difference between the performance of male and female children in the age range of 4-4.6 years as indicated by Independent t- test. Pearson's Product Moment correlation was applied on the data to study the relationship between comprehension and production and cognition scores. As specified in the table 12 this also

showed no correlation between reception, expression and cognitive. Repeated measure ANOVA was done to compare the performance of children in the age range of 4-4.6 years across the three different sections such as reception, expression and cognition. No significant difference was demonstrated across the sections in the age range of 4-4.6 years.



*Figure 4: Graphical representation of the mean scores for Reception, Expression and Cognition between males and females in the age range of 4-4.6 years.*

It can be inferred from the above graph that there was no significant difference observed between the performance of males and females. Reception, Expression and Cognition also do not demonstrate a wide variation across them. The present study concurs with the study done by Sudha (1981) where it was reported that the comprehension and

expression of children in the age range of 2 to 5 years showed no significant difference between males and females in their performance. Slobin (1973) recognized the important roles that the language being learned may play both in at the time of development of the linguistic structures in that language and in the development of cognitive concepts that run parallel to those structures, which support the present study where reception, expression and cognition are found to be acquired paralelly.

**B) Age group 4 (4.6-5 years) :**

Table 13:

Mean and Standard deviation scores for Reception, Expression and Cognition of males and females in the age group of 4.6-5 years.

	<b>Subject</b>	<b>Number of subjects</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Reception</b>	Males	17	4.82	1.24
	Females	13	4.77	0.93
<b>Expression</b>	Males	17	4.88	1.27
	Females	13	5.31	1.03
<b>Cognition</b>	Males	17	4.82	1.55
	Females	13	4.54	0.78

The mean and standard deviation scores obtained by the male and female preschool children in the age range of 4.6- 5 years for the three different sections of reception, expression and cognition are represented in table 13. It can be understood from the table that there are not much variation in the performance between the two genders in



the same section neither even across the sections such as reception, expression and cognition.

Table 14:

Pearson Correlation Coefficients between reception, expression and cognition for the age range of 4.6-5 years.

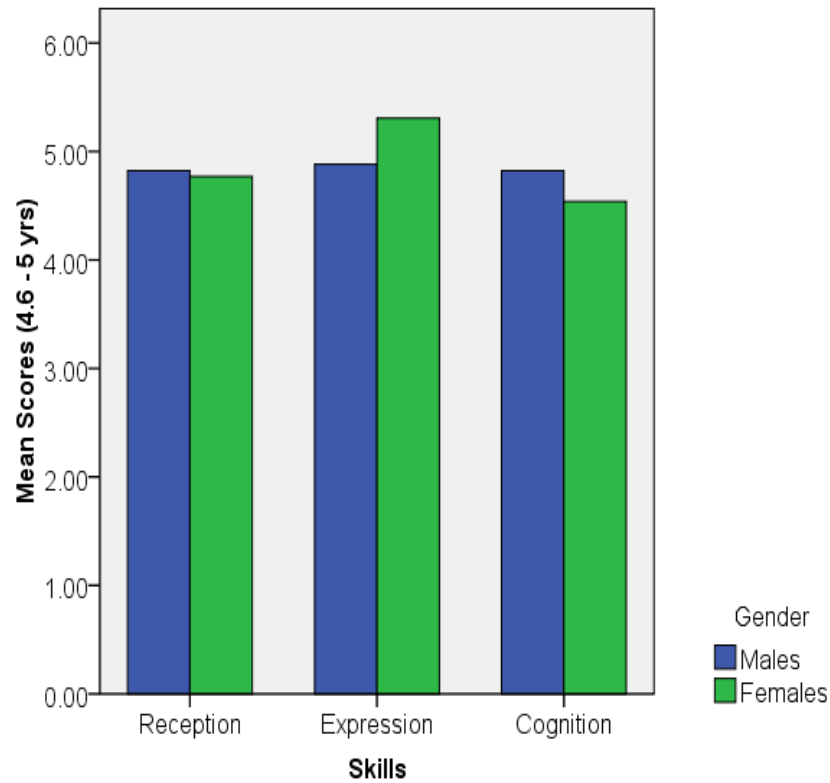
		<b>expression</b>	<b>Cognition</b>
<b>Reception</b>	Pearson Correlation	.628**	.603**
	Sig. (2-tailed)	.000	.000
	N	30	30
<b>Expression</b>	Pearson Correlation		.456*
	Sig. (2-tailed)		.011
	N		30

\*\* Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

Independent 't' test showed no significant difference between males and females. The data in table 14 indicates Pearson's product moment correlation which was applied to study the relationship between reception, expression, and cognition scores. It revealed that there was a high positive correlation between reception and cognition ( $r=0.603$ ,  $p=0.01$ ). Cognition and expression showed statistically significant correlation ( $r=0.456$ ,  $p=0.01$ ), and the reception and expression also demonstrated statistically significant correlation ( $r=0.628$ ,  $P=.001$ ). Hence it can be inferred from the data that reception correlates more with cognition and expression than, expression with cognition ( $r=.456$ ).

Repeated measure ANOVA showed that there was no significant difference found in the age range of 3-3.6 years across the three different sections of reception, expression and cognition.



*Figure 5: Graphical representation of the mean scores for Reception, Expression and Cognition between males and females for 4.6-5 years.*

It can be observed from the graph ( figure: 5) that reception, expression and cognition do not show obvious differences and there was no evident variation found in the performance of males and females except for expression. Thus, the present study finds support from the study done by Jerperon (1922) who reported that girls talk earlier than boys; they articulate better and acquire a more extensive vocabulary than boys of comparable age.

**E) Age group 5 (5-6 years):**

The mean and standard deviation for children in the age range of 5-6 years which included 12 males and 18 females are shown in the table 13 below. There were not much difference between males and females across the three sections.

Table 15:

Mean and Standard deviation scores of males and females for Reception, Expression and Cognition (5-6 years).

	<b>Subject</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Reception</b>	Males	12	4.67	1.37
	Females	18	5.06	1.06
<b>Expression</b>	Males	12	4.83	1.11
	Females	18	5.00	1.03
<b>Cognition</b>	Males	12	4.58	1.08
	Females	18	5.00	1.19

Mc. Neil (1970) and Brown etal (1973) has indicated that the period from 18 months to 4 years is the most active period of language acquisition and distinct level in language development can be made out. After the age of five years the rate of acquisition decreases markedly and differences between adult and child specially are not so obvious. The immaturity of a child's language after the age of five years is revealed only if a depth analysis of the language structure is done (Chomsky, 1969). This can be correlated with the above fact, demonstrated by the present study. However, it would be premature to draw any conclusion since the age range considered was wide.

Table 16:

Pearson Correlation Coefficients between reception, expression and cognition for the age range of 5-6 years.

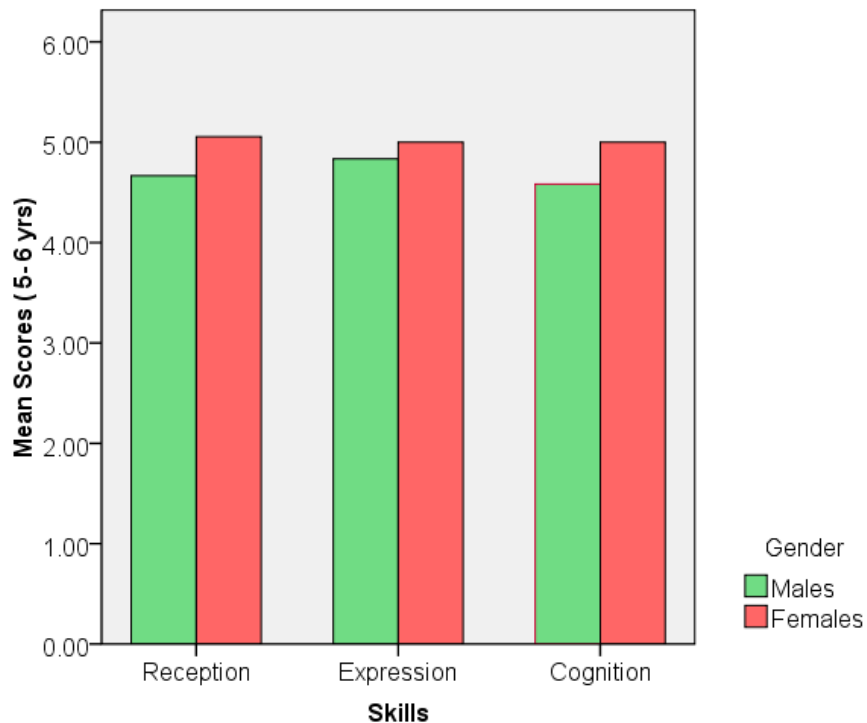
		<b>Expression</b>	<b>Cognition</b>
<b>Reception</b>	Pearson Correlation	0.466**	0.469**
	Sig. (2-tailed)	0.009	0.009
	N	30	30
<b>Expression</b>	Pearson Correlation		0.535**
	Sig. (2-tailed)		0.002
	N		30

\*\* Correlation is significant at the 0.05 level (2-tailed).

Independent 't' test which was carried out to compare the male and female performances in the age range of 5- 6 years showed no significant difference between males and females. As depicted in the table 16, Pearson's product moment correlation which was performed to study the relationship between reception, expression, and cognition scores denoted a positive correlation between reception and cognition ( $r=0.469$ ,  $p=0.01$ ). Cognition and expression showed statistically significant correlation ( $r=0.535$ ,  $p=0.01$ ), and the reception and expression also showed statistically significant correlation ( $r=0.466$ ,  $P=.001$ ). Hence it can be inferred from the data that there exists a close association between reception, expression and cognition. Repeated measure ANOVA illustrates that there was no significant difference found in the age range of 5-6 years across the three different tasks such as reception, expression and cognition.

The results of the present study are in agreement with the research done by Piaget ,1962; Bates, 1976; Bates, Benigni, Bretherton, Camaioni, & Volterra, 1977; McCune-Nicolich, 1981; Beeghly et al., 1990; Ogura, 1991; McCune, 1995; Lyytenin, Laakso, 1997; Tomasello et al., 1999).

These studies also demonstrated a strong relationship between play, cognitive development, and early communication and language which tells the importance of cognition and language development in preschoolers. The present study conflicts with the report obtained by Macaulay (1978).



*Figure 6: Graphical Representation of the mean scores for 5-6 years for Reception, Expression and Cognition between males and females.*

Bliss, Allen & Wrasse (1977) in their study found that males and females performed alike, holding age constant, but the males require more prompting and structuring before they produced the correct response. However, in the present study from the above graph, it is understood that reception, expression and cognition the 5- 6 years old group of children.

In other words, the rate of emergence of various linguistic expressions in child language more or less directly indexes the degree of their conceptual complexity (Huttenlocher, Smiley, & Charney, 1983). A different position suggests that language itself has the power to shape non-linguistic categories. This perspective was encouraged by Whorf (1956) who reported that the systematic encoding of certain conceptual distinctions in grammar may encourage (or force) speakers of the language to use these distinctions consistently in their non-linguistic thinking.

The results for standardization group across the sections such as reception, expression and cognition and their performance can be summarized as:

- Significant differences in performances were not observed between males and females within the group.
- Result based on the statistical analysis emphasizes that there was a well defined correlation existing between reception, expression and cognition.

The results obtained based on the performance between males and females exemplify that there was no significant differences noticed between them. Therefore, the present study is in contrast to studies when reviewed over the literature where research done by Templin (1957) on a large scale revealed that girls tended to exceed performance

in articulation of sounds at the older age and the boys in the word knowledge, yet the differences between the sexes were somewhat less pronounced than was frequently stated. The study by Garai & Schlenfield (1968) also conflicts the present findings where the author observed that verbal ability in girls and women surpass boys and men in verbal fluency, usage, correct language usage, sentence complexity, grammatical structure, spelling and articulation, while males tended to excel in verbal reasoning and comprehension.

Popular belief and scholarly opinion have generally maintained that girls are more advanced in language development than boys. Jerperon (1922) observes that 'little girls' on the average learn to talk earlier and more quickly than boys; they overtake them in talking. Mc Carthy (1954) consistently found a faster development of language in girls than in boys. The evidence of superiority of girls in pronunciation, mean length of utterance, vocabulary, comprehensibility of responses at an early age and verbosity was found. In addition, language disorders are reported to be more frequent in boys. The studies cited by Maccoby (1966) also support this view.

The present study is however in consonance with Macaulay (1978) who observed in his review that most of the studies had considered gender as a variable. In the study on "The Myth of Female Superiority in Language", Macaulay (1978) concluded that the female superiority of language might be more of an apparent nature than a real one. If any difference exists, it is probably only of transient nature in language acquisition.

A study by Owens (2005) also reported that four major perspectives were evolved representing a range of possible relationship between cognition and language. One view point would hold that the two domains develop and function entirely independent of each other. The three remaining possibilities would assert that cognition and language are interdependent; that is they influence each other on one of several ways. According to some researchers, linguistic effects on cognition are more likely to be found in domains removed from perception, involving higher-level cognitive representations where human cognition appears to differ from other species (Spelke & Tsivkin, 2001) thus supporting the importance of relationship between cognition and language as discussed in the present study.

It is not entirely understood how comprehension and production relate to each other in early stages of language acquisition. It seem logical to assume that at least the basic steps in comprehension ( sensation, perception, and perhaps imagery ) must precede production; a child must have experienced a language form to eventually reproduce it. However, some have asserted that even beyond mere reception, comprehension consistently precede production (Ingram, 1974). Others have maintained that this relationship might vary depending on the child's stage of language development (Bloom & Lahey, 1978).

Comprehension prior to production was previously considered a universal stage of language acquisition. Data from young Thai children suggests, however, that they may employ a distributional (Location & frequency) strategy for production of certain language forms before they comprehend these forms (Carpenter, 1991). In other words, they produce frequently used words that appear in the same linguistic location repeatedly.



This may be one of several strategies used by all children. However, the findings of the present study on an overall basis shows a significant correlation between comprehension, expression and cognition from which it can be extrapolated that comprehension has gained its own importance.

In general however, the current study discovered mixed results where few groups demonstrated correlation between cognition, reception and expression and few only between reception or expression and cognition which could be due to factors such as linguistic, social and environmental influences experienced by the child in their day to day life. Therefore, during the preschool years, the relationship between comprehension, production, and cognition changes frequently and inconsistently as the child develops. In general, linguistic developments parallel much of the cognition growth of the preschool child, although there is no one- to- one relationship. Such heterogeneity suggests that development is very complex. Similarly, the present study also found inconsistent female superiority in the age range studied.

**Reliability:**

The test retest reliability was carried out for the present study. Thus the pretest and post test raw scores obtained from the preschool children performance for all sections were compared. Alpha reliability coefficient was calculated for this. The coefficient was found to be 0.98 for reception, 0.92 for expression and 0.98 for cognition indicating good reliability between pre and post raw scores.

## **CHAPTER V**

### **SUMMARY AND CONCLUSION**

The present study was mainly designed to construct a tool for assessment of language and cognitive abilities in typically developing preschool children in the age range of 3 to 6 years where language was not considered as a hurdle for testing especially in multilingual and multicultural Indian context.

The study consisted of 150 typically preschool going children. They were divided into totally five groups according to the age level. The groups were constructed with six months apart while the last group was constructed with a gap of one year. The test was carried out in three phases. The Phase I incorporated the test construction which contained a pool of items related to reception, expression and cognition based on current skill behavior in preschool children. The Phase II consisted of pilot study where initial field try out of all the selected items was administered to 25 parents of typically developing preschool children in the age range of 3- 6 years. Thus, the test device developed based on the performance of the typically developing preschool children in the pilot study had three main sections, i.e., reception, expression and cognition. Each section consisted of six items per age group. The items were arranged in the hierarchical order of difficulty. The response expected from the subject for each item was a binary choice (yes/no). The data was obtained by an interview approach. The last phase i.e. Phase III included the standardization procedure where the test developed based on pilot study was administered on 150 typically developing preschool children for obtaining the normative data. The age range considered was 3 to 6 years. Hence, there were 5 groups ( 3 to 3.6

years, 3.6 to 4 years, 4 to 4.6 years, 4.6 to 5 years and 5 to 6 years ) consisting of 30 children in each group. Both boys and girls were considered for the study. The time taken for administration of the test approximately included 30 to 60 minutes. The appendix I gives the Comprehensive Language Assessment Tool for Children (3-6 years).

The data for each group was statistically analysed. Mean and standard deviation were obtained for each group. A general significant correlation was obtained between the development of language and cognition. The performances of males and females was compared which showed mixed results. After the administration of the test, the child's score had to be compared with the normatives. This would indicate whether the child is deficient in speech, language and cognitive aspects. The appendix II gives the normative scores for 3-6 years old typically developing children.

It can be concluded that the present assessment tool tests the development of language and cognitive abilities in typically developing preschool children appropriately. The normative data obtained reveals that the performance of the children increases as a function of age.

**Implications of the study:**

- The current study would help to assess and identify the language delayed/deviant children between 3-6 years based on their receptive, expressive and cognitive abilities.
- It would serve as a quick assessment tool for people with communication disorders.

**Limitations of the test:**

- This test can only recognize children with language disabilities. It does not give information on specific aspects of language such as syntax, semantics, phonology, morphology and pragmatics.
- The fifth group considered has wide age range which does not give a cogent idea of the performance of children of 5- 6 years.
- The influence of medium of instruction and multilingual abilities was not controlled in the present study.

**Recommendations for further research:**

- The age range of the present test can be extended further considering the cognitive development.
- The validity of the present test can be checked by administering it on a large group of language disordered children.
- The efficacy of the present test can be judged by its use in speech and hearing clinics.
- Further, the test tools can be standardized for different language speakers keeping in consideration the social and environmental needs.

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