TEST FOR THE ASSESSMENT OF METASEMANTIC AWARENESS IN CHILDREN IN KANNADA (TAMAC-K)

Saranya, V
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ALL INDIA INSTITUTE OF SPEECH AND HEARING
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Dedicated to
my dear amma,
appa, rums &
paati

Acknowledgments

Thanks almighty for the blessings,
You have bestowed upon me
Thanks for the challenges, you have made me face,
For they gave me the courage to be leading every race.

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Chapter 1

Introduction

Before a child begins school, the child uses language almost exclusively as a means of communication. Sometimes the child talks for the sheer pleasure of hearing his own voice, and at times he just plays with sounds and words, but the child mostly uses language to communicate. When the child enters school, he learns to separate himself from language and to separate language from communication so that he can identify, analyze, study, and think about the elements of language. Significant changes occur in the child's use of language as he moves from preschool to the school years. The process of learning language is seen even in late childhood where the child masters the more subtle syntactic and semantic-pragmatic aspects of language. The acquisition and mastery of the use of language for analytical as against social use is seen to take place during school age and beyond.

Knowledge that mature speakers of a language possess permits them not only to produce and understand utterances in that language but, in addition, to reflect upon and evaluate those utterances. This sort of reflection and evaluation has generally been referred to as involving "linguistic intuitions". Mature speakers factually realize that they occasionally produce utterances that are not well formed. The abilities that make such intuitions possible were referred to as metalinguistic abilities by Cazden (1972). Tunmer, Pratt, and Herriman (1984) defined metalinguistic awareness as the ability to reflect upon

and manipulate the structural features of spoken language, training language itself as an object of thought.

Tunmer and Bowey (1984) identified four components of metalinguistic awareness which include phonological (metaphonological), lexical/semantic (metalexical/metasemantic), syntactic/structural (metasyntactic) and pragmatic (metapragmatic) awareness. *Metaphonological awareness* comprises of awareness of phonological strings (awareness of phonological length, sound similarity etc.), awareness of syllables, awareness of phonemes and awareness of phonetic features (Morais, Alegria, & Content, 1987). *Metasemantic awareness* is the ability to analyze, abstract and play with words, to look at and recognize synonyms, antonyms, homonyms, and multiple definitions, to segment sentences and phrases into words, separation of words from their referent, ability to substitute words etc. (Tunmer & Cole, 1985). *Metasyntactic awareness* is the ability to reason consciously about the syntactic aspects of language and to exercise intentional control over the application of grammatical rules (Gombert, 1992). *Metapragmatic awareness* includes an awareness of the relationship between language and the social context in which it is being used (Hickmann, 1985; Ninio & Snow, 1996).

The development of metalinguistic ability in children is a metacognitive skill that emerges towards the end of preschool period and is characterized by a cognitive shift in intellectual functioning when a child can begin to treat language as an object of thought. Gleason, 2005 (as cited in Angell, 2010) stated that the metalinguistic awareness i.e. the ability to understand that words can be manipulated to be read and written to accomplish many tasks, continues to develop through middle school years. By developing these

skills, school age children are able to segment speech in order to identify words and to map their meanings. However, metalinguistic development is not considered as a simple epiphenomenon and the nature of metalinguistic ability is such that it is not a clearly defined, universally agreed concept. The boundaries between using and reflecting upon language are not clearly drawn and there is controversy about the age at which children are said to be able to demonstrate awareness of language and indeed what constitutes evidence of awareness (Angell, 2010). There are various viewpoints about the development of metalinguistic awareness expressed by various researchers. One viewpoint is that the awareness develops as language grows and develops. The other viewpoint is that awareness develops in the middle childhood and it is related to development of informational processing capability. Yet another viewpoint states that the awareness develops around the start of formal schooling and is associated with learning to read. Literacy provides a new form of word representation; it means adding orthographic representations to the pre-existing phonological and semantic representations of the word. Success in the acquisition of reading and writing gives the child a very powerful way of processing information and thus, acquiring knowledge, together with developing sophisticated linguistic and metalinguistic skills (Morais, 1991b).

In most children, metalinguistic ability develops as a consequence of the development that occurs in various domains in the child, i.e. as they learn to read, write and develop complex language and information processing abilities and its development does not require specific instruction. However, in some children this does not happen. Literature reveals several groups of children with various communication disorders such

as phonological disorders, stuttering, specific language impairment (SLI), and learning disability (LD) in whom this ability is affected.

Research evidence has shown that some children with language disorders demonstrate deficits in metalinguistic abilities and are at a considerable disadvantage when they reach the middle primary school years (Kamhi & Koenig, 1985; Van Kleeck, 1995). Children with language disorders lacked metalinguistic awareness of words, syllables and sounds and did not perform as well as younger mental age-matched children (Kamhi, Lee, & Nelson, 1985). Children with SLI performed significantly poorer than their normally developing peers on tasks that tapped the metalinguistic abilities (Menyuk, Chesnick, Liebergott, Korngold, DÁgostino, & Belanger, 1991).

A similar deficient performance was also reported in children with phonological disorders. According to Howell (1989), phonological disordered children made as many attempts as age matched children with superior phonological ability to correct mispronounced words when they were deliberately misunderstood by the listeners in an experiment which compared the ability of the two groups to judge and correct mispronounced tape recorded words. This showed that phonologically disordered children were capable of increasing the number of phonetic revisions they make to their habitual pronunciation, particularly if they are placed in situations where such changes serve the specific purpose of increasing understanding by the listener. However, these children could not spontaneously correct the mispronounced words, but they were able to make the corrections when they were prompted to.

Children with stuttering are yet another group in whom such metaliguistic deficits have been reported. Bajaj, Hodson, and Schommer-Aikins (2004) reported that children with stuttering have significantly poor abilities on a grammar judgement task (judging syntactically and semantically anomalous sentences). Children with stuttering also performed poorly on higher language abilities like syntactic judgement and metaphonology when compared to children with no stuttering (Yashaswini & Geetha, 2010).

Metalinguistic awareness has also been reported to be affected in children with learning disabilities. Acquisition of reading requires intact phonological skills (Torgessen, 1985), higher order linguistic skills such as syntax (Smith, Mann, & Shankweiler, 1986), semantics (Smith, 1971) and metalinguistic skills (Tunmer & Bowey, 1984). Breakdown at any one or more of these levels have been observed in children with reading disorders (Kamhi & Catts, 1989). Research in the area of metalinguistic abilities in this population has reported deficits which hamper their reading abilities. Semantic relations such as paradigmatic, syntagmatic relations, and contiguity were poorly understood by children with learning disability as compared to their normal peers (Sharma, 2000). Priya and Manjula (2009) compared the metalinguistic abilities, reading and writing tasks in typically developing children and children with dyslexia. They found that children with dyslexia performed poorly on all the metalinguistic, reading and writing tasks. Further, they also reported that among the various metalinguistic skills, metasemantics contributed significantly to reading and writing in them.

Need for the study

The previously accepted notion that metaphonological abilities are a prerequisite for the acquisition of reading was contradicted by studies in Kannada language on metaphonology and reading abilities (Rekha, 1987, 1996). This is because Indian scripts developed from Brahmi are semi-syllabic script which has highly transparent orthographies. Prema (1997) profiled the reading acquisition of children from Grade III to Grade VII and reported that the hierarchy of predictors of reading disability in Kannada were metasemantics, metasyntax and metaphonological skills.

Although many tests are available to assess the linguistic skill, there are limited tests to assess the metalinguistic skill. In the Indian context, there are a few tests to assess metaphonological skill such as Reading Acquisition Profile-Kannada (Prema, 1997) and the Test for metaphonological skills (Karanth & Prakash, 1996). However, there are no tests to assess metasemantic and metasyntactic abilities. Although tests such as Linguistic Profile Test (LPT, Karanth, Ahuja, Nagaraja, Pandith, & Shivashankar, 1991) includes a few domains to test metasemantic skills, there are other tasks cited in the literature which fall under the domain of metasemantic skill but are not a part of LPT.

A look into the literature suggests that the metalinguistic abilities are essential for the mastery of phonological, semantic and syntactic information and metasemantics contributes to reading and writing success in Indian children compared to the other domains such as metaphonology or metasyntax. Hence there is a need to develop a test for assessing metasemantic awareness in children which would in turn prove beneficial for the population with communication disorders. Metasemantic skills could be

incorporated in the assessment and treatment protocol of children with communication disorders. A large part of successful language intervention is centred on the student being aware of language and the components of language. Having an understanding of metalinguistic awareness allows the clinician to have a better sense of whether a student understood a given task, and whether that task is appropriate for a particular child. Further, research has shown that children who had made only minor or no apparent progress under other treatment regimens made rapid progress once the metalinguistic activities were initiated (as cited in Howell & Dean, 1994). Hence, developing a test for assessing metasemantic awareness would help speech-language pathologists to assess the metasemantic ability in a systematic manner and select appropriate treatment programs for individuals with communication disorders. This test would especially prove to be advantageous to assess and treat the metasemantic abilities of individuals with learning disability as metasemantics contribute to reading and writing in Kannada in the Indian context. Tasks that are sensitive in predicting the reading success in children obtained from this test can be used as a screening tool for children with communication disorders. Further, it can be also be used as criterion reference test for degenerative disorders. Keeping this in view, the present study was planned.

Aim of the study

To develop a Test for the Assessment of Metasemantic Awareness in Children in Kannada (TAMAC-K) and to standardize the test material on typically developing children in the age range of 8-11 years.

The specific objectives of the study were:

1. To develop a test for the assessment of metasemantic awareness in Kannada for children.
2. To assess the item and content validity of the developed test.
3. To standardize the developed test material by administering it on the typically developing children in the age range of 8-11 years.
4. To assess the clinical validity of the tool by administering the same on children with learning disability.

Chapter 2

Review of Literature

Metalinguistic ability or awareness is said to be a "developmentally distinct kind of linguistic functioning that develops separately from and later than basic speaking and listening skills" (Tunmer, 1991). 'Meta' is an ancient Greek term, meaning 'beyond.' In the context of language learning 'meta' can be interpreted as going beyond communication and meaning, and to instead focus attention on the underlying structures. Specifically, metalinguistic skill involves amplified and logical understanding of the rules used to govern language. These skills allow an individual to think about the elements of language used by themselves and others and evaluate the utterances as correct or incorrect. According to Tunmer, Pratt, and Herriman (1984), metalinguistic awareness is the ability to reflect upon and manipulate the structural features of spoken language, training language itself as an object of thought. Hulit and Howard in 2002 described metalinguistic awareness as the individual's ability to use language to analyze, study and understand language. The construct describes the ability to make language forms objective and explicit and to attend to them in and for themselves. The individual with well developed metalinguistic skills is able to view and analyze language as a "thing," language as a "process," and language as a "system." Any individual can reflect on the nature of language, by using the following skills:

1. An awareness that language has a potential greater than that of simple symbols (it goes beyond the meaning).

2. An awareness that words are separable from their referents (meaning resides in the mind, not in the name i.e. Latha is Latha, and I will be the same person even if somebody calls me by another name).

3. An awareness that language has a structure that can be manipulated (realizing that language is malleable: you can change and write things in many different ways (for example, if something is written in a grammatically incorrect way, you can change it).

This awareness about deeper aspects of language is a skill first learned in school which requires an understanding of the rule system of language, including phonology, morphology, syntax and semantics. Meta-awareness skill is at work when students are able to switch their attention from the meaning of what they, or others, say to the sayings themselves. This ability - metalinguistic awareness - is a vital skill in language learning. Metalinguistic skill has the largest increase between the ages of 5 and 8 years, when teachers conduct specific activities during instruction requiring these skills. As metalinguistic awareness grows, children begin to recognize that statements may have a literal meaning and an implied meaning. They begin to make more frequent and sophisticated use of metaphors such as the simile, "We packed the room like sardines." Subsequently they also start to recognize irony and sarcasm. These concepts require the child to understand the subtleties of an utterance's social and cultural context. Metalinguistic abilities are related to cognitive development, intellectual capacity, scholastic achievement, reading skills and environmental factors such as play experience and other adult language stimulation (Hulit & Howard, 2002).

Components of metalinguistic skill

Any linguistic skill is a candidate for a metalinguistic counterpart in development. Therefore, metalinguistic abilities (or tasks) are sometimes classified according to the aspect of linguistic skill from which they derive, creating subcategories of metalinguistic proficiency in syntax, word awareness, and phonology. Tunmer and Bowey (1984) proposed four components of metalinguistic awareness viz. phonological (metaphonological), lexical/semantic (metalexical/metasemantic), syntactic/structural (metasyntactic) and pragmatic (metapragmatic) awareness.

Metaphonological awareness: Metaphonology is the knowledge about sounds and syllables and the ability to manipulate sounds out of context. Phonological awareness usually refers to the ability to conceive spoken words as sequences of smaller units of sound segments (syllables, onsets, rimes, or phonemes) (Liberman, Shankweiler, Liberman, Fowler, & Fischer, 1977; Goswami, 1999). It is a kind of metalinguistic ability that requires clear knowledge of the phonological structure of speech as opposed to normal conversation that is interpreted and produced largely automatically (Tunmer, Herriman, & Nesdale, 1988). This skill is related to learning the letters of the alphabetic system as the latter are symbols for sounds. Phonological awareness uses a single modality- the auditory one. It is the ability to hear sounds in spoken words in contrast to recognizing sounds in written words, which access the child's coding abilities. This ability refers to all kind of sound units, such as words, syllables, onset-rime and phonemes. Metaphonological awareness includes conscious ability to detect and manipulate sound segments, such as moving sounds around in a word, combining certain sounds together, or deleting sounds [Smith, Simmons, & Kameenui, 1995 (as cited in

Bauman-Waengler, 2008)], awareness of phonological strings (awareness of phonological length, sound similarity etc), awareness of syllables, awareness of phonemes and awareness of phonetic features (Morais, Alegria, & Content, 1987). The tasks used to assess metaphonological awareness include the following:

- ≡ Spoken rhyme recognition- e.g., do these words rhyme: hop and top?; Which word does not rhyme: cat, rat, war?
- ≡ Spoken rhyme production- e.g., tell me a word that rhymes with dog.
- ≡ Onset-rime blending-e.g., "c" "at" is blended to?
- ≡ Syllable segmentation- e.g., how many syllables are there in the word 'banana'?
- ≡ Syllable completion- e.g., here is a picture of rainbow. I will say the first part of the word and you can complete it. Here is a rain___.
- ≡ Syllable identity- e.g., which part of "rainbow" and "raincoat" sound the same?
- ≡ Syllable deletion- e.g., say the word "rabbit" without the syllable "ra".
- ≡ Phoneme detection- e.g., which one of the following words has a different first sound: "rose, red, bike, rabbit"?
- ≡ Phoneme isolation- e.g., which sound do you hear at the beginning of the "toad"?
- ≡ Phoneme completion- e.g., here is a picture of a ball. Can you finish the word for me? "ba__".
- ≡ Phoneme blending- e.g., can you tell me what the word is? "b-i-g".
- ≡ Phoneme deletion- e.g., can you say "toad" without the "d" sound.
- ≡ Phoneme segmentation- e.g., what sounds do you hear in the word "jeep"?
- ≡ Phoneme counting- e.g., how many sounds do you hear in the word "jeep"?

≡ Sound to sound matching- e.g., is there a /k/ in “bike”?

Good readers are good at phoneme awareness tasks while poor readers are poor at phoneme awareness tasks. These results led to the conclusion that good phoneme awareness was a necessity for becoming a good reader. It is also observed that there was an increase in phonological awareness with increased exposure to reading. These observations suggest that the relationship between phonological awareness and reading is reciprocal (as cited in Thapa, Van Der Aalsvoort, & Pandey, 2008).

Metalexical/Metasemantic awareness: Metasemantic awareness is the ability to abstract and play with words. Word awareness is the understanding of a word as a constituent part of speech. Metasemantics is the ability to analyze words, to look at and recognize synonyms, antonyms, homonyms, and multiple definitions. It also includes the ability to segment sentences and phrases into words, separation of words from their referent, ability to substitute words (Tunmer & Cole, 1985). Three types of tasks are commonly employed to study metasemantic awareness which includes a judgment, revision and generation task. Either of these tasks, in various combinations or isolation is used. In a judgment task, the participants are asked to judge whether a given utterance is right or wrong; in a revision task, the participants are asked to correct the error and in a generation task, they are asked to produce an utterance based on the instruction given. The tasks used to assess metasemantic awareness generally include the following:

- ≡ Analyze a sentence into lexical units or words- e.g., can you count the number of words in the sentence “Apple is red in color”?
- ≡ Free word association- e.g., can you say a word that comes to the mind when you hear the word “red”.
- ≡ Provide the definition for a word including superordinate information and specific differentiating features- e.g., can you define the word “carrot”?
- ≡ Provide a synonym for a word- e.g., can you give an equivalent word for the word “blade”.?
- ≡ Provide an antonym for a word- e.g., can you give an opposite word for the word “big”.?
- ≡ Provide multiple meanings for homonyms or lexically ambiguous words- e.g., can you provide another meaning for the word “bank”.
- ≡ Identify the grammatical category for a word- e.g., can you identify the grammatical category for the word “run”?
- ≡ Semantic anomaly- e.g., can you identify the error in the sentence ‘milk is black in colour’?
- ≡ Syntagmatic and paradigmatic relations- e.g., can you provide a word for the second pair after understanding the relationship between the first paired words? “Banana: fruit:: Elephant:____; Milk: white:: Hair:_____”.
- ≡ Lexical/referential arbitrariness- involves symbol substitution and answering final questions. E.g., sun-moon. Substitute the word moon by sun. Final question asked will be: What would you see at night?

Metasyntactic awareness: Syntactic awareness is the ability to reason consciously about the syntactic aspects of language, and to exercise intentional control over the application of grammatical rules (Gombert, 1992). Studies on metasyntactic ability used either a grammaticality judgement task or a revision task or both tasks to assess children's awareness of different syntactic constructions. In a judgement task, the subject is presented with both grammatical and ungrammatical sentences. He/she is required to indicate which are grammatical and which are ungrammatical. In a revision task, the subject is presented with only ungrammatical sentences and is required to correct them. Findings revealed that syntactic awareness improves with age. Children perform better on the judgement task than on the revision task. Owing to the possibility of a response bias in judgement tasks, a revision task is thought to be a more sensitive measure of syntactic awareness (Pratt, Tunmer, & Bowey, 1984; Blackmore, Pratt, & Dewsbury, 1995). The tasks used to assess metasyntactic awareness generally include the following:

≡ Unscramble jumbled sentences- e.g., can you unscramble the jumbled sentence: "beautiful the is rose"?

≡ Determine if two sentences have the same or different meanings- e.g., can you identify if the two given sentences have same or different meanings: "the boy was hitting the girl" and "the girl was hit by the boy"?

≡ Determine if a sentence is grammatical or not- e.g., can you identify if the sentence is grammatical or not: 'the girl is eating'?

≡ Correct grammatical errors- e.g., can you correct the sentence: "he is my mother"?.

≡ Recognize or produce a paraphrase of a sentence- e.g., can you rephrase the sentence: "John loves Mary"?.

≡ Recognize or detect a lexically or structurally ambiguous sentence- e.g., can you detect the ambiguity in the sentence: "Flying planes are dangerous"?

Metapragmatic awareness: It includes an awareness of the relationship between language and the social context in which it is being used (Hickmann, 1985; Ninio & Snow, 1996). Common examples of metapragmatic awareness include the ability to judge referential adequacy, the ability to determine comprehensibility, and the ability to describe explicitly the social rules (e.g., politeness rules) governing language use.

Development of metalinguistic awareness in typically developing children

Using language to communicate is a skill achieved by children experiencing a wide range of environments and thus considered a robust phenomenon. Metalinguistics provides the base for the children to move from social to increasingly instructional uses of language by treating language as a focus of cognitive reflection. Children learn to think about language in order to use language to think. Children's competency in language enhances school learning and learning enhances language [Van Kleeck, 1994 (as cited in Karanth & Rozario, 2003)].

The strongest argument for a role of linguistic awareness in phonological acquisition comes from theories which see the process of phonological development as involving children actively discovering how to communicate with others. Cognitive theory of phonological development (Macken & Ferguson, 1983) and the interactionist discovery theory (Menn, 1976; Kiparsky & Menn, 1977) appear to presume a role for

some degree of metalinguistic awareness during the acquisition process. Proponents of these theories believe that successful phonological development requires children to discover how to communicate with others in their efforts to make them understood. Macken and Ferguson argue that the phonological acquisition is not automatic and that children must at some point in development recognize similarities and formulate rules through active experimentation.

During the preschool period, children view language as a means of communication. They do not focus on the manner in which language is conveyed. During the school-age years, children begin to reflect on language as decontextualized object. This metalinguistic ability enables children to think and to talk about language i.e., to treat language as an object of analysis and to use language to talk about language. The development of metalinguistic abilities takes place during middle childhood, between 5 and 8 years of age (Scholl & Ryan, 1980; Van Kleeck, 1982, 1984; Pratt, Tunmer & Bowey, 1984).

Children show sensitivity to linguistic markers in spontaneous repairs of their own speech by the age 4 but it is not until 6 years that they give explicit metalinguistic judgments based on those same linguistic markers (Karmiloff-Smith, 1986). There appears to be a developmental continuum based on explicitness of awareness starting from spontaneous repair of their own speech, later by correcting the utterance of others, and finally by explaining why certain sentences are possible and how they should be interpreted and the endpoint being overt verbalized metalinguistic judgments (Clark, 1978). There are three levels of metalinguistic awareness: the children's ability to note

errors in ungrammatical sentences, to correct those errors and to explain why those errors were wrong. The ability to spontaneously repair their own speech and the ability to detect or note ungrammaticality in others speech is due to the unconscious error-detecting mechanism which runs without any need for conscious awareness (Marshall & Morton, 1978; Karmiloff-Smith, 1986) and this leaves no trace of structural information in memory (Marshall & Morton, 1978). Correcting an error is more complex, as it requires both the ability to detect error at the start, as well as the ability to process the ungrammatical construction exhaustively and retain it in short term memory to generate a correct sentence associated with the incorrect form (Fowler, 1988). The capacity to explain error is the most explicit metalinguistic skill developed by young children. A child giving an explanation must also demonstrate explicit and articulate knowledge of the rules underlying the corrected sentence. Thus, the tasks of noting, correcting and explaining ungrammaticality appear to differ systematically in the level of explicit knowledge of language required to perform each task.

The nature of metalinguistic ability is such that it is not a clearly defined, universally agreed concept and various researchers have expressed various viewpoints about the development which can be grouped under three main categories:

1. Awareness develops alongside language itself: The major supporters of this view were Clark (1978) and Karmiloff-Smith (1986). It is argued that as language grows and develops, the ability to reflect more deeply about more aspects of language grows. The main source of this evidence comes from descriptions of children playing with and manipulating the phonological structure of language and making

spontaneous repairs (corrections) to their utterances if they are not understood. This type of behaviour has been reported in children aged from about 18 months or so. Such observations suggest that children from this very young age know something about, atleast, some aspects of language, in particular its phonemic composition.

2. It is an ability that develops in middle childhood and is related to the more general development of information processing capability which occurs during this period.
3. It develops around the start of formal schooling and is associated with learning to read. This is a view that emerged in the early 1970's which suggests that reading and writing give messages a static nature which can be written and reflected upon by the child. Thus, school literacy and extensive reading and writing instructions are suggested to be the propelling factor for metalinguistic awareness. The major supporter of this view was Donaldson (1976). Metalinguistic abilities emerge about the same time children are learning to read, and it has been suggested that metalinguistic awareness and reading development are related (Tunmer & Bowey, 1984; Catts, 1996). According to Priya and Manjula (2009), metaphonology contributes to reading and writing in Indian typically developing children.

It is well established that the preschool child has some metalinguistic awareness, but their metalinguistic awareness and abilities are not complete until they are about seven or eight years old. Clark (1978) reported the evolution of metalinguistic abilities in children which have been listed below:

- Can differentiate basic units of language- i.e., sounds, syllables, words, and sentences.
- Can attach correct inflections to unfamiliar words.
- Recognizes when words are used incorrectly in sentences, and knows when word order is incorrect.
- Understands how it is possible to construct varying sentence types, and can convey their understanding to other people.
- Know when utterances are acceptable, based upon who the listener is and/or the setting in which the communication is taking place.
- Knows how to define words in a manner that makes their meaning clear to others.
- Demonstrates an understanding of the language forms used in creating humorous constructions, such as riddles.

The research findings reveal that the metalinguistic abilities develop around middle childhood (Scholl & Ryan, 1980; Van Kleeck, 1982, 1984; Pratt, Tunmer & Bowey, 1984) and Van Kleeck (1982) identified three important aspects of metalinguistic development:

1. **Language is an arbitrary conventional code:** Understanding that language is an arbitrary code includes understanding that words are arbitrary labels, separate from the objects or events they represent. Young children do not recognize the arbitrary nature of language; thus, they tend to treat words as though they were parts of their referents. For example, a 4 year old might say that the word jet is a big word because jets are big and that ant is a short word because ants are short. In contrast, a 7 year old

is likely to say that the word jet is a small word because it does not have many letters. Evidence of the arbitrary nature of language can be seen in children's ability to recognize ambiguity:

a) Words and sentences can have more than one meaning. Example: ambiguity detection involves the recognition that the sentence "The duck is ready to eat" could mean either (1) the duck (that is in the field) is ready to eat some grass or (2) the duck (which has been cooked) is ready to be served for dinner. Surface- and deep-structure ambiguity, such as in sentences that allow for more than one interpretation (she fed her dog biscuits), are not understood until 11 or 12 years of age (Westby, 1998).

b) Children's awareness of the arbitrary nature of words is reflected in rhyming and word play. Children are able to understand that words are composed of segments and these segments can be manipulated.

c) Recognize synonymy: It is an ability to understand that different sentence forms can convey the same meaning. An example of recognizing synonymy would be realizing that the following sentences describe the same events: "the girl chased the boy", "the boy was chased by the girl", and "it was the girl who chased the boy". Children are unable to recognize synonymy until the early to middle elementary school years (Tunmer, Pratt, & Herriman, 1984).

2. Language is a system of units and rules: The awareness that language is a system of units is demonstrated by children's ability to break down larger linguistic units into smaller parts. This ability allows the child to divide the sentence "The girl chased the cat" into five words. It also enables the child to break down the word 'cat' into three

phonemes. The ability to segment words into their component sounds is a result of the child's phonological awareness. It is characterized by the ability to rhyme, to segment words into syllables and sounds, to manipulate sounds, and to blend sounds (Goswami & Bryant, 1990).

The recognition that linguistic rules must be used to combine syntactic units emerges during the early school years (Owens, 2005). This is illustrated by children's awareness that the utterance "The cat chasing the dog" is ungrammatical.

2. **Language is used for communication**: Preschool age children demonstrate some awareness of the social rules for language use at age 3 to 4, but it is during the early elementary school years that they can judge the adequacy and appropriateness of their messages. They can judge if an utterance is appropriate for a specific listener or setting and are aware that they should be polite to achieve their goals.

Development of metaphonology

Phonological awareness develops mostly between the ages of 3 and 8. The development of the ability to recognize and analyze sounds and sound patterns that make up words expand during the preschool period. They can detect sound and syllable changes in verbal tasks [MacLean, Bryant, & Bradley, 1987 (as cited in Fahey & Reid, 2000)]. As children grow older and interact more with both oral and written language, their phonological awareness skills become more defined and diversed. Phonological awareness increases rapidly upon the entry to school and its relationship to reading acquisition is strong. There is a reciprocal relationship between the two [Wagner, Torgeson, & Rashotte, 1994 (as cited in Fahey & Reid, 2000)], that is, phonological

awareness becomes more explicit and highly developed as experiences with written language increases. Good readers exhibit the ability to deliberately reflect on and manipulate the structural features of language and treat language as an object of thought (Tunmer & Cole, 1991). Poor readers show deficiencies in their knowledge and awareness of oral language or may have differences in their general phonological processing abilities [Stanovich & Siegal, 1994 (as cited in Fahey & Reid, 2000)].

Pre-schoolers begin to recognize, analyze and reflect about sounds in words. They can make corrections and manipulate sounds in words during spontaneous speech, creative sound play and rhyming games. As the children complete their fourth year, they develop the capacity to segment words into syllables and individual sounds (Liberman, Shankweiler, Fisher, & Carter, 1974; Ehri, 1975) and this may continue to develop till 6 or 7 years. Three- and four-year-olds coming from high-print households may recognize the relationship between letters and sounds without explicit instructions but youngsters without such experience often require explicit instruction and lots of practice time in kindergarten and the early elementary grades.

Ramkishan (1990) studied the development of metalinguistic ability on ten Kannada speaking typically developing children in grade 1 and grade 2. The tasks included were as follows: 1. Counting the number of words in the sentences presented orally by the experimenter, 2. Counting the number of words in their response to questions, 3. Counting the number of syllables in the words presented orally by the experimenter, 4. Counting the number of syllables in their response to questions, and 5. Counting the number of phonemes in the orally presented syllables and words. Results

showed that the children performed better in segmenting the speech of the experimenter than in segmenting their own speech and grade 2 good achievers scored higher in all the tasks. Syllable segmentation was the easiest while phoneme segmentation was the most difficult and phoneme segmentation abilities were not developed even by the age of 7-10years (II grade). Metalinguistic abilities correlated positively with scholastic achievement i.e., good achievers were found to be better in segmentation abilities.

Some research has been done to examine the development of phonological awareness in bilingual children. Rubin and Turner, 1989 (as cited in Bailystok, 2000) compared the phonological awareness of English-speaking first grade children who were either in French immersion or English programs and found an advantage for the French-immersion children. On the similar lines, Bruck and Genesee, 1995 (as cited in Bailystok, 2000) compared monolingual and beginning bilinguals longitudinally from kindergarten to first grade children on a variety of tasks. They found an advantage for the bilingual children on onset-rime segmentation in kindergarten but it disappeared in grade one. In first grade, there was an advantage for the monolingual children on a phoneme counting task.

Development of metasemantics

Metasemantic knowledge evolves gradually over school years. Children must understand that words are basic units of language system and that the relationship between the phonological constituents of words and their referents are arbitrary (Bowey & Tunmer, 1984; Homer & Olson, 1999). Children must have an implicit understanding that words are separable from their referents before they can engage in flexible uses of

words. Young children consider the name of an object due to its intrinsic attributes. Later, they learn that words themselves are not the inherent attributes of objects which allow them move beyond literal word use and adopt a metaphoric sense (Chaney, 1992).

Studies on semantic development generally deal with children's word associations (Di Vesta, 1964; Palermo & Jenkins, 1965; Reigel, 1965; Entwisle, 1966) and children's ratings of words on the semantic differential (Rice & Di Vesta, 1965; Di Vesta, 1966; Di Vesta & Dick, 1966). These studies are primarily concerned with the child's knowledge of words in isolation rather than words within the context of a sentence. But semantic knowledge consists not only of knowledge of the properties or features of a lexical item, but also knowledge of the semantic restrictions on the combination of lexical items in a sentence [Miller & Isard, 1963; Davidson, 1966; Chapman, 1967; Downey & Hakes, 1968; Danks, 1969).

Brown and Berko (1960) used a free word association task where in subjects were given a particular word and was instructed to give the next word that comes to their mind. Results indicated that there was a syntagmatic-paradigmatic shift in children's responses.

McNeill (1965) studied the ability of 5 to 8 year old children to imitate three kinds of verbal strings through a masking noise. The strings were meaningful, semantically anomalous but grammatical, or scrambled. Results showed that the ungrammatical or scrambled sentences were imitated least well by all age groups and meaningful sentences were imitated only slightly better than anomalous sentences. There was a moderate difference between the 7-year-old children's performance on the meaningful and anomalous sentences, while the 8-year-olds recalled meaningful

sentences markedly better than anomalous sentences. The author concluded that 5- and 6-year old children are not aware of, or do not attend to semantic restrictions on word combinations as they have incomplete listings of the semantic features for lexical items.

Development of metalinguistic notions of the concept of word in children requires them to verbalize such concepts. Panpandropoulou and Sinclair (1974) presented preschool and elementary school children with a variety of metalinguistic tasks wherein they were read a list of words and they were asked whether each was a word or not and the reason for why or why not. There was a developmental trend wherein older children acknowledged both content and function words as words, while younger children sometimes rejected. There was a developmental trend wherein older children acknowledged both content and functional words as words, while younger children sometimes rejected the functional words and older children were more skilled at articulating what constitutes a word.

Ben-Zeev (1977) developed a symbol substitution task. This task assessed children's level of awareness of referential arbitrariness. Subjects were asked to substitute a given word for a particular word in a sentence. Results showed that bilingual children were significantly more reliable in making substitutions than monolinguals. It was easier for bilinguals to ignore the meaning and deal with formal instructions.

Children will have a rudimentary awareness of the nature of words well before they demonstrate this explicit knowledge. In this view, Pease, 1986 (as cited in Gleason & Ratner, 2009) examined children's implicit awareness of the concept of word. The age of the subjects ranged from 4.6 years to 10 years and they were asked to say the favourite

words and favourite things. Results indicated that the difference between the two questions were clear in the older group compared to the younger group and the older group were able to clearly articulate about the metalinguistic aspects of words.

By age 10, children acquire a clear understanding of the use of the term word and at this point, they are able to provide formal definitions of words through the use of copula and a superordinative clause (Snow, Cancini, Gonzales & Shriberg, 1989; Snow, 1990). Defining a word is a twofold process; 1. Speaker needs to have adequate semantic knowledge about the meaning of the word to be defined, and 2. The speaker needs to be familiar with the formal structure of definitions i.e. the definitional genre. A developmental progression in this task was noticed among children aged 5 to 11 years and college students by Wehren, Dehisi, and Arnold (1981), beginning with an emphasis on personal experience and moving towards information of a more general, socially shared nature. Snow (1990) reported that during the early school years; children's definitions are concrete, personal and incidental. This is gradually replaced by abstract types of responses: synonyms, explanations and specifications of categorical relationship during the elementary school years (Al-Issa, 1969; Kurland & Snow, 1997). Researchers have found that strong readers gave better definitions than weak readers (Nippold, Hegel & Sohlberg, 1999). Prerequisites for the development of adult like definitional skills are the knowledge of the conventional form for good definition, combined with frequent opportunities to practice hearing and giving definitions.

Development of metasyntax

Several studies have been carried out to study the development of metasyntax. One of the commonly researched tasks that falls under metasyntax domain is the ability to identify and correct grammatical errors. Children as young as 2½ year old are able to make acceptability distinctions, but the distinctions are not sharply drawn (Gleitman, Gleitman, & Shipley, 1972). De Villiers and de Villiers (1972) pursued the Gleitman finding that early judgments of acceptability often appeared to be semantically based rather than syntactically based. They studied the acceptability judgment in children between the age of 28 and 45 months, using normal and reversed-order imperatives and also imperatives that were semantically anomalous (e.g., apple the soup; chew the push). Most of the children judged the anomalous imperatives more wrong than they did the well-formed imperatives. But the older, more linguistically mature children judged the reversed imperatives wrong more often than the well-formed ones. This result suggests that the young children judge acceptability on a different basis than adults do. Younger subjects are not sensitive to the word order strategy for comprehending utterances. Young children judge acceptability in terms of whether an utterance is understood or not. The younger children accept the reversed imperatives since they are insensitive to word order and so the utterance makes sense. As they don't understand the anomalous sentences they reject them. The older subjects understand the word order strategy in comprehension and hence judge both the reversed and anomalous sentences as wrong. Thus, young children's earliest metalinguistic judgments are tied closely to their comprehension strategies i.e., if they understand an utterance they will accept it or else reject it. Adults' judgments of acceptability are far less closely linked to comprehensibility than is the case for the

younger children. This implies that during the course of language acquisition there is a change in the basis on which such judgments are made.

There are two changes that children undergo before they reach adult criterion. Initially, judgments are made on the basis of understandability of a sentence. As children grow older and learn more of the comprehension strategies and rules of their language, they tend to reject more ungrammatical sentences. There is an intermediate stage during which judgments are based on content rather than form. During this stage, some sentences, both grammatical and ungrammatical will be rejected. It is in middle childhood there is a substantial growth that occurs in children's thinking processes.

James and Miller (1973) conducted a study to determine if children attend to minimal violations of selection restriction rules and also to determine whether older children (6.8 to 7.3 years), who should have developed a more complete set of semantic features for lexical items, demonstrate a greater awareness of selection restriction violations and a greater proficiency in the use of selection restriction rules than do younger children (4.8 to 5.3 years). Children were asked to judge the acceptability of sentences and to correct those containing selection restriction violations. Two lists of 32 sentences (lists A and B) were constructed with each list containing 16 meaningful and 16 semantically anomalous sentences. Eight of the anomalous sentences in each list contained adjective-noun (A-N) violations and eight contained subject-verb (S-V) violations. Two pictures were drawn representing the possible speakers of the experimental sentences. One picture depicted a bizarre-looking woman, the silly lady, and the second picture was of a relatively normal-looking woman, the okay lady. Each

experimental session consisted of three tasks. First, the subject was asked to identify the sentence as meaningful or anomalous (identification). Then, based on his identification, he was asked to explain why the sentence was anomalous or meaningful (explanation). The explanation task served as a check against the possibility of the subjects guessing the correct response on the identification task. Finally, the subject was asked to convert a meaningful sentence to an anomalous one or an anomalous sentence to a meaningful one. Analysis of the subject's responses on the two tasks indicates that both 5- and 7-year-old children are capable of distinguishing between anomalous and meaningful sentences although 7-year-olds demonstrate greater awareness of selection restriction rules. 7-year-old children were more proficient than 5-year-olds at using selection restriction rules in sentence production.

Scholl and Ryan (1975) designed a sentence classification experiment that systematically addressed the issue of developmental changes in syntactic judgments in children 5 to 7 years old. The children were asked to assign each stimulus (by pointing) to either an adult or a child speaker. Corrections were not requested after "child" classifications because such a reinforcement contingency might lessen the frequency of that particular response. The number of appropriate assignments indicated that both the five- and seven-year olds had some ability to discriminate well-formed negatives and interrogatives from primitive (i.e. deviant) ones. Nevertheless, despite the significant trend to make appropriate "speaker" assignments as a function of grammaticality, even the seven-year olds did not discriminate perfectly.

Hakes, Evans, and Tunmer (1976) (as cited in Foss & Hakes, 1978) studied whether two given sentences are synonym or not. Results revealed that children do not correctly judge the synonymy of a pair of sentences until well after they are able to understand both sentences. Hakes et al. found that youngest subjects (4-year-old) correctly identified the non-synonymous pairs. But on the synonymous pairs their performance was significantly worse. The pattern of the children's synonymy judgments suggests that the younger children were judging solely on the basis of the sentence form, without considering the meanings. Hence, they were correct more often than chance for the non-synonymous pairs because such sentences differed in meaning and in form. For synonymous pairs they were usually wrong as they judged based on the form alone. During the middle childhood there is a change from considering only the sentences' forms to considering both their forms and their meanings.

There are few studies that interpret children's spontaneous speech repairs as evidence for grammatical awareness. Clark and Andersen (1979) conducted a longitudinal study of three 2- and 3-year old children. Results showed that the morphological repairs remained constant with age while syntactic repairs increased with age. The spontaneous speech errors can also be studied by giving children simple but deviant sentences and asking them to correct them. Research has shown that older children are better at correcting the errors than the younger group (Menyuk, 1969).

Scholl and Ryan (1980) studied the extent to which children in kindergarten, second, and fourth grade could control their knowledge of syntax was examined in two metalinguistic tasks, judgment and repetition of sentences that varied in grammaticality.

The older children produced more accurate judgments, but no age differences were noted for repetitions. The unbiased judgment accuracy was correlated with the prereaders' reading readiness scores, providing some evidence for the relationship between the developments of these two types of metalinguistic skills.

Cairns, Schlisselberg, Waltzman, and McDaniel (2006) studied the ability to judge the grammaticality and correct the ill formed sentences of ten different sentence types to seventy seven 4-, 5- and 6-year-old children. Results showed that there was a developmental trend for both the tasks and these abilities reflected the child's developing ability to consciously access the syntactic knowledge and to employ the knowledge in the processing of sentences.

Development of metapragmatics

The awareness of the relationship between language and the social context in typically developing children has also been studied. Research findings indicate that in judging referentially inadequate messages, children aged 5 and under often blame the listener for the communicative failure. After age 8, children are able to identify the speaker as the source of the problem (Robinson, 1981).

Metapragmatic awareness requires more than knowing how to use language in culturally appropriate ways. Children must be able to articulate the rules explicitly. Younger children fail to follow the social norms of language use. By late childhood and early adolescence, most children have a fairly solid understanding of the rules governing language use in everyday social contexts [Berko, Gleason, Hay, and Cain, 1988 (as cited in Gleason & Ratner, 2009)].

Metalinguistic development and schooling

School literacy and extensive reading and writing instructions are suggested to be the propelling factor for metalinguistic awareness. The awareness increases through exposure to the teacher's talk about the words (Watson & Olson, 1987). Research has shown that the cognitive and metalinguistic abilities develop slowly among second-language learners who have little or no-schooling. The development of metalinguistic awareness during the school years can be grouped under three stages mentioned below:

Metalinguistic development in the preschool years: Language of the families is acquired by children by hearing them in everyday social interactions and because of the capacity of human brain. Tunmer and Cole (1991) stated that children as early as 2 or 3 years begin to deliberately reflect on and manipulate the structural features of spoken language, treating the language system itself as an object of thought, as opposed to using the language system to comprehend and produce sentences. Depending on the communication partner, children monitor their own utterances and make repairs, practise sounds, words and word combinations (Clark, 1978). Such awareness is due to the result of both innate characteristics and direct experience with language.

Pre-schoolers monitor their own utterances and repair them when the information is not conveyed to their communication partner. Clark (1978) stated that they deliberately practise new words, sentences and social rules. Pre-schoolers also develop the ability to recognize and analyze the sounds and sound patterns that make up words as they are taught to write their names, produce letters and numbers, and even read simple stories. The extents to which pre-schoolers pay attention to and manipulate sounds depend on the

amount of experience and explicit instruction received at home or in day care or preschool settings.

Metalinguistic development in the elementary and middle school years: In the elementary school, the most growth in metalinguistic skill occurs as children use language as a tool for learning about language itself. They judge an utterance based on the setting situational appropriateness. An important metalinguistic ability developed in this period is the development of comprehension monitoring which is the progressive ability to judge what they have heard. During the early school years, children have difficulty in understanding ambiguous, contradictory and incomplete sentences. After second grade, they are better able to recognize ambiguous messages and engage in repair and requests for clarification (Beal & Flavell, 1983; Beal, 1987).

During this period, children engage in reflection about specific topics and they can explain when forms are not correctly used within a sentence. They also provide various definitions for words and construct a variety of figurative language forms (Clark, 1978).

In the elementary level, children are taught to tap out the sounds in spoken words and syllables, identifying words beginning and ending with a particular consonant, identifying words containing a particular vowel, producing alliterations. These activities signal to the predictability and regularity of the spoken and written language. Continuing instruction in reading, writing, and language arts during this period expands children's' knowledge of the various systems of language.

Metalinguistic development in the later school years: Metalinguistic abilities come into use when children learn to apply the previously learned information to the newly learned information. During this period, metalinguistic ability helps children to proof read and edit their own writing or the writing of their peers. These tasks involve being able to analyse the sentence structure for grammatical forms, recognize spelling errors, and determine whether information is appropriate to the paragraph structure.

Factors influencing the development of metalinguistic awareness in children

Galambos and Golden-Meadow (1990) suggested that there are various factors that influence the development of metalinguistic awareness in children which are given below:

- One of the factors which influence the development is a young child's experience with language in general.
- Exposure to more than one language: Bilinguals learn to differentiate the two language codes that they are learning. Up to the age of two, children exposed to two languages have only one linguistic system which is same as that of the linguistic system of monolinguals. The difference is that the bilingual child's system is a mixed one which has features from both the language models. During the third year, one code gradually unfolds into two, and each language is assigned fairly rigidly to the person who speaks it or to the context in which it typically occurs. Initially the phonological and lexical aspects of the two codes are separated first followed by a separation of syntactic aspects. Finally, by the age of 3-4, bilingual children begin to decontextualize their language and realize that they speak two distinct languages. It is

at this point that bilinguals exhibit a variety of explicit metalinguistic behaviours i.e. they begin to translate spontaneously, ask for transitions, tag constructions according to their linguistic affiliations, and sharply reduce mixing of the two codes (Hakuta, 1986). They also noted more grammatical errors than the monolinguals. They had an advantage over the monolinguals with respect to noting and correcting errors. This bilingual advantage was not seen for explanation task. The younger children tended to give grammar-oriented corrections based on the awareness of isolated linguistic markers while the older children gave grammar-oriented corrections based on an awareness of a more complex linguistic system. A progression was seen in children's corrections from content-oriented corrections to grammar-oriented corrections. The bilinguals' advantage over monolinguals could be attributed to the fact that learning to differentiate two language codes requires extensive attention to the form of the language which is not essential when a acquiring a first and only one language.

- Learning to read: Acquisition of reading has an effect on the ability to correct grammatical errors. Metalinguistic abilities emerge about the same time children are learning to read, and it has been suggested that metalinguistic awareness and reading development are related (Tunmer & Bowey, 1984; Catts, 1996).

Although most typically developing children acquire metalinguistic ability without any additional instruction, children with communication disorders fail to do so. Research has shown that few children with language disorders demonstrate deficits in metalinguistic abilities (Kamhi & Koenig, 1985; Van Kleeck, 1995) and that metalinguistic and language processing deficits underlie reading disabilities (Catts,

1996). Mattingly (1972), Tunmer & Bowey (1980), Hodgson (1992) and others emphasize that the metalinguistic processes, specially the metaphonological skills need to be paid more attention to in the identification and management of reading disabled children.

Metalinguistic awareness in children with communication disorders

There have been several studies documenting the metalinguistic abilities in children with various language impairments. Kamhi, Lee, and Nelson (1985) examined metalinguistic awareness of words, syllables and sounds in fifteen 5-6 year old children with language disorder, fifteen typically developing children matched for mental age, and fifteen chronologically age-matched children. Results indicated that the children with language disorders lacked metalinguistic awareness of words, syllables and sounds and did not perform as well as younger mental age-matched children, placing them at risk for difficulty in learning to read, write and spell.

Menyuk, Chesnick, Liebergott, Korngold, DÁgostino, and Belanger (1991) compared the metalinguistic abilities in children labelled as specific language impairment (SLI) and those of normally developing and at risk children. They reported that some SLI and some at risk children clustered together in these abilities but that, although some at risk children performed significantly poorer than their normally developing age peers, they did significantly better than did the SLI children. A comparison of the metalinguistic skills of the three language ability groups in all the areas showed that the SLI group was most different in pattern of development of semantics and phonology (Chesnick, Menyuk, DÁgostino, & Belanger, 1992).

Menyuk (1993) reported difficulties in two groups of children with SLI. One group had difficulties in both metalinguistic abilities and general metaprocessing abilities and this retarded their development. On the other hand, another group of children with SLI showed differences in the patterns of development and language behaviour, and their difficulties were mostly metalinguistic, not general metaprocessing difficulties.

Children with language impairments have been reported to show deficits in phonological awareness beginning in school (Kamhi, Lee, & Nelson, 1985; Boudreau & Hedberg, 1999). Gardner (1998) compared the interaction of three types of children with their mothers-phonologically disordered children, normally developing children of equivalent mental age and younger children with age appropriate phonological ability. Results indicated that children in all groups sometimes made phonetic and semantic revisions (i.e. they altered the structure of a word or used a new word) when the mother indicated to them that she had not understood but the phonologically disordered group made more revisions than either of the two groups but showed a preference for semantic revisions.

A similar deficient performance was also reported in children with phonological disorders. According to Howell (1989) phonological disordered children made as many attempts as age matched children with superior phonological ability to correct mispronounced words when they were deliberately misunderstood by the listeners in an experiment which compared the ability of the two groups to judge and correct mispronounced tape recorded words. This showed that phonologically disordered children were capable of increasing the number of phonetic revisions they make to their

habitual pronunciation, particularly if they are placed in situations where such changes serve the specific purpose of increasing understanding by the listener. However, these children could not spontaneously correct the mispronounced words, but they were able to make the corrections when they were prompted to. This suggests that structuring the therapeutic session to encourage such revision, as done in Metaphon, is a valuable treatment strategy.

Karthikeyan and Shyamala (2003) compared a sample of children with Down syndrome (DS) and a sample of typically developing children (Malayalam as mother tongue for both the groups) matched for reading ability (RA) and phonological awareness (PA) skills and thereby investigated relation between PA and RA. Rhyme recognition, syllable stripping, syllable reversal, phoneme detection and reading matching ability were the tasks used. Results indicated that there was no relation between reading and phonological awareness in DS children, and they obtained lower scores on all tasks which may be attributed to their limited cognitive capacity.

Namrata and Prema (2003) studied the relation between reading skills and phonological awareness in children with hearing impairment. Reading readiness test and metaphonological test were administered to all the participants. Results indicated that the experimental group performed poorly in tasks of phonological awareness and reading and children with hearing impairment did exhibit a certain level of phonological awareness inspite of having been taught in a top-down approach. In phonological awareness tasks, children performed best in rhyme recognition and poorer in syllable level tasks indicating that syllable segmentation tasks are sensitive predictors of reading than sound

comparison tasks like rhyme recognition. Phonological awareness skills and auditory discrimination interact in development of reading skills. She concluded that there was no apparent cause and effect relation between phonological awareness and reading. But it was observed that better reading skills co-existed with better phonological awareness and it was assumed that they complement each other and acquisition of one facilitates the other.

Bajaj, Hodson, and Schommer-Aikins (2004) evaluated the performance on metalinguistic tasks by children who stutter (CWS) and children who do not stutter (CWNS). The tasks included phonological awareness and grammatical judgment task wherein syntactic and semantic appropriateness of sentences were evaluated by the participants. Results revealed that CWNS outperformed CWS in judging syntactically and semantically anomalous sentences but no significant differences were observed for phonological awareness tasks.

Lewis, Murdoch, and Woodyatt (2007) studied the communicative competence and metalinguistic abilities in children and adults with autism spectrum disorder (ASD) using the Test of Language Competence-Expanded Edition (TLC-E) (Wiig & Secord, 1989). The findings revealed that children with ASD were less skilled on tasks of resolving ambiguity, understanding inferential language, and using linguistic flexibility to produce speech acts constrained by a communicative situation while adults with the same diagnosis presented with difficulties in interpreting figurative language and producing relevant speech acts.

Research was carried out by Priya and Manjula in 2009 with the aim of comparing the metalinguistic skills between bilingual-biliterate children with developmental dyslexia and language age matched typically developing children and the correlation between reading abilities and different metalinguistic skills that contribute significantly to the acquisition of reading and writing abilities in the two groups of children. The tasks to assess metaphonology, reading and writing were taken from the Reading Acquisition Profile (Prema, 1997), and tasks to assess metasemantics and metasyntax were taken from Linguistic Profile Test (Karanth, 1980). Results revealed that there was significant difference between the two groups on metalinguistic and literacy skills. Children with developmental dyslexia performed poorly on all the metalinguistic, reading and writing tasks. Metaphonology contributed significantly to the acquisition of reading in typically developing children whereas, metasemantics contributed significantly to the acquisition of reading in children with developmental dyslexia.

Yashaswini and Geetha (2010) compared children with stuttering and children without stuttering on various linguistic and metalinguistic tasks. Stuttering severity index-3 (Riley, 1994), linguistic profile test (Karanth, Ahuja, Nagaraja, Pandith, & Shivashankar, 1991) and metaphonology section of reading acquisition profile in Kannada (Prema, 1997) were administered. Results indicated that children with stuttering performed poorly on higher language abilities like syntactic judgement and metaphonology when compared to children with no stuttering.

Metalinguistic awareness in adults with communication disorders

Thompson-Smitha and Tina (1989) studied the ability of people with Broca's aphasia to make metalinguistic judgments concerning which was or was not a violation of linguistic rule usage within both the semantic and syntactic domains. Subjects were asked to judge, revise, and explain a corpus of sentences on a set of formal (created by the examiner) and informal (subject's spontaneous errors) tasks. The results showed that the control and mild aphasic subjects were able to judge, revise, and explain sentences significantly better than the moderate aphasic subjects across all formal tasks for absolute and relative values. All subjects were able to judge, revise, and explain semantically anomalous utterances significantly better than ungrammatical utterances on the formal tasks for absolute values.

Harley, Jessiman, MacAndrew, and Astell, (2008) studied whether Alzheimer's disease affect metalinguistic abilities and poor definitions in them is because they lose semantic information, or because they lose the knowledge of what constitutes a good definition. The authors asked the elderly people with Alzheimer's disease to define the words and as anticipated, their definitions were very poor. Then authors asked them forced and open-choice questions about the information that they omitted from their definitions. Results showed that the people with Alzheimer's disease could access semantic information that they appear to have lost. The Alzheimer's disease group performed significantly worse than control participants on a word definition task, but importantly, some of the information they did not provide spontaneously was provided after questioning. The format of their definitions was also different from the controls where they made particular use of autobiographical information. They concluded that the

individuals with Alzheimer's disease have lost some semantic information and they do not provide them because of metalinguistic impairment and they do not understand what constitutes a good definition. The authors attribute the metalinguistic impairment results to the frontal atrophy.

Role of metalinguistics in reading acquisition in the Indian context

The widely accepted notion that metaphonology contributes to reading is challenged in Indian languages as phonemic awareness is not so crucial for learning to read Indian languages. This is because Indian writing systems originates from Brahmi and it is a semi-syllabic script which bears a closer relationship between their phonemes and graphemes in comparison with the alphabetic scripts like English.

In Indian languages studies have shown that the phonological awareness is neither evident nor as crucial to successful reading (Prakash & Rekha, 1992; Prakash, Rekha, Nigam, & Karanth, 1993; Prema & Karanth, 2003). Children learning to read alphasyllabaries and adult monoliterates in alphasyllabaries performed well in rhyme recognition and syllable deletion tasks but performed poorly on the phoneme segmentation tasks. Whereas, the biliterate adults with exposure to the alphabetic script of English, were able to carry out the phoneme segmentation and oddity tasks successfully (Prakash & Rekha, 1992; Prema & Karanth, 2003). Prakash and Rekha (1992) documented that children studying in Kannada-medium schools showed a spurt in performance on phoneme awareness tasks such as phoneme stripping and phoneme oddity after having been introduced to the alphabetic script of English.

Karanth and Prakash (1996) conducted a longitudinal study of 48 Kannada speaking children from upper kindergarten to grade II. They tested children's reading, writing and metaphonological skills regularly. The results revealed that children learning to read Kannada progressed from 'akshara' recognition through 'kagunitha', geminated words, exceptional words to words with consonant clusters. This indicated that literacy acquisition in non-alphabetic Indian languages followed stages that are more clearly linked to the levels of complexities inherent in the script.

Acquisition of reading skills was profiled by Prema (1997) on 150 typically developing children learning to read Kannada from grade III to grade VII, with the objectives of developing a profile for acquisition of reading and writing, delineating the specifics of reading with respect to the orthographic features of Kannada, identifying predictors of reading ability and identifying reading disabled children. The results revealed that the hierarchy of predictors of reading abilities in Kannada in monolingual-monoliterate was metasemantics, metasyntax and metaphonology. The same hierarchy of predictors was observed in bilingual-biliterate children with learning disability by Priya and Manjula (2009).

Sharma (2000) studied the language skills on 23 Hindi speaking children with learning disability using Hindi version of Linguistic Profile Test (LPT) (Sharma, 1995). The results indicated poor performance of children with learning disability on the LPT, with syntax and semantics more affected than phonology. These findings were replicated by George (2001) on a group of 21 Malayalam speaking children with learning disability.

A look into the literature has shown that the metasemantics predicts the reading abilities in Kannada and contributes to academic success in Indian context. Since there are no tests to assess metasemantic abilities in children, it is of interest to develop and standardize a test for assessing metasemantic awareness which could prove advantageous in the intervention of individuals with communication impairment. Keeping this in view, the study was designed with the aim of developing and standardizing a test for assessing the metasemantic awareness in children in Kannada. The method adopted to develop the test has been described in detail in the next chapter.

Chapter 3

Method

The aim of the present study was to develop and standardize a test to assess the metasemantic awareness in Kannada speaking children in the age range of 8 to 11 years. The study was undertaken in the following phases:

Phase I: Construction of the Test for the Assessment of Metasemantic Awareness in children in Kannada (TAMAC-K).

Phase II: Standardization of TAMAC-K on typically developing children.

Phase III: Assessment of test-retest reliability.

Phase IV: Administration of TAMAC-K on clinical population.

Phase I: Construction of the Test for the Assessment of Metasemantic Awareness in children in Kannada (TAMAC-K): As a part of construction of the test, the following research steps were undertaken:

Step 1: Development of the assessment tool:

This step involved the development of the test for the assessment of metasemantic awareness in children in Kannada. The tasks to be incorporated under the metasemantic ability were collated after a review of the relevant literature. A total of fifteen tasks were compiled. Tasks 1 to 13 were designed to be elicited through a judgment and a revision type of subtask and task 14 and 15 were designed to be elicited through a generation type

of subtask. The judgment type of subtask required the participants to judge whether a given utterance was correct or wrong; the revision type of subtask required the participants to correct the wrong utterance; and the generation type of task required the participants to produce an utterance. The details of the tasks included were as follows:

Task 1: Analyze a sentence into lexical units/ words: This task was designed to check the ability of the participants to count the number of words present in a sentence.

Task 2: Word association task:

a: This was planned to check the ability of the participants to give the items that belong to a particular category.

b: This was intended to check the ability to categorize the words according to its super ordinate.

Task 3: Word concept awareness: This was planned to check the ability of the participants to decide whether the target stimuli is a word or not.

Task 4: Free word association task: This was planned to check the ability of the participants to give a related word that comes to their mind when they hear a target word.

Task 5: Synonyms: This task was intended to check the ability of the participants to give an equivalent word to the target word.

Task 6: Antonyms: This was included to check the ability of the participants to give an opposite word to the target word.

Task 7: Homonyms: This task was considered to test the ability of the participants to give multiple meaning of a word.

Task 8: Identify the grammatical category for a word: This task was designed to assess the participant's ability to give the grammatical category of a word.

Task 9: Semantic anomaly: This task was considered to check the participant's ability to comment on the acceptability of a sentence.

Task 10: Paradigmatic relations: This task was intended to test the ability of the participants to understand the categorical relationship between the first paired words and give a word to the second pair.

Task 11: Syntagmatic relations: This task was incorporated to assess the participant's ability to understand the functional relationship between the first paired word and give a word to the second paired word on the same lines.

Task 12: Semantic contiguity: This task was designed to assess the participant's skill to provide a word which is related to the target word.

Task 13: Semantic similarity: This task was incorporated to assess the participant's ability to provided semantically similar words.

Task 14: Define a word: This task was considered to test the skill of the participants to provide a well formed definition of a given word with a general information and super ordinate category.

Task 15: Lexical/referential arbitrariness: This task was intended to test the ability of the participants to ignore the meaning of a sentence by substituting a word/symbol and answering to the question asked at the end of symbol substitution.

A total of 15 items (test stimuli) were included under each task. The test stimuli under each task were prepared from the textbooks in Kannada prescribed by the Karnataka board of primary and secondary education and from the standardized tests previously developed and used for assessing language (Linguistic Profile Test, LPT, Karanth, Ahuja, Nagaraja, Pandith, & Shivashankar, 1991). A score sheet was also prepared to document the children's responses under each task. Instructions were prepared for each task. The following scoring pattern was designed to score all the tasks except for the word definition task and lexical/referential arbitrariness task: 1 for a correct response and 0 for a no response/incorrect response. For the word definition task and lexical/referential arbitrariness task the scoring pattern adopted was: 2-Correct response, 1-partially correct/only little information was provided, and 0-no response/incorrect response.

Step 2: Content validity check

The tasks included under the test were given to three speech-language pathologists who had more than five years of teaching, research and clinical experience in various aspects of language for their feedback on the contents (appropriateness of the tasks included in the test and the items under each task). The feedback was collected from various tasks of the test using a 3 point rating scale ranging from the contents are not very valid (score 0) to all the contents are valid (score 2). Based on the feedback, two tasks

(word association task and word concept awareness task) were deleted from the test as it was rated as not very valid by two of the three judges.

Step 3: Familiarity rating

The prepared test items under each task were subjected to familiarity rating. The stimuli were given to the teachers working in the state board English medium schools who taught Kannada for the III, IV, and V grade and they were asked to rate each stimulus on a 3 point rating scale ranging from most familiar to unfamiliar. The stimulus that was rated as most familiar by teachers was selected as the final stimuli. There were 15 stimuli under each task initially and finally, 8 stimuli that were rated as most familiar only were retained.

Step 4: Pilot study

A pilot study was carried out in which TAMAC-K was administered on six typically developing Kannada speaking children in the age range of 8 to 11 years from grade III, IV, and V with two children in each grade. The pilot study was conducted to check the ease with which the test material could be administered, the appropriateness of the test, and the approximate time required by the children to complete the test. This was also carried out so that the experimenter becomes experienced in the test administration and response recording. Following this, the task on semantic similarity was deleted from the test since the V grade students also responded poorly i.e. they obtained a score of '0' on the entire item. The final form of the test thus developed contained 12 tasks with 8 items (3 test items under each type of subtask i.e. judgment and revision subtask and 2 sample items) under each task. The tasks and the scoring pattern adopted for each task

included in the test are provided in the Table 1. The final form of the complete test of metasemantic awareness in Kannada along with the stimuli and instructions has been provided in the appendix I.

Table 1: *Details of the Test for the Assessment of Metasemantic Awareness in children in Kannada.*

Sl. No.	**Task**	**No. of items**	**Score for each correct response**	**Total score**
1	Analyze a sentence into lexical units/words	06	1	06
2	Free word association task	06	1	06
3	Synonyms	06	1	06
4	Antonyms	06	1	06
5	Homonyms/lexically ambiguous words	06	1	06
6	Identify the grammatical category	06	1	06

7	Semantic anomaly	06	1	06
8	Paradigmatic relations	06	1	06
9	Syntagmatic relations	06	1	06
10	Semantic contiguity	06	1	06
11	Define a word	06	2	12
12	Lexical/referential arbitrariness	06	2	12
	Total			**84**

Phase II: Standardization of TAMAC-K on typically developing children

Participants: TAMAC-K was administered on 180 typically developing Kannada speaking children, across grade III (age group: 8-8.11 years), IV (age group: 9-9.11 years) and V (age group: 10-10.11 years) with 60 participants in each grade. Equal number of males and females were considered in each age group. These children were selected from different state board English medium schools in Mysore. The details of the participants have been provided in the Table 2.

Table 2: *Details regarding the number of typically developing participants.*

Grade	Males	Females	Total
III	30	30	60
IV	30	30	60
V	30	30	60
Total number of participants			180

Inclusion criteria: The following criteria were adhered to while selecting the participants.

1. The participants should be a native speaker of Kannada and English should be the medium of instruction at school.
2. They should have had a minimum of two years of formal training at school.
3. Participants should have had no history of neurological, communicative, cognitive, or sensorimotor, and academic impairment. This was ensured using the 'WHO Ten-question disability screening checklist' (Singhi, Kumar, Malhi & Kumar, 2007).
4. Participants should have had age adequate language abilities which were ascertained using Linguistic Profile Test (LPT, Karanth, Ahuja, Nagaraja, Pandith, & Shivashankar, 1991). LPT is a test developed to assess the phonology, semantic and syntactic aspects of the Kannada language in children above six years. The LPT has items for phonemic discrimination and phonetic expression; sentence structure covering the core syntactic features of the language; various semantic categories and relationships to evaluate individual's semantic knowledge.

5. Participants should have had adequate scholastic performance which was ascertained by obtaining the opinion regarding the academic performance from the class teacher. Children with adequate scholastic performance were only selected.

All ethical standards were met for subject selection and their participation. Prior to testing, a written consent was obtained from the school authorities and parents of the participants after explaining the purpose of administration of the test. Participants belonging to low, middle and high socio-economic statuses were selected which was ascertained using the NIMH socioeconomic status scale developed by Venkatesan (2009). The scale has sections such as occupation and education of the parents, annual family income, property, and percapita income to assess the socioeconomic status of the participants.

Procedure: Initially the examiner engaged the child in a general conversation to build a rapport with the participant. After the initial phase of rapport building, WHO disability checklist, NIMH SES Scale, and LPT in Kannada were administered. Following this, each participant was tested on the TAMAC-K individually in a relatively noise free environment with minimum distractions. The instruction for different tasks was given in Kannada and they were repeated only once. Two sample test stimuli were also provided to familiarize the child with the tasks on hand. Once the child was familiar with the type of task, the test stimuli under each task was presented one at a time and their responses were documented in the score sheet. Adequate breaks were provided in between the testing sessions. The approximate time for testing was around 25-30 minutes. Positive

reinforcements like verbal and social reinforcements were provided to maintain the interest and motivation of the child throughout the test administration. At the end of the administration, a tangible reinforcement (chocolate) and token reinforcement (pencil) were provided to the child.

Phase III: Test-retest reliability

The TAMAC-K was re-administered on 33.3% of the sample selected randomly within a period of 10-15 days to assess the test-retest reliability, the scores of which was subjected to statistical procedures. A total of 60 participants with 20 participants in each grade were selected. Equal number of males and females were selected for assessing the test-retest reliability.

Phase IV: Administration of TAMAC-K on clinical population

Any newly developed screening/diagnostic test, developed by measuring the typical behaviour in normal children (normative group) with a view to use it for screening deviant behaviour, must be used for testing clients with disorders (Hegde, 1994). Therefore, TAMAC-K was administered on 15 Kannada speaking children with learning disability in the age group of 8-11 years. The children were diagnosed as learning disabilities using Early Reading Skills (ERS) (Loomba, 1995) in a clinical set up by a multidisciplinary team of qualified specialists including a speech-language pathologist and a clinical psychologist. They functioned two grades or more below their expected grade. The details of the participants are depicted in Table 3.

Table 3: *Details regarding the number of participants with learning disability.*

Grade	Males	Females	Total
III	3	2	5
IV	4	1	5
V	5	0	5
Total number of participants			15

The participants were selected based on the following criteria:

1. They should be a native speaker of Kannada and English should be the medium of instruction at school.
2. They should have had no history of neurological, cognitive or sensorimotor impairment based on history, the assessment report and reports from parents and school teachers.
3. They should have had a minimum of two years of formal training at school.

None of the participants had attended speech-language therapy but they had received guidelines and counselling regarding the activities to be carried out to improve academic skills. The procedure used for selection of participants from all socioeconomic status was the same as in the typically developing group. Each group comprised of children from low, middle and upper socioeconomic statuses according to the NIMH SES scale (Venkatesan, 2009). TAMAC-K was administered on the selected participants. The

procedure of administration was similar to that in the typically developing group. All ethical standards were met for subject selection and their participation. Prior to testing, a written consent was obtained from the school authorities and parents of the participants after explaining the purpose of the administration of the test.

Analysis: The responses obtained from each child for each task were scored. The scores obtained for each task were averaged across all children and fed to the computer for statistical analysis. SPSS version 18 software was used for the statistical analysis. The mean performance level along with the standard deviation for each task was determined. The pattern(s) in the responses within each group and between each grade was then recorded. Gender differences for each grade were determined. The data obtained from children with learning disability was compared with that of the typically developing children to check for any significant group differences. The results obtained have been presented and discussed in the next chapter.

Chapter 4

Results and Discussion

The aim of the study was to develop and standardize the Test for Metasemantic Awareness in Kannada on typically developing (TD) children in the age range of 8-11 years who belonged to the III (age range: 8.0-8.11 years), IV (age range: 9.0-9.11 years) and V (age range: 10.0-10.11 years) grade. Equal number of males and females were selected in each group. The test material was administered on these participants as a part of standardization and also on children with learning disability (LD) to assess the clinical validity of the test. The data obtained from these groups were averaged across participants for each task separately and subjected to statistical analysis using SPSS version 18 software. The following statistical procedures were used:

1. Descriptive statistical analysis was used to compute the mean and standard deviation scores for the both the groups individually.
2. MANOVA was used to find out the significant difference in the performance of TD children on each task across three grades.
3. Duncan's test was used for pairwise comparison of grades on each task in the TD group.
4. Repeated measure ANOVA was used to examine whether significant difference existed within each age group across tasks in the TD group.
5. Bonferroni's pairwise comparison test was used to find out the pairs which were significantly different in the TD group.

6. Kruskal-Wallis test was used to compare the performance of children with LD across grades for each task.
7. Cronbach's alpha test was used to calculate test-retest reliability.
8. Mann-Whitney U test was used to compare the performance of TD children with children with LD across grades on each task.
9. Friedman test was used to compare the performance of participants within each grade across tasks for children with LD.
10. Wilcoxson signed rank test was used for pair wise comparison within each grade across tasks for children with LD.

The results of the statistical analysis for both groups on the different tasks have been presented and discussed under different sections listed below. Each task had items for which the responses were elicited through a judgment and revision subtask.

I. Comparison of overall performance of TD children across age groups

II. Comparison of performance of TD children on each individual task across age groups

III. Comparison of TD children within each age group on different tasks

IV. Comparison of performance of TD children across different socioeconomic status

V. Test-retest reliability

VI. Clinical validity

I. Comparison of overall performance of TD children across age groups

The overall performance of the TD children and the total performance on judgment, revision, and generation subtask separately across all the twelve main metasemantic tasks included in the test were compared across the different age groups. Descriptive statistical analysis was used to calculate the mean and standard deviation in the TD children in each age group. The mean and standard deviation (SD) scores of TD children thus obtained for all the grades for the total of judgment, revision, and generation subtask and the total overall performance have been depicted in Table 4. The performance of the TD participants across grades for the judgment, revision and generation subtasks has been graphically represented in Figure 1.

Overall performance: The % mean value obtained for the grade III was the lowest compared to the other grades. The % mean value obtained for grade IV was higher than that obtained for grade III and TD children of grade V obtained the highest mean score. This indicated that the performance of the children on the various metasemantic tasks increased with age.

Table 4: *Percentage (%) mean and standard deviation (SD) scores of TD children of different grades across various subtasks.*

Subtask	III Grade		IV Grade		V Grade	
	% Mean	SD	% Mean	SD	% Mean	SD
Judgment	89.11	5.88	95.28	3.59	97.39	2.46
Revision	75.17	9.81	87.78	6.83	93.79	4.81
Generation	89.79	7.80	96.94	4.05	98.19	2.80
Total	84.32	6.43	93.08	3.07	96.33	2.54

ANOVA was used to statistically analyze the performance of participants of different grades on the total score with grade as the independent factor. Results revealed a statistically significant effect in the performance of the participants of three grades [F (2, 177) = 121.062, P<0.001]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$).

The total score increased with increase in age and a full score was not obtained even by the older children considered for this study. This shows that the development of metalinguistic awareness is not completed even by the fifth grade although it begins in the middle childhood. This result is in consonance with the study done by Wehren, DeLisi, and Arnold (1981). They found a developmental progression in word definition task and the development takes place even during the college period.

Judgment subtask: The total percentage mean and SD scores of each group of TD participants on the judgment subtasks across all the twelve main metasemantic tasks have also been depicted in Table 4. The % mean value obtained for the judgment task for grade III was the lowest compared to the other grades. The % mean value obtained for grade IV was higher than that obtained for grade III and TD children of grade V obtained the highest % mean score. Therefore, there was a gradual increase in the mean values obtained across grades on the judgment task. This indicated that as age increased, the performance of the children improved. MANOVA was used to analyze the performance of the subjects of different grades on this subtask with grade as an independent factor. Results revealed a statistically significant effect in the performance of subjects of three grades [$F(2, 177) = 62.168$, $P<0.001$]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$).

Revision subtask: The total percentage mean and SD scores of each group of TD participants on the revision subtask on all the twelve main metasemantic tasks have also been depicted in Table 4. In the revision task too, a similar pattern was obtained. The % mean scores increased as the age increased. However, the mean score obtained in the revision task was lesser than that obtained in the judgment task across all the grades. MANOVA was used to statistically analyze the performance of subjects of different grades on this subtask with grade as an independent factor. Results revealed a statistically significant effect in the performance of subjects of three grades [$F(2, 177) = 97.886$, $P<0.001$]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$).

Generation subtask: The total percentage mean and SD scores of each group of TD participants on the generation subtasks of the 11th and 12th metasemantic tasks have also been depicted in Table 4. The mean scores obtained by the TD children increased across grades on this task too which indicated that their performance improved with age. The scores obtained on the generation task were almost comparable to the scores obtained on the judgment task. MANOVA was used to statistically analyze the performance of subjects of different grades on this subtask with grade as independent factor. Results revealed a statistically significant effect in the performance of subjects of three grades [F (2, 177) = 43.466, P<0.001]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the grades (p<0.05) except between fourth and fifth (p<0.05).

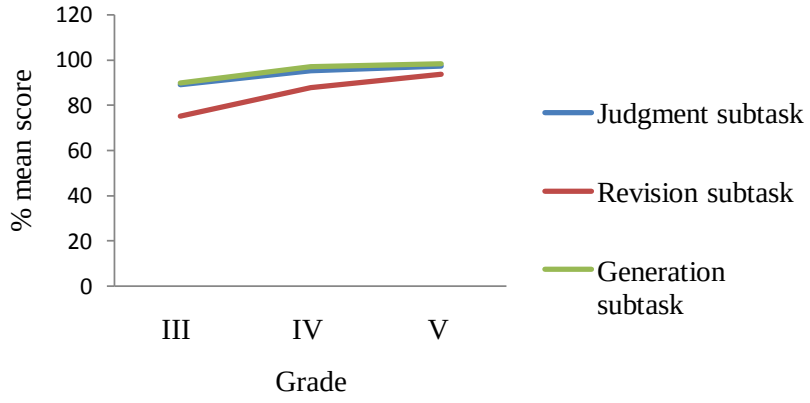

Figure 1: *Percentage (%) mean score of TD children of different grades across various subtasks.*

The performance of the TD children within each grade across the three subtasks was compared using repeated measure ANOVA. F values and p values across the three

grades have been depicted in Table 5. The results revealed that on all the three grades, there was statistically significant difference between all the three tasks. Pairwise comparison was done using Bonferroni's test which revealed a statistically significant difference between judgment and revision and revision and generation type of tasks for all the three grades ($p<0.05$).

Table 5: *F values and p values across three grades.*

Grades	**F values (2, 118)**	**P values**
III	118.966	0.00*
IV	59.116	0.00*
V	59.116	0.00*

*significantly different at $p<0.001$

The % mean scores in the judgment subtask improved with age. The % mean scores for the revision and generation subtasks also improved with age and this result is in accordance with the study done by Scholl and Ryan (1980) who found that the older children produced more accurate judgments than the younger children and a developmental trend was noticed in the ability to detect an error. There appears to be a developmental continuum based on explicitness of awareness starting from spontaneous repair of their own speech, later by correcting the utterance of others, and finally by explaining why certain sentences are possible and how they should be interpreted and the

endpoint being overt verbalized metalinguistic judgments (Clark, 1978). Thus, the tasks of noting, correcting and explaining ungrammaticality appear to differ systematically in the level of explicit knowledge of language required to perform each task.

The results indicated that for TD children the judgment and generation task was easier and required the same amount of cognitive load than when compared to the revision type of task which was more difficult compared to the other two tasks. This result holds well across all the three age groups. The results also support the view that judgment tasks are easier than revision tasks and are the first of the metalinguistic skills to emerge and expand since the younger TD children were able to judge the grammaticality of the sentence but were unable to revise them. Judgment task is more easier than the revision type of task because the ability to detect or note ungrammaticality in others speech is due to the unconscious error-detecting mechanism which runs without any need for conscious awareness (Marshall & Morton, 1978; Karmiloff-Smith, 1986) and this leaves no trace of structural information in memory (Marshall & Morton, 1978) whereas, correcting an error or revision task is more complex, as it requires both the ability to detect error at the start, as well as the ability to process the ungrammatical construction exhaustively and retain it in short term memory to generate a correct sentence associated with the incorrect form (Fowler, 1988).

II. Comparison of performance of TD group on individual tasks across age groups

The performance of the TD group on each individual metasemantic task included in the test was compared across the three different age groups. The comparison was made separately for the judgment and the revision subtasks for the first ten tasks. On the 11th

and 12th task, a generation subtask was used, for which again a comparison of TD participants across age groups were made the results of which have also been presented and discussed. Descriptive statistics was used to compute the mean and SD scores which have been depicted in Table 6. The mean scores for the male and female participants in all the three age groups have also been depicted in Table 6.

Table 6*: Mean and SD scores of typically developing children across age groups on various tasks.*

T*	ST*	8.0-8.11 years (III Grade)						9.0-9.11 years (IV Grade)						10.0-10.11 years (V Grade)					
		Male		Female		Total		Male		Female		Total		Male		Female		Total	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	J	2.70	0.47	2.70	0.47	2.70	0.46	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00
	R	2.30	0.79	2.10	0.89	2.20	0.84	2.90	0.31	2.80	0.48	2.85	0.40	2.87	0.35	2.93	0.25	2.90	0.30
	O	5.00	1.11	4.80	1.13	4.90	1.12	5.90	0.31	5.80	0.48	5.85	0.40	5.87	0.35	5.93	0.25	5.90	0.30
2	J	2.93	0.25	2.93	0.25	2.93	0.25	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00
	R	2.97	0.18	2.90	0.40	2.93	0.31	2.97	0.18	2.97	0.18	2.97	0.18	2.90	0.31	3.00	0.00	2.95	0.22
	O	5.90	0.40	5.83	0.46	5.87	0.43	5.97	0.18	5.97	0.18	5.97	0.18	5.90	0.25	6.00	0.00	5.95	0.18

	J	2.23	0.43	2.00	0.46	2.12	0.45	2.37	0.49	2.47	0.51	2.42	0.50	2.77	0.43	2.87	0.35	2.82	0.39
3	R	1.90	0.66	1.67	0.66	1.78	0.67	2.50	0.73	2.37	0.67	2.43	0.70	2.83	0.38	2.57	0.50	2.70	0.46
	O	4.13	0.78	3.67	0.96	3.90	0.90	4.87	0.94	4.83	0.91	4.85	0.92	5.60	0.56	5.44	0.92	5.42	0.77
4	J	2.90	0.31	2.90	0.31	2.90	0.30	2.97	0.18	3.00	0.00	2.98	0.13	2.97	0.18	3.00	0.00	3.00	0.00
	R	2.73	0.52	2.80	0.41	2.77	0.47	2.80	0.61	2.83	0.38	2.82	0.50	2.97	0.18	2.93	0.25	2.95	0.22
	O	5.63	0.72	5.70	0.54	5.67	0.63	5.77	0.77	5.83	0.38	5.80	0.61	5.94	0.25	5.93	0.40	5.95	0.33
	J	2.60	0.62	2.63	0.49	2.62	0.56	2.70	0.54	3.00	0.00	2.85	0.40	2.87	0.35	2.77	0.43	2.82	0.39
5	R	0.87	0.94	1.10	0.96	0.98	0.95	1.33	0.92	1.90	0.85	1.62	0.92	2.20	0.85	2.43	0.82	2.32	0.83
	O	3.47	1.17	3.73	1.26	3.60	1.21	4.03	1.07	4.90	0.82	4.47	1.03	5.07	1.02	5.20	0.82	5.14	0.92
	J	2.23	0.94	2.40	0.77	2.32	0.85	2.73	0.45	2.73	0.45	2.73	0.45	2.87	0.35	2.83	0.38	2.85	0.36

6	R	2.20	1.10	2.37	0.85	2.28	0.98	2.90	0.31	2.83	0.59	2.87	0.47	2.97	0.18	2.97	0.18	2.97	0.18
	O	4.43	1.87	4.77	1.50	4.60	1.69	5.63	0.62	5.56	0.73	5.60	0.67	5.83	0.38	5.80	0.48	5.82	0.43
	J	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00
7	R	3.00	0.00	2.97	0.18	2.98	0.13	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00
	O	6.00	0.00	5.97	0.18	5.98	0.13	6.00	0.00	6.00	0.00	6.00	0.00	6.00	0.00	6.00	0.00	6.00	0.00
	J	2.53	0.51	2.60	0.50	2.57	0.50	2.67	0.55	2.83	0.38	2.75	0.47	2.80	0.41	2.83	0.38	2.82	0.39
8	R	2.40	0.68	2.53	0.63	2.47	0.65	2.87	0.35	3.00	0.00	2.93	0.25	3.00	0.00	3.00	0.00	3.00	0.00
	O	4.93	0.98	5.13	1.01	5.03	0.99	5.54	0.57	5.83	0.38	5.68	0.50	5.80	0.41	5.83	0.38	5.82	0.39
	J	2.77	0.43	2.87	0.35	2.82	0.39	2.97	0.18	2.83	0.38	2.90	0.30	2.97	0.18	2.97	0.18	2.97	0.18
9	R	1.57	0.77	1.73	0.69	1.65	0.73	2.10	0.71	2.10	0.76	2.10	0.73	2.47	0.73	2.40	0.68	2.43	0.70

	O	4.33	0.84	4.60	0.86	4.47	0.85	5.07	0.69	4.93	0.87	5.00	0.78	5.43	0.77	5.37	0.67	5.40	0.72
	J	2.87	0.35	2.67	0.48	2.77	0.43	2.97	0.18	2.97	0.18	2.97	0.18	2.90	0.31	2.97	0.18	2.93	0.25
10	R	2.47	0.63	2.27	0.74	2.37	0.69	2.77	0.43	2.60	0.56	2.68	0.50	2.93	0.25	2.90	0.31	2.92	0.28
	O	5.33	0.80	4.93	0.91	5.13	0.87	5.74	0.45	5.57	0.63	5.65	0.55	5.83	0.38	5.87	0.43	5.85	0.40
11		10.83	1.23	10.80	0.85	10.82	1.05	11.67	0.61	11.50	.078	11.58	0.70	11.73	0.45	11.83	0.46	11.78	0.45
12		10.63	1.38	10.90	1.32	10.77	1.35	11.50	0.82	11.90	0.31	11.7	0.65	11.8	0.48	11.77	0.57	11.78	0.52
	Jt	26.77	1.83	26.70	1.73	26.73	1.77	28.33	0.96	28.83	1.15	28.58	1.08	29.20	0.61	29.23	0.86	29.22	0.74
	Rt	22.47	2.85	22.63	3.08	22.55	2.48	26.20	2.17	26.47	1.94	26.33	2.05	28.13	1.41	28.13	1.50	28.13	1.44
	G	21.50	2.13	21.60	1.61	21.55	1.87	23.13	1.07	23.40	0.86	23.27	0.97	23.53	0.63	23.60	0.72	23.57	0.67

*T- task; ST- subtask; J- judgment; R- revision; O-overall; Jt- total Judgment; Rt- total revision; G- total generation

Task 1: ***Analyze a sentence into lexical units/words***

This task involved the participants to count the number of words in a given sentence. On the whole (overall) mean scores was the lowest for III grade compared to the other grades. The overall mean value obtained for IV grade TD children was higher than the grade III and the grade V TD children obtained the highest overall mean scores for this task. The total mean scores when compared across age groups revealed that the scores increased with increase in the age. The mean scores were higher for males compared to females in III and IV grade, however, the scores for females in the V grade were higher than males.

The overall performance of participants of different grades on this task was statistically analyzed using two way MANOVA. Results revealed a statistically significant effect in the performance of participants of the three grades [$F(2, 174) = 37.825$, $P<0.001$]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the age groups ($p<0.05$) except between fourth and fifth ($p>0.05$). The performance was also analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: On comparison with the total mean scores, it was found that the III grade children obtained the lowest mean scores compared to the other grades. The mean score of the IV and V grade TD children were similar. Further, the mean scores for males and females for judgment task was the same across grades which indicated that the males performed similar to the females on this task.

The performance of TD group participants of different age groups on this subtask was statistically analyzed using two way MANOVA to assess if there was a significant difference across grades. Results revealed a statistically significant effect

in the performance of participants of the three grades [F (2, 174) = 24.857, P<0.001]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all groups (p<0.05) except fourth and fifth grade (p>0.05). Results also showed that there was no statistically significant difference between the gender on this task (p>0.05).

b. Revision subtask: The mean scores on this subtask gradually increased with increase in age i.e., the mean score of the III grade were the lowest and the V grade was the highest. Further when the performance of males vs. females was compared, it was found that the mean scores were higher for males compared to females in the III and IV grade and scores for females were higher than males in V grade.

Performance of the participants of different age groups on this subtask was statistically analyzed using two way MANOVA. Results revealed a statistically significant effect in the performance of participants of the three grades [F (2, 174) = 28.515, P<0.001]. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all groups (p<0.05) except between fourth and fifth (p>0.05). No statistical gender difference was noticed.

The results obtained from this task revealed that the performance of the children increased as the age increased i.e., a developmental trend was seen. As it can be seen from the mean scores depicted in the table, the judgment subtask was easier than the revision subtask. In judgment subtask, maximum score was attained by the age group 9.0-9.11 years whereas the development was not complete even by 10.0-10.11 years in revision type subtask. The increase in score with increase in age is in consonance with the study by Edwards and Christophersen (1988) (as cited in

Bialystok, 2001) who found that higher levels of literacy were associated with higher task performance.

Task 2: ***Free word association task***

In this task, participants had to give a word related to the target word that comes to their mind. The overall mean scores (Table 6) revealed that the scores were the lowest for the III grade TD children when compared to the other grades and the scores were highest for the IV grade TD children. However, the scores decreased from the IV grade to V grade, although the decrease was not very significant. Further, the overall mean scores revealed that the males outperformed the females in III grade, performed similarly in IV grade and females' scores were higher than males in V grade. Two way MANOVA revealed no statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 2.373, P>0.05] on the task. Results also showed that there was no statistically significant difference between the gender on this task (p>0.05). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: The mean score of TD children in the III grade was lower compared to the other grades and the mean scores of the IV and V grade were the same although higher than the mean of the III grade (Table 6). Therefore, a developmental trend was seen because the mean scores increased with increase in the age. Further, the mean scores of the males and females were similar for this subtask across all the three grades. Two way MANOVA revealed no statistically significant difference in the performance of the participants across the three grades [F (2, 174) = 2.877, P>0.05] on the subtask. Results also showed that there was no statistically significant difference between the gender on this task (p>0.05).

b. Revision subtask: The mean score was the lowest for the III grade TD children when compared to the other grades and the scores were highest for the IV grade TD children. However, the scores decreased from the IV grade to V grade although the decrease was not very significant (Table 6). The male participants of the lowest age group outperformed females in this task, whereas there was no difference in the mean scores of males and female participants in the age group of 9.0 to 9.11 years, and female participants of the highest age group scored higher than male participants. Two way MANOVA revealed no significant effect in the performance of the participants of the three grades [$F(2, 174) = 0.282$, $P>0.05$] on this subtask. Further, there was no statistically significant difference between the genders ($p>0.05$).

Even though there was slight increase in the score with increase in the age it was not statistically significant. The decrease in the score could be attributed to the individualistic cognitive differences in the children as metalinguistic abilities are related to cognitive development, intellectual capacity, scholastic achievement, reading skills and environmental factors such as play experience and other adult language stimulation (Hulit & Howard, 2002). But there was a syntagmatic-paradigmatic shift in children's responses. This result is in agreement with the study by Brown and Berko (1960) who indicated a similar shift in children's responses. This shift may be attributed to the developmental changes in the interpretation of the task, changes in the knowledge of the features that define words (McNeill, 1966).

Task 3: ***Synonyms***

For this task, participants had to give a word which gives the same meaning as the given word. On comparing the mean scores, it was seen that the mean score increased gradually from the third grade to the fifth grade (Table 6). Further, the mean scores were higher for the male participants compared to the female participants in all the three grades. Two way MANOVA revealed a statistically significant difference in the performance of the participants of the three grades [F (2, 174) = 50.949, P<0.001] on the task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades (p<0.05). Further, the results revealed a statistically significant difference between the gender on this task values [F (1, 174) = 4.007, P<0.05]. The performance was also analyzed for the judgment and revision subtasks separately.

a. Judgment subtask: The mean scores increased gradually from the third grade to the fifth grade (Table 6). The mean scores for males were higher compared to females of the III grade and scores for females were higher than males in the other two grades. Two way MANOVA revealed a statistically significant effect in the performance of participants of three grades [F (2, 174) = 37.178, P<0.001] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three groups (p<0.05). Results also showed that there was no statistically significant difference between the gender on this task (p>0.05).

b. Revision subtask: A similar trend was seen for this subtask too. Further, the mean scores were higher for males compared to females in all the three age groups (Table 6). Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 35.507, P<0.001] on this subtask.

Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$). Further, the results revealed a statistically significant gender difference for this task [$F (1, 174) =5.339$, $P<0.05$].

On the whole, it was seen that there was a gradual increase in the score with increase in age and the development was not complete even by 10.0-10.11 years. This result is in agreement with the study done by Sack and Beilin (1971) (as cited in Sharma, 1995) and Sharma (1995) who reported that the ability to judge synonymy emerges later in the development. There is a considerable development during middle childhood of children's ability to judge synonymy and that this development occurred later than the development of the ability to understand the sentences judged. Children are unable to recognize synonymy until the early to middle elementary school years (Tunmer, Pratt, & Herriman, 1984). Further, they also suggested that the younger children may perform systematically worse than chance for synonyms sentence pairs (Hakes, Evans, & Tunmer, 1976).

Task 4: *Antonyms*

In this task, participants had to give an opposite word for the target word. The overall mean score was the lowest for the lowest grade compared to the other grades and highest for the highest grade (Table 6). This shows that the overall mean scores increased gradually from the lowest grade to the highest grade. Further, the mean scores were higher for males compared to females in the highest grade and scores for females were higher than males in the other two grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F (2, 174) = 3.180$, $P<0.05$] on this task. Pairwise comparison was done

using Duncan test which revealed a statistically significant difference between the third and the fifth grade ($p<0.05$). Further, results did not reveal any statistically significant gender difference for this task ($p>0.05$). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: The mean score increased gradually from the third grade to the fifth grade. The mean scores obtained were similar for males and females in the lowest grade whereas the female participants obtained a higher mean score than males in the other two grades (Table 6). Two way MANOVA revealed no significant effect in the performance of the participants of the three grades [$F (2, 174) = 2.436$, $P>0.05$] on this subtask. Further, there was no statistically significant gender difference ($p>0.05$).

b. Revision subtask: The mean score was the lowest for lower grades and highest for higher grade (Table 6). This shows that the mean score increased gradually from the lowest grade to the highest grade. The mean scores were higher for males of the highest grade compared to females and scores for females were higher than males of the other two grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F (2, 174) = 3.078$, $P<0.05$] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between third and fifth grade ($p<0.05$). Results did not reveal any gender difference for this task ($p>0.05$).

A better performance was noticed for this task which indicates that this task is acquired and mastered earlier on as contrasted to other tasks. This also shows that these tasks require less cognitive load in comparison to the other tasks.

Task 5: *Homonyms*

This task involved the participants to give multiple meanings for a word. The overall mean scores were lower for the lowest grade and higher for the highest grade (Table 6). This shows that the mean score increased gradually from third grade to fifth grade. Further, the mean scores were higher for the female participants than the male participants in all the three age groups. Two way MANOVA revealed a statistically significant effect in the performance of the participants of three grades [$F (2, 174) = 33.637$, $P<0.001$] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$). The results also revealed a statistically significant gender difference ($p>0.05$). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: The mean scores increased from the third grade to the fourth grade. However, there was a slight decrease observed in the mean scores from the fourth grade to fifth grade, this decrease being very insignificant (Table 6). The mean scores were higher for males compared to females in the highest age group whereas, scores for females were higher than males in the other two age groups. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F (2, 174) = 4.710$, $P<0.05$] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the groups ($p<0.05$) except fourth and fifth grade ($p>0.05$). Results did not reveal any statistically significant difference between the two gender ($p>0.05$).

b. Revision subtask: The mean scores were lowest for the III grade compared to the other grades which indicated a developmental trend (Table 6). The mean scores were higher for the female participants than the male in all the three age groups. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 33.725, P<0.001] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades (p<0.05). Further, results revealed a statistically significant gender difference [F (1, 174) =6.746, P<0.01].

There was a gradual increase in the score with increase in age and the development was not complete even by 10.0-10.11 years. Moreover, it was seen that the judgment subtask was easier than the revision subtask, which was the most difficult task in this study. This result concurs with the findings of Shultz and Pilon (1973) (as cited in Flood & Menyuk, 1983), who reported that children did not acquire the ability to detect surface and deep structure ambiguity until 12 years of age. A decrease in the score was observed for the judgment subtask which could be attributed to the individualistic cognitive differences in the children as metalinguistic abilities are related to cognitive development, intellectual capacity, scholastic achievement, reading skills and environmental factors such as play experience and other adult language stimulation (Hulit & Howard, 2002).

Task 6: ***Identify the grammatical category***

In this task, participants had to identify the word that does not belong to the group based on the grammatical category. The overall mean score was lower for the lowest grade and higher for the highest grade (Table 6). This showed that the mean score increased gradually with the increase in age. Females obtained a higher mean

score than males in the lowest grade, however, females obtained a lower score than males in the other two grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 21.552, P<0.001] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all groups (p<0.05) except fourth and fifth grade (p>0.05). Further, results did not reveal any statistically significant gender difference (p>0.05). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: The mean score increased gradually with the increase in age. Females obtained a higher mean score than males in the lowest grade, and the mean scores of TD participants in the IV grade were similar however, the females of the highest grade obtained a lesser score than males (Table 6). Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 13.251, P<0.01] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the groups (p<0.05) except between fourth and fifth grade (p>0.05). Further, results did not reveal any statistically significant gender difference (p>0.05).

b. Revision subtask: A similar pattern was seen for this subtask when compared with the overall mean scores which showed that the mean score increased gradually from third grade to fifth grade (Table 6). Females obtained a higher mean score than males in the lowest age group, and the mean scores of TD in the highest grade were similar however, the males in the IV grade obtained a lesser score than females. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 20.151, P<0.001] on this subtask.

Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the grades ($p<0.05$) except between fourth and fifth ($p>0.05$). Further, results did not reveal any statistically significant difference between the two genders ($p>0.05$).

A gradual increase in the score with increase in age was seen for both judgment and revision task and a maximum score were not attained even by children in the age group of 10.0-10.11 years. This is consistent with the results of Scholl and Ryan (1980) who found that the older children produced more accurate judgments about grammaticality. Further, in this task, revision scores were higher than judgment scores for the age group 9.0-9.11 years and 10.0-10.11 years. This could be because of the complexity of the stimuli in the judgment subtask.

Task 7: *Semantic anomaly*

This task involved the participant's ability to identify and correct the error in the meaning of a given sentence. The overall mean scores was lower for the lowest grade compared to the other grades however, the scores were same for the other two grades (Table 6). Males and females performed similarly on this task across the fourth grade and the fifth grade whereas males outperformed females in the third grade. Two way MANOVA revealed no statistically significant effect in the performance of the participants of the three age groups [$F (2, 174) = 1.00$, $P>0.05$] on this task. Further, results did not reveal any statistically significant difference between the two gender ($p>0.05$). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: The mean score obtained by all the three age groups were similar which revealed that a ceiling effect was achieved for this subtask even in the

lower grade i.e. III grade considered for the study (Table 6). Males and females performed similarly on this subtask across all three grades.

b. Revision subtask: A similar trend was seen for this subtask as in overall mean scores wherein the mean scores increased with increase in the age, however, the mean scores of the fourth and the fifth grade TD children were the same (Table 6). Males and females performed similarly on this subtask across the IV and the V grade whereas males outperformed females in the lowest grade. Two way MANOVA revealed no significant effect in the performance of the participants of the three grades [F (2, 174) = 1.00, P>0.05] on this subtask. Further, results did not reveal any statistically significant gender difference (p>0.05).

Better performances on this task may reflect on the skills which are acquired and mastered earlier on as contrasted to other tasks. This also shows that these tasks require less cognitive load in comparison to the other tasks and a ceiling effect is achieved by 9.0-9.11 years.

Task 8: ***Paradigmatic relations***

This task was intended to test the ability of the participants to understand the relationship between the first paired words and give a word to the second pair. The overall mean scores were lower for the lowest grade and higher for the highest grade which revealed that the mean score increased gradually from the lowest grade to the highest grade (Table 6). A higher mean score was obtained for females when compared to males across all the three grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 22.941, P<0.001] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all groups

($p<0.05$) except between fourth and fifth ($p>0.05$). Further, results did not reveal any statistically significant gender difference ($p>0.05$). The mean scores were analyzed separately for the judgment and revision subtasks.

a. Judgment subtask: A similar trend was seen in the mean score as seen in the overall mean score i.e. the mean score increased gradually from third grade to fifth grade (Table 6). A higher mean score was obtained for females when compared to male participants across all the three grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F (2, 174) = 4.798$, $P<0.01$] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the groups ($p<0.05$) except between fourth and fifth grade ($p>0.05$). Further, results did not reveal any statistically significant gender difference ($p>0.05$).

b. Revision subtask: A similar trend was seen in the mean score as seen in the overall mean score i.e. the mean score increased gradually from third grade to fifth grade (Table 6). A higher mean score was obtained for females when compared to males across the III grade and the IV grade and males and females performed similarly in the highest grade. Two way MANOVA revealed a statistically significant effect in the performance of the participants of all the three grades [$F (2, 174) = 31.336$, $P<0.001$] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the grades ($p<0.05$) except fourth grade and fifth grade ($p>0.05$). Further, results did not reveal any statistically significant difference between the genders ($p>0.05$).

A gradual increase in the score with increase in age was seen for both judgment and revision subtasks. In this task, revision scores were higher than

judgment scores for the age group 9.0-9.11 years and 10.0-10.11 years. This could be attributed to the complexity of the stimulus in the judgment subtask as the stimuli were randomly distributed for the judgment and revision subtask.

Task 9: *Syntagmatic relations*

This task was planned to assess the participants' ability to understand the association between the first paired word and give a word to the second paired word on the same lines. The overall mean scores were lower for the lowest grade and higher for the highest grade i.e., the mean scores increased gradually from the lowest grade to the highest grade (Table 6). A higher mean score was obtained for females when compared to males in the lowest grade and in the other two grades, males obtained a higher mean score than females. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 21.208, P<0.001] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$). Further, results did not reveal any statistically significant gender difference ($p>0.05$). The mean scores were analyzed separately for the judgment and revision subtask.

a. Judgment subtask: As seen in the overall mean scores, a similar pattern was observed for this subtask wherein the mean score increased gradually from third grade to fifth grade (Table 6). A higher mean score was obtained for females when compared to males in the lowest grade however, in the IV grade, males obtained a higher mean score than females and in the V grade, both male and female participants obtained a similar score. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 3.709,

P<0.05] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between third and fifth grade (p<0.05). Further, results did not reveal any statistically significant difference between the two gender (p>0.05).

b. Revision subtask: As seen in the overall mean scores, a similar pattern was seen for this subtask wherein the mean scores increased gradually from third grade to fifth grade. A higher mean score was obtained for the female participants when compared to the male participants in the lowest grade and males and females obtained a similar score in other two grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 17.671, P<0.001] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the age groups (p<0.05). Further, results did not reveal any statistically significant difference between the two gender (p>0.05).

There was a gradual increase in the score with the increase in age and the development was not complete even by 10.0-10.11 years. Further, the judgment subtask was easier than the revision subtask. The task difficulty could be attributed to the increased cognitive load because the children had to produce a word based on the understanding of the relationship between the first word pair.

Task 10: ***Semantic contiguity***

This task was designed to assess the participant's skill to provide a word which is related to the target word. The overall mean scores were lower for the lowest grade and higher for the highest grade i.e., the mean scores increased gradually from the lowest grade to the highest grade (Table 6). A higher mean score was obtained for

females when compared to males in the highest grade and in the other two grades; males obtained a higher mean score than females. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 20.573, P<0.001] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the age groups (p<0.05) except fourth grade and fifth grade (p>0.05). Further, results did not reveal any statistically significant difference between the two gender (p>0.05). The mean scores were analyzed separately for the judgment and revision subtask.

a. Judgment subtask: The mean scores increased from the III grade to the IV grade however, the mean score were slightly lesser for the V grade, which was not significant (Table 6). A higher mean score was obtained for females when compared to males in the highest grade however, in lowest grade, males obtained a higher mean score than female participants and in the IV grade, a similar mean score was obtained for both male and female participants. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 7.619, P<0.001] on this subtask. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the groups (p<0.05) except fourth and fifth grade (p>0.05). Further, results did not reveal any statistically significant difference between the two gender (p>0.05).

b. Revision subtask: The mean score for this subtask increased gradually from third grade to fifth grade (Table 6). A higher mean score was obtained for males when compared to females across all the three grades. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [F (2, 174) = 17.121, P<0.001] on this subtask. Pairwise comparison was done using

Duncan test which revealed a statistically significant difference between all the three grades ($p<0.05$). Further, results did not reveal any statistically significant difference between the two gender ($p>0.05$).

There was a gradual increase in the score with the increase in age and the development was not complete even by 10.0-10.11 years. The judgment subtask was easier than the revision subtask. The task difficulty could be attributed to the increased cognitive load because the children had to produce a word based on the understanding of the relationship between the words. In the judgment subtask, there was slight decrease in the score from the IV grade to the V grade which could be attributed to the individualistic cognitive differences in the children as metalinguistic abilities are related to cognitive development, intellectual capacity, scholastic achievement, reading skills and environmental factors such as play experience and other adult language stimulation (Hulit & Howard, 2002).

Task 11: ***Define a word***

This task was considered to test the skill of the participants to provide a well formed definition. The mean score was lower for the lowest grade and higher for the highest grade i.e., the mean scores increased gradually from third to fifth grade (Table 6). A higher mean score was obtained by males than females in the III grade and the IV grade and in the V grade, females obtained a higher mean score than male participants. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F (2, 174) = 25.847$, $P<0.001$] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the groups ($p<0.05$) except fourth grade

and fifth grade ($p>0.05$). Further, results did not reveal any statistically significant difference between the two gender ($p>0.05$).

A gradual increase in the scores with increase in age was noticed for this task which indicated a developmental trend. Defining a word is a twofold process; 1. The speaker needs to have adequate semantic knowledge about the meaning of the word to be defined, and 2. The speaker needs to be familiar with the formal structure of definitions i.e. the definitional genre. A developmental progression in this task was noticed among children aged 5 to 11 years and college students by Wehren, Dehisi, and Arnold (1981) which is consistent with the result of the present study. By age 10, children acquire a clear understanding of the use of the term word and at this point, they are able to provide formal definitions of words through the use of copula and a superordinative clause (Snow, Cancini, Gonzales, & Shriberg, 1989; Snow, 1990).

Task 12: ***Lexical/referential arbitrariness***

This task was intended to test the ability of the participants to ignore the meaning of a sentence by substituting a word/symbol and answering to the question asked at the end of symbol substitution. The mean score was lower for the lowest grade and higher for the highest grade, i.e., the mean scores increased gradually from third to fifth grade (Table 6). A higher mean score was obtained by females than males in the III grade and IV grade and in the highest grade, male participants obtained a higher mean score than female participants. Two way MANOVA revealed a statistically significant effect in the performance of the participants of the three grades [$F(2, 174) = 23.094$, $P<0.001$] on this task. Pairwise comparison was done using Duncan test which revealed a statistically significant difference between all the

groups ($p<0.05$) except between fourth and fifth grade ($p>0.05$). Further, results did not reveal any statistically significant difference between the two gender ($p>0.05$).

The results indicated that the older children were able to ignore the meaning and were able to deal with the formal instructions than the younger children. Understanding that the relationship between words and referents are arbitrary develop later in life which is consistent with the study by Bowey and Tunmer, (1984); Homer and Olson, (1999) who reported that the metasemantic knowledge evolves gradually over school years and children must understand that words are basic units of language system and that the relationship between the phonological constituents of words and their referents are arbitrary (Bowey & Tunmer, 1984; Homer & Olson, 1999).

III. Comparison of performance of TD group within each age group on different tasks

The performance of TD children within each grade across different tasks was compared using repeated measure ANOVA in order to group the tasks based on the difficulty level. The first ten tasks had similar types of subtasks so that they could be combined together for the analysis whereas the other two tasks had a generation type of subtask. Hence the last two tasks could not be considered for this analysis.

For third grade, the results revealed a statistically significant difference between the tasks [$F (1, 59) = 8070.266$, $p<0.001$]. Pairwise comparison was done using Bonferroni's test which revealed that the task 1-2, 1-3, 1-4, 1-5, 1-7, 2-3, 2-5, 2-6, 2-8, 2-9, 2-10, 3-4, 3-7, 3-8, 3-9, 3-10, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 5-6, 5-7, 5-8, 5-9, 5-10, 6-7, 7-8, 7-9, 7-10, 8-9, 9-10 were significantly different ($p<0.05$). This indicates that the task 1, 6, 8, 9, and 10; 2, 4, and 7; 3, and 5 could be grouped together as there was no significant difference across these tasks ($p>0.05$).

For fourth grade, the results revealed a statistically significant difference between the tasks [F (1, 59) = 36268.243, $p<0.001$]. Pairwise comparison was done using Bonferroni's test which revealed that the task 1-3, 1-5, 1-9, 2-3, 2-5, 2-6, 2-8, 2-9, 2-10, 3-4, 3-6, 3-7, 3-8, 3-10, 4-5, 4-9, 5-6, 5-7, 5-8, 5-10, 6-7, 6-9, 7-8, 7-9, 7-10, 8-9, 9-10 were significantly different ($p<0.05$). The results revealed that the task 1, 2, 4, 6, 7, 8, and 10; and 3, 5, and 9 could be grouped together as there was no significant difference across these tasks ($p>0.05$).

For fifth grade, the results revealed a statistically significant difference between the tasks [F (1, 59) = 48769.517, $p<0.001$]. Pairwise comparison was done using Bonferroni's test which revealed that the task 1-3, 1-5, 1-9, 2-3, 2-5, 2-9, 3-4, 3-7, 3-10, 4-5, 4-9, 5-6, 5-7, 5-8, 5-10, 6-9, 7-8, 7-9, 8-9, 9-10 were significantly different ($p<0.05$). The results revealed that the task 1, 2, 4, 6, 7, 8, and 10; and 3, 5, and 9 could be grouped together as there was no significant difference across these tasks ($p>0.05$).

The results of repeated measure ANOVA and the mean values were used to arrange the task in a hierarchy starting from least difficult to the most difficult. The tasks were arranged in an ascending order starting with semantic anomaly followed by free word association task, antonyms, semantic contiguity, paradigmatic relations, analyze a sentence into lexical units/words, identify the grammatical category, syntagmatic relations, synonyms and finally homonyms.

IV. Comparison of performance of TD group across different Socio-Economic Status (SES)

The TD group consisted of participants from the lower, middle and upper socioeconomic status. The performance of all the TD participants across different SES was compared. The mean and SD scores of TD children across different SES has been depicted in the Table 7. The performance of TD participants across different SES was statistically analyzed using Kruskal-Wallis test to check for any significant difference. The results did not reveal any significant effect of SES on various tasks of the test.

Table 7: *Mean and SD score of TD children across different SES.*

Task	Subtask*	Lower SES		Middle SES		Higher SES		Asymp. Sig.
		Mean	SD	Mean	SD	Mean	SD	
	J	2.88	0.33	2.92	0.28	2.86	0.36	0.61
1	R	2.53	0.71	2.64	0.67	2.82	0.39	0.24
	O	5.41	0.93	5.56	0.85	5.68	0.67	0.41
	J	2.97	0.17	3.01	0.31	2.96	0.19	0.65
2	R	2.94	0.34	2.95	0.22	2.96	0.19	0.86
	O	5.91	0.38	5.91	0.27	5.93	0.26	0.91
	J	2.38	0.55	2.47	0.52	2.43	0.57	0.70
3	R	2.35	0.69	2.31	0.76	2.21	0.63	0.56

	O	4.74	1.02	4.76	1.12	4.64	0.99	0.80
	J	2.97	0.17	2.96	0.30	2.96	0.19	0.87
4	R	2.79	0.41	2.86	0.42	2.86	0.45	0.47
	O	5.76	0.43	5.80	0.56	5.82	0.61	0.42
	J	2.74	0.45	2.77	0.48	2.75	0.44	0.76
5	R	1.41	1.05	1.67	1.05	1.79	1.07	0.34
	O	4.18	1.22	4.44	1.22	4.50	1.29	0.47
	J	2.65	0.69	2.60	0.66	2.75	0.44	0.59
6	R	2.59	0.86	2.70	0.70	2.86	0.45	0.39
	O	5.24	1.40	5.31	1.24	5.61	0.63	0.74
	J	3.00	0.00	3.00	0.00	3.00	0.00	1.00
7	R	3.00	0.00	2.99	0.09	3.00	0.00	0.77
	O	6.00	0.00	5.99	0.00	6.00	0.00	0.77
	J	2.82	0.39	2.68	0.47	2.71	0.54	0.25
8	R	2.82	0.39	2.79	0.49	2.82	0.48	0.91
	O	5.65	0.54	5.47	0.82	5.54	0.69	0.76
	J	2.91	0.29	2.88	0.33	2.93	0.26	0.72

9	R	2.09	0.79	2.02	0.77	2.21	0.83	0.40
	O	5.00	0.89	4.90	0.85	5.14	0.93	0.30
	J	2.85	0.36	2.88	0.33	2.96	0.19	0.35
10	R	2.50	0.66	2.70	0.53	2.64	0.56	0.21
	O	5.35	0.85	5.58	0.68	5.61	0.57	0.32
11		11.32	0.98	11.39	0.86	11.50	0.84	0.71
12		11.29	1.14	11.45	1.03	11.43	0.79	0.63
	Jt	28.15	1.76	28.15	1.68	28.32	1.39	0.97
	Rt	25.12	3.33	25.71	3.26	26.18	2.89	0.35
	G	22.62	1.79	22.81	1.54	22.93	1.33	0.83
	Total	75.88	6.18	76.68	5.61	77.43	4.95	0.55

* J- judgment subtask, R- revision subtask, O- overall, Jt- overall judgment score, Rt- overall revision score, G- generation task

The results revealed that the children from different SES performed almost similarly across the tasks. This is in contrast with the study by Walker, Greenwood, Hart, and Carta, (1994) which suggested that children in lower SES environments have slower rates of vocabulary growth associated with lower IQ when they are three years old, and poorer educational achievement when they are nine or ten. The difference in the results can be attributed to the cultural differences. In the present day

scenario, the society in general is more aware of the importance of education and the thrust on education is greater compared to the earlier years. Empowerment, equal opportunity to education and the right to free education could have contributed to the disparity in the results.

V. Test-retest reliability

The consistency among repeated observations of the same phenomenon by the same person refers to test-rest reliability and it is a crucial element. In the current study, reliability testing was carried out by administering the test on 33.3% of the same participants across all the three grades. Test-retest reliability was assessed using the cronbach's alpha test.

The cronbach's alpha value is depicted in the below table for third, fourth and fifth grade across all the tasks. The results revealed that all the tasks across the three grades have high degree of test-retest reliability except for the second task in III grade which has moderate degree of test-retest reliability.

Table 8: *Cronbach's alpha values across the three grades for the TD participants.*

Task	III Grade	IV Grade	V Grade	Overall
1	0.73	1	1	0.80
2	0.65	1	1	0.85
3	0.95	0.98	0.96	0.98
4	0.91	0.91	1	0.92
5	0.79	0.92	0.93	0.92
6	0.81	0.95	1	0.89
7	1	1	1	1
8	0.88	0.94	0.93	0.90
9	0.91	0.97	0.85	0.91
10	0.90	0.94	1	0.90
11	0.94	0.97	1	0.94
12	0.85	0.95	1	0.85

VI. Clinical validity

Any newly developed diagnostic test, developed by measuring the typical behavior in normal children (normative group) with a view to use it for screening

deviant behavior, must be used for testing clients with disorders (Hegde, 1994). With this view, TAMAC-K was administered on 15 children with learning disability (LD) in the age range of 8-11 years with 5 children each in 8.0-8.11, 9.0- 9.11, and 10.0-10.11 years who were studying in III, IV and V grade respectively. The data obtained was statistically analyzed.

a. Comparison of performance of TD children and children with LD across age groups on different tasks

The performance of TD children and children with LD were compared across the different age groups for different tasks. Descriptive statistics was used to compute the mean and standard deviation (SD) scores for each age group. The results have been presented and discussed task wise.

Task 1: Analyze a sentence into lexical units/words

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 9 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. The mean values were subjected to Mann-Whitney U test to examine for any significant differences between the two groups. Results revealed a statistically significant difference between TD children and children with LD in the judgment subtask for fourth and fifth grade and in revision subtask and overall score for fifth grade.

Table 9: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.70	0.46	1.64	3.00	0.00	4.94*	3.00	0.00	3.46*
	Children with LD	2.20	0.84		2.60	0.55		2.80	0.45	
Revision	TD children	2.20	0.84	0.05	2.84	0.40	0.55	2.90	0.30	4.36*
	Children with LD	2.20	0.84		2.60	0. 89		1.80	0.84	
Overall score	TD children	4.90	1.12	0.88	5.85	0.40	1.71	5.90	0.30	4.48*
	Children with LD	4.40	1.52		5.20	1.30		4.60	0.89	

* significantly different at $p<0.05$

Task 2: Free word association task

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 10 along with the /z/ score. Children with LD performed

poorer than TD children on all the subtasks. Results of the Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades.

Table 10: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

		III Grade			**IV Grade**			**V Grade**		
Subtask	**Group**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.93	0.25	4.84*	3.00	0.39	4.17*	3.00	0.00	4.94*
	Children with LD	2.00	0.71		2.60	0.55		2.40	0.89	
Revision	TD children	2.93	0.31	4.05*	2.97	0.18	4.58*	2.95	0.22	5.22*
	Children with LD	2.20	0.84		2.20	0.84		2.00	0.71	
Overall score	TD children	5.87	0.43	4.34*	5.97	0.18	4.64*	5.97	1.81	5.79*
	Children with LD	4.20	1.304		4.80	1.30		4.40	1.14	

* significantly different at $p<0.05$

Task 3: Synonyms

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 11 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. Results of the Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades.

Table 11: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.12	0.45	3.02**	2.42	0.50	2.31*	2.82	0.39	3.12**
	Children with LD	1.40	0.55		1.40	0.45		2.20	0.45	
Revision	TD children	1.78	0.67	3.76***	2.43	0.70	3.07***	2.70	0.46	4.13***
	Children with LD	0.20	0.45		1.00	1.00		1.00	0.71	
Overall score	TD children	3.90	0.90	3.62***	4.85	0.92	3.21***	5.45	0.77	3.60***
	Children with LD	1.60	0.89		2.80	1.30		3.20	1.10	

*significantly different at p<0.05, **significantly different at p<0.01, ***significantly different at p<0.001

Task 4: Antonyms

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 12 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. Results of the Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades except for the judgment subtask in fourth grade.

Table 12: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.90	0.30	3.21**	2.98	0.13	0.29	3.00	0.32	3.01*
	Children with LD	2.20	0.84		3.00	0.00		2.60	0.55	
Revision	TD children	2.77	0.30	4.26**	2.82	0.50	3.97**	2.95	0.22	4.27**
	Children with LD	1.00	1.00		1.00	1.23		1.60	1.34	
Overall score	TD children	5.67	0.63	3.90**	5.80	0.61	3.94**	5.92	0.33	3.91**
	Children with LD	3.20	1.79		4.00	1.23		4.20	1.79	

*significantly different at p<0.01, **significantly different at p<0.001

Task 5: Homonyms

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 13 along with the /z/ score. Children with LD performed

poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades except for the judgment subtask in fifth grade.

Table 13: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

		III Grade			**IV Grade**			**V Grade**		
Subtask	**Group**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.62	0.56	4.16***	2.85	0.40	4.17*	2.82	0.39	1.54
	Children with LD	0.60	0.55		1.20	1.10		2.20	1.10	
Revision	TD children	0.98	0.95	2.49*	1.62	0.99	3.06**	2.32	0.83	3.36***
	Children with LD	0.00	0.00		0.20	0.45		0.40	0.89	
Overall score	TD children	3.60	1.21	3.76***	4.45	1.03	3.63***	5.15	0.92	3.19***
	Children with LD	0.60	0.55		1.40	1.14		2.60	1.67	

*significantly different at $p<0.05$, **significantly different at $p<0.01$, ***significantly different at $p<0.001$

Task 6: Identify the grammatical category

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 14 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades except for the judgment subtask in fourth grade.

Table 14: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.32	0.85	2.59*	2.73	0.45	1.81	2.85	0.36	3.62**
	Children with LD	1.40	0.55		2.20	0.84		2.00	0.71	
Revision	TD children	2.28	0.98	3.37**	2.87	0.49	5.55**	2.97	0.18	6.86**
	Children with LD	0.40	0.55		0.20	0.45		0.60	0.55	
Overall score	TD children	4.60	1.69	3.11*	5.60	0.67	4.26**	5.82	0.43	5.02**
	Children with LD	1.80	0.84		2.40	0.89		2.60	0.55	

*significantly different at $p<0.01$, **significantly different at $p<0.001$

Task 7: Semantic anomaly

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 15 along with the /z/ score. Children with LD

performed poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades except for the judgment subtask in fourth and fifth grade.

Table 15: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

		III Grade			**IV Grade**			**V Grade**		
Subtask	**Group**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	3.00	0.00	4.94*	3.00	0.00	0.00	3.00	0.00	0.00
	Children with LD	2.60	0.55		3.00	0.00		3.00	0.00	
Revision	TD children	2.98	0.13	3.90*	3.00	0.00	6.09*	3.00	0.00	3.46*
	Children with LD	2.60	0.55		2.20	0.84		2.80	0.45	
Overall score	TD children	5.98	0.13	5.20*	6.00	0.00	6.09*	6.00	0.00	3.46*
	Children with LD	5.20	0.84		5.20	0.84		5.80	0.45	

*significantly different at $p<0.05$

Task 8: Paradigmatic relations

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 16 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades except for the judgment subtask in fourth.

Table 16: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.57	0.50	3.12*	2.75	0.47	0.79	2.82	0.39	3.12*
	Children with LD	1.60	0.55		2.60	0.55		2.20	0.45	
Revision	TD children	2.47	0.65	3.43**	2.93	0.25	4.84**	3.00	0.00	7.09**
	Children with LD	1.00	0.71		2.00	0.55		1.80	0.84	
Overall score	TD children	5.03	0.99	3.46**	5.68	0.50	2.72**	5.82,	0.39	4.56**
	Children with LD	2.60	1.14		4.60	1.14		4.00	1.00	

*significantly different at p<0.01, **significantly different at p<0.001

Task 9: Syntagmatic relations

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 17 along with the /z/ score. Children with LD performed

poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades.

Table 17: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.82	0.39	4.39**	2.90	0.30	3.09*	2.97	0.18	3.25**
	Children with LD	1.60	0.55		2.40	0.55		2.60	0.55	
Revision	TD children	1.65	0.732	2.82*	2.10	0.73	2.73*	2.43	0.70	3.31**
	Children with LD	0.60	0.55		1.00	0.71		1.00	0.71	
Overall score	TD children	4.47	0.85	3.69**	5.00	0.78	2.90*	5.40	0.72	3.43**
	Children with LD	2.20	0.87		3.40	1.14		3.60	0.89	

*significantly different at p<0.01, **significantly different at p<0.001

Task 10: Semantic contiguity

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 18 along with the /z/ score. Children with LD performed poorer than TD children on all the subtasks. Results of Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD for all the subtasks across three grades.

Table 18: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	2.77	0.43	2.00*	2.97	0.18	3.31***	2.93	0.25	2.46*
	Children with LD	2.20	0.84		2.40	0.89		2.60	0.55	
Revision	TD children	2.37	0.69	3.40***	2.68	0.50	3.0**	2.92	0.28	3.46***
	Children with LD	0.60	0.89		1.20	1.30		2.20	0.84	
Overall score	TD children	5.13	0.87	3.19***	5.65	0.55	3.70*	5.54	0.70	3.87***
	Children with LD	2.80	1.48		3.60	1.67		4.80	0.84	

*significantly different at p<0.05, **significantly different at p<0.01, ***significantly different at p<0.001

Task 11: Define a word

The mean and SD scores of TD children and children with LD across grades have been depicted in Table 19 along with the /z/ score. Children with LD performed poorer than TD children on this task. Results of the Mann-Whitney U test revealed statistically significant difference between TD children and children with LD across three grades.

Table 19: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

		III Grade			IV Grade			V Grade		
Task	**Group**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Define a word	TD children	10.82	1.05	3.82*	11.58	0.70	4.24*	11.78	0.45	4.80*
	Children with LD	5.60	0.89		6.00	1.23		6.80	2.05	

*significantly different at p<0.01

Task 12: Lexical/referential arbitrariness

The mean and SD scores of TD children and children with LD across grades have been depicted in table 20 along with the /z/ score. Children with LD performed poorer than TD children on this task. Results of the Mann-Whitney U test revealed a statistically significant difference between TD children and children with LD across three grades.

Table 20: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Task	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Lexical /referential arbitrariness	TD children	10.77	1.35	3.84*	11.70	0.65	4.69*	11.78	0.52	3.94*
	Children with LD	4.00	2.35		6.00	1.87		7.60	2.88	

*significantly different at p<0.01

b. **Comparison of overall performance of TD children and children with LD across age groups**

The overall performance of TD children and children with LD were compared across the different age groups. Descriptive statistics was used to compute the mean and SD scores for each group. The mean and SD scores of TD children and children with LD across grades have been depicted in Table 21 along with the /z/ values. The performance of the TD children and children with LD on various subtasks across grades has been graphically represented in Figures 2, 3 and 4. A comparison of the overall mean scores revealed that the children with LD performed poorer than TD children. Mann-Whitney U test was administered in order to compare the performance of the two groups. Results revealed a statistically significant difference between TD children and children with LD across all the three grades.

Table 21: *Mean, standard deviation (SD) scores and /z/ values of TD children and children with LD across the three age groups.*

Subtask	Group	III Grade			IV Grade			V Grade		
		Mean	**SD**	**/z/**	**Mean**	**SD**	**/z/**	**Mean**	**SD**	**/z/**
Judgment	TD children	26.73	1.77	3.74*	28.14	2.67	3.67*	29.22	0.74	3.94*
	Children with LD	17.80	3.49		23.80	1.92		24.60	2.07	
Revision	TD children	22.55	2.94	3.69*	25.67	5.02	3.71*	28.13	1.44	3.79*
	Children with LD	10.80	4.76		13.60	4.62		15.20	3.70	
Generation task	TD children	21.55	1.87	3.74*	22.22	3.64	3.98*	23.57	0.67	4.25*
	Children with LD	9.60	2.51		14.00	1.58		14.40	3.36	
Total score	TD children	70.83	5.40	3.70*	78.18	2.58	3.72*	80.92	2.13	3.73*
	Children with LD	38.20	10.40		51.40	6.19		54.20	7.79	

* significantly different at $p<0.05$

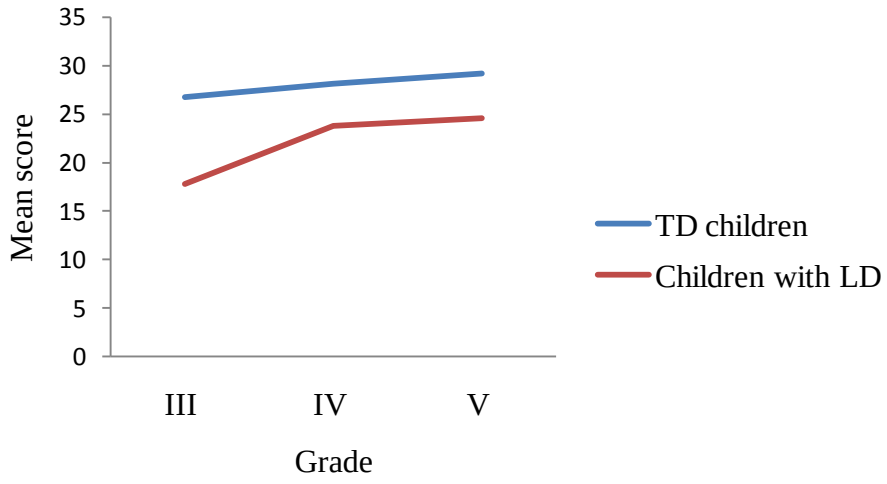

Figure 2: *Performance of the TD children and children with LD across the three grades on the judgment subtask.*

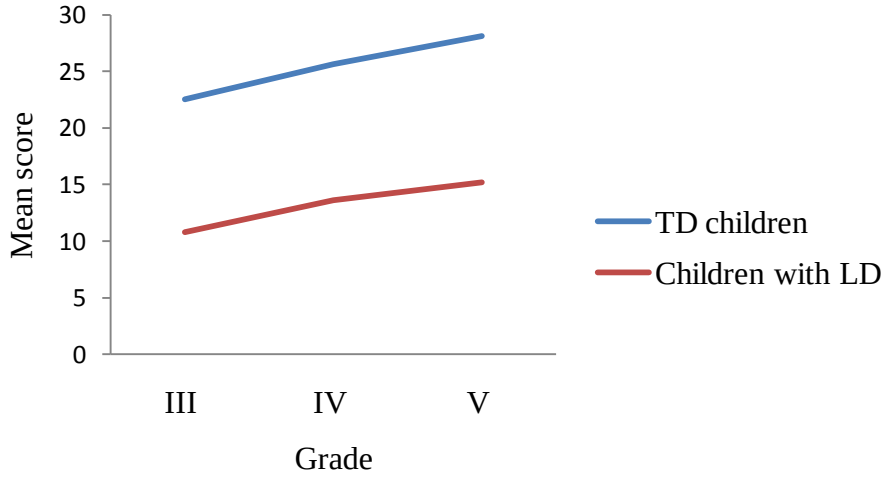

Figure 3: *Performance of the TD children and children with LD across the three grades on the revision subtask.*

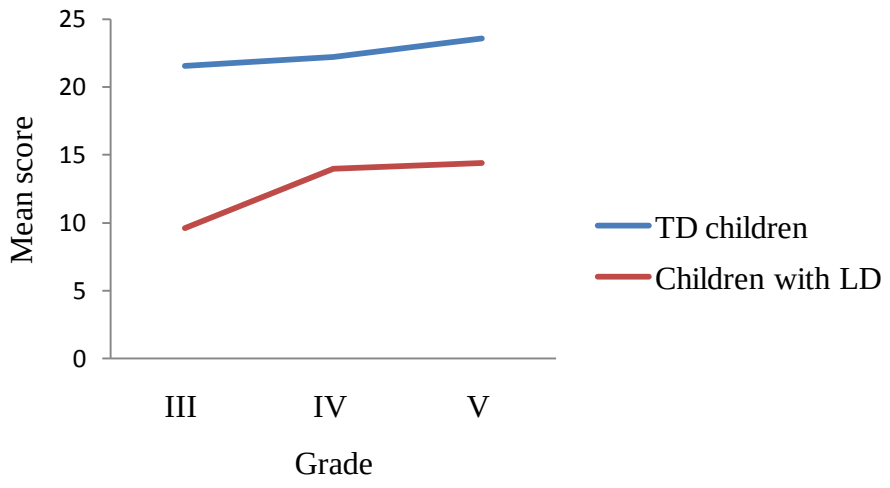

Figure 4: *Performance of the TD children and children with LD across the three grades on the generation subtask.*

The mean scores of children with LD were lower than the TD group in all the age groups on the all the subtasks which indicated that the children with LD performed poorer than TD children on the metasemantic tasks included in the test. Mann-Whitney U test administered revealed a statistically significant difference between TD children and children with LD across all the three grades. This showed that this test has good discriminant validity, i.e., this test is satisfactory in discriminating the children with learning disability from the typically developing children.

There was a gradual increase in the score with increase in the age but the scores fell short when compared to TD children which showed that metasemantics is affected in children with LD as seen with other metalinguistic tasks. This is consistent with the literature reported on metalinguistic abilities in children with language disorders (Kamhi et al., 1985; Menyuk, 1993). These investigators reported poorer performance of children with language disorders including LD, SLI and autism on

various aspects of metalinguistics. Poorer performance of children with developmental dyslexia on metalinguistic skills draws support for the same. School literacy and extensive reading and writing instructions are suggested to be the propelling factor for metalinguistic awareness. Children with LD have difficulty with reading, writing, and academic performance which in turn might affect the development of metalinguistic skills. Since the acquisition of reading has an effect on the ability to correct grammatical errors and metalinguistic abilities emerge about the same time children are learning to read. It has been suggested that metalinguistic awareness and reading development are related (Tunmer & Bowey, 1984; Catts, 1996) and that metalinguistic and language processing deficits underlie reading disabilities (Catts, 1996; Mattingly, 1972; Tunmer & Bowey, 1980; Hodgson, 1992). Literature also suggests that the children with LD perform poorly on metalinguistic abilities (Priya & Manjula, 2009).

c. Comparison of performance of children with LD across grades

The total overall mean for the children with LD was lower for the lowest grade and higher for the highest grade. The performance of children with LD across grades was statistically analyzed using Kruskal-Wallis test. Results revealed no significant effect in the performance of children with LD across grades ($p>0.05$).

Table 22*: Mean and* standard deviation (*SD) scores of children with LD across grades on various tasks.*

Task	Subtask*	III Grade		IV Grade		V Grade	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
	J	2.20	0.84	2.60	0.55	2.80	0.45
1	R	2.20	0.84	2.60	0.89	1.80	0.84
	O	4.40	1.52	5.20	1.30	4.60	0.89
	J	2.00	0.71	2.60	0.55	2.40	0.89
2	R	2.20	0.84	2.20	0.84	2.00	0.71
	O	4.20	1.30	4.80	1.30	4.40	1.14
	J	1.40	0.55	1.80	0.45	2.20	0.45
3	R	0.20	0.45	1.00	1.00	1.00	0.71
	O	1.60	0.89	2.80	1.30	3.20	1.10
4	J	2.20	0.84	3.00	0.00	2.60	0.55
	R	1.00	1.00	1.00	1.23	1.60	1.34
	O	3.20	1.79	4.00	1.23	4.20	1.79

	J	0.60	0.55	1.20	1.10	2.20	1.10
5	R	0.00	0.00	0.20	0.45	0.40	0.89
	O	0.60	0.55	1.40	1.14	2.60	1.67
	J	1.40	0.55	2.20	0.84	2.00	0.71
6	R	0.40	0.55	0.20	0.45	0.60	0.55
	O	1.80	0.84	2.40	0.89	2.60	0.55
	J	2.60	0.55	3.00	0.00	3.00	0.00
7	R	2.60	0.55	2.20	0.84	2.80	0.45
	O	5.20	0.84	5.20	0.84	5.80	0.45
	J	1.60	0.55	2.60	0.55	2.20	0.45
8	R	1.00	0.71	2.00	0.71	1.80	0.84
	O	2.60	1.14	4.60	1.14	4.00	1.00
	J	1.60	0.55	2.40	0.55	2.60	0.55
9	R	0.60	0.55	1.00	0.71	1.00	0.71
	O	2.20	0.84	3.40	1.14	3.60	0.89
	J	2.20	0.84	2.40	0.89	2.60	0.55
10	R	0.60	0.89	1.20	1.30	2.20	0.84

	O	2.80	1.48	3.60	1.67	4.80	0.84
11		5.60	0.89	8.00	1.23	6.80	2.05
12		4.00	2.35	6.00	1.87	7.60	2.88
Judgment overall		17.80	3.49	23.80	1.92	24.60	2.07
Revision overall		10.80	4.76	13.60	4.62	15.20	3.70
Generation overall		9.60	2.51	14.00	1.58	14.40	3.36
Total		38.20	10.40	51.40	6.19	54.20	7.79

* J- judgment subtask, R- revision subtask, O- overall

Their performance was also analyzed separately for the judgment and revision subtask.

a. ***Judgment subtask:*** The mean scores obtained on the judgment subtask (depicted in Table 22 and Figure 5) were lesser for the lowest grade and increased as the age increased. The mean scores were highest for the highest grade. The performance of children with LD across grades was statistically analyzed using Kruskal-Wallis test. Results revealed a statistically significant difference in the performance across grades ($p<0.05$). Pairwise comparison made using Mann-Whitney U test revealed a statistically significant difference between third and fourth and third and fifth grade ($p<0.05$) and no significant difference between fourth and fifth grade ($p>0.05$).

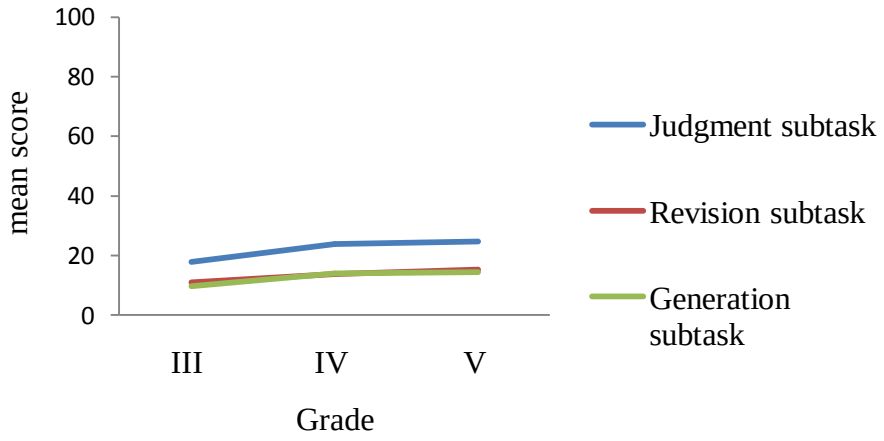

Figure 5: *Mean score of children with LD across grades on various subtasks.*

b. ***Revision subtask:*** In the revision subtask too, a similar pattern was observed. Their performance on the revision subtask has been graphically represented in Figure 5. The mean scores increased with the increase in age. The performance of children with LD across grades was statistically analyzed using Kruskal-Wallis test. Results revealed no significant effect in the performance of children with LD across grades ($p>0.05$).

c. ***Generation subtask:*** The generation subtask too revealed a similar pattern of the performance by the LD group. The mean scores were lowest for the lowest grade and highest for the highest grade. Their performance on the generation subtask has been graphically represented in Figure 5. The performance of children with LD across grades analyzed using Kruskal-Wallis test revealed a statistically significant difference in the performance of children with LD across grades ($p<0.05$). Pairwise comparison made using Mann-Whitney U test revealed a statistically significant difference between third and fourth ($P<0.05$) and no significant difference between third and fifth grade and fourth and fifth grade ($p>0.05$).

A developmental trend was noticed for all the subtasks in children with LD were the scores increased with the increase in age. This shows that as the experience with literacy increases there is a development seen in the metalinguistic abilities.

d. **Comparison of performance of children with LD on individual task across age groups**

For the tasks such as 'analyze a sentence into lexical units/words', 'free word association', 'paradigmatic relations', the overall performance revealed that the mean score increased from the III grade to the IV grade. However, there was a slight decrease in the mean scores from the IV grade to the V grade. The overall mean score gradually increased with age for the tasks: 'synonyms', 'antonyms', 'homonyms', 'identify the grammatical category for a word', and 'semantic contiguity'. The overall scores were similar across the III and IV grade and then gradually increased from IV grade to V grade for 'semantic anomaly', and 'syntagmatic relations' task. The performance of children with LD across grades analyzed using Kruskal-Wallis test revealed no significant difference ($p>0.05$). The performance was also analyzed for the judgment and revision subtask separately.

For the judgment subtask, the mean score increased from the III grade to the IV grade. However, there was a slight decrease in the mean scores from the IV grade to the V grade for the tasks: 'free word association', 'antonyms', 'identify the grammatical category for a word', and 'paradigmatic relations'. The mean scores were similar across the III and IV grade and then gradually increased from IV grade to V grade for the synonym task. However, the mean score increased from the III grade to IV grade and then the score was similar across IV and V grade for the 'semantic anomaly' task. The mean score gradually increased with age for the tasks:

‘analyze a sentence into lexical units/words’, ‘homonyms’, ‘syntagmatic relations’, and ‘semantic contiguity’. The performance of children with LD across grades analyzed using Kruskal-Wallis test revealed no significant difference ($p>0.05$) for all the tasks except for the paradigmatic relations ($p<0.05$). Pairwise comparison was done using separate Mann-Whitney u test which revealed a statistically significant difference between third and fourth grade ($p<0.05$).

For the revision subtask, the mean score increased from the III grade to the IV grade. However, there was a slight decrease in the mean scores from the IV grade to the V grade for the tasks: ‘analyze a sentence into lexical units/words’, ‘free word association’, and ‘paradigmatic relations’. The mean scores were similar across the III and IV grade and then gradually increased from IV grade to V grade for the ‘synonym’ and ‘antonyms’ task. However the mean score increased from the III grade to IV grade and then the score was similar across IV and V grade for ‘identify the grammatical category for a word’ task. The mean score was lower for the III grade and higher for the V grade for the tasks: ‘homonyms’, and ‘semantic contiguity’. The mean score decreased from III grade to the IV grade and then the score increased from IV grade to the V grade for the tasks: ‘semantic anomaly’ and ‘syntagmatic relations’. The performance of children with LD across grades analyzed using Kruskal-Wallis test revealed no significant difference ($p>0.05$) for all the tasks.

For the generation subtask, the mean scores increased with age for the tasks: ‘define a word’ and ‘lexical/ referential arbitrariness’. Kruskal-Wallis test revealed no significant results in the performance of children with LD across grades ($p>0.05$).

e. **Comparison of performance of children with LD within each grade on different tasks**

The performance of children with LD within each grade across different tasks was analyzed using Friedman test. For the third grade, results revealed a statistically significant difference between overall judgment, revision and generation task ($p<0.05$). Pairwise comparison was made using Wilcoxon Signed Ranks test which revealed a statistically significant difference between overall judgment and revision and judgment and generation ($p<0.05$).

For fourth grade, results revealed statistically significant difference between overall judgment, revision and generation task ($p<0.05$). Pairwise comparison was made using Wilcoxon Signed Ranks test which revealed a statistically significant difference between overall judgment and revision and judgment and generation ($p<0.05$).

For fifth grade, results revealed statistically significant difference between overall judgment, revision and generation task ($p<0.01$). Pairwise comparison was made using Wilcoxon Signed Ranks test which revealed a statistically significant difference between overall judgment and revision; revision and generation and judgment and generation ($p<0.05$).

For children with LD the performance on the revision and generation subtasks were similar and they both were different from the judgment task which was relatively simpler compared to the other two tasks. This pattern was different from that observed in TD children which could be attributed to the fact that the generation and revision tasks depends on the level of literacy and literacy experience which is affected in children with LD.

In summary, a developmental trend was observed in TD children wherein the scores increased with the increase in the age for almost all the tasks included in the test and a significant difference was seen for almost all the tasks. The judgment subtask was easier than the revision subtask across all the grades for most of the tasks. Results revealed no significant difference between males and females on all the tasks except the revision subtask of 'synonym' and 'homonym' task. Further there was no significant difference in the performance of the TD participants from the different socioeconomic statuses. The results on test-retest reliability revealed that almost all the tasks across the three grades had high degree of test-retest reliability.

Children with LD performed poorer than the TD children on all the metasemantic tasks when the performances of both the groups were compared. This indicated that the test had a good discriminant validity. Across all the grades, judgment subtask was easier than the revision subtask. In children with LD also, the scores increased with the increase in age and a similar trend was noticed as seen in the TD group. However, a slight decrement in the score was noticed for the revision subtask of 'analyze a sentence into lexical words/units', judgment and revision subtask of 'free word association task', judgment subtask of 'antonyms', judgment and revision subtask of 'paradigmatic relations'. Results revealed a statistically significant difference across grades for the judgment subtask of paradigmatic relations.

In TD children, judgment and generation subtasks were easier than the revision subtask, however, in children with LD a different trend was observed wherein, judgment subtask was easier than the revision and generation type of subtasks.

Chapter 5

Summary and Conclusions

The aim of the study was to develop a Test for the Assessment of Metasemantic Awareness in Children in Kannada (TAMAC-K) and to standardize the test material on typically developing children in the age range of 8-11 years. The tasks to be incorporated under the metasemantic ability was collated from the review of literature and the stimuli under each task were prepared from the textbooks in Kannada prescribed by the Karnataka board of primary and secondary education and from standardized tests previously developed and used for assessing language (Linguistic Profile Test, LPT, Karanth, Ahuja, Nagaraja, Pandith, & Shivashankar, 1991). The test was finalized after incorporating the suggestions obtained from the content validity and the familiarity rating. The final form of the test consisted of twelve tasks which were semantic anomaly, free word association task, antonyms, semantic contiguity, paradigmatic relations, analyze a sentence into lexical units/words, identify the grammatical category, syntagmatic relations, synonyms, homonyms, define a word and lexical/ referential arbitrariness. The first ten tasks were elicited through a judgment and revision type of subtask and last two tasks were elicited through a generation type of subtask.

TAMAC-K was administered on 180 typically developing (TD) Kannada speaking children, across grade III (age group: 8-8.11 years), IV (age group: 9-9.11 years) and V (age group: 10-10.11 years) with 60 participants in each grade. Equal number of males and females were considered in each age group. The TAMAC-K was re-administered on 33.3% of the sample selected randomly within a period of 10-

15 days to assess the test-retest reliability. Also, the TAMAC-K was administered on 15 children with learning disability (LD) with 5 children in III, IV and V grade each as part of assessing the clinical validity of the test.

The results revealed that in TD children the mean scores increased with an increase in age i.e., a developmental trend was seen across all the tasks. It was also found that the judgment and generation subtasks were easier than the revision subtask except in the tasks identify the grammatical category for a word and paradigmatic relations. The results on test-retest reliability revealed that all the tasks across the three grades had high degree of test-retest reliability except for the free word association task in III grade which had moderate degree of test-retest reliability. The mean and standard deviation (SD) score obtained for TD children on the entire test forms the "norm" for each grade and it is provided in Appendix II. The values obtained from these TD participants can be used as norms to compare children with communication disorders who exhibit a deficit in the metasemantic tasks.

Comparison of the performance of TD children and children with LD revealed that the children with LD performed poorer to the TD children on all the tasks across all the grades. This shows that the test has good discriminant validity. The tasks on which children with LD have scored significantly poorer than the TD children can be used as screening tool (semantic contiguity, paradigmatic relations, identify the grammatical category for a word, syntagmatic relations, synonyms, homonyms, define a word, & lexical/ referential arbitrariness). The same developmental trend was seen in children with LD wherein the scores increased with the increase in the age. Across all the grades, judgment subtask was easier than the revision and the generation subtasks.

Implications of the study

1. This test can be used to assess the metasemantic awareness of individuals with learning disability as metasemantics contribute to reading and writing in Kannada in children with developmental dyslexia. Further, it can also be used to assess metasemantic abilities of other children with communication disorders
2. Tasks that are sensitive in predicting the reading success in children obtained from TAMAC-K can be used as a screening tool.
3. It would help the speech-language pathologists to select appropriate treatment programs targeting the metasemantics for individuals with learning disability and other communication disorders.
4. It can be also be used as criterion reference test for degenerative disorders.

Future directions

1. The test can be adapted in various Indian Languages.
2. The test can be administered on larger sample of children with LD to find other measures of clinical validity.
3. The test can be administered on various other clinical population like children with specific language impairment, children with language disorders, individuals with Alzheimer's disease, individuals with aphasia etc.
4. Based on the results of this test, a treatment protocol can be developed targeting the metasemantic ability which can be field tested on children with other communication disorders.

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APPENDIX I

Test for the Assessment of Metasemantic Awareness in children in Kannada (TAMAC-K)

Name: Date:

Age/Gender:

Class:

School:

Mother tongue:

Instructions for the examiner: The responses for the first ten tasks have to be elicited through a judgment and revision subtask. The first three items under each of the ten tasks have to be elicited through a judgment subtask, where in the child has to judge whether the given stimuli is right or wrong and the next three items have to be elicited through a revision subtask, wherein the child has to correct the error in the stimuli. For the first three items, score only for the judgment subtask and for the last three items score only for the revision subtask. The last two tasks are elicited through a generation subtask wherein participants have to answer appropriately to the questions asked.

Task 1: Semantic Anomaly

Instruction: ನಾನು ಈಗ ಒಂದು ವಾಕ್ಯಾವನ್ನು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳುವ ವಾಕ್ಯದ ಅರ್ಥ ಸರಿಯಾಗಿದೇಯೋ ಎಂದು ತಿಳಿಸಿ. ತಪ್ಪಾಗಿದ್ದಲ್ಲಿ, ನಾನು ಹೇಳುವ ವಾಕ್ಯಾದ ಅರ್ಥವನ್ನು ಸರಿ ಪಡಿಸಿ ಹೇಳಿ.

You will be hearing a sentence now. After hearing the sentence, judge if the meaning of the sentence is right or wrong. If it is wrong, correct the meaning of the given sentence.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಮೀನು ನೀರಿನಲ್ಲಿ ಹಾರುತ್ತದೆ.
/mi:nu ni:rinalli ha:ruthadhe/
2. ಲತಾ ನನ್ನ ಅಣ್ಣ.
/latha nanna aNNa/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಬೆಕ್ಕು ಬೊಗಳ್ಳುತ್ತದೆ /bekku bogaluthadhe/ ಸಕ್ಕರೆ ಕಹಿಯಾಗಿರುತ್ತದೆ /sakkare kahiyagirathe/		

	ಹುಲಿ ಹುಲ್ಲನ್ನು ತಿನ್ನುತ್ತದೆ /huli hullannu thinnuthadhe/		
Revision	ಚಂದ್ರ ಬೆಳಿಗ್ಗೆ ಹುಟ್ಟುತ್ತಾನೆ /Chandra beLigge huttuthane/ ಹಾಲಿನ ಬಣ್ಣ ಕಪ್ಪು /halina baNNa kappu/ ಐಸ್ ಕ್ರೀಮ್ ಬಿಸಿಯಾಗಿರುತ್ತದೆ /ice cream bisiyagiruthadhe/		

Max score: 6 Patient score:

Task 2: Free word association task

Instruction: ನಾನು ಈಗ ಎರಡು ಪದಗಳನ್ನು ಹೇಳುತ್ತೇನೆ. ಹೇಳಿದ ಎರಡು ಪದಗಳಿಗೆ ಹೋಲಿಕೆ (ಸಂಬಂಧ) ಇದೆಯ ಅಥವ ಇಲ್ಲವ ಎಂದು ಗುರುತಿಸಿ ಹೇಳಿ. ನಾನು ಹೇಳುವ ಎರಡು ಪದಗಳಿಗೆ ಹೋಲಿಕೆ (ಸಂಬಂಧ) ಇಲ್ಲದಿದ್ದಲ್ಲಿ, ಹೇಳಿದ ಪದಕ್ಕೆ ಹೋಲಿಕೆಯಾಗಿ ಬರುವ ಇನ್ನೊಂದು ಪದವನ್ನು ಹೇಳಿ.

I will be saying a pair of words and you have to judge if there is any relation between the two given words. If there is no relationship between the two given words, then you have to come up with a word that comes to your mind as soon as you hear the target word.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಹಸಿರು–ಕೆಂಪು
/hasiru - kempu/
2. ಹಸು– ಪೆನ್ನು
/hasu – pennu/

Subtask	**Stimulus**	**Scoring**	
		Correct response	**Incorrect / no response**
Judgment	ಹಕ್ಕಿ–ಹಾರು. /hakki – haru/ ಪೆನ್ಸಿಲ್–ನರಿ. /pencil – nari/ ಕಾರು–ವಾಹನ. /karu – vahana/		
Revision	ನಾಯಿ– ಚಂದ್ರ.		

	/ nayi – Chandra/ ಟೊವೋಟೊ–ಪೆನ್ನು. /tomato – pennu/ ಕಿತ್ತಳೆ–ನಾಯಿ. /kithaLe – nayi/		

Max score: 6 Patient score:

Task 3: Antonyms

Instruction: ನಾನು ಈಗ ಎರಡು ಪದಗಳನ್ನು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳುವ ಈ ಪದಗಳು ವಿರುದ್ಧಾರ್ಥಕವಾಗಿದೆಯೋ ಇಲ್ಲವೋ ಎಂದು ತಿಳಿಸಿ ವಿರುದ್ಧಾರ್ಥಕ ಪದಗಳು ಆಗದಿದ್ದಲ್ಲಿ, ಮೊದಲನೆಯ ಪದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕ ಪದ ಕೊಡಿ.

I will be saying a pair of words and you have judge if the given pair is an opposite or not. If they are not opposite, ask them to give an opposite word to the first word.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಹೊರಗೆ– ಒಳಗೆ
/horage – oLage/
2. ಮುಂದೆ–ಹಿಂದೆ
/mundhe – hindhe/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಬಿಳಿ– ಕಪ್ಪು /biLi – kappu/ ನಗು–ಹಿಂದೆ /nagu – hindhe/ ಬೆಳಿಗ್ಗೆ –ರಾತ್ರಿ /beLigge – rathri/		
Revision	ಸಿಹಿ–ದುಃಖ /sihi – dhuKha/ ದೊಡ್ಡ–ಒಳಗೆ /dhoDDa – oLage/ ಹತ್ತಿರ–ಮುಂದೆ /hathira – mundhe/		

Max score: 6 Patient score:

Task 4: Semantic Contiguity

Instruction: ನಾನು ಈಗ ಎರಡು ಪದಗಳನ್ನು ಹೇಳುತ್ತೆನೆ. ಅದರಲ್ಲಿ ಒಂದು ಪದದಿಂದ ಇನ್ನೊಂದು ಪದದ ಅರ್ಥ ಬರುತ್ತದ್ದೆಯೋ ಇಲ್ಲವೋ ಎಂದು ಯೋಚಿಸಿ, ಒಂದರಿಂದ ಇನ್ನೊಂದು ಪದದ ಅರ್ಥ ಬರದಿದ್ದಲ್ಲಿ, ಕೊಟ್ಟಿರುವ ಪದದಿಂದ ಮಾಡುವ / ತಯಾರಾಗುವ ವಸ್ತುಗಳನ್ನು ಹೇಳಿ.

I will be telling you two words and you have to judge whether the given two words have any relationship between them or not. If there is no relationship between the given two words, give a word to the first word such that the words are related.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಬೀಜ–ಮರ

/bi:dza – mara/

2. ಮೋಡ–ಮಳೆ

/mo:Da – male/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಕಾಯಿ–ಹಣ್ಣು /ka:yi – haNNu/ ಬೆಣ್ಣೆ–ಕಲ್ಲು /beNNe – kallu/ ಮಣ್ಣು–ಮಡಿಕೆ /maNNu – maDike/		
Revision	ಹಾಲು–ಮಳೆ /ha:lu – maLe/ ಗೋಧಿ–ಉಪ್ಪು /goDHi – uppu/ ಅಕ್ಕಿ–ತುಪ್ಪ /akki – thuppa/		

Max score: 6 Patient score:

Task 5: Paradigmatic Relations

Instruction: ನಾನು ಈಗ ಎರಡು ಜೋಡಿ ಪದಗಳನ್ನು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳುವ ಎರಡು ಜೋಡಿ ಪದಗಳು ಒಂದೇ ರೀತಿಯ ಗುಂಪಿಗೆ ಸೇರುವುದೋ ಇಲ್ಲವೋ ಎಂದು ಯೋಚಿಸಿ ಹೇಳಿ. ಎರಡನೆಯ ಜೊಡಿ ಪದಗಳು ಮೊದಲನೆಯ ಜೊಡಿ ಪದಗಳ ಸಂಬಂಧದಂತೆ ಇಲ್ಲದಿದ್ದರೆ ಅದನ್ನು ಸರಿಪಡಿಸಿ ಹೇಳಿ.

First, a pair of words will be given, followed by which one more pair of words will be given. Ask the participants to judge whether the second pair of words has the same relation as the first word pair. If the second word pair is judged wrong or if it does not

follow the same relationship as the first word pair, ask the participants to give a word such that it follows the same relation as the first pair.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಅಮ–ಅಪ್ಪ:: ಅತ್ತೆ–ಮಾವ
/amma-appa :: athe-mava/
2. ಕಿತ್ತಳೆ–ಹಣ್ಣು :: ನಾಯಿ–ಪ್ರಾಣಿ
/kithaLe – haNNu :: nayi – praNi/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	೧.ಸಂಪಿಗೆ–ಹೂವು :: ಸೇಬು–ಹಣ್ಣು /sampige – hu:vu :: se:bu – haNNu/ ೨.ಗುಲಾಬಿ–ಹೂವು :: ಅಕ್ಕಿ–ಕಾಳು /gulabi – huvu :: akki – kaLu/ ೩.ದ್ರಾಕ್ಷಿ–ಹಣ್ಣು:: ಆಲೂಗಡ್ಡೆ–ಹೂವು /drakshi – haNNu :: a:lugaDDe – hu:vu/		
Revision	೧.ತಾಯಿ–ತಂದೆ :: ಅಜ್ಜಿ–ಅಪ್ಪ /thayi –thandhe :: adzi –appa/ ೨.ಅಕ್ಕ–ತಂಗಿ :: ಅಣ್ಣ–ಪಾಪು /akka – thangi :: aNNa – papu/ ೩.ಕಾಗೆ–ಹಕ್ಕಿ :: ಕೋತಿ–ಪೆನ್ನು /ka:ge – hakki :: ko:thi- pennu/		

Max score: 6 Patient score:

Task 6: Analyze a sentence into lexical units/words

Instruction: ನಾನು ಈಗ ಒಂದು ವಾಕ್ಯವನ್ನು ಹೇಳುತೇನೆ. ಆದರಲ್ಲಿ ಎಷ್ಟು ಪದಗಳಿವೆ ಎಂದು ಮನಸ್ಸಿನಲ್ಲಿ ಲೆಕ್ಕ ಮಾಡಿಕೊಳ್ಳಿ. ನಾನು ಈಗ ಹೇಳಿದಂಥಹ ವಾಕ್ಯದಲ್ಲಿ ಎಷ್ಟು ಪದಗಳಿವೆ ಎಂದು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳಿದ್ದು ಸರಿಯಾಗಿದೆಯೋ ಅಥವ ತಪ್ಪಾಗಿದೆಯೋ ಎಂದು ಹೇಳಿ. ತಪ್ಪಿದ್ದಲ್ಲಿ ಅದನ್ನು ಸರಿಯಾದ ಉತ್ತರ ಕೊಟ್ಟು ಸರಿಪಡಿಸಿ.

You will be hearing sentences made up of many words. You have to count the number of words in a sentence as soon as you hear them. I will be telling you the number of words in the sentence and you have to say whether the number of words told by me is right or wrong and if it is wrong correct them by giving the correct number of words.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1.ಸುರೇಶ ಅಂಗಡಿಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುತ್ತಾನೆ.

/suresha angaDiyalli kelsa ma:Duthane/

2. ಹಾಗಲಕಾಯಿ ಒಂದು ತರಕಾರಿ ಆದರೆ ಸೀಬೆಕಾಯಿ ಅಲ್ಲ.

/hagalaka:yi ondhu tharaka:ri a:dhare se:beka:yi alla/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ರಾಮನು ಪುಸ್ತಕವನ್ನು ಓದಿದನು. /ramanu pustakavannu o:dhidhanu/ ಇಟ್ಟಿಗೆಯಿಂದ ಮನೆಯನ್ನು ಕಟ್ಟಿಸುವರು. /ittigeyindha maneyannu kattisuvaru/ ಲತ ದೇವಸ್ಥಾನಕೆ ಹೋಗಿ ಪೂಜೆ ಮಾಡುತ್ತಾಳೆ. /latha de:vasthanake ho:gi po:dze maduthaLe/		
Revision	ಇಬ್ಬರ ಜಗಳ ಮೂರನೆಯವನಿಗೆ ಲಾಭ. /ibbara dzagala muraneyavanige la:Bha/ ೨. ಕೊಕ್ಕರೆಗೆ ಉದ್ದವಾದ ಕಾಲು ಮತ್ತು ಕತ್ತು ಇರತ್ತದೆ. /ko:kkarege udhavadha ka:lu mathu kathu iruthadhe/ ಸೀತ ಮತ್ತು ಅವಳ ತಂಗಿ ಬೆಂಗಳೂರಿಗೆ ಹೊರಟ್ಟಿದ್ದರು. /si:tha mathu avaLa thangi bengaLu:rige horattidharu/		

Max score: 6 Patient score:

Task 7: Identify the grammatical category for a word

Instruction: ನಾನು ಈಗ ನಾಲ್ಕು ಪದಗಳನ್ನು ಹೇಳುತ್ತೆನೆ. ಈ ನಾಲ್ಕು ಪದಗಳು ಒಂದೇ ಗುಂಪೆಗೆ ಸೇರಿದೆಯೋ ಇಲ್ಲವೋ ಎಂದು ತಿಳಿಸಿ. ಪದ ಗುಂಪಿಗೆ ಸೇರದಿದ್ದಲ್ಲಿ, ಅದೇ ಗುಂಪಿಗೆ ಸೇರಿದ ಇನ್ನೊಂದು ಪದವನ್ನು ಹೇಳಿ.

I will be giving you four words. You have to judge whether all the four words belong to the same grammatical category. If a word does not belong to the same category then you have to provide a which belongs to the same category.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample: 1. ಹಸು, ನಾಯಿ, ಬೆಕ್ಕು, ನಾನು.

/hasu, na:yi, bekku, na:nu/

2. ಮಾಡಿದನು, ತಿಂದನು, ಹೋದನು, ಬಂದನು.

/ma:Didhanu, thindhanu, ho:dhanu, bandhanu/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ನಡೆದ, ಮಾಡಿದ, ಓದಿದ, ಓಡಿದ /naDedha, maDidha, o:dhidha, o:Didha/ ಅವಳು, ನಾನು, ಇವನು, ಅವನು /avaLu, na:nu, Ivanu, avanu/ ಬಂದನು, ಸೀತ, ತಂದನು, ನಡೆದನು /bandhanu, si:tha, thandhanu, naDedhanu/		
Revision	ಸಂತೋಷ, ಸೀತ, ರಾಮ, ನಡೆದ /santhosh, si:tha, rama, naDedha/ ನಾನು, ತಾವು, ಅವನು, ನದಿ /na:nu, tha:vu, avanu, nadhi/ ಬಂದನು, ಸೀತ, ತಂದನು, ನಡೆದನು /bandhanu, si:tha, thandhanu, naDedhanu/		

Max score: 6 Patient score:

Task 8: Syntagmatic Relations

Instruction: ನಾನು ಈಗ ಎರಡು ಜೊಡಿ ಪದಗಳನ್ನು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳುವ ಎರಡು ಜೊಡಿ ಪದಗಳು ಒಂದೇ ರೀತಿಯ ಸಂಬಂಧ ಕೋಡುತ್ತದೆಯೋ ಇಲ್ಲವೋ ಎಂದು ಯೋಚಿಸಿ ಹೇಳಿ. ಒಂದೇ ರೀತಿಯ ಸಂಬಂಧ ಕೊಡದ್ದಿದ್ದಲ್ಲಿ, ಅದನ್ನು ಸರಿ ಪಡಿಸಿ ಹೇಳಿ.

First, a pair of words will be given, followed by which one more pair of words will be given. Ask the participants to judge whether the second pair of words has the same relation as the first word pair. If the second word pair is judged wrong or if it does not follow the same relationship as the first word pair, ask the participants to give a word such that it follows the same relation as the first pair.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample: 1. ಪೆನ್ಸಿಲ್– ಬರೆಯುವುದು :: ಪುಸ್ತಕ–ಓದುವುದು

/pencil – bareyuvudhu :: pustaks – o:dhuvudhu/

2. ಎಲೆ–ಹಸಿರು :: ಬಾಳೆಹಣ್ಣು–ಹಳದಿ
/ele – hasiru :: ba:LehaNNu –haLadhi/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಹಾಲು–ಕುಡಿ :: ಅನ್ನ–ತಿನ್ನು /ha:lu – kuDI :: anna – thinnu/ ಮೊಲ–ಬೇಗ :: ಆಮೆ–ಓಡು /mola – be:ga :: a:me – o:Du/ ಕಾಫಿ–ಬಿಸಿ :: ಐಸ್‌ಕ್ರೀಮ್– ಖಾರ /ko:fe – bisi :: ice cream – Khara/		
Revision	ಮೇ–ತಿಂಗಳು :: ಬುಧವಾರ– ದಿನಾಂಕ /me:- thingaLu :: budhava:ra – dhinanka/ ಫ್ಯಾನು–ಗಾಳಿ :: ದೀಪ–ಟೇಬಲ್ /fanu –ga:Li :: di:pa – te:ble/ ಕ್ಯಾರಟ್–ಸಿಹಿ :: ಹಾಗಲಕಾಯಿ–ಉಪ್ಪು /carrot – sihi :: hagalakayi – uppu/		

Max score: 6 Patient score:

Task 9: Synonyms

Instruction: ನಾನು ಹೇಳುವ ಪದಗಳು ಸಮನಾರ್ಥಕ ಪದಗಳೆ ಎಂದು ತಿಳಿಸಿ. ಅವುಗಳು ಸಮನಾರ್ಥಕ ಪದಗಳು ಇಲ್ಲವಾದಲ್ಲಿ, ಮೊದಲನೆಯ ಪದಕ್ಕೆ ಸಮನಾರ್ಥಕ ಪದ ಕೊಡಿ.

I will be saying a pair of words and you have to judge if the two words have similar meaning or not. If they do not have share same meaning, ask the participants to come up with a word that has same meaning as the target word.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಸ್ನೇಹ–ಗೆಳೆತನ
/sne:ha – geLethana/
2. ಕಾಡು–ವನ
/ka:Du - vana/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಆನಂದ–ಸಂತೋಷ /a:nandha – santhosha/ ಮಂಗ–ಕಾರು /manga – ka:ru/ ಮನೆ–ಗೃಹ /mane – gruha/		
Revision	ತಾಯಿ– ಗೆಳೆಯ /tha:yi – geLeya/ ಮೃಗ– ಅಮ್ಮ /mruga – amma/ ಅರಸ–ಪ್ರಾಣಿ /arasa – praNi/		

Max score: 6 Patient score:

Task 10: Homonyms

Instruction: ನಾನು ಈಗ ಒಂದು ಪದ ಹೇಳುತ್ತೆನೆ. ಒಂದು ಪದಕ್ಕೆ ನಾನು ಬೇರೆ ಬೇರೆ ಅರ್ಥಗಳು ಹೇಳುತ್ತೆನೆ, ಹೇಳುವ ಬೇರೆ ಬೇರೆ ಅರ್ಥಗಳು ಸರಿಯಾಗಿದೆಯೋ ಅಥವ ಇಲ್ಲವೋ ಎಂದು ತಿಳಿಸಿ. ನಾನು ಹೇಳುವ ಬೇರೆ ಬೇರೆ ಅರ್ಥಗಳು ಸರಿ ಇಲ್ಲದಿದ್ದಲ್ಲಿ, ಸರಿಯಾದ ಬೇರೆ ಅರ್ಥಗಳು ತಿಳಿಸಿ.

You will be hearing a target word followed by two different words with different meanings for the target word. You have to judge whether the target word has different meanings indicated by the given two words. If not provide the correct meaning for the target word.

Scoring: Give a score of 1 for the correct response and 0 for incorrect or no response.

Sample items: 1. ಎತ್ತು– ಹಸು, ಎತ್ತುವುದು
/ethu/- /hasu, ethuvudhu/
2. ಅರಸ– ರಾಜ, ಮನೆ
/arasa/ - /raja, mane/

Subtask	Stimulus	Scoring	
		Correct response	Incorrect / no response
Judgment	ಕರಿ–ಕಪ್ಪು, ಕರಿಯುವುದು /kari – kappu, kariyuvudhu/ ಹತ್ತು–೧೦, ಮೆಟ್ಟಿಲು ಹತ್ತು /hathu – 10, mettilu hathu/ ಹತ್ತಿ– ಬಟ್ಟೆ, ಹತ್ತುವುದು. /hathi – batte, hathuvudhu/		
Revision	ಆಡು–ಪಕ್ಷಿ, ಆಟ ಆಡು /a:Du – pakshi, a:Ta a:Du/ ಏಳು–ಎದ್ದೇಳು, ನಡಿಯುವುದು /e:Lu – edheLu, naDiyuvudhu/ ಹೊಳೆ–ಹೊಳೆಯುವುದು, ನಲ್ಲಿ /ho:Le –ho:Leyuvudhu, nalli/		

Max score: 6 Patient score:

Task 11: Define a word

Instruction: ನಾನು ಒಂದು ಪದವನ್ನು ಹೇಳುತ್ತೇನೆ. ನಾನು ಹೇಳುವ ಪದವನ್ನು ವಿಸ್ತರಿಸಿ ಅಥವಾ ಅದರ ವಿವರಣೆ ಕೊಡಿ.

I will be telling you a word. After listening to the word, tell me what all you know about the word heard.

Scoring: Give a score of 2 for correct response, 1 for partially correct/only little information was provided, and 0 for no response/incorrect response.

Sample items: 1. ತಾಯಿ
/tha:yi/
2. ಬಾಳೆಹಣ್ಣು
/ba:LehaNNu/

Stimulus	Scoring		
	Correct response	**Partially correct/only little information**	**Incorrect / no response**
ಹಸು /hasu/ ಕ್ಯಾರೆಟ್ /carrot/ ಬಸ್ಸು /bassu/ ಸೇಬು /se:bu/ ನವಿಲು /navilu/ ಟೀಚರ್ /ti:char/			

Max score: 12 Patient score:

Task 12: Lexical/Refrential Arbitrariness

Instruction: ನಾನು ಈಗ ಎರಡು ಪದಗಳನ್ನು ಹೇಳುತ್ತೇನೆ. ಆ ಎರಡು ಪದಗಳಲ್ಲಿ ಒಂದು ಪದಕ್ಕೆ ವಾಕ್ಯ ಹೇಳುತ್ತೇನೆ. ಆ ಪದದ ಬದಲಾಗಿ, ನೀವು ಇನ್ನೊಂದು ಪದವನ್ನು ಉಪಯೋಗಿಸಿ, ಅದೇ ವಾಕ್ಯವನ್ನು ಹೇಳಿ. ವಾಕ್ಯದ ಅರ್ಥ ತಪ್ಪಾದರೆ ಅದಕ್ಕೆ ಗಮನ ಕೊಡಬೇಡಿ. ನಂತರ ನಾನು ಕೇಳಿದ ಪ್ರಶ್ನೆಗೆ ಅನುಗುಣವಾಗಿ ಸರಿಯಾದ ಉತ್ತರವನ್ನು ಕೊಡಿ.

You will hear a pair of words now. I will be telling you a sentence. Whenever you hear any one word of the pair in that sentence you have to substitute it with another word. Then you have to answer to the question asked.

Scoring: Give a score of 2 for correct response, 1 for partially correct/only little information was provided, and 0 for no response/incorrect response.

Sample items:

1. ಅಪ್ಪ–ಮಕ್ಕಳು /appa – makkalu/

   ಸಂಜೆ ಅಪ್ಪ ಮನೆಗೆ ಬರುತ್ತಾರೆ /sandze appa manege barutha:re/

   ಸಂಜೆ ಯಾರು ಮನೆಗೆ ಬರುತ್ತಾರೆ? /sandze yaru manege baruthare ? /

2.ಸಕರೆ–ಉಪ್ಪು /sakkare – uppu/

   ಸಕ್ಕರೆ ಸಿಹಿಯಾಗಿರುತ್ತದೆ /sakkare sihiyagiruthadhe/

   ಯಾವುದು ಸಿಹಿಯಾಗಿರುತ್ತದೆ? /yavudhu sihiyagiruthadhe ? /

Sl No.	Stimulus	Scoring		
		Correct response	Partially correct/only little information	Incorrect / no response
1.	ನೀರು–ಹಾಲು /ni:ru – ha:lu/ ಬಾವಿಯೊಳಗೆ ನೀರು ಕಾಣಿಸುತ್ತದೆ /bhaviyoLage ni:ru ka:Nisuthadhe/ ಬಾವಿಯೊಳಗೆ ಏನು ಕಾಣಿಸುತ್ತದೆ? / bhaviyoLage e:nu ka:Nisuthadhe?/			
2.	ಸಿಹಿ–ಉಪ್ಪು /sihi – uppu/ ಸಮುದ್ರದ ನೀರು ಉಪ್ಪಾಗಿರುತ್ತದೆ. /samudradha ni:ru uppagiruthadhe/.			
3.	ಸಮುದ್ರದ ನೀರು ಕುಡಿಯಲು ಹೇಗಿರುತ್ತದೆ? /samudradha ni:ru kuDiyalu hegirathe?/			
4.	ಬೆಂಕಿ–ನೀರು /benki – ni:ru/ ಬೆಂಕಿ ಕೈಯನ್ನು ಸುಡುತ್ತದೆ /benki kaI suDathe/ ಯಾವುದು ಕೈಯನ್ನು ಸುಡುತ್ತದೆ /yavudhu kaI sudathe ?/			
5.	ಕೈ–ಕಾಲು /kaI – ka:lu/ ಕೈಯಿಂದ ಚಪ್ಪಾಳೆ ತಟ್ಟುತ್ತೇವೆ /kaIyindha chappaLe thattutheve/ ಯಾವುದಿಂದ ಚಪ್ಪಾಳೆ ತಟ್ಟುತ್ತೇವೆ /yavudharindha chappaLe thattutheve/			
6.	ಡಾಕ್ಟರ್–ಟೀಚರ್ /doctor –ti:char/ ಡಾಕ್ಟರ್ ಸೂಜಿ ಚುಚ್ಚುತ್ತಾರೆ			

	/doctor su:dzi chuchuthare/ ಯಾರು ಸೂಜಿ ಚುಚ್ಚುತ್ತಾರೆ? /yaru su:dzi chuchuthare?/ ಲೈಟು–ಫ್ಯಾನು /light – fa:nu/ ಲೈಟಿನಿಂದ ಬೆಳಕು ಬರುತ್ತದೆ /lightinindha beLaku barathadhe/ ಯಾವುದರಿಂದ ಬೆಳಕು ಬರುತ್ತದೆ? /yavudharindha beLaku barathadhe?/			

Max score: 12 Patient score:

Test results

Task	Max score	Patient's score
Overall judgment score	30	
Overall revision score	30	
Overall generation score	24	
Total	84	

Interpretation:

Appendix II (Norms)

Sl No.	Task	Subtask	8.0-8.11 years (III Grade)		9.0-9.11 years (IV Grade)		10.0-10.11 years (V Grade)	
			Mean	**SD**	**Mean**	**SD**	**Mean**	**S D**
1	Semantic anomaly	Judgment	3.00	0.00	3.00	0.00	3.00	0.00
		Revision	2.98	0.13	3.00	0.00	3.00	0.00
		Overall	5.98	0.13	6.00	0.00	6.00	0.00
2	Free word association task	Judgment	2.93	0.25	3.00	0.00	3.00	0.00
		Revision	2.93	0.31	2.97	0.18	2.95	0.22
		Overall	5.87	0.43	5.97	0.18	5.95	0.18
3	Antonyms	Judgment	2.90	0.30	2.98	0.13	3.00	0.00
		Revision	2.77	0.47	2.82	0.50	2.95	0.22
		Overall	5.67	0.63	5.80	0.61	5.95	0.33
4	Semantic contiguity	Judgment	2.77	0.43	2.97	0.18	2.93	0.25
		Revision	2.37	0.69	2.68	0.50	2.92	0.28
		Overall	5.13	0.87	5.65	0.55	5.85	0.40

5	Paradigmatic relations	Judgment	2.57	0.50	2.75	0.47	2.82	0.39
		Revision	2.47	0.65	2.93	0.25	3.00	0.00
		Overall	5.03	0.99	5.68	0.50	5.82	0.39
6	Analyze a sentence into words/lexical units	Judgment	2.70	0.46	3.00	0.00	3.00	0.00
		Revision	2.20	0.84	2.85	0.40	2.90	0.30
		Overall	4.90	1.12	5.85	0.40	5.90	0.30
7	Identify the grammatical category for a word	Judgment	2.32	0.85	2.73	0.45	2.85	0.36
		Revision	2.28	0.98	2.87	0.47	2.97	0.18
		Overall	4.60	1.69	5.60	0.67	5.82	0.43
8	Syntagmatic relations	Judgment	2.82	0.39	2.90	0.30	2.97	0.18
		Revision	1.65	0.73	2.10	0.73	2.43	0.70
		Overall	4.47	0.85	5.00	0.78	5.40	0.72
9	Synonyms	Judgment	2.12	0.45	2.42	0.50	2.82	0.39
		Revision	1.78	0.67	2.43	0.70	2.70	0.46
		Overall	3.90	0.90	4.85	0.92	5.42	0.77
10	Homonyms	Judgment	2.62	0.56	2.85	0.40	2.82	0.39
		Revision	0.98	0.95	1.62	0.92	2.32	0.83
		Overall	3.60	1.21	4.47	1.03	5.14	0.92

11	Define a word	10.82	1.05	11.58	0.70	11.78	0.45
12	Lexical/ referential arbitrariness	10.77	1.35	11.70	0.65	11.78	0.52
	Overall judgment	26.73	1.77	28.58	1.08	29.22	0.74
	Overall revision	22.55	2.48	26.33	2.05	28.13	1.44
	Overall generation	21.55	1.87	23.27	0.97	23.57	0.67
	Total	84.32	6.43	93.08	3.07	96.33	2.54