Language Development in Adolescents

Language which is a transparent medium for younger children, is crucial for the performance of everyday personal skills such as texting friends, organizing independent travel and telephoning (Durkin, 1995). According to Owens (2004), the major focus of language research have always been on infancy and early childhood, with less emphasis given towards adolescence and early adulthood. Nippold (2000) defines adolescence as the time between 12 and 20 years of age when a major aspect of development of language occurs in the areas of semantics and syntax. According to Anglin (1993), the acquisition of new words takes place at a rapid pace throughout school years. Children shifting from primary to secondary school tend to be exposed to new subjects, curriculum, vocabulary, teachers, teaching style and organizational abilities, which can be quite demanding. For a child to be able to make links between different subject areas, understanding technical terms, and managing less structured social time, is dependent on effective and flexible language skills. With high demands being placed by secondary schools on the language skills of adolescents, these individuals are expected to learn abstract and complex vocabulary, adapt and learn from a range of teaching approaches, and learn about and write in different styles as seen in poetry. Such communication is important even outside of the formal learning environment. Nippold (1998a) suggests that communication developments are persistent throughout adolescence. Nippold (2007) has identified the major changes that occurs between the ages of 10 and 15 years, which are in the domain of verbal reasoning (e.g., more abstract and complex analogies); pragmatics (e.g., complete and complex narratives, and more coherent persuasive arguments); syntax (e.g., longer clause length, complex subordination); lexicon (e.g., prefixes and suffixes, abstract nouns, double-function terms); figurative language (e.g., slang, proverbs, idioms, sarcasm), and literacy (e.g., differentiating opinion and facts, comprehension of expository texts). Nippold attributes these changes that appear during the adolescent period to be characteristic of the adolescent thought process, suggesting four developments that could explain many of the specific developments in this period. The first and foremost change being the growth in metacognitive processes, which is the ability to analyze and reflect upon language, understanding grammatical structures, new words, and pragmatic as well as building a basis for the understanding of figurative expressions. The second change could be attributed to the cognitive development, which is the ability to think abstractly. Here along with the combination of the acquisition of metalinguistic skills, abstract
words, and sentence meanings, the appreciation of humor and ambiguity are also facilitated. The third change could be referred to the aspect of social cognition, wherein a specific growth is evident in social perspective taking, laying the foundation of almost all the sophisticated and complex changes in social interaction concerning the people’s intentions during the use of language, as well as expressing intentions. Such interactions become progressively dependent on competent verbal skills, even though their life is deskbound and technology dependent. The final attribution could be in the introduction of advanced syntax, vocabulary, and figurative expressions, which is largely learnt by print input rather than by spoken input, and also beginning to use a range of genres of discourse.

The main development in adolescent language takes place through extensive and enthusiastic reading along with educational exposure (Reed, 2005) and social experiences (Locke & Bogin, 2006). The adolescents compared to younger children, are found to produce repetitive language utterances and spend more time talking to others (Reed, 2005). They become proficient in switching between styles of language which may be based on figurative expressions. This ability to use sophisticated linguistic expressions have been linked to peer acceptance (Nippold, 1998a) and in the maintenance of social groups. Being able to maintain a conversation (Brinton, Robinson, & Fujiki, 2004) and narrate (Wetherall, Botting, & Conti-Ramsden, 2007) becomes crucial in creating and maintaining social relationships (Eckert, 2003) throughout adulthood. Labelling which is an important aspect of producing and maintaining social differences, creates a category allowing it to enter into everyday discourse. Such labels arise with use and in relation to certain people in actual situations. The adolescents decide the inclusion or exclusion of members in groups on the basis of the adolescent register which encompasses a range of linguistic features which may include syntactic, semantic, phonological, and discourse patterns (Beaumont, Vasconcelos, & Ruggeri, 2001; Gee, Allen, & Clinton, 2001). These language resources which are used by the adolescents, help them to deal with a variety of challenges they need to face during the transition into the adult world (Fortman, 2003; Lefkowitz, Boone, Sigman, & Au, 2002; Smetana, Metzger, Gettman, & Campione-Barr, 2006).

According to Joffe and Nippold (2012), during the past 22 years, significant advancements have occurred concerning the nature of language development in the later stages
as well as the subtle changes that may occur in the written and spoken communication skills of typically developing adolescents and young adults who are brought up in diverse countries and cultures including France, Israel, New Zealand, Sweden, the Netherlands, the United Kingdom, and the United States (Berman & Nir-Sagiv, 2004, 2010; Berman & Verhoeven, 2002; Berman, 2004b, 2008; Jisa, 2004; Nippold, 2007, 2010; Ravid & Berman, 2006; Ravid, 2006; Wengelin & Strömqvist, 2004). The increased lexical growth in typically developing youth (Nagy & Scott, 2000) can be attributed to their exposure to written language as they become proficient readers.

When compared to spoken language, the written language contains a greater variety of complex and low-frequency words. This facilitates the learning of the meanings of words particularly after the fifth grade (Cunningham & Stanovich, 1998). With the improvement in fluency and decoding skills, children use reading as a tool for gaining new knowledge which may include the learning of words that occur in textbooks of older children (Chall, 1983). According to Sternberg and Powell (1983), the increased word knowledge leads to stronger reading comprehension, which in turn may lead to the further expansion of the lexical system. Therefore there exists an ongoing reciprocal relationship between literacy and language development in youth. Children who are brought up in well-educated societies are exposed to varying degrees of literacy in their communities and homes which can be termed as emergent literacy (Purcell-Gates, 2001; Whitehurst & Lonigan, 2002); and this exposure can be a potential contributor towards formal literacy which may include both reading and writing. In addition to this, the use of cognitive and social processes helps individuals create meaning and discover ideas, and foster the expression of these ideas and opinions. Literacy also enables functions such as analysis, synthesis, organization, and evaluation, nurturing the understanding of how texts are created and how meanings are conveyed by various sources. This in turn facilitates learning in a variety of disciplines in important and complex ways.

The information obtained from research on language development in the later stages can be utilized to improve the identification of language impairments in adolescents, and thereby designing appropriate intervention programs targeting specific aspects. Adolescents with language impairments studying in mainstream schools (Conti-Ramsden, 2008) find secondary school more demanding and challenging than their subsequent college years (Palikara, Lindsay, & Dockrell, 2009). In order to succeed in middle and high school, the necessary oral and written
language skills may include the ability to analyze texts by commenting explicitly about the language used, summarizing texts by inferring implicit meanings, explicitly defining concepts, writing and discussing long and coherent texts, and evaluating arguments and stating assumptions (Schleppegrell, 2001). Lightbown and Spada (2006) have suggested that because of the complexity of learning language in middle and high school contexts, children continue to exhibit language deficits throughout their adolescence.

**Language Impairment in Adolescents**

According to Milosky (1994), the terms *language impaired, language disabled* and *language disordered* all refer to children with significant and specific delays in receptive and/or expressive language, without cognitive, emotional or sensory impairment. According to Paul (2001), language impairment can be defined as a receptive-expressive language disorder in the absence of cognitive delay or hearing loss. However, according to Leonard (1991), language impairment can also be referred to a problem in the comprehension or use of one’s first language in both written and oral language domains, especially when this deficit cannot be attributed to a primary cause such as neurological damage, hearing loss or intellectual impairment. The written language domain encompasses the processes of written expression and reading comprehension, while the oral language domain involves spoken language and listening comprehension. Longitudinal studies of children with receptive and/or expressive language impairment have found to have persistence of the impairment well into their adolescence (Conti-Ramsden, Botting, Simkin, & Knox, 2001; Conti-Ramsden, St. Clair, Pickles, & Durkin, 2012; Johnson, Beitchman, & Brownlie, 2010; Nippold et al., 2009; Snowling, Bishop, & Stothard, 2000; Spencer, Clegg, & Stackhouse, 2012) and adulthood (Clegg et al., 2005, 2009). Similar outcomes have also been reported in other longitudinal studies which involves young adolescents with persistent language impairments (Brinton, Fujiki, & Baldridge, 2010; Conti-Ramsden, Durkin, Simkin, & Knox, 2009a; Whitehouse, Watt, Line, & Bishop, 2009). I CAN which is a children’s communication charity, estimates 10% of children and young adolescents to have language impairments which are likely to be persistent and are due to a difficulty learning language. This difficulty in young adolescents comes to light in their secondary school due to the increasing demands in society and academics (Larson & McKinley, 2003). The severity and type of the
language impairment influences the nature of the persistent language difficulties in adolescents, which can be difficult to delineate.

Children studying in secondary classrooms access most aspects of their educational curriculum through their language skills (Wetherall et al., 2007). According to McLeod and McKinnon (2007), 16% of children attending mainstream secondary language schools have communication deficits in expression and reception. Understanding a text (Snow, Porche, Tabors, & Ross Harris, 2007), or producing a narrative (Montgomery & Kahn, 2003) are aspects of written language which can be limited because of deficient oral language skills. Research have shown adolescents with language impairment to have slower language processing speed (Miller, Kail, Leonard, & Tomblin, 2001), smaller vocabularies (Weismer et al., 2000), less developed morphosyntactic abilities (Rice, Tomblin, Hoffman, Richman, & Marquis, 2004), and poorer story composition skills (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004).

Parallel to the language impairments which persist across childhood and into adulthood, issues associated with academics, social, cognitive, psychiatric and behavioural aspects also seem to follow the same pattern (Clegg et al., 2009; Durkin & Conti-Ramsden, 2010; Jerome, Fujiki, Brinton, & James, 2002). Studies have revealed language impaired adolescents to have academic issues (Conti-Ramsden, Durkin, Simkin, & Knox, 2009b; Conti-Ramsden & Durkin, 2008; Durkin, Conti-Ramsden, Walker, & Simkin, 2009; Snowling et al., 2000; Snowling, Adams, Bishop, & Stothard, 2001), overlapping literacy difficulties (Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998), psycho-social and behavioral problems (Brownlie et al., 2004; Clegg et al., 2005), depression and anxiety (Law, Rush, Schoon, & Parsons, 2009), and eventually restricting the individual’s vocational options. Though certain adolescents with language impairments are able to manage the academic demands of schools, they appear to struggle in social interaction (Conti-Ramsden et al., 2009b; Wadman et al., 2008). These adolescents are found to shy away and have poorer quality of friendships, and also though controlled for anti-social behavior, the language impaired adolescents are found to lag behind their peer group in building and maintaining friendships as well as in academics (Durkin & Conti-Ramsden, 2007). Snowling et al. (2006) reported these individuals to have poor coping with the speed and topic change in conversations leading to poor self-esteem (Jerome et al., 2002). Adolescents with language impairments are found to be less independent than their peers.
in self-organizational tasks (Conti-Ramsden & Durkin, 2008). If this group of individuals are left unsupported, this may lead to relationship difficulties and unemployment (Clegg et al., 2005), drug abuse (Snow, 2000), and in certain cases anti-social and even unlawful behavior (Brownlie et al., 2004; Smart et al., 2003). In addition to this, another overlooked consequence of having a language disability is its impact on the ability to understand the complex language spoken by professionals such as police officers, lawyers and/or judges. The adolescents, whom such questions are directed to, are often incompetent to speak appropriately to narrate about the series of events that they encountered. According to Snow, Powell, and Sanger (2012) adolescents with language disorders are frequently involved in forensic interviews as witnesses, suspects or victims in cases of physical, sexual or verbal abuse, and hence fall under the juvenile offender population (Snow & Powell, 2004). Montgomery and Levine (1995) describe adolescents with language impairment as being a population which is abandoned by the system at a time when their scholastic skills may be the most perplexing and unsettled. It has also been found that a high level of juvenile offenders exhibit difficulties with written and oral language (Bryan, Freer, & Furlong, 2006; Snow & Powell, 2004).

Although increasing evidence is present for the existence of language disorders in adolescents, these individuals remain to be relatively a neglected group by the professionals (Larson & McKinley, 2003). The reasons could be attributed to: teachers tending to assume that all students might have mastered the basic skills of listening, thinking and speaking by the time they have reached secondary school; students who are labelled as language disordered in primary schools are frequently relabeled as ‘reading’ or ‘learning’ disabled because of the greater emphasis that is placed on written language in secondary schools; language disorder being an invisible disability, there exist no outward signs to identify such students; lack of normative data or diagnostic tools available for use in secondary schools; funding agencies tend to prioritize on early intervention services; misidentification or inadequate diagnosis; failure to recognize the negative effects that adolescents with persisting language impairments may have; failure to realize that adolescent’s personal, social or academic difficulties may be associated with the linguistic deficits; certain unresolved linguistic problems encountered by adolescents during their childhood, could once again emerge when confronted by new educational, social and vocational demands during secondary school; and certain academic problems which were not apparent in
the elementary school years could arise during high school. Hence, restricted knowledge of
typical language development in the adolescent population makes it difficult to identify students
who are low achievers.

The extent of the impact of poor communication in adolescence has been found to be
dependent on the type and severity of the communication impairment (Snowling et al., 2006),
early literacy and linguistic skills (Conti-Ramsden et al., 2009a), non-verbal IQ, and
social/economic factors. The adolescents with communication impairment will have an impact
on their literacy which is the medium for learning, teaching and testing. These related difficulties
in literacy restricts educational outcomes (Conti-Ramsden & Durkin, 2008). Surveys done by
Conti-Ramsden et al. (2009b), show a shift towards young individuals gaining more
opportunities to stay in education; and also taking more external exams than they did in the
1990s, with their peers continuing to outdo them, thereby gaining twice as many qualifications at
the end of their mandatory education (Conti-Ramsden et al., 2009a). Language impairments in
adolescents appear to be hidden with their language profile changing over time, and their social
communication deficits becoming more evident (Conti-Ramsden, Simkin, & Botting, 2006) and
complex. Adolescents having troubles with literacy and also associated with emotional, social
and behavior difficulties are given more priority than language based impairments. These
adolescents with language difficulties can be misinterpreted - with a processing delay appearing
as clumsiness or moodiness (Reed, 2005). These impairments can be masked by clear speech
(Clegg et al., 2009) or good surface language skills (Wetherall et al., 2007). According to Simkin
and Conti-Ramsden (2009), as adolescents get older they tend to purposefully conceal their
difficulties.

Studies have also found that the support given for an adolescent with language
impairment decreases dramatically once they reach secondary school (Hollands, van
Kraayenoord, & McMahon, 2005). Although children with language impairment are provided
with early support, they may still continue to exhibit a lag compared to their age-matched peers
in measures of written language and reading comprehension when reaching secondary school age
(Rescorla, 2005). The nature of language impairment can be studied in terms of receptive and
expressive language, as both receptive and expressive vocabularies are related to the
performance in reading (Ouellette, 2006; Tannenbaum, Torgesen, & Wagner, 2006; Wise, Sevcik, Morris, Lovett, & Wolf, 2007).

Receptive Language Impairment

The receptive language abilities include both listening and reading comprehension. These skills involve the effective processing, interpretation and retaining of written and spoken language. The difficulties in these domains are crucial indicators of any possible language impairment (Catts, Adlof, & Weismer, 2006; Loucas et al., 2010; Nation, Clarke, Marshall, & Durand, 2004). According to Montgomery and Levine (1995), adolescents with language processing difficulties are found to be less efficient in using executive functions or certain metacognitive strategies. Students with language impairment are found to be disengaged from classroom activities when their teacher talks excessively or if they have several concurrent demands on their auditory processing abilities. Factors such as being surrounded by distracting levels of classroom noise or having to retain a string of complex instructions from the teacher, may act as barriers for completion of the desired task or work. In addition, responding accurately and promptly to the teacher’s questions requires not only well-organized auditory processing skills, but also efficient lexical organization abilities and rapid retrievable knowledge. Having language impairment can point towards a breakdown in all or any one of the parts of this process. Such receptive language impairments indicate that these students may fail to learn and apply required curricular vocabulary; and without a good hold over new vocabulary, these students may appear to have problems in comprehending and retaining factual and conceptual information which is vital for efficient learning of academic materials.

Apart from auditory comprehension, students with language impairment also demonstrate incompetency in reading comprehension which is closely correlated to the understanding of spoken language (Perfetti, Landi, & Oakhill, 2005). According to Catts and Kamhi (2004), a discrepancy between the less developed comprehension ability and reading accuracy can influence the learning skills. Students with a history of language impairments exhibit deficits in reading comprehension throughout their adolescence years though they display adequate reading fluency and accuracy (Snowling et al., 2001). A poor comprehension of figurative language, such as proverbial, idiomatic or metaphorical forms can also lead to receptive language problems.
that may become evident in social situations and in the classroom (Reed, 2005), indicating deficits in the pragmatic use of language (Bishop & Adams, 1989).

**Expressive Language Impairment**

Expressive language deficits are demonstrated by reduced and grammatically immature spoken output. For example, students with expressive language impairment may have a limited and repetitive vocabulary overusing non-specific words such as ‘stuff’ and ‘thing’. These individuals may also exhibit phoneme reversals, word retrieval problems and hesitations in speech. They also appear to use written and oral sentences that are shorter and semantically less sophisticated and syntactically not complex (Reed, 2005). Another observation by Durkin et al. (2009) suggest that such expressive language impairment may also be apparent with a student’s inability to use appropriate key words for the efficient use of Internet search engines. Wetherall et al. (2007) report the prevalence of syntactic errors (verb tense and agreement) while producing oral and written narratives in language impaired students. These written narratives are less informative and cohesive than their typically developing peers (Reed, Patchell, Coggins, & Hand, 2007). Specific association between the production of written text and oral language competence have been reported both for children with resolved and continuing language deficits, suggesting that written language can reveal residual language deficits (Bishop & Clarkson, 2003; Fey et al., 2004). Difficulties may also be evident in tasks which involve the creative writing of poetry and prose, which may be challenging for students with language impairment. According to Ripley and Yuill (2005) expressive language problems also elicit high levels of emotional problems in adolescent boys leading to exclusion from school.

Individuals with communication impairments have specific speech and language impairments; whereas others may have deficits as part of a more generalized learning difficulty or other conditions such as hearing impairment or Autistic Spectrum Disorders (ASD). A study done by MacKay and Shaw (2004) revealed typically developing age matched children to perform significantly better than children with ASD, in tests of figurative language skills. Language based impairments include deficits on expressive and receptive syntax, pragmatics and semantics (Reed, 2005). Along with the mental health problems encountered by this population (Law et al., 2009), co-morbid conditions such as dyslexia (Snowling et al., 2000), Attention Deficit Hyperactivity Disorder (Cohen et al., 2000), and conduct disorder (Toppelberg &
Shapiro, 2000) also do exist. Children with Specific Language Impairment (SLI) persist to have language difficulties throughout their adolescence and adulthood (Clegg et al., 2005; Conti-Ramsden et al., 2001). These adolescents are at risk of reaching the end of their secondary school with poor social and educational attainments (Conti-Ramsden & Botting, 2004). This in turn will restrict the opportunities for some adolescents with SLI to develop independence. The language delays that are apparent in individuals with Down Syndrome when compared to their age matched peers have deficits that are more expressive in nature than receptive (Dykens, Hodapp, & Evans, 1994). These deficits persist well into adolescence and adulthood (Chapman, Hesketh, & Kistler, 2002; Thordardottir, Chapman, & Wagner, 2002). Similarly, receptive and expressive language deficits along with cognitive delays are present even at the earliest stages of development of children with Fragile X syndrome (Roberts, Mirrett, & Burchinal, 2001). These language learning difficulties of individuals with this syndrome have been found to persist well beyond the early development, affecting all domains of language, with the expressive language abilities being more affected than the receptive abilities (Philofsky, Hepburn, Hayes, Hagerman, & Rogers, 2004; Roberts et al., 2001).

**Adolescent Language Assessment**

Clinicians make judgments of language development in clinical and educational settings using assessment data which is assumed to represent the child’s true language abilities. However, many of the static assessments may not correctly foretell the child’s language-learning potential or the child’s future language performance, especially if the assessment tool is not culturally standardized. A child’s academic and intellectual functioning is entirely influenced by their language skills. A Speech-Language Pathologist is an integral member of a multidisciplinary team to assess the current level of performance and profile the student’s requirements, as suggested by the Individuals with Disabilities Education Act (2004). Though many evaluations are conducted at the elementary level, such evaluations also need to be continued into the middle and high school inorder to determine the remediation goals for the older children. According to Nippold (2007), the language performance in adolescence is difficult to measure using standardized tools as the development in this stage is marked by subtle and gradual improvement in skills. Therefore these changes may not be obvious unless the group is widely separated and studied (for example, 10-year-olds vs. 13-year-olds) (Nippold, Schwarz, & Undlin, 1992). Hence
this language growth may not be obvious from listening to the student’s informal conversation; rather assessing their performance in academic tasks that may involve written and spoken communication (Scott, 1988). Both children and adolescents with linguistic impairments experience significant problems in getting meaning from spoken as well as written language (Staskowski & Creaghead, 2001). As it is difficult to find appropriate tools for the assessment of language impairments in this population (Wetherall et al., 2007), either under or over identification is a common scenario.

       Standardized language tests promote a certain idea about the presence and severity of an adolescent language disorder (Apel, 1999). Nelson (1998) suggested that any standardized test of adolescent language should include the assessment of both comprehension of language in both listening and reading. The main objective of clinicians is to learn the most about the adolescent’s language in the shortest time as possible. Tests that are norm-referenced are often required to attain a first time diagnosis, to define the nature and extent of the language disorder, as well as to establish eligibility for services (Wiig & Secord, 1991). Language tests that are norm-referenced go through a process of widespread development and design (Wiig & Secord, 1991). These tests begin with the formation of a concept and initial plan of subtasks and items, validating it using pilot studies and performing subsequent revisions of the initial version of the test. This is then followed by field testing on a larger group, and revision of the subtasks and items. The process ends with the standardization and publication of the developed test. The results of the pilot and field test are analysed statistically to determine the contribution of the items to the subtest totals, as well as the subtest contribution to the composites. In addition, the reliability and validity measures are established, the size of measurement error across the age levels, and the age referenced scores (percentile ranks and standard scores) are obtained, as well as its applicability for specified populations. The criterion-referenced tests on the other hand can be tailor-made to the curriculum, social or vocational demands for adolescent communication, similar to the design of probing into the developmental aspects or acquisition of language (Wiig, 1990). These tests are normally used to determine an adolescent’s success or failure level on a probe which is compared to some criteria. Criterion-referenced tests usually begin with the design and use of more specific probes. These assessments frequently use one criterion for performance and judge an accuracy level of 70% to indicate adequate acquisition of the content tested (Wilson, 1980).
Silbert, Carnine, and Stein (1981), suggests that the skill acquisition follows growth patterns which may have implications for performance. While, the lowest level of acquisition can be considered at 30% or less accuracy, the next level can be considered to be between 50 and 80% accuracy (level of emergence). The subsequent level between 50 and 80% accuracy, can be considered as the transition level. The highest level is often considered as the independent or mastery level.

In comparison to the several standardized tests of language designed to assess younger children, there exists only a handful for adolescents. Few of the tools used for adolescent language are as follows:

- The *Adolescent Language Screening Test*, developed by Morgan and Guilford (1984), screens individuals between 11 - 17 years. This test comprises of tasks pertaining to pragmatics, receptive and expressive vocabulary, concepts, morphology, sentence formulation and phonology. Naylor, Staskowski, Kenney, and King (1994) assessed school-refusing adolescents using a battery of tests which also included the Adolescent Language Screening Test and found that the subjects had a significantly higher incidence of both learning and language impairments than controls.

- The *Clinical Evaluation of Language Fundamentals Screening Test—4*, developed by Semel, Wiig, and Secord (2004), screens individuals between 5 - 21 years. This screening test comprises of tasks pertaining to receptive, expressive, grammatical and semantic skills. Screening tests such as this are constructed with items that are selected across language domains from complete language assessment tests based on their ability to identify language impairments.

- The *Speech and Language Evaluation Scale*, developed by Fressola and Hoerchler (1989), screens individuals between 4.6 – 18 years and above. This scale comprises of tasks pertaining to voice and articulation, fluency, form, content and pragmatics. It provides a profile of the student’s level of speech and language functioning across all its subscales.

- The *Screening Test of Adolescent Language-Revised*, developed by Prather, Breecher, Stafford, and Wallace (1990), screens individuals between 11 – 18 years. This test comprises of tasks pertaining to vocabulary, language processing, auditory memory
span, and proverb explanation. It identifies students who lack competency in specific linguistic skills indicating further detailed testing.

The diagnostic tools used for the assessment of adolescent language are as follows:

- The *Fullerton Language Test for Adolescents- 2nd edition*, developed by Thorum (1986), assesses individuals between 11 years – adult. This test comprises of tasks pertaining to auditory synthesis, morphology, oral commands, convergent and divergent production, syllabification, grammar competency and idioms. This test helps pinpoint possible reading difficulties along with the assessment of related language skills. In a study done by Nippold and Martin (1989), the authors assessed adolescent’s figurative language using a modified version the idiom subtest of Fullerton Language Test for Adolescents with participants requiring to interpret orthographically presented idioms (with and without story contexts) using the written mode. Though the results did follow an expected pattern, with the participants performing better in idioms presented in story context than in isolation, the authors did admit a number of serious limitations using the subtest from Fullerton Language Test for Adolescents.

- The *Test of Language Competence – Expanded edition*, developed by Wiig and Secord (1989), assesses individuals between 10 – 18.11 years. This test comprises of tasks pertaining to metalinguistics, multiple meanings, multiple inferences, figurative usage, conversational and sentence production. This test has been shown to differentiate adolescents and adults with high-functioning autism from IQ matched controls (Minshew, Goldstein, & Siegel, 1995).

- The *Test of Adolescent/Adult Word Finding*, developed by German (1990), assesses individuals between 12 – 80 years. This test comprises of tasks pertaining to naming, nouns, verbs, sentence completion, description and categories. Tingley, Kyte, Johnson, and Beitchman (2003) used the Test of Adolescent/Adult Word Finding along with two other tests inorder to assess the inaccurate performances of young adults in semantic-retrieval and single-word naming tasks and disruptions to conversational fluency. However the study required additional validation, as single-word measures were inconclusive in the identification of word-finding deficits.
• The *Test of Word Knowledge*, developed by Wiig and Secord (1990), assesses individuals between 5 – 17 years. This test comprises of tasks pertaining to expressive and receptive vocabulary, word definitions, synonyms, word opposites, figurative language, multiple contexts, conjunctions, and transition words. According to the authors, this test can be considered as a useful instrument in determining the severity of semantic deficits in individuals who are already identified as language disordered or someone who is being assessed for that possibility. Moreover it provides information about ‘giftedness’ in the semantic domain.

• The *Woodcock Language Proficiency Battery – Revised*, developed by Woodcock (1991), assesses individuals between 2 – 95 years. This battery comprises of tasks pertaining to oral language, vocabulary, antonyms, synonyms, reading and writing. Studies were conducted to segregate struggling readers from proficient readers using this battery (Brasseur-Hock, Hock, Kieffer, Biancarosa, & Deshler, 2011).

• The *Evaluating Communicative Competence*, developed by Simon (1994), assesses individuals between 10 - 18 years. This test comprises of tasks pertaining to language processing, metalinguistic skills and functional uses of language.

• The *Oral and Written Language Scales - 2nd edition*, developed by Carrow-Woolfolk (1996), assesses individuals between 3 - 21 years. This scale comprises of tasks pertaining to measures of reading comprehension, written expression, oral expression, and listening comprehension.

• The *Comprehensive Assessment of Spoken Language*, developed by Carrow-Woolfolk (1999), assesses individuals between 3 – 21 years. This tool comprises of tasks pertaining to lexical, semantic, syntactic, pragmatic awareness of appropriate forms and complex comprehension. Reichow, Salamak, Paul, Volkmar, and Klin (2008) assessed individuals with autism spectrum disorders using this tool and found that the participants performed at above-average levels on the language (lexical, semantic and syntactic) subtests, though their performance in the pragmatic and inference making domains were near the bottom of the normal range.

• The *Receptive One-Word Picture Vocabulary test – 4th edition*, developed by Martin and Brownell (2000), assesses individuals between 2 – 80 years and above. This test comprises of a task pertaining to Receptive vocabulary.
• The **Word Test – 2- Adolescent**, developed by Bowers, Huisingh, LoGiudice, and Orman (2005), assessed individuals 12 years and above. This test comprises of tasks pertaining to associations, synonyms, semantic absurdities, antonyms, definitions, and flexible word use.

• The **Peabody Picture Vocabulary Test – 4th edition**, developed by Dunn and Dunn (2007), assesses individuals between 2.6 years - adult. This test comprises of a task pertaining to receptive vocabulary.

• The **Test of Adolescent and Adult Language – 4**, developed by Hammill, Brown, Larsen, and Wiederholt (2007), assesses individuals between 12 – 24.11 years. This test comprises of tasks pertaining to receptive and expressive vocabulary and grammar, reading and writing, and auditory comprehension. The earlier versions of this test were used to make decisions regarding qualification for special education services and educational placements (Stephens & Montgomery, 1985); and also helping determine treatment goals (Plante, 1996).

• The **Test of Language Development: Intermediate – 4th edition**, developed by Hammill and Newcomer (2008), assesses individuals between 8 – 17.11 years. This test comprises of tasks pertaining to sentence combining, word ordering, morphological comprehension, multiple meanings, relational vocabulary and picture vocabulary. In a study done by Klin, Volkmar, and Sparrow (2000), the authors used the earlier version of this test and found children with Aspergers Syndrome to exhibit age appropriate scores hence warranting assessment of higher-level language and verbal problem-solving skills.

• The **Bader Reading and Language Inventory - 7th edition**, developed by Bader and Pearce (2009), assesses individuals between K – 12 and adult. This test comprises of tasks pertaining to reading and language abilities.

• The **Clinical Evaluation of Language Fundamentals - 5th edition**, developed by Wiig, Semel, and Secord (2013), assessing individuals between 5 – 21 years. The CELF-5 comprises of tasks pertaining to language, expressive language, language structure and language content.

• The **Comprehensive Receptive and Expressive Vocabulary Test – 3rd edition**,
developed by Wallace and Hammill (2013), assessing individuals between 5 – 89 years. The test comprises of tasks pertaining to receptive and expressive oral vocabulary. This test is specifically used to identify individuals who are significantly lagging in oral vocabulary, to document oral vocabulary development and to measure the oral vocabulary in research studies.

Till date, the only Indian test tapping upon the language deficits encountered by adolescents is the *Linguistic Profile Test – Kannada version* (11 – 15+ years) developed by Suchitra and Karanth (2007), which is an extension of their previous tool, which is the *Linguistic Profile Test* (6 – 10+ years) developed by Suchitra and Karanth (1993). *The Linguistic Profile Test* was originally designed by Karanth (1980) in Kannada and was then called as the *Test of Psycholinguistic Abilities in Kannada*. A parallel version of the test was developed in Hindi by Karanth, Pandit, and Gandhi (1986) on normal adults and patients with stroke including aphasia and non-aphasia. Sharma (1995) later developed a Hindi version of Linguistic Profile Test on individuals between 6 and 15 years and above. Several unpublished versions of the test are available in other Indian languages – *Malayalam* (Asha, 1997; Rukmini, 1994), *Telugu* (Suhasini, 1997; Reddy, 2001), *Nepali* (Karna, 2003) and *Konkani* (Barreto, 2004). The sections of Linguistic Profile Test contain three major sections – Phonology, Semantics, Syntax and Discourse. The phonology section includes phonemic discrimination and phonemic production. The semantic section assesses for the semantic discrimination in several categories such as synonyms, antonyms, naming, polar questions, lexical categories, paradigmatic and syntagmatic relations, identification of semantically ambiguous sentences, and similarity and contiguity. The syntax section assesses for grammaticality judgement in syntactic structures which includes morphophonemic alterations, PNG markers, plural tenses, affirmatives, comparatives, transitive, intransitives and causatives, conditionals, negatives and interrogatives, quotatives, conjunctives and participial constructions. Finally the discourse section contains the elicitation of a discourse sample through picture description, story narration and an interview. A quantitative and qualitative analysis of the performance is then conducted. Observations pertaining to other linguistic factors such as stress, intonation and juncture are also made. Linguistic Profile Test served as a test for monitoring the acquisition of language.
Semantics

The study of semantics reveals information about the representation and attainment of the meaning of words and how they are structured in the lexicon (Nippold, Hegel, & Sohlberg, 1999). This component of language is the most vastly studied aspect of development. The literate lexicon and figurative expressions are the two aspects of semantic development that are predominantly crucial for academic success (Nippold, 1993). Inorder to express these two aspects of language, metalinguistic complexity is essential to infer meaning from context. The words that commonly occur in academic contexts in high school and college is considered as literate lexicon. These types of words frequently occur in lectures, textbooks, seminars pertaining to literature, arts and philosophy. Similar to the words comprising the literate lexicon, the figurative expressions such as proverbs, idioms, and metaphors frequently occur in written and oral language during high-school and college. These figurative expressions are understood with increasing levels of accuracy during the adolescent period (Nippold, 1988). Kamhi, Masterson, and Apel (2007) suggest that understanding of figurative language is influenced by a good foundation in literate lexicon. The vocabulary knowledge also influences the language fluency of language learners (Nation, 1993). The vocabulary size of second language learners act as an indicator of their academic language skills such as writing, listening, and reading (Bear, Invernizzi, Tempelton, & Johnston, 2008).

According to Stahl (1999), knowing a word indicates not only knowing its literal definition but also its association with other words in different contexts, and its ability to transform into several other forms. However, according to Biemiller and Slonim (2001), factors such as what counts as a word or word category and the varied definitions of what it means to know a word, complicates the quantification of such information. Children on an average are able to understand about 6000 root word meanings at the end of second grade, which expands upto 10,000 words by the end of sixth grade (Biemiller, 2005). The development continues in this pace, wherein the youth will tend to know a minimum of 80,000 different words while graduating from high school (Miller & Gildea, 1987). According to Berk (2006), the adolescent's vocabulary can expand upto over 40,000 words by age 18, which includes abstract words. Other studies have reported that by the time the students reach high school they are estimated to know 15,000 to 45,000 words (Biemiller & Slonim, 2001). Graves (2006) proclaims that an eighth
grader who is a native English speaker should have a reading vocabulary of around 25,000 word families, while the twelfth grader having 50,000 word families.

The development of word knowledge is closely related to literacy levels during the school-age and adolescent years continuing throughout the lifespan. Literacy development and academic success depends upon the basic role played by vocabulary knowledge (National Reading Panel, 2000). Active and proficient readers who have their interest in a wide range of topics, cultivate significantly larger vocabularies than their peers who read with reduced skill, motivation and interest (Miller & Gildea, 1987). Hence, it was also found that students who know more words tend to exhibit greater levels of reading comprehension than their peers who have limited word knowledge (Nagy & Herman, 1987; Sternberg, 1987). According to Nagy and Scott (2000), an adequate reading comprehension would indicate that the reader know 90-95% of the words in the text. Fitzgerald (1995) has identified vocabulary knowledge to be one of the most substantial variables in the reading success of poor language learners. Cunningham and Stanovich (1997) advocated that apart from the literacy development which is facilitated by vocabulary knowledge, the cognitive development also seems to be influenced by the same. Dockrell, Lindsay, Palikara, and Cullen (2007), opine that the combined effect of literacy and language difficulties typically results in reduced educational achievements.

Models/Theories of Semantics

The types of semantic response that are generated by children are regulated by the organization of the semantic categories in their lexicon.

- The ‘semantic feature analysis’ theory introduced by Clark (1973), implies that children learn concepts by the process of identification of the meaningful elements that words share or do not share.
- In Bowerman’s ‘prototype theory’ of semantic category acquisition, he speculated that children develop or acquire a prototype for each concept that is learnt (Gleason, 2005); wherein the child is speculated to compare the prototype to a new probability of the concept that is encountered.
• In the ‘probabilistic grounds theory’ when a new concept is encountered, the child will classify it into the most probable category that is formed which is based on the important features that are identified.

• In Nelson's (1974) ‘functional core hypothesis’ he proposed that the meanings of early words are based on the actions or functions that the concepts represent. In order to achieve an entirely developed lexicon, not only does the child need to organize his lexical system into an effective system, but also add new entries to his vocabulary store.

• In the ‘hierarchical network model’ proposed by Collins and Quillian (1972), the learnt semantic concepts are arranged in a hierarchical structure which are organized based on the semantic features of superordinate and subordinate categories. The classic feature of the hierarchical model indicates that the more common a semantic feature is, the higher the level at which it is stored; and the larger the category the longer would be the time taken for search. Once the word has been represented as a concept in the lexical system of an individual, the mapping and retrieval of the word is required, which is achieved via semantic activation. According to Collins and Loftus (1975), the semantic activation can be described in terms of nodes, links, and spreading activation.

• According to the ‘spreading activation model’ (Collins, 1969), conceptual nodes represent each words, further each node is linked to other nodes that share a semantic relation. With the stimulation of the nodes, the activation spreads across to the other nodes. Hence, the nodes which are strongly related or connected receive the maximum activation, and the weakly related or connected receive the minimum activation.

• The ‘feature oriented model’ assumes two different types of characteristics to be stored – feature and characteristic definition. On defining the feature aspect of a lexical item ‘bike’, are its ‘handle-bars’, ‘wheels’ and ‘fuel’ describing it. Whereas in defining a characteristic aspect, the characteristic of the lexical items such as ‘ride’, ‘accelerate’, would describe ‘bike’.

Vocabulary and reading comprehension which are highly correlated, makes vocabulary the best predictor of comprehension. A number of hypotheses have been suggested to account for this correlation, each of it suggesting a different method for vocabulary instruction.
• The *instrumental hypothesis* (Anderson & Freebody, 1981), suggests that it is essential to increase the number of word meanings to improve understanding.

• The *byproduct hypothesis* (Ruddell, 1994) suggests with increased opportunities to read, understanding of the meanings of new words will be better.

• The *knowledge hypothesis* (Anderson & Freebody, 1981), suggests the correlation between comprehension and vocabulary, which is due to their connection to the reader’s background knowledge about what is being read.

• The *language proficiency hypothesis* (Stahl & Fairbanks, 1986) on the other hand refers to the relation between vocabulary and comprehension which is the reflection of the overall competence of the individual with the language.

The basic organizational principles that form the lexical-semantic system are the taxonomic and thematic relations. The taxonomic relations involve a hierarchical category membership, whereas the thematic relations involve the co-occurrence in event schemas. Though both these relations are at the disposal, right from an early age (Waxman & Gelman, 1986), the shift to taxonomic from thematic relations are evident with age, as the taxonomic relations begin to play a crucial role in the structuring of the child’s semantic networks as well as controlling the retrieval of semantic knowledge. This shift is considered as a result of a rapid expansion of world knowledge and vocabulary which is distinctive of middle childhood. Such a shift is not necessarily observed throughout all cultures (Greenfield, 1997) but is evident in societies having schools. A simultaneous developmental phenomenon observed in children is the syntagmatic-paradigmatic shift. It was observed that 5 year old children responded to a word stimulus with a syntactically related word (e.g., phone-call) (syntagmatic response), which fell under a different form class; while the 9 year old children responded with a semantically related word (e.g., phone-fax) (paradigmatic response), which fell under the same class. Therefore Lippman (1971) suggests that a developed semantic system in mature language users may be indicated by the predominance of paradigmatic over syntagmatic responses. This predominance could be attributed to formal schooling which alters the individual’s interpretation skills of a particular task (Cole, 1990), the acquisition of reading (Cronin, 2002), and a shift in the conceptual organization (Nelson, 1977). Sheng, McGregor, and Marian (2006) suggests that the understanding of paradigmatic relations such as synonymy, antonymy and gradation is crucial in
the acquisition of adjectives which facilitates a former and more complete shift to paradigmatic from syntagmatic.

During the production of a single word, an initial specification of the semantic aspect of the word occurs, that takes place at the lemma level which happens to exist in the early stages of processing. The activation of lemmas (set of lexical candidates) and the selection of the target lemma occur in this semantic level, wherein the level addresses the relationships between words (Clark, 2002). This level contains multiple organizational sets and semantic relations in the entire lexicon (Miller & Fellbaum, 1991). Subsequent to this, the activation of the phonological information takes place at the lexeme level (Levelt, Roelofs, & Meyer, 1999); wherein the activation and selection of the lexemes (phonological forms) happens. An additional naming process is present in the system which can be characterized into the stages of object identification, name activation and response generation (Johnson, Paivio, & Clark, 1996). Three models have explained the production of words – interactive processing model, cascade model and the modular view. The interactive processing model (Dell, Burger, & Svec, 2002) involves a positive feedback from a lexeme to a lemma. Whereas the cascade model suggests that the activation spreads from lemmas to the phonological level, and the activation of the target lemma occurs along with the partial activation of the alternative forms (Blanken, Dittman, & Wallesch, 2002). In the modular view (Levelt et al., 1999), the naming happens in a serial process wherein there is transfer from the lemma level to the lexeme level. Only after the selection of the target lemma, will phonological encoding take place, in turn establishing the phonological encoding of the target lexeme. All these models elaborate on the importance of both lemma and lexeme levels during lexical selection, and also the influence of the competitors on the error patterns at both the lexeme (Gaskell & Dumay, 2003) and the lemma levels (Blanken et al., 2002).

**Assessment and Development of Semantics in Adolescents**

The development of language not only contains the addition of new words to lexicon but also the acquisition of a more correct and expanded knowledge of words that are familiar (Miller, 1991). At the initial stages of word learning, one may realize a word which had been heard before but would be unable to identify or convey its exact meaning. Nagy, Herman, and Anderson (1985) stated that the acquisition of the understanding of a word is a steady process rather than an “all or none” process. Semantic development studies reveal an increase in the
responses in word association tasks during childhood. This suggests that children actively build links between the word nodes in their semantic networks (Cronin, 2002). While progressing through school, the types of words students encounter become progressively abstract and rare, often occurring in written contexts (formal) than in spoken contexts (casual) (Nagy, Diakidoy, & Anderson, 1993). The process of word learning continues even after high school with new words being learnt throughout the life span, mostly by individuals who are proficient and voracious readers (Miller & Gildea, 1987).

Words that are present in the child’s vocabulary can have different semantic properties when compared to the same words in the vocabulary of an older child or an adult. Preschoolers use certain words in the vocabulary even though a complete understanding of those words may not be attained until adolescence (Flores D’Arcais, 1978). It was also noted that double-function terms such as ‘bark’, ‘sweet’ and ‘sun’ demonstrate this phenomenon. Though their superficial meanings may be understood by young children, the psychological meanings may not be understood by them; also the way in which the two meanings overlap may not completely be understood until adolescence or early adulthood (Schecter & Broughton, 1991). The correct production of words on various types of naming tasks increases as normal children mature to become adolescents (German, 1990). Apart from the addition of words to the lexicon, the expansion in word knowledge involves the development of a systematized network, wherein the semantically associated words happen to become more intricately linked (Nelson, 1977). This semantic reorganization observed using word association tasks, is reflected in the syntagmatic-paradigmatic shift which occurs between 5 and 9 years (Lippman, 1971). It was noted that children’s errors in using words provides the evidence of partial lexical knowledge. Children used overextensions on words, which was not evident in the vocabulary usage of adults when considering the same words (Bloom, 1973; Clark, 1973). This mismatch was evident until the children had developed a more complex understanding of the concepts involved. Researchers have found that similar types of errors are produced by older children as they try to use unfamiliar and novel words.

The semantic development in children, adolescence, and adults were also studied within the context of persuasive writing (Nippold, Ward-Lonergan, & Fanning, 2005); wherein the authors analyzed semantics based on three types of literate words (meta-verbs, abstract nouns,
and adverbial conjugates), and found that all three aspects showed an increase in production with age. It was also noted that the adults exhibited greatest increase in use of abstract nouns, while the meta-verbs and adverbial conjugates remained low. Regarding the development of the changes in phonological representations, the children tend to move from a holistic representation to a segmental representation. According to the *lexical restructuring hypothesis*, the lexical representations in typically developing children steadily becomes increasingly segmental between 1 and 8 years of age (Metsala, 1997), with the restructuring happening first for the high frequency words in dense neighborhoods.

Tasks that tap upon the vocabulary knowledge were viewed as an indicator of the development of intelligence and status. De Deyne and Storms (2008) indicated that the word association task is used extensively as a measure for semantic knowledge. Similarly to study the lexical-semantic organization, word association paradigms (Henriksen, 1999), as well as repeated word association paradigms (Sheng et al., 2006) are used.

**Contrastive relations (Antonymy).** According to Soifer (2005), word opposites which is an important semantic aspect of language, assesses a person’s knowledge of antonym. Antonyms are words (lexemes) that are opposite in meaning which comes in three varieties – mutually exclusive opposites (true/false; convergent/divergent), mutually dependent on each other (front/back; superior/inferior), and relative degree of comparison (long/short; sad/happy). Jones (2002) estimates the occurrence of a pair of antonyms in every fifty sentences that serves in many possible discourse functions. The role of antonymy is exemplified in children’s rhymes, songs, and stories that make use of major lexical contrast. Eisenberg, Murkoff, and Hathaway (1989) recommend parents to stress on antonomic terms which may facilitate cognitive development. The National Literacy Strategy have also emphasized on the awareness of antonym throughout the primary education which helps build the metalinguistic awareness that is essential for reading.

During the learning of antonymic terms, synonomy and overextension are also raised. This indicates that children normally produce or respond first and more correctly to one member of an antonymic pair; often the first-to-emerge term being the first learned form. The second term which can be used interchangeably can be treated as a synonym for the first term; however it’s not necessary that the second term to emerge is to be treated as a synonym (Coker, 1975;
Harner, 1975; Kuczaj & Maratsos, 1975). However this pair could be discriminated with conventional use; however Barrett (1978) and Clark (1972) suggest that such word learning attributes a parallelism between order of mastery and order of emergence. The word frequency also guides the bases of lexical overextension (Anglin, 1977). Situational and affective commonalities and similarities in functional relationships (Nelson, 1974) are also noted to contribute towards lexical overextension (Clark, 1971). Abkarian (1988) suggested that when a linguistically competent person is assessed for the developmental mastery, a degree of 75% of adult like performance is considered. The author proposed two strategies that address the 75% criteria – the ‘situationally appropriate approach’ which overestimates the child’s knowledge of the first word of an antonymic pair to enter the lexicon; and the ‘qualitative approach’ which links mastery with word use that is consistent with standard performance at least 75% of the time. Children of young ages are able to appreciate and grasp antonymy based relations quite naturally (Kagan, 1984). Murphy (2003) has shown the contrastive use of antonyms by children (between ages 2 and 5) in their utterances, with higher rates and more types of antonyms being used, than the adults whom they were conversing with. This lead to the adults (mostly parents) parroting the child’s antonym use.

**Multiple relations (Synonymy).** Synonymy or word similarities are considered as a type of paradigmatic relationship wherein there is sameness of meaning. They are lexical items having identical senses abiding to the central semantic traits. Persson (1990) suggests that the existence of ‘true synonyms’ that have completely identical meanings are very rare, and that there is always some kind of differentiation between the two. Therefore, Cruse (1986) states that it is not easy to characterize synonyms, and hence suggest that synonyms not only manifests a high degree of semantic overlap (large and huge) but they also exhibit a low degree of implicit contrastiveness (Doberman and Alsation). According to Soifer (2005), having synonymous knowledge is a crucial semantic ability that plays a main role in understanding written meaning. Hence synonyms can be considered as a measure of reading comprehension and semantics.

Synonyms can be looked upon in terms of sameness and meaning. Harris (1973) suggests four kinds of ‘sameness’. **Type-I sameness** – The word ‘same’ used in linking various instances of occurrence of one constant thing. For example, though the position of a table has been altered, the table will still be considered as ‘the same table’. **Type-II sameness** – The occurrence of a non-
constant thing at two or more instances. For example, ‘the same question’ or ‘the same song’.

**Type-III sameness** – The occurrence of two or more simultaneous copies of one thing which is recognized as the same. For example, ‘the same book’.

**Type-IV sameness** – The occurrence of at least two constant things that appear same. For example, “She has ‘the same eyes’ as her father”.

Whereas according to Leech (1981) the ‘meaning’ can be broken down into seven aspects.

- The **conceptual meaning**, which is regarded as ‘cognitive’ or ‘denotative’ meaning, is considered to be the key factor in linguistic communication and a simple meaning of the word.
- The **connotative meaning**, in contrast to conceptual meaning is more superficial in nature, varying according to the historical period, experience and culture of the individual.
- The **reflected meaning**, is conveyed when one sense of a word forms a response to another sense, which can also be considered as a multiple conceptual meaning.
- The **affective meaning**, reflects the speaker’s attitudes and personal feelings.
- The **social meaning** indicates an expression which conveys about the social contexts of its use; wherein a reader is able to comprehend the social meaning of a text through his or her recognition of various levels of style and dimensions within the same language.
- The **thematic meaning** is the organization of a message by a speaker or a writer which determines the meaning of the sentence.
- And finally the **collocative meaning** is the acquired meaning of a word from the associations with other words that occur in the context.

Because of the various types of meanings that can get conveyed, Leech (1981) states that there are hardly any pair of lexical items that satisfy both the conceptual and the same stylistic meaning, indicating that true synonyms do not exist. It is therefore essential to limit the term synonymy’ to any one of the meanings that are mentioned. As the cognitive (conceptual) meaning is defined as the key centre of understanding, this type of meaning is used as a criterion to select a synonym. Palmer (1986) groups cognitive synonyms into five possible divisions – synonyms that belong to different dialects of the language (e.g., *dude* in American English and a male person in other countries), words that are used in different styles (e.g., *a dirty smell* and *a*
horrible stench), words that differ only in their evaluative or emotive meaning (e.g., freedom and independence), words that are collocationally restricted, and words that overlap in meaning or near in meaning (e.g., for job possible synonyms are business, trade, work, occupation and career).

Cruse (1986) states that synonyms exist as a matter of degree, indicating that certain pairs of synonyms are more synonymous than the others. This leads to the possibility to a scale of synonymity of certain kind (Lyons, 1995). According to Lyons, there exist three scales of synonymity – ‘absolute synonymy’, ‘partial synonymy’ and ‘near synonymy’. Absolute synonyms are lexical items that are independent of dialect, having the same meaning and not differing collocationally. Hence, these synonyms are also considered as the zero point in the scale. Lyons (1995) suggests three conditions which are to be satisfied to qualify a pair or more of lexical items as absolute synonyms; i.e., the lexical items must be synonymous at any given context, the words must have similar semantic meaning, and their meanings must be identical. Partial synonymy on the other hand are those lexical items which fail to meet the conditions of absolute synonyms but can be identified as an alternative meaning. And finally near synonymy being lexical items that are similar however not as close as the partial synonymy. Marinellie and Johnson (2003) did a study on children between grades 6 and 10 and college students, and examined the development of adjectival definitions. The authors found that the participants’ ability to provide synonyms and use abstract and specific information increased with age. An additional finding was that the older participants used synonyms to define low-frequency words, while the younger participants used synonyms to define high frequency words.

Polysemous words/Homonyms (Homographs and Homophones). Polysemous terms are words that have multiple meanings (Durkin, Crowther, Shire, Riem, & Nash, 1985). These words often have a primary meaning that is spatial and a secondary meaning that is abstract but semantically associated to the primary meaning (Durkin, Crowther, & Shire, 1986). Such secondary meanings of polysemous words is often important for the understanding of mathematical and musical concepts which are presented in school (Durkin et al., 1985). For example, the spatial sense of ‘up’ can be denoted by the sentence ‘The girl ran up stairs’; the mathematical sense being, ‘The teacher counted up by tens’; and the musical sense being, ‘The singer went up a note’. Durkin et al. (1985) indicates that the primary meanings of such
Polysemous words are mostly understood by preschool children; however, the secondary meanings are acquired much later in school. These secondary meanings are a source of confusion to school-age children when used in reference to comparison, pitch, and quantitative relationships. This difficulty in the understanding of secondary meanings of polysemous terms may continue well into adolescence (Durkin et al., 1986).

Researchers have studied the difficulty exhibited by students in the understanding of polysemous terms. In the study done by Mason, Kniseley, and Kendall (1979), children were examined for their comprehension of 20 polysemous terms that were taken from upper-elementary grade textbooks. Students of grade 3 and 4 were assessed for their comprehension of the primary and secondary meanings of the words. This comprehension was also examined in relation to their reading ability, indicating an overall mean accuracy of 49% and 63% obtained by the students of grade 3 and 4 respectively. It was also found that the higher proficient readers in both grade levels outperformed the lower proficient readers on the task. In addition, the combined accuracy scores of both the grades for the primary meanings of the words were 69% when compared to combined accuracy score of 43% for the secondary meanings. This indicated that the third and fourth graders had difficulty understanding the meanings of the secondary sense of polysemous terms.

Double-function terms such as ‘bark’, ‘miss’ and ‘flat’ are a special type of polysemy which have both psychological and a physical meaning. Billow (1977) considers these words to be metaphoric in nature, wherein the physical meaning refers to a literal sense and the psychological meaning a nonliteral sense. Complete understanding of double function terms requires the person to be able to identify and explain how the psychological and physical meanings are related. Compared to the other types of polysemous words, the double function terms are acquired steadily throughout the school years. Asch and Nerlove (1960) examined the understanding of double function terms in 50 children (aged 3 to 12 years), wherein the younger children (3 and 4 year olds) were displayed objects that represented the double function terms. Hence they concluded that the psychological meanings of the double function terms are grasped years after the understanding of its physical counterpart. Schecter and Broughton (1991) replicated Asch and Nerlove’s study extending the age range of the subjects to early adolescence. The results were in agreement with the study done by Asch and Nerlove (1960). Double function
terms that do not occur commonly may remain difficult to explain throughout adolescence and also adulthood.

**Word finding.** Skill in word definition is crucial as it is associated with measures of verbal ability, intellectual performance, and academic achievement in school-age children and adolescents (Wechsler, 1991). In order to comprehend word definitions, it may require an understanding of words and knowledge which is a combination of linguistic, metalinguistic and cognitive competencies. These word definitions are evident in educational contexts during classroom discussions with the instructors (Snow, Cancini, Gonzalez, & Shriberg, 1989), and also when reading textbooks and referring dictionaries to learn the meanings of unaware words. One of the common types of definition formats used in schools is the Aristotelian style, which takes the form “A is a B that C”, wherein A is the defined term, B is its superordinate category term, and C is one or more characteristics of the word (Nippold, 1998b) (e.g., an orange is a fruit which is juicy). This Aristotelian definition is considered as a chief communication tool which provides a maximally informative explanation of a word in a brief and resourceful manner. Marinellie and Johnson (2003) reported that the children’s definition of nouns has been given more priority than verbs and adjectives, as nouns tend to predominate in children’s early lexicons. Studies have found that the noun definitions develop from concrete and functional oriented to more conceptual and abstract (Storck & Looft, 1973). Such definitional skill advances slowly, with improvements in both form and content throughout childhood and adolescence (Nippold et al., 1999). According to Watson (1985) a word definition involves an individual explicitly labeling a lexicon of what is known implicitly. Noun definitions consist of superordinate or categorical terms. Hence the development of noun definitions is characterized by the improvement in the superordinate terms (content) and the syntactic form.

The development of word finding occurs due to the change in storage and retrieval. The storage improves with the expansion of knowledge, which continues throughout childhood, adolescence, and adulthood. While new words are acquired, the old words take on different meanings. As school-age children and adolescents develop, they retrieve a larger number and range of words more effectively. Examination of such word finding abilities can be conducted using ‘convergent’ and ‘divergent’ tasks. Convergent tasks require a more focused search of the lexicon to produce an exact response (e.g., “What is the name of something which is used to put
letters in and is mailed?”). Whereas divergent tasks require a wide-ranging lexical search, with more flexibility in the expected response (e.g., “Tell me all the states of our country”).

**Convergent naming.** Studies done pertaining to convergent naming include assessing the naming speed (Cirrin, 1983) in children and adolescents. Various methods were used to assess this aspect, concluding that the naming speed and accuracy increases with age (Wiegel-Crump & Dennis, 1986). A parallel increase in the reading performance (Kail & Hal, 1994; Wolf & Segal, 1992) was also observed. The facilitation of word recall in a convergent context is attributed to the categorical organization of information in individuals (Kail, 1984). Studies have shown older children being able to recall a larger number of words when compared to their younger counterparts (Paris, 1978).

**Word relations.** The development of semantics also includes the study of word acquisition and the links between the words that are used for communication. According to Gleason (2005), the semantic knowledge includes all information about a word, its relations to other words and its possible meanings. The development of word meanings is based on the semantic categories and how these categories incorporate new occurrences of the same word and their relation to other words. This semantic meaning or knowledge is a social concept that is shared by the common language speakers and not existing within only a single individual. Lexical semantics explains the existence of semantics at word level which focuses on the meaning which is derived from words and their morphemes.

Word association tasks, initially developed in the 1970’s, focused on the process of associations. The words included in the set are not only categorized on the basis of their meaning but also on their co-occurrence, which consists of a complex association between the lexical items. The studies done on word association which is an important aspect of lexical knowledge helps establish a socio-cultural perspective, L2 proficiency and mental lexicon; and also the assessment of quality and depth of word knowledge and productive vocabulary skills. Such word association tests have been used to examine how individuals attain, shape and process lexical knowledge.

**Semantic Impairment in Adolescents**

Adolescents having persistent language impairment are found to have a delay in
their acquisition of age appropriate vocabulary (Stothard et al., 1998). Learning new vocabulary depends on forming associations with an established lexicon and prior knowledge, thereby enabling stronger lexical networks (Beck & McKeown, 2007; Nash & Donaldson, 2005). Children with Word Finding Difficulties (WFDs) have been studied (Faust, Dimitrovsky, & Davidi, 1997) on the basis of the lemma and lexeme structure (German, 2000, 2002). A survey based study conducted in the United Kingdom reported 23% of language-impaired children have WFD (Dockrell, Messer, George, & Wilson, 1998). These children may have more difficulty to produce the words which were easily identifiable in comprehension assessments compared to their chronological age matched group (Dapretto & Bjork, 2000). They also exhibit significant delays in the recognition speed of category members, indicating weak links between the words at different levels of the noun hierarchy. Children with known deficits in word retrieval had poor semantic knowledge, indicating a link that exists between the richness of semantic representation and word retrieval. Individuals having linguistic deficits who encounter word finding problems, show errors which are evident by the use of indefinite pronouns, empty fillers and lexical substitutions during spoken communication (Dennis, 1992; German, 1992; Wolf & Segal, 1992). These deficits may result from inadequate word learning, word leaning without following use of it, irregular word use, or from deficient stimulus cues (Bjork & Bjork, 1992). McGregor and Waxman (1998) studied the naming errors using a contrastive naming task in children without and with WFDs, and the results indicated that the children with WFDs may not have stored enough information to differentiate between the semantic neighbors. Analyzing the patterns of errors as well as the speed of retrieval, these two levels of semantic and phonological representations have found to act as blockades for effective lexical retrieval. Hence children with WFDs use alternative behaviours that compensates for these difficulties (Messer & Dockrell, 2006).

Semantic errors are the most frequently occurring naming errors (Rubin & Liberman, 1983). In fact these errors have been noted to exist in both children with WFDs and chronological age matched control participants (McGregor, 1997). However the WFD group exhibited more errors than the other group, suggesting poor semantic representations. Since the language system of the children with WFDs is less developed than the control group, the error production may be higher. In addition children with under-developed language may produce more errors than the older children, indicating that the language level can act as a predictor of semantic errors.
Another issue lies in the failure to access the target phonological representation (lexeme level) and instead activating a semantically (lemma level) related phonological representation (McGregor, 1994) thereby originating problems encountered by children with WFDs. In a single case study, Constable, Stackhouse, and Wells (1997) found naming errors of a child with severe WFD and reading delay, which was attributed to the inaccurate phonological representations of certain words, and not because of any semantic, motor, or other deficits. In the studies done by German (2002) and McGregor (1994), phonological intervention have been found to reduce both semantic and phonological errors. Further research done by Newman and German (2002) and German and Newman (2004) indicate that the neighborhood frequency and neighborhood density influences the responses generated by children. There are also other indications that suggest that though the children were able to access the lemma level, they found the lexeme level inaccessible, which might have occurred due to the poor phonological representation. German and Newman (2004) however suggest that the complete access to the phonological form of the target word was not possible because of the organization of the phonological features in the lexicon.

In a study done by Dockrell, Messer, George, and Ralli (2003), though the children with WFDs produced definitions that were similar to that of the control group, the WFD group provided significantly less correct definitions than the chronological age group. The role of semantic and phonological representations was assessed using a serial free recall, wherein the children with WFD had to name as many items as possible that corresponded to a target. The results revealed that poor performance by the WFD group could be attributed to the less sophisticated connection networks between the semantic elements in the lexicon when compared to the other children. According to Curtis and Longo (1999), one out of every two teenagers may have vocabulary problems which can cause comprehension deficits. Research on this domain was done on children who were termed as poor comprehenders. This group of children though having normal phonological skills performed poorly on reading comprehension (Nation & Snowling, 1998), lexical decision tasks with priming (Nation & Snowling, 1999), contextual facilitation in reading (Nation & Snowling, 1998), and on picture naming (Nation, Marshall, & Snowling, 2001). The characteristics of children with WFDs resembled the group of poor comprehenders as suggested by Messer, Dockrell, and Murphy (2004). Another study have
found children with WFDs to produce fewer errors when verbs were related or similar to the target (Dockrell, Messer, & George, 2001).

It was found that the children with WFDs exhibited slower naming compared to their control groups which affect their learning and performance (Dockrell et al., 2001). A study done by German (1985), found that the 7 – 11 year old children having performed normal in intelligence measures and receptive language but exhibiting below grade level performance, exhibited WFDs compared with the typically developing children of the same cognitive ability and age. Similarly Wiig and Semel (1975) after comparing low achieving adolescents and typically developing adolescents, found a range of word retrieval problems in the former group. Word retrieval difficulties are also considered as indicators of reading problems and poor performance in school (Wolf & Segal, 1992). Several studies have revealed WFDs ranging from mild to severe, which commonly occurs in children and adolescents who are identified with learning disability, language disorders, aphasic and dyslexia (Murphy, Pollatsek, & Well, 1988). However there is also evidence to state that the children with WFD perform no differently from typically developing children. McGregor and Windsor (1996) examined the effects of semantic priming on WFDs and chronological age groups and found that the both groups performed with accuracy with the presentation of primes. In another study done by McGregor and Waxman (1998), which aimed to study the hierarchical nature of the semantic representations, the authors were unable to find children with WFDs to have an impaired semantic system compared to the chronological age control participants.

Studies done on examining the lexical access in children with Specific Language Impairment (SLI) compared to that of age-matched peers revealed slower discrete naming, containing more errors (Wiig, Semel, & Nystrom, 1982), also with naming difficulties (McGregor & Appel, 2002). The difficulties in spoken communication does persist into adolescence for young individuals with SLI (Botting, Faragher, Simkin, Knox, & Conti-Ramsden, 2001). The older students continue experiencing difficulties with accurate use of verb morphology (Clahsen, Bartke, & Göllner, 1997), syntactic structures (Norbury, Bishop, & Briscoe, 2001) and reduced vocabulary levels (Johnson et al., 1999). Studies done by Kail, Hale, Leonard, and Nippold (1984) and Kail and Leonard (1986) put forth that the children with language difficulties have a less developed language system than chronological age controls,
indicating a restricted semantic input which indirectly affects the word retrieval, which was further supported by McGregor, Friedman, Reilly, and Newman (2002). According to Bishop (1997), the late onset of vocabulary acquisition is the first sign of SLI, also indicating a deficit in the extent of their lexicons when compared with their age-matched peers on measures of receptive and expressive vocabulary (Alt, Plante, & Creusere, 2004; Alt & Plante, 2006). Another explanation for the WFDs of children with SLI was proposed by Kail (1994) who suggested that the reduced processing speed in the children is responsible for the slow naming. This particular hypothesis was further supported by other researchers (Montgomery, 2002).

It was also found that the children with SLI had distinct naming speeds when compared with language age and chronological age matched controls (Leonard et al., 1983). This suggested that the children with SLI having an under-developed language system than the chronological age controls did have faster reaction times than the younger language age controls. This was attributed to the overall decrease in the latency to respond with age. According to Dockrell, Lindsay, and Connelly (2009) students with SLI continue to experience problems with spoken language and literacy. Other studies have also documented deficits in the semantic domain of children with SLI (Brackenberry & Pye, 2005; Sheng & McGregor, 2010). Earlier Brook and Bowler (1992) suggested SLI to have a further subtype known as Pragmatic Language Impairment, where language disordered children exhibited semantic and pragmatic problems of word finding difficulties and uncommon word choice.

Children having literacy difficulties when compared to the typically developing children, were found to perform slower in serial naming tasks, though their receptive-vocabulary matches or reading-age matches were used (Wolf, 1999). According to Wolf and Bowers (1999) these naming deficits exhibited by the children with dyslexia are central to a double-deficit hypothesis, which suggested that dyslexia can either be a result of a deficit involving phonological processing or the problems with the speed of processing information, which in turn affects reading comprehension and serial naming tasks without any impairment in phonological processing or decoding abilities. Children who experience both the sets of problems during development are considered to have a double-deficit. However children can still have a deficit in any one of the two areas. Davidson and Strucker (2002) did a study on low-literacy adults and found the receptive vocabularies to be below the 10th percentile, while the expressive vocabularies (knowledge of word meanings) were found to be below the 7th grade-level.
Analogical Reasoning

The basic human ability to reason by analogy is considered to be a hallmark of human intelligence (Holyoak, Junn, & Billman, 1984) and an important component of human knowledge (Goswami, 1992) and language. Analogy is a higher-order thinking skill allowing effective performance on fresh problems, the skill in transference of knowledge or information to different situations, and learning by taking in a range of information from various contexts (Richland, Morrison, & Holyoak, 2006). Analogical reasoning which is central to creative thinking, involves particular processes which may include the ability to gather knowledge or information pertinent to a domain, and to hold several relations in mind across different domains (Gentner & Smith, 2013; Richland et al., 2006). It also requires the manipulation, maintenance and inhibition of mental representations in order to identify and draw inferences regarding higher-order similarity relationships which is essential for cognitive development and learning (Bunge, Wendelken, Badre, & Wagner, 2005; Bunge, Wendelken, & Helskog, 2009; Cho et al., 2010; Cho, Holyoak, & Cannon, 2007; Christie & Gentner, 2014; Goswami, 2001; Green, Fugelsang, Kraemer, Shamosh, & Dunbar, 2006; Krawczyk et al., 2008; Morrison & Cho, 2008; Morrison, 2005; Morrison et al., 2004; Waltz, Lau, Grewal, & Holyoak, 2000). Analogies permit one to understand and create inferences about new information and situations with the things already understood and known (Dunbar & Blanchette, 2001).

Analogies are formed by seeing one thing as if it were a different thing, while perceiving relational or structural similarities of variable degrees between two given domains – source/base and target (Dunbar & Blanchette, 2001). The target is the matter or problem that one desires to describe, and the source is the familiar piece of information that is used to comprehend the matter. Bartha (2010) suggests that the understanding of the source can lead to a hypothesis about the target. This indicates that one makes a mental leap between both the domains. While one inspects for likeness between the target and source, knowledge or information can be transposed from the familiar situation applying it to the new one. The target and source can exhibit readily apparent similarities in superficial features. These similarities may exist in the form of different dimensions: the content, which may comprise of the semantic domain; the surface elements and the context; and the deep structure or schema though different in the superficial features. Though problems may share similarities at any of the dimensions, an
appropriate answer usually does depend on the arrangement of their deep structure. According to Eva, Neville, and Norman (1998), the main challenge to import knowledge from one situation to another does require strategies to recognize and realize the core of the problem, though there may be differences in its surface elements, content and/or context. However Kostic, Cleary, Severin, and Miller (2010) revealed that the target analogy could also be derived without recalling the source analogy. Importing such knowledge for analogical reasoning is aided by individual’s long term memory (Wharton, Holyoak, Downing, & Lange, 1994; Wharton, Holyoak, & Lange, 1996) which plays a key role in cognitive linguistic processing.

Analogical reasoning which is crucial for executive functioning and working memory, requires the manipulation, maintenance and inhibition (selective activation) of mental representations inorder to detect, map and draw inferences about similarity based higher order relations. Such restricted executive functioning skills have shown to have reduced the performance in tasks pertaining to analogical reasoning, which demands the integration of multiple relations as well as inhibiting distractors that are featural than relational. Analogies can be created on the basis of many interrelated tasks – retrieval, mapping, and transfer. Initially when exposed to the target domain, the identification of the source domain is essential which can be related to the target. Retrieval methods are applied inorder to search the memory for items which seem like candidates for an analogy (Hsu & Wedman, 1994). At certain instances the source domain is explicitly given, which may or may not require special means of retrieval. During the mapping phase, the analogical relation between the two domains needs to be established from many possible mappings (Chen, 1996; Wedman, Wedman, & Folger, 1996). The appropriate mapping depends on the goal of the analogy and the context it exists in. During the process of mapping the major task is to identify the parts of the domains that are relevant within the context of the analogy which helps enter into the analogical relation; and also when the two domains have differentially structured representations. The transfer phase directs the translation of information between the two domains by analogical reasoning. This phase is a crucial aspect of learning, enabling the children to apply what they have learnt in school to other situations (Goldstone & Day, 2012). Generally there is a transfer of knowledge from the source to the target domain which helps introduce new structures or concepts, provide new
explanations, or answer given problems (Wedman et al., 1996). In certain cases there is also the evaluation of the transferred knowledge depending on the process of analogy making.

Use of analogies have also been linked to effective decision making skills which has been explored from different perspectives, including political reasoning (May, 1973), legal decision-making (Holyoak & Simon, 1999), social judgement (Andersen & Chen, 2002; Mussweiler & Epstude, 2009), persuasion and argumentation (Diamond, 1995) and consumer behavior (Gregan-Paxton, 2001). Before making a choice, the decision maker recognizes the current condition as similar to some earlier experience, thereby drawing inferences from his/her previous choices (Markman & Medin, 2002). According to Souza, Fifho, and Pena (2001) analogies have been used for better recall of medical concepts (and images), allowing the learners to appreciate the real situation better. They have also been used in explaining medical situations to the patient (Arroliga, Newman, Longworth, & Stoller, 2002; Bedell, Graboys, Bedell, & Lown, 2004; Caroci & Lareau, 2004; Frieden & Dolev, 2005; Gibbs & Franks, 2002; Kirklin, 2007; Penson, Schapira, Daniels, Chabner, & Lynch, 2004; Periyakoil, 2008; Reisfield & Wilson, 2004; Skelton, Wearn, & Hobbs, 2002). Analogies act as a facilitator between a diagnostic category and a radiological, pathological or clinical finding (Pena & Andrade-Filho, 2006). In addition to the medical domain, researchers have found the use of analogies in subjects like geoscience (Jee et al., 2010), biology and physics, and also applying their analogical skills to learn and teach procedures (Richland, Holyoak, & Stigler, 2004), to transfer representations across contexts (Novick, 1988; Reed, Dempster, & Ettinger, 1985), abstract concepts (Gentner, Holyoak, & Kokinov, 2001) and fresh mathematics (Bassok, 2001).

The comparison between the elements (target and source) of an analogical problem play an important role in children’s acquisition of word meaning (Childers, 2008; Gentner & Namy, 2004). Researchers have found that children were more inclined to extend a new word on the basis of conceptual and not perceptual commonalities. The comparison between the exemplars is particularly effective in conveying the relational information that is necessary for verb learning and other relational devices (Childers & Paik, 2009; Gentner & Namy, 2004; Haryu, Okada, & Imai, 2011; Pruden, Hirsh-Pasek, Shallcross, & Golinkoff, 2008). Teachers can also use instructional analogies to clarify differences and similarities among procedures, concepts and problems, and also among correct strategies and misconceptions (English, 2004; Gentner,
Loewenstein, & Thompson, 2003). Such clarification of the differences and similarities have been used for reading (Kolodner, 1997) in English, and to assist in the explanation of complex words (Simons, 1984). The learner is expected to map differences and similarities along with the resolution of original or obvious contradictions, between formerly existing information and the information to be learned. Hence, such tasks can be used to bridge the gap between what the learner has to learn and what he already knows. A. Brown, (1990) believed that analogical skills are core to children’s reasoning and is crucial to educational advancement. Vygotsky (1978) conveyed that analogies can be understood as components that can be used by the tutor, inorder to help the learner to manage a new task with some kind of support. Whereas, Wood, Bruner, and Ross (1976) suggested that the leaner must recognize the solution of a problem before he himself is able to produce the steps which may lead to it without any aid. The importance of using analogies have also been emphasized for phonological awareness, which contributes towards early reading abilities (Kamhi & Laing, 2000). Walton, Walton, and Felton (2001) compared the effects of teaching beginning readers to read by using the strategy of “rhyme analogy” with the effects of teaching beginners to read by using letter-sound recoding strategy, suggesting that even early readers can use analogies if they have good phonological skills. Competency in using such analogies are considered as a basic mechanism for learning in classroom (Csapo, 1997; Goswami, 1992).

The analogies used in psychometric testing are used to measure the basic aspect of analogical reasoning, which is the skill to reason on the basis of relational likeness. Traditional analogy depiction are of four different types – pattern based analogy (use of proportions or shapes for each item), verbal analogy (the use of words for each item), numerical analogy (use of formula or numbers for each item), and pictorial analogy (use of pictures for each item). Among the ones described, the pictorial and verbal analogies are most commonly encountered in literature and research. Schmid, Gust, Kuhnberger, and Burghardt (2003) opine that analogies can also exist as proportional, predictive and analogical problem solving. Proportional analogies exist in the general form (A: B :: C : Y). These analogies can either be within a domain (A, B, C being expressions from the same domain), or across domains (A and B are related in the source domain, whose concept should be applied to C of the target domain to get the result Y also in the target domain). Predictive analogies describes the target domain by specifying structural
commonalities with the source domain along with the transfer of explanations and information to
the target from the source (Hummel & Holyoak, 1997). Correlation between complex concepts
between different domains, as well as the classical domain of metaphoric expressions can be
considered as an adequate example for such analogies. This type of analogy mainly relates to
domains that can be linked from a deeper concept than its physical features. Analogical problem
solving can be used to transfer a solution to an unknown domain from a well-known domain.
According to Masterson, Evans, and Aloia (1993) the performance in analogical reasoning tasks
does require knowledge of the vocabulary items included in it as well as the ability to
comprehend the relationships between the two pairs of terms.

One of the most common methods to assess such reasoning abilities in school-age
children and adolescents has been the Aristotelian way as described above, with the presentation
of incomplete analogies of the form “X is to Y as A is to …?” (X : Y :: A : B), where the student
is required to generate the appropriate B item or choose it from many alternatives. These
symbols X, Y, A and B are filled by words (e.g., eyes : see :: ears : ? touch, hear, smell, taste) or
it can also be visually depicted objects which are to be named. Analogies can be of both open
and forced choice formats, and can also be divided into quasi or non quasi analogies. Quasi
analogies which is considered to be easier are represented as ‘A Train is driven by a driver, but
an Aeroplane is flown by a ….’; whereas non quasi analogies are represented as ‘Train is to
driver as Aeroplane is to ….’. Analogies consisting of forced choice (multiple choice) formats
can be made more demanding by decreasing or increasing the similarity between the alternatives
available. Analogies could also be constructed and viewed based on its concreteness and
abstractness.

**Theories of Analogical Reasoning**

Three theories have been suggested to describe the development of analogical reasoning -
the relational primacy, relational shift and the relational complexity hypotheses. The relational
primacy hypothesis as proposed by Goswami (1992) speculated that infants are capable of
analogical reasoning, provided they are familiar with the appropriate relations that are being
used. This theory states that, the poor performance of children on analogy based problems are
due to their lack of domain knowledge for the relations used, and not due to their incompetence
to reason analogically (Goswami, 1992). Hence according to the author, if the children are familiar with the necessary relations, then their performance in analogical based problems are successful (Goswami, 2001). Goswami (1992) indicates that this development in analogical performance may be due to a growth in children’s domain knowledge. Goswami, Leevers, Pressley, and Wheelwright (1998) also supported the relational primacy hypothesis by suggesting that when 3-4 year old children were familiar with the relational knowledge they could proficiently perform analogy based problems. However, Goswami et al. (1998) noted that once the relational complexity was increased, the performance of the 3 year olds did negatively get affected, proposing that domain knowledge cannot completely describe the changes in children’s analogical reasoning abilities. Other studies have confirmed that when children possess adequate domain knowledge, they are also adept in succeeding on tasks of analogical reasoning (Singer-Freeman & Goswami, 2001).

The relational shift hypothesis (Gentner, 1988) postulated that before children attain relational reasoning they will be biased towards the similarity existing between objects during processing of analogical problems. Before a shift towards the more correct form of relational reasoning, children will initially be more prone to pick choices with similar features (Gentner & Rattermann, 1991). The shift according to Gentner is predominantly centered on perceptual to relational properties, which comprises the relational shift in children’s analogical reasoning, and depends upon the increase in knowledge of domains that are relevant to the analogy task that is being performed (Rattermann & Gentner, 1998). Another explanation of this shift given from feature to relational level is due to the strong development of executive functions during the school-age period (Goswami, 2011). Research done on scene based analogies have found that older children are more likely to choose feature based answers (as opposed to relational ones) than younger children (Richland et al., 2006; Richland, Morrison, & Holyoak, 2004; Richland, Chan, Morrison, & Au, 2010), indicating that relational similarities are most crucial for analogical reasoning (Krawczyk, McClelland, Donovan, Tillman, & Maguire, 2010; Krawczyk, Hanten, et al., 2010; Morrison et al., 2004; Richland et al., 2010, 2006; Thibaut, French, & Veznèva, 2010). In the study done by Thibaut et al. (2010), the performance of 6, 8, and 14 year-olds on an analogy making task was targeted and the results did reveal a pattern in the children’s performance based on the nature of the distractors. Additionally, while measuring the reaction times instead of the accuracy of the responses, it was noted that the 6 year olds seemed to select
the first match they noticed; whereas the reaction times of the 8 year olds were significantly influenced by the perceptual distractors. The 14 year olds were less influenced by any featural distractors compared to their younger peers. Peer-led small group (fourth-grade) discussions have also found to influence the development of analogical reasoning in children (Lin et al., 2012). The authors found that the increasing use of novel analogies led to a spread in using analogies among children. There was an evidence of triggering of relational analogies in the process, thereby showing a trend of relational shift. In an exploratory study done by (Booij, 2013) on 60 children between the age of 8 to 11 years (third and fifth grade), the results conveyed that though the fifth grade children did not exhibit higher analogical reasoning performance, the number of perceived relational similarities was significantly higher in the fifth grade than the third grade.

Another explanation for children’s development of analogical reasoning is based on the working memory capacity (Halford, 1993). Children are unable to represent complex relations due to limitations in working memory to carry out relational matches in the presence of compelling elements. Researchers argue that young children can process only definite levels of complex relations parallely which can exist in two forms – binary and ternary relations. In the binary relation, the relationship is between two arguments, both of which are bound to vary as per the problem; whereas for the ternary relation, the relationship is between three arguments, all of which are bound to vary similar to the binary relation. A person who reasons would have to hold both arguments and the appropriate relation in mind inorder to reason on the basis of this relationship. Halford (1993) thus claimed that children (>2 years of age) initially may process binary relations, and subsequently ternary relations (> 5 years of age). Therefore children will have difficulty solving analogy problems with complex relations, if it occurs above their existing level of working memory capacity. Other work has also supported Halford’s (1993) claim that working-memory function influences the analogy resolution (Morrison, Holyoak, & Truong, 2001; Morrison, 2005; Waltz et al., 2000). This indicates that with increased capacity to handle complex relations, the capability of analogical reasoning also increases. Vendetti, Wu, Rowshanshad, Knowlton, and Holyoak (2014) investigated the influence of analogical mapping on subsequent recognition memory for features of the source analog using proportional analogies (A: B :: X : Y). Different dimensions of the source analog were identified which were relevant for the target (X : Y). A randomly selected dimension was specified inorder to complete the
target analog, after which memory for the source analog was assessed using a recognition test. The results revealed that the participant’s recognition memory was being influenced when there was a feature change.

An alternate form of relational complexity is the role of inhibitory control (Richland et al., 2006) in analogical reasoning. Studies have put forth the notion that the limits of the working memory capacity and inhibitory control of children determined their ability to process multiple relations concurrently (Andrews & Halford, 2002; Halford, Andrews, Dalton, Boag, & Zielinski, 2002; Krawczyk et al., 2008; Kubose, Holyoak, & Hummel, 2002; Morrison, 2005; Morrison et al., 2004; Morrison et al., 2001; Viskontas, Morrison, Holyoak, Hummel, & Knowlton, 2004; Waltz et al., 2000), which are known to steadily increase in childhood (Diamond, Kirkham, & Amso, 2002; Diamond, 2002). Morrison et al. (2004) suggested that the working-memory load exploits the inhibitory resources in working memory essential to suppress responses that are based on the prominent features of objects during the processing of relations as well as object matching. Changes in the inhibitory levels in the working memory system does explain the development in children’s ability to cope with the increase in relational complexity (Morrison, Doumas, & Richland, 2011). Decline in attention and inhibitory functions in older adults have also known to influence their reasoning performance (Viskontas et al., 2004).

Assessment and Development of Analogical Reasoning in Adolescents

Reasoning skills that are vital for cognitive and linguistic processing are portrayed throughout the life span, beginning during the infancy period (Baillargeon & Hanko-Summers, 1990) and persisting well into the old age (Clark, Gardner, Brown, & Howell, 1990). Analogical reasoning being an important cognitive construct has shown steady improvement throughout the elementary, middle and high school years, and is also dependent on the intellectual capacity and academic achievement (Kaufman & Kaufman, 1983; Sternberg & Downing, 1982; Sternberg, 1982) exhibiting greater use of systematic problem-solving abilities (Nippold, 1994). Researchers have suggested that analogy is the primary means by which cognition advances (Brown, 1990), and the growth in solving such analogies also does depend on increased accuracy and speed, improvements in the ability to solve analogies that involve greater structural and semantic complexity, and greater use of systematic strategies (Goldman, Pellegrino, Parseghian,
In order to study the age-related advances in analogical reasoning and its relationship with academic achievement and cognitive level, (Achenbach, 1970) developed the Children's Associative Responding Test, which is a measure intended to distinguish children who solve analogies through analogical reasoning from those who use word association skills. This test consisted of a written multiple choice task which included analogies in the form X: Y :: A: __?, along with five single-word answer choices. The author found an age-related growth in analogical reasoning. Similar results (Achenbach, 1969) were also found when considering the association between the associative and non-associative responders using the Matching Familiar Figures Test (Kagan, Rosman, Day, Albert, & Phillips, 1964). Studies have also shown that the associative response strategy reduces through the school-age years and that by early adolescence, if not before, analogies of the form X: Y :: A : B are solved through suitable reasoning processes (Goldman et al., 1982). Another related study was done by Armour-Thomas and Allen (1990), who studied 54 ninth-grade students (aged 14 and 15 years), on three sets of problems; wherein the high achievers outperformed (84%) the low achievers (63%) on all the three sets of problems.

When considering solving analogical problems from a cognitive perspective, Inhelder and Piaget (1958) had concluded that children are unsuccessful in reasoning based skills using analogies making it a late developing skill which was accessible only when reaching the stage of formal operations at 11 – 12 years. They found that before this stage, the child was noted to lack the cognitive ability to represent the required relations to accomplish classical problems based on analogies. Piaget, Montangero, and Billeter (1977) studied the relationship between chronological age and cognitive level to verbal analogical reasoning in children between 5 through 12 years and found that the children passed through three separate stages that corresponded to the cognitive levels in executing this task. This finding supported the notion that children in the preoperational stage (5 and 6 year olds) were able to successfully form the pairs, however were unable to organize the pairs to complete the analogies. This group though occasionally completing an analogy, was unable to explain the reason of its connection, and was also easily persuaded to choose other related alternatives. However, for the children in the
concrete-operational stage (7- through 10-year-olds), the analogies were completed and better explained, though they still accepted the related alternatives (especially the 2 and 8 year olds). Finally, the children in the formal operational stage (11- and 12-year-olds) were able to successfully complete most of the analogies without any trial and errors, with their explanations being superior to those of their younger counterparts. This period considered to be the preadolescence, gives the individual the capability to reason taking a leap forward which may be attributed to improvements in lower skills of meta-cognitive awareness, using relevant knowledge and information processing abilities.

In order to study the role of semantics in the comprehension of analogies, Goldstein (1962) devised a task to identify whether various types of analogical problems would present differences in difficulty. The results indicated that the antonymous, characteristic property, and synonymous analogies were easier to solve than the part-whole and superordinate analogies; and the functional, sequential and causal analogies were the most difficult. A similar semantic based task was done by Sternberg and Nigro (1980) who studied the semantic influence on a verbal analogical reasoning task, representing five semantic types - functional, antonymous, synonymous, superordinate-subordinate, and sequential. The results indicated that the categorical, sequential, and synonymous relationships were more difficult than the antonymous and functional analogies. As the authors found that the synonymous analogies were easier to solve than the functional analogies which were most difficult, it was suggested that it is important to consider various types of analogies.

Analogy based problems are also influenced by raising the vocabulary level of the words it contains. Cashen (1989) devised a task that contained 10 problems for each of three difficulty levels – low, moderate, and high, with difficult analogies containing words that were less common, expressing more understated meanings. The results exhibited a gradual improvement with each successive grade level, from 5 to 11 grades. The performance of the students were differentially challenging with the mean accuracy scores for each group for the sets of high, moderate and low level problems respectively indicating that the oldest students were also challenged by analogy problems that contained less common words. Nippold and Sullivan (1987) found a relation between the receptive vocabulary development with perceptual analogical reasoning and proportional metaphor comprehension. Age related improvements have
been observed with control over the vocabulary used in the analogy problems (Sternberg & Nigro, 1980). Hence this can be attributed to the growth in reasoning apart from word knowledge. Verbal analogical reasoning is considered to be a mental construct with cognition and language converge, with the competence in both areas being essential to solve such problems. According to Crais (1990), world knowledge which is frequently related to word knowledge, likely influences the ability to comprehend verbal analogies.

With regard to the structure of presentation, Levinson and Carpenter (1974) studied analogical reasoning using a generative task, and the results indicated that for the 9-year olds, the true analogies were significantly more difficult than the quasi analogies. The 12 and 15 year olds outperformed the younger students on both types of analogies; and as for the oral explanations of answers, the results were in line with other studies (Goldman et al., 1982), indicating that proportional thinking (analytical reasoning) gradually increased with age. Another similar study to assess the structure of presentation was done by Goldman et al. (1982) who studied 47 children (aged 8 and 10 years old) under two different conditions – a multiple choice task and a generative task. The results revealed that the multiple choice task was easier than the generative task, with the 10 year olds outperforming the 8 year olds on both tasks. The older children in this study exhibited a lesser tendency to respond associatively on the multiple-choice task. It was also noted that few of the 8 year olds did outperform the less skilled 10 year olds. Additionally the less skilled children in both age groups also found it more difficult to defend their correct responses on the multiple-choice task, providing irrelevant explanations compared to the skilled children.

Nippold (1994) studied analogical reasoning abilities using third-order analogies which comprised of simple vocabulary. The students were presented with the analogies of different semantic relationships - categorical, synonymous, sequential, functional, and antonymous in random order. The results revealed that the mean accuracy scores of the group of 10-, 12-, 14-, and 16-year-olds were 59%, 73%, 88%, and 86% respectively, which indicated that the performance gradually improved through age 14. The analogies varied in difficulty according to the semantic relationships they expressed. The sequential relationship was the easiest, followed by synonymous, antonymous, categorical, and then functional relationship. According to the
authors, though a plateau of performance was achieved by 14 years of age, the 16 year olds would have had challenging analogies if it comprised of less common and more abstract words.

**Analogical Reasoning Impairment in Adolescents**

The skill of analogical reasoning includes the combination of cognitive and linguistic resources. Numerous studies have assessed the pattern of reasoning abilities across various age groups, showing the intricacy and complexity behind such tasks. However, when the same cognitive and/or linguistic resources are compromised, it leads to deficits in skills that require the independent participation or the co-ordination between both the resources. A variety of disorders have been studied wherein skills such as the analogical reasoning have been affected. Deficits in phonological word processing restricts the flow of information to higher levels of processing (Ransby & Swanson, 2003). In contrast to the children with verbal learning disabilities, children with nonverbal learning disabilities exhibited deficits in tasks that require higher order academic abilities (Forrest, 2004; McDonough-Ryan et al., 2002). These children also exhibited difficulties in analyzing and assimilating information, along with difficulties in concept formation, performing task specific activities, inhibition, planning and problem solving, cognitive flexibility and working memory (Forrest, 2004). Children with nonverbal learning disabilities did have deficits in organization and tasks that require sequencing (Tanguay, 2001), learning from past experiences and understanding cause and effect relationships (Matte & Bolaski, 1998). Matte and Bolaski (1998) suggest that children’s poor performance in academics could be attributed to deficits in generating ideas, reasoning with elaboration, and abstract thinking. Schiff, Baumberger, and Toledo (2009) conducted a study on 25 typically developing school going children (mean age = 8;7 years) without learning disabilities and 65 children with learning disabilities (verbal learning disabilities and nonverbal learning disabilities) (mean age = 8;9 years). The authors investigated the analogical reasoning (story context) abilities between the groups and found that the children without disabilities exhibited better skills when compared to the disordered group. However, no significant differences were found between the nonverbal learning disabilities and verbal learning disabilities participants.

Children with intellectual disability who have difficulty extracting the abstract relations between pairs of items (Paour, 1992) have deficits in working memory (Numminen, Service, & Ruoppila, 2002) and have incompetent short term memory (Campione & Brown, 1984).
According to Jensen (1970), these individuals with mild and moderate intellectual disability are unable to go beyond reasoning at a concrete level. Such limitations prevent these individuals to solve cognitive problems that are abstract in nature. A study conducted by Feuerstein (1979) on 253 students (aged 8 through 14 years) with normal cognitive development, along with a group of 551 adolescents with mild mental retardation (mean age = 15:3), revealed that in students with normal cognitive development, the accuracy improved with age. And as for the adolescents who are intellectually challenged, a significant difference was attained in their mean scores. Swanson, Christie, and Rubadeau (1993) assessed the relation between analogical reasoning and meta-cognition among typically developing individuals, intellectual disability, learning disability, and gifted children with the same chronological age. The results revealed that the performance of individuals with intellectual disability was inferior to the other groups across analogical reasoning and meta-cognition. Denaes (2012) compared children with intellectual disability and typically developing children using a computerized version of the analogical reasoning task and found that the former group exhibited lower performances in the same.

In a study done by Krawczyk et al. (2010), adolescents with moderate to severe Traumatic Brain Injury (TBI) were compared with typically developing controls on a set of picture based analogy problems. The results indicated the controls performing better than the TBI group. Similar findings were also reported by other studies wherein disruptions in reasoning were evident in adolescents with TBI (Levin & Hanten, 2005) and older adults with dementia (Krawczyk et al., 2008; Morrison et al., 2004). Analogical reasoning skills were also studied in the deaf and hard of hearing children (Edwards, Figueras, Mellanby, & Langdon, 2011). The authors assessed the children’s spatial and verbal analogical reasoning skills, as well as their language skills (syntactic and vocabulary skills) and found significant differences between the two groups on analogy and language based tasks. They also concluded that the language measures were significant predictors of verbal analogical reasoning. Bandurski and Galkowski (2004) did a study on similar grounds inorder to assess children with hearing impairment from two different linguistic environments (children with hearing impairment of hearing parents and children with hearing impairment of deaf parents) and hearing children using three series of analogy tasks (verbal analogy, numerical analogy and figural-geometric analogy). The results conveyed that early and constant sign language communication with deaf children seemed to
have an equivalent role in the development of all the three types of analogies, as that of hearing children who were exposed to constant spoken language communication from their early years. In contrast to the typical findings of studies conducted on disordered children who happened to have deficits in analogical reasoning, Morsanyi and Holyoak (2010) found that children with autism and typically developing children (matched on age, IQ and non-verbal and verbal working memory) performed with equal competence, indicating that the ability to reason in autism was intact.

Nippold, Erskine, and Freed (1988) studied chronological age and sex matched typically developing school-age (mean age = 7;6 years) children with language disorder. The authors examined the functional and verbal proportional reasoning, along with perceptual analogical skills, and found significant differences between the two groups in all the three domains. Hence the authors concluded that children with language disorder failed to benefit from classroom teaching which employed the use of analogies as an instruction tool. According to Masterson et al. (1993), this low score on the analogical reasoning task by the children with language disorder, when compared to the children with normal language children may be because of their limited vocabulary rather than their reasoning abilities. Kamhi, Gentry, Mauer, and Gholson (1990) did a similar study assessing the analogical reasoning skills in young mental age matched school age children with and without language deficits; with the results indicating no difference in the performance of children with language deficits and typically developing children for the analogical reasoning tasks. Hence, developmental increases are noted in verbal analogy performance (Sternberg & Nigro, 1980). This also indicates that any discrepancies between the performance of children with and without language deficits would be more evident at a later age (Masterson et al., 1993). In the study done by Masterson et al. (1993), the authors studied the influence of linguistic and cognitive abilities on verbal analogy completion tasks. Children with language learning disabilities were compared with typically developing children (mental age matched) as well as a language age matched group. The groups were administered five types of analogies – linear order, functional relationship, antonyms, category membership and synonym relationship. The results indicated that the group that was matched for mental age performed better on all types of analogies, than the other two groups. Leroy, Parisse, and Maillart (2012) hypothesized that the hindrance in the development of morpho-syntax in children with specific
language impairment could be attributed to the difficulties of schema abstraction. They also posited that the analogical mechanism is shared by non-linguistic and linguistic processes. In their study, 15 children with specific language impairment were compared with age matched peers on a non-linguistic analogical reasoning task and the results indicated that children with specific language impairment exhibit difficulties in analogical reasoning. Subsequent to this, Leroy, Maillart, and Parisse (2014) did a similar study on 19 children with specific language impairment and their age-matched peers in order to investigate the analogical mapping between linguistic and nonlinguistic modalities. The results demonstrated that the specific language impairment group exhibited poorer performance compared to the typically developing children, indicating that the children with specific language impairment have difficulties in analogical mapping.

**Morphological Derivations**

Morphology being the study of word structure and its elements (morphemes) contributes to the meaning of the word itself. The conscious awareness of the morphemic structure of words, and their ability to manipulate and reflect on that structure can be termed as *morphological awareness* (Carlisle, 1995), *morphological knowledge* or *morphological processing*. Deacon, Parrila, and Kirby (2008) consider morphological processing to include a less conscious or an implicit processing of the morphological information. According to Kuo and Anderson (2006), morphological awareness is a higher-order ability, more than an ability to encode or decode morphemes. It can also be termed as ‘grapho-morphological awareness’, which influences phonological awareness, semantic awareness, and orthographic awareness (Kuo & Anderson, 2006). Cues for pronunciation, meaning, and spelling can be derived from the breaking-down of morphological words which contains smaller morphological units (Carlisle, 2003). For example, the word *enjoyment* comprises of two morphemes, the root ‘enjoy’ and the suffix ‘-ment’, changing the noun into a verb. Morphemes generally consist of two types: bound and unbound (free) morphemes. Suffixes (e.g., –ly, -y) and prefixes (e.g., un-, re-) make bound morphemes incapable of standing alone as words; whereas unbound morphemes are roots that are capable of standing alone as words (e.g., entertain). Inflectional and derivational morphemes are the two types of bound morphemes containing suffixes. The change in the number or tense of a word without changing its part of speech makes up an inflectional morpheme (e.g., ‘-es’, ‘-ed’, ‘-s’);
whereas, the change in a word’s part of speech makes up a derivational morpheme (e.g., ‘–tion’, ‘-ly’). While young children comprehend how inflectional morphemes are attached to words; older children in upper elementary school continue to progress in the comprehension of the relation of derivational morphemes to words (Tyler & Nagy, 1989). In contrast to the inflectional suffixes, the derivational suffixes deliver information pertaining to the syntactic and semantic aspects, in turn conveying a subtle distinction. Derivational suffixes and derivations are found to generally pose the greatest challenge (Gardner, 2007) in academic based learning.

According to Crystal (2002), the English language contains more than 100 affixes have a variety of prefixes and suffixes. When adding particular affixes to root words, the resultant is a new word. Hence morphological analysis is the ability to define the meanings of infrequent morphologically complex words by using one’s knowledge of affixes and root words that form derived words. These words that exist in reading resources pertaining to the school curriculum, occurs with an increasing frequency as children progress through their grade levels, thereby gaining fresh information (Nippold, 2007). Nagy and Anderson (1984) have projected that school texts encompass 88,500 different words, wherein each word consists of related forms whose meanings could be derived via contextual and morphemic breakdown. Ebbers (2008), and Nagy and Anderson (1984) noted that the textbooks of the intermediate and secondary grades contained more morphologically complex words than the primary texts.

The importance of morphological awareness increases as children mature and the educational texts become densely populated with morphologically complex words. The development of morphological awareness with exposure to written and oral modalities have grabbed interest on its contribution towards reading ability (Deacon & Kirby, 2004; Mahony, Singson, & Mann, 2000; Nagy, Berninger, & Abbott, 2006; Nunes & Bryant, 2006) and reading proficiency in different populations, which includes diverse and typical learners (Kieffer & Lesaux, 2008; Nagy et al., 2006). With regard to this, McBride-Chang, Wagner, Muse, Chow, and Shu (2005) found that the second-grade prospectus accounts for only 15% of the variance in vocabulary; whereas by the fifth grade, the morphological awareness becomes a stronger predictor for reading proficiency than phonological awareness (Mann & Singson, 2003).

Since reading comprehension is related to word knowledge, the curriculum becomes more useful in learning the complex morphological word which is a key feature of the literate
lexicon (Nippold, 2007). Thus it is imperative that children identify the meanings of thousands of complex morphological words (Larsen & Nippold, 2007a), especially when they are reading technical books in areas such as social studies, science, and mathematics which often contain challenging vocabulary (Henry, 2003). The transition towards reading to learn among older children from learning to read in younger children is important for advanced vocabulary development (Chang, Wagner, Muse, Chow, & Shu, 2005). The mastery of deriving words has a wide influence on learning to read (Verhoeven & Perfetti, 2003). With improvement in reading proficiency, children reaching the middle elementary grades undergo a rapid expansion of the word structure, gaining skills in the analysis of words to determine the meaning. Hence, Kieffer and Lesaux (2010) consider morphology to be a strong tool which increases English word learning (Baumann, Font, Tereshinski, Kame’enui, & Olejnik, 2002; Henry, 2003; Nagy, 2005; Scott, 2005; Templeton, 2004) for the English Language Learners who struggle during their middle school. Knowing that the word structure is effective for English Language Learners (Kieffer & Lesaux, 2008), the fifth grade native speakers and the second language learners of English have displayed interest for the exploration of morphological relationships, which comprises of cognates that share the similar base (Carlo et al., 2004).

Researchers have recommended that the acquisition of these complex morphological words is a late linguistic achievement which is also linked to the development of literate language (Nippold & Sun, 2008; Ravid, 2006), with the most rapid growth occurring between the fourth and eighth grade (Templeton & Scarborough-Franks, 1985). Windsor (1994) conveyed that children’s use of their knowledge of derivational morphology in order to increase their written and spoken vocabularies becomes a crucial issue in language development. With regard to the decompositional task, some children and adults can both break down many derivationally complex words into distinct morphemes as well as create new words by analogy or rule (Freyd & Baron, 1982), though sometimes the perceptions of base-suffix boundaries are not always straightforward (Wheeler & Schumaky, 1980). According to Jarmulowicz and Hay (2009), the ability to decompose or compose derived words in English helps in the expansion of an individual’s vocabulary.

Studies have suggested that vocabulary are learnt through frequent exposure in reading materials (Landauer & Dumais, 1997; Schwanenflugel, Stahl, & McFalls, 1997), indicating that
Morphological analysis is important for the development of vocabulary (Larsen & Nippold, 2007b; Nagy et al., 2006; Rastle, Davis, Marslen-Wilson, & Tyler, 2000), spelling (Apel, Masterson, & Hart, 2004; Tsesmeli & Seymour, 2006), and reading (Carlisle & Stone, 2005; Carlisle, 2000; Casalis, Colé, & Sopo, 2004; Deacon & Kirby, 2004; Singson, Mahony, & Mann, 2000) in school-age children. In addition, other studies have found the influence of morphology on reading comprehension, spelling, and decoding (Carlisle, Stone, & Katz, 2001; Jarmulowicz, Hay, Taran, & Ethington, 2008) and also in the possible pronunciation of pseudowords (Deacon & Kirby, 2004; Kirby et al., 2012). The speed of reading processing can be increased via morphological awareness (Elbro & Arnbak, 1996), contributing to both word and text reading which is central in academic success (Singson et al., 2000). Hence, Kieffer (2014) suggests that the skills exhibited in morphological analysis can be used to differentiate skilled readers from students with reading difficulties. Though the importance of morphological awareness for literacy skills has been well documented (Lyster, 2002; Wolter, Wood, & D’zatko, 2009), this area of linguistic awareness has attained limited interest when compared to phonological awareness (Carlar-Ryeng, 2010).

Morphologically complex words comprise of both lexical and derivational morphemes (Larsen & Nippold, 2007a). Derivational morphemes comprise of affixes that are allocated to lexical morphemes forming the root word, thus creating new words. Some of the prefixes include un- (unable, unhappy), pre- (premature, predominant), re- (recreate, resend), and super (superman, supersensitive). Whereas, some of the suffixes include -y (silky, milky), -er (preacher, maker), -er (shorter, weaker), -est (biggest, slowest) and –ness (aggressiveness, humbleness). Two different types of complex morphological words do exist - derived adjectives and derived nominal. By adding a suffix such as –ness to the adjective sad, creates the noun ‘sadness’. Likewise, adding the suffix –ful to the noun mercy, generates the adjective ‘merciful’. Hence derived adjectives can be produced by creating adjectives from verbs and nouns; whereas derived nominal can be produced by creating nouns from verbs and adjectives. Nominal and adjectives are very common occurring in school-based textbooks (Larsen & Nippold, 2007a). Studies have reported that such derived nominal and adjectives have been used to teach subjects such as mathematics, social studies, science, and literature in the upper-elementary grades and throughout college (Gibbons, Ozias, & Stockton, 2003; Holt, Rinehart, & Winston, 2000; Scott-Foresman, 2000). Derived adjectives, forming descriptors of nouns signify intangible qualities
and abstractness (a persistent person, a wonderful place, a miraculous escape). The use of such derivatives adds exactness to discourse, adding to the semantic complexity.

Phonological transparency between the derived forms and root is a crucial factor in acquiring words that are morphologically complex in nature and is an essential variable in a number of studies which checks for the development of derivational processes (Carlisle et al., 2001; Carlisle & Stone, 2005; Carlisle, 2000; Jarmulowicz, 2006; Windsor, 2000). It was also observed that the derived words that were phonologically consistent were easier than derived words with phonological differences in their roots. A different classification would be to look at phonological transparency as having either phonologically neutral or nonneutral suffixes. Suffixes which do not induce a change in the phonological characteristics of the root are considered to be neutral suffixes (e.g., -ment, -er, -ful, -ness, etc.). Whereas, suffixes that do result in any phonological change to the root are the nonneutral suffixes (e.g., -ic, -al, -(a)tion, -ity, etc.). In addition to this, the morphophonological knowledge may also facilitate the correct production of those freshly attained derived words. According to Jarmulowicz, Taran, and Hay (2007), children who do not link the phonological and orthographical representations of the derived word can perhaps be less competent word learners as well as less proficient readers.

As fresh derived words come across in reading, the establishment of these lexical representations becomes predictable. When a child does come across an unfamiliar written word, then its orthographic representation can be established straightway, inferring from their phonological and semantic components. The typical stress pattern is implicitly known, as the stress is not explicit within the orthography. This can increase the possibility of establishing accurate phonological representations with the orthographic aspect. And also on hearing the spoken word the identification of the representation will be reinforced. Hence, when using the written modality to learn complex morphological words, the morphophonological knowledge of the words is also known to contribute to children’s skill to correctly access and store novel words.

The ease of learning certain suffixes to convey a given meaning does depend on the productivity of the suffix attachment, wherein less productive suffixes are mastered after high productive suffixes (Clark & Cohen, 1984). According to Baayen (1992), this aspect of productivity refers to the relative ease with which a suffix does attach to a certain root and is
sometimes associated with the incidence of the suffix in the language. Aronoff (1976) indicated that the productivity of a suffix differs with the syllabic, semantic, and phonological features of the root to which it attaches. For example, both ‘ize’ and ‘en’ may express the meaning to make a word. However, ize attaches only to roots ending in /n/, /l/, and /l/ (e.g., ‘modernize’, ‘vaporize’, ‘hospitalize’) and en attaches most productively to roots ending in a fricative or stop (e.g., ‘sadden’, ‘harden’). Likewise, a diminutive meaning for an object is conveyed often by ‘let’ (e.g., ‘applet’) while ‘ling’ is used frequently for animals (e.g., ‘hatchling’). The examinations of such morphologic derivations with children have focused on the meanings of root words, derived words, and affixes (Carlisle, 2000; Larsen & Nippold, 2007b). Bertram, Laine, and Virkkala (2000) suggested that the complex morphological words that are uncommon are more difficult to decode than the more common ones. Readers of low and high proficiency use morphological cues to facilitate themselves to decode words (Carlisle & Stone, 2005; Singson et al., 2000). Hence, adequate decoding and comprehension of complex words are attained when students develop morphological awareness including skills based on structural analysis (Bowers & Kirby, 2010; Bowers, Kirby, & Deacon, 2010; Kieffer & Lesaux, 2008; Ku & Anderson, 2003; Nagy et al., 2006; Nunes, Bryant, & Olsson, 2003).

Morphologically complex words may be stored as an entire unit with their identifiable lexical representations (Bybee, 2001; Plaut & Gonnerman, 2000; Seidenberg & Gonnerman, 2000), or they may be made as needed. Certain authors have also suggested dual-route/dual mechanism models which includes both whole words and morphemes as possible lexical processing units, wherein, the direct access of a word as an entire unit is one way of processing the word; and the composition and decomposition of individual morphemes is the other one (Hamilton & Coslett, 2008; Hay, 2002). An advantage of the word being stored as a whole is that the semantic as well as the phonological characteristics of a derived form would be specified as part of the derived word representation (i.e., lexeme and lemma) independent of the root. Hence, if nonneutral suffix (e.g., -ly) within a derived word were accessed for production, the consonant, stress and vowel characteristics would be stored and available with the whole word representation. Therefore, no phonological changes to the root would be essential because there would be no active composition process which includes the root.

Certain cognitive prerequisites support the late attainment of complex
morphological words as part of a word-learning strategy. These requisites include metalinguistic awareness, word structure awareness, and fluency in reading, each of which illustrates literate language development (Nippold, 2007). According to Anglin (1993), the knowledge of using prefixes, suffixes, and roots permits a learner to determine the meanings of the morphologically complex words. This knowledge of word structure expands rapidly during the middle elementary grades during which children can read fluently, gaining skills in examining words to determine the meaning. This learning process includes a metalinguistic strategy that children continue to use into their adult years to learn several novel words (Berman, 2004a; Bertram et al., 2000; Carlisle, 2000; Larsen & Nippold, 2007b; Ravid, 2004). The awareness of the morphological structure and the ability to use it are associated to various levels of reading (Carlisle & Fleming, 2003; Carlisle, 2000).

The abstractness of the word determines the difficulty of morphologically complex words (Ravid, 2006). According to Nippold, Hegel, and Sohlberg (1999), abstract nouns are learnt later than concrete nouns, as the former relies deeply on verbal information by links to other words and phrases to support the meaning. However, concrete nouns are supported by relations with the verbal and nonverbal information, such as mental imagery. Hence, they are more likely to induce clear mental images than abstract nouns, enhancing their understanding and availability (Sadoski, Kealy, Goetz, & Paivio, 1997). The morphologically complex word can also be derived from the root word if it is previously known (Anglin, 1993; Nagy et al., 1993). For example, ‘childhood’ may be easier to learn than ‘neighborhood’ because the word ‘child’ typically is learnt prior to the word ‘neighbor’. It was also noted that lexical representations apparently develop with frequent exposures. Repeatedly occurring derived words are more likely to be well established in the lexicon than those that occur less repeatedly. Nagy and Anderson (1984) suggest that if the students knew the root word and are able to breakdown the complex word, then a huge number of the unfamiliar words encountered in printed school curriculum could be understood.

According to Alegre and Gordon (1999), suffixed words are represented as whole words once they attain certain level of occurrence. However, low frequency words may not have rich representations, and hence may be produced or accessed through a compositional route. The frequency should affect both the phonological and semantic levels with the storage of
the derived word. Thus, children are expected to be aware of both the stress pattern and the meaning of more high frequency word derivations than the low frequency word derivations. The lexical frequency can also affect children’s vocabulary acquisition and production accuracy (Morrisette & Geirut, 2002). Effects of frequency have been found for word derivations and monomorphemic roots (Ford, Marslen-Wilson, & Davis, 2003). Alegre and Gordon (1999) have also found frequency effects for inflected words and their root clusters (i.e., the frequencies of all the inflected forms containing the same stem, for example dance, danced, dancing, dances). Bertram et al. (2000) suggests that it is often easier to decipher the most common derived words than the less common ones. In the study done by Nippold and Sun (2008), the difficulty exhibited by the younger children compared to older children in the task encompassing the comprehension of morphologically complex words was attributed to the familiarity of the participant with the root word. It was observed that with increased familiarity of the root words, the participants found the corresponding derivatives easier to comprehend. Other studies have also supported the findings wherein several words are learned by recurrent exposure in text (Nippold & Sun, 2008). Baumann et al. (2002) trained fifth-grade children to split low-frequency morphological words into their root words and prefixes by analyzing the word structure. Subsequently these root words were revised in classroom lessons, wherein their prefixes were defined and the sets of prefixed words were discussed. This resulted in the children being able to learn the meanings of additional prefixed words.

Derived words that are transparent in nature share stable meanings and phonological forms with their roots. The phonological and semantic transparency are considered to be independent despite substantial overlap (Derwing & Baker, 1979; Derwing, 1976). Semantic transparency is an essential factor in the expansion of morphologically complex words (Clark, 1993). Both adults and children can identify morphological relationships between the derived and the root word when the relationship is semantically transparent (Lewis & Windsor, 1996). The children’s use of this ability increases with age, using suffixes that occur in words with semantically transparent relationships more effectively than the use of suffixes that occur in words with semantically less transparent relationships (Windsor, 2000). As for the phonological transparency, it was observed that it does affect how children acquire words morphologically complex in nature. Children are more inclined to learn to produce derived words that are
phonologically consistent with their roots better than the words that display phonological variations (Carlisle, 2000; Jarmulowicz, 2006; Windsor, 2000). Some of the examples of phonological variations seen during derivations are: consonant alterations (confident, confidence), stress shift (imagine, imagination), vowel change (respire, respiration) and multiple changes in one derived word. It was also noted that the speed and accuracy of both auditory recognition (Windsor & Hwang, 1999) and the reading of word derivations (Carlisle et al., 2001) were reduced by phonological opacity.

According to Caplan (1992), the phonetic structure of the word derivation is also a key factor, which can affect the ease with which the root word can be detected. Word derivations such as ‘various’, ‘deception’, and ‘contagious’ have experienced changes to the phonetic structure of their roots, making it challenging to detect those words (vary, deceive, contagion). Such derived words which are nonneutral may be more difficult to learn than neutral words such as enjoyment, homeless, and joyful, whose roots are more obvious (Carlisle, 2000; Levin, Ravid, & Rapaport, 2001). In addition to the above mentioned factors, Nippold and Sun (2008) suggested that the difficulty observed in certain derived words could be its multiderivative nature. For example, for the derived word ‘dictatorship’, the root word ‘dictate’ would have undergone two derivations (dictator, dictatorship).

Assessment and Development of Morphological Derivations in Adolescents

Morphological knowledge includes morphophonological, morphosemantic and morphosyntactic knowledge. Different methods are used to tap the morphological knowledge in individuals that differ across several dimensions (Deacon et al., 2008). The traditional methods consisted of assessing the inflectional morphophonology, wherein the children were verbally presented the target word in a sentence with a picture context (This is a dog.), after which, the picture context again being changed, with the child expected to produce a suitable derivative which abides by the verbal semantic and syntactic context. Tasks pertaining to morphological awareness assess production, decomposition, or judgement abilities. In a judgement task administered by Carlisle and Nomanbhoy (1993), the participant was required to make a choice, without manipulating the structure of the word or applying any morphological analysis. For example, “Is there a little word in burger that means something like burger?” and “Is there a
little word in *caller* that means something like *caller*?”. A decomposition task however requires the participant to identify the correct root word of a given derivation or inflection. For example, “Eater. She is very slow to ____”. The correct response being ‘eat’. In contrast to this, Carlisle (2000) administered a production task which assesses the ability to produce word derivations applying morphological analysis. In his study the participants were given the root word and were instructed to supply a missing word. For example, “Sing. She was a great ____.” The correct response being ‘singer’. Other studies have also supported the use of such sentence contexts with children inorder to elicit production (McCutchen, Green, & Abbott, 2008). Ideally, a word that fits in both the syntactic and semantic frame must be provided inorder to complete a sentence. Hence children must employ a morphologically compositional task that incorporates the phonological and semantic systems.

Research on complex morphological words have been conducted pertaining to the perception of both spoken and printed words (Rastle, Davis, & New, 2004; Rastle et al., 2000), and also spoken word production (Melinger, 2003; Roelofs & Baayen, 2002). It has also been found that verbally presented sentence context facilitates morphosemantic generalization. According to Ebbers and Denton (2008), students could be trained to create such inferences by integrating the information gathered from the internal clues (morphemes inside the word), and the external clues (surrounding context around the world). Performance on morphosemantic based tasks is likely to tap into the children’s lexical networks, sentence processing abilities, and the syntactic and semantic knowledge of the root and suffix.

Another method for assessing word derivation is by using both morphological production and decomposition in word analogy based tasks, wherein the participant could be instructed to complete patterns such as comb: combed :: drank : ____ (drunk) (Kemp, 2006). Here the participant must identify a morphological relationship involving decomposition process (in this case, the first pair of words) and then apply the perceived relationship to the third word inorder to derive and produce a suitable word to solve the analogy. This assimilation of decomposition and production in analogy based tasks requires an explicit level of awareness of morphological patterns than the judgement or production tasks (Carlisle, 2003). Though this type of task requires the manipulation of the morphological structure of words, word analogy based tasks generally involves analogical reasoning abilities. Spontaneous productions and metalinguistic
tasks were used to conclude that children’s morphological awareness have been evident earlier for inflections than for derivations (Carlisle, 2003; Kuo & Anderson, 2006; Rabin & Deacon, 2008). Baumann et al. (2002) have reported a dearth of research evidence in studying the effectiveness of morphemic analysis instruction for the improvement in comprehension and vocabulary.

Developmental studies have indicated that the ability to analyze and use derivatives increases with grade level. This development follows an expected pattern, though the rate at which the student’s progress through the sequence differs considerably between children. Hence, the student’s at a given grade level can actually be at very different levels in morphological knowledge. Children in preschool are sensitive to morphological structure, with the tendency to use frequently occurring transparent suffixes in their production of novel derivations (Clark, 1993). Before children reach the second grade, they are able to identify root words in complex morphological words having transparent suffixes (Rubin, Patterson, & Kantor, 1991). From around third grade, children begin to understand the semantic relationship between the derived words and the root word as well as the meanings of the suffix (Lewis & Windsor, 1996). The vocabulary of school age children grow exponentially between the third and fifth grades, mainly because of the acquisition of derived words as well as an increase in knowledge of the meanings and properties of linking prefixes and suffixes (Windsor, 1994). Improvement in the children’s ability to compose and decompose derived forms is also seen (Carlisle, 2000). While the fourth grade children have attained relational knowledge of both opaque and transparent derivatives (Tyler & Nagy, 1989), the sixth and eighth graders demonstrated greater syntactic and relational knowledge than the fourth graders (Carlisle, 1988).

During the elementary school years, the relationship between reading and morphological awareness either progresses (Deacon & Kirby, 2004; Nagy et al., 2006) or remains stable (Mahony, Singson, & Mann, 2000). Hence, morphophonology associated with derivation is considered to be a main area of development for school age children. Throughout the elementary school years, an improvement in the accuracy of production of morphophonological nonneutral suffixes occurs, such as changes in primary stress (Jarmulowicz, 2006) and vowel quality (Jaeger, 1984). Studies have suggested that children between the first and sixth grades become more skillful in understanding words with suffixes, making new words with suffixes and
isolating suffixes (Carlisle, 2000; Mahony et al., 2000), as they continue progressing in these skills through high school (Nagy et al., 2006). A sharp growth in the morphological skills during the upper elementary grades (between the fourth and sixth grades) (Abu-Rabia, 2007; Carlisle, 2000; Mahony et al., 2000; Nagy et al., 2006; Nagy, Berninger, Abbott, Vaughan, & Vermeulen, 2003) has also been reported. Another study done by Templeton and Scarborough-Franks (1985) found that the sixth and tenth graders were less accurate in producing derivatives with vowel and stress changes than producing opaque nonsense derivatives which incorporated a vowel change. Studies have reported that the growth of derivatives does increase three times compared to the growth of root words among children (Singson et al., 2000). This pattern can be attributed to the increasing awareness of the inner structure of words as the readings become more complex and refined. When considering age-wise achievement of such word forms, it has been found that a partial use of the highly productive instrumental and agentive er (e.g., ‘cooker’ and ‘preacher’ respectively) occurs by 7 or 8 years of age (Derwing, 1976). Whereas the less productive agentive suffixes ist (e.g., ‘cyclist’) and ian (e.g., ‘magician’) appear by 4 years of age, and are used seldom when compared to the agentive er (Clark & Cohen, 1984). According to Derwing (1976), the adverbial suffix, ly, and an adjectival suffix, y, appear slightly later than agentive suffixes. The relational knowledge of the diminutive suffix ie (‘doggie’) is acquired much later, although it may serve as a nickname rather than a diminutive function (Derwing, 1976).

Anglin (1993) revealed a significant growth in vocabulary knowledge during the early and middle elementary school years, with improvement in the comprehension of derived words across grades 1 and 5. Multimorphemic words (three or more morphemes) were also observed to develop better in children of fifth grade than the first grade. The author concluded that the lexical development can be described in terms of increasing morphological complexity. Mahony (1994) revealed a greater performance by 14 year-olds compared to 20 year old adolescents on the sentence completion task. Performance on both reading comprehension and derivational morphology exhibited a significant correlation supporting their interaction with each other. Carlisle (2000) reported that the fifth graders performed superiorly when compared to the third graders on all the tasks. The reading comprehension was significantly correlated with word definition and morphological structure at fifth grade, but not for the third grade. Another study done by Carlisle and Stone (2005) found that the third graders read derivations that were bimorphemic (baker, cutter) more precisely and faster than the second graders. However all
children generally read words constructed by root and suffix, such as *sunny*, more effortlessly than they read bisyllabic words similar in spelling, but consisting of only one morpheme, such as *penny*. Hence the authors concluded that the second and third-graders mostly accessed morphemes for word reading.

According to Windsor (1994), the reason as to why adolescents and adults were unable to consistently provide an appropriate suffix may be because the individuals mastered derivational skills, rather than applying internalized knowledge and they treated the tasks as requiring controlled strategies. Windsor (1994), investigated the relational knowledge of twenty-one derivational suffixes that conveyed six different meanings and the results revealed that the comprehension of the suffixes were easier than the production of the same. It was noted that the children through the fifth and eighth grades fared better than the children in the third and fourth grades, in both suffix comprehension and production. It was also found that the less productive suffix was produced irregularly than the more productive suffixes inorder to convey a given meaning. In the study done by Jarmulowicz (2006), the author used a derived word production task wherein the participants were instructed to attach a suffix on a root. This task was envisioned to avoid semantic generation so that the participant’s morphophonological knowledge could be assessed in particular words. The results of the study revealed that the children between the first and third grades exhibited improvement (30% to approximately 75%) in stress production on derived words with nonneutral suffixes. Whereas the children’s placement of primary stress with neutral suffixes on derived words reached the ceiling level, right from the lowest grade. Subsequently, Jarmulowicz et al. (2008) and Jarmulowicz et al. (2007) used the derived word production task in their studies and found that the stress production in word derivations with nonneutral suffixes was a predictive indicator of decoding abilities in third graders. They also pointed out that the relationship between phonological awareness and decoding was weaker than the association between accurate stress productions and decoding, indicating that derived word production task might be tapping a different level of the phonological system. Jarmulowicz and Taran (2007) examined whether the semantic knowledge, lexical frequency, or sentence context affected children’s production of primary stress in word derivations. Thirty children (mean age = 9.1 years) were assessed for their production of high and low frequency derived word forms with stress changing suffixes. In addition to the assessment of the semantic knowledge of the derived words, half of the children produced the
derived words in isolation and the other half in a sentence context. The results revealed that the primary stress was produced less accurately in low frequency words than in high frequency words. The high frequency words that were produced in a sentence context were more correct than all the low and high frequency words that were produced in isolation. Word knowledge and its accurate stress production were more likely for the high frequency words than the low frequency words. Another study done by Jarmulowicz and Hay (2009) on third grade children using high and low frequency real English words and nonsense word derivations revealed that, children made more stress and segmental on nonsense words than on high and low frequency words. More syllabification errors were noted on low frequency words than on high frequency and nonsense words. Nippold and Sun (2008) studied 46 younger children (10 year olds) and 48 older adolescents (13 year olds) in the use of derived nominal and derived adjectives and found that the performance of the latter group was better than the former in both types of word derivations. The derived nominals were more difficult than the derived adjectives for both groups.

Palincsar, Brown, and Campione (1994) suggested a dynamic assessment task that may be helpful as it provides insight into the type and extent of assistance that a student requires in order to be successful in determining word meanings using the strategy of morphological analysis. The dynamic assessment is based on the concept of zone of proximal development (Vygotsky, 1978), which includes the distance between the child’s assisted and independent levels of performance (Santrock, 1996). The study done by Larsen and Nippold (2007b) incorporated the use of a dynamic assessment procedure on 50 typically developing sixth grade children to describe the meanings of 15 low-frequency complex morphological words. The task consisted of interviewing the children individually and asking them to define each word. The results revealed a varied range of skills in children with a positive relation observed with the literacy levels.

Children with typical linguistic development differ extensively in their skill to learn the word meanings through morphological analysis, with proficiency closely linked to reading comprehension (Larsen & Nippold, 2007b). Levy (1987) noted that the spoken derivational suffixes may take many years to master in typically developing children. Jarmulowicz and Taran
(2007) have indicated that still little is known about the factors influencing the typical development of derivational morphology.

**Morphological Derivation Impairment in Adolescents**

Children with reading and language deficits appear to be less sensitive both to syntactic information and to the morphological aspects which are conveyed by derivational morphemes than typically developing children (Anastasia, 2014; Carlisle et al., 2001; Windsor, 2000). In addition to recognition, the production of derived words are predominantly challenging for children with language or reading difficulties (Casalis et al., 2004). Poor understanding of grammatical structures, weak working memory and poor morphological awareness may cause difficulties in recalling and applying spelling and syntactic rules and breaking-down spoken language. Deficits in these areas might make it challenging for the children with dyslexia to cultivate adequate language (Dal, 2008; Ganschow, Schneider, & Evers, 2000; Simon, 2000), and to develop metalinguistic awareness of their written and oral language (Schneider & Ganschow, 2000). Morphological awareness also does make a substantial contribution to children with dyslexia (including poor readers) having poor word-reading and reading comprehension (Abu-Rabia, 2007; Leikin & Hagit, 2006; Nagy et al., 2003; Siegel, 2008). Numerous other studies done across languages have offered evidence that children with dyslexia and poor readers do exhibit inferior morphological awareness skills in both written and oral language tasks when compared to typically developing peers (Abu-Rabia, Share, & Mansour, 2003; Casalis et al., 2004; Chung, Ho, Chan, Tsang, & Lee, 2010; Coleman, Gregg, McLain, & Bellair, 2009; Deacon, Parrila, & Kirby, 2006; Hamilton & Coslett, 2008; Helland & Kaasa, 2005; Joanisse, Manis, Keating, & Seidenberg, 2000; Schiff & Raveh, 2006; Siegel, 2008; Tsesmeli & Seymour, 2006).

Collaborative work and attempts to encourage students’ word knowledge from the syllabus may help benefit the individuals with language deficits at par with their typically developing peers (Throneburg, Calvert, Sturm, Paramboukas, & Paul, 2000). Research have shown that school-age children with linguistic impairments often exhibit delays in the acquisition of derivational morphemes such as the comparative –er (*smaller*), the superlative –est (*smallest*), the adjectival –y (*sticky*), the agentive –er (*preacher*), and the diminutive –let (*booklet*) (Windsor & Hwang, 1999). Children with reading and language impairments appear to be less sensitive to
syntactic information conveyed by derivational morphemes and to morphological relatedness than typically developing children (Tyler & Nagy, 1990). Hence the authors have suggested that this area of study is an important step towards evolving assessment and interventional tests for school-aged children with language-based learning difficulties.

In the study done by Coleman et al. (2009), individuals with dyslexia spelt derivational suffixes incorrectly (such as attempting the word captivate which did not reflect the knowledge of the root word captive). The errors of this type have been observed to be a characteristic not only of poor reading but also poor writing. In Rubin et al.’s (1991) study, the morphemic errors exhibited by the children with language-learning disability were mostly additions (such as picks for pick and crafted for craft), omissions of inflectional and derivational morphemes (such as help for helped and Sam for Sam’s) and occasional substitutions (such as entertaining for entertained). The children with reading disability in Fowler and Liberman's (1995) study exhibited difficulty in the production of morphological forms which underwent a phonological change (such as six/sixth, mischief/mischievous); however they performed better when the phonology of the base was retained in the derivative (e.g., ten/tenth, agree/agreement).

The morphological awareness skills of children with dyslexia that were examined by Casalis et al. (2004) found that the age and reading experience may determine the development of morphological awareness in children with dyslexia than would their phonological abilities. Elbro and Arnbak (1996) found that the Danish adolescents with dyslexia were efficient in reading comprehension and word decoding using morphological information. They found that the children with dyslexia read the morphologically complex non-transparent words slower than the semantically transparent words. These morphophonologically complex words are also found to be difficult for typically developing children to spell (Templeton & Scarborough-Franks, 1985), read (Carlisle & Stone, 2005; Carlisle, 2000), and produce (Jarmulowicz, 2006). Such words are found to be even more difficult for children with language or reading deficits (Carlisle et al., 2001; Windsor, 2000). However, Bourassa and Treiman (2008) found children with dyslexia to adhere to the principle of morphological constancy to the similar extent as that of the typically developing younger children of the same spelling level.
Deacon, Parrila, and Kirby (2008), after analyzing the relevant literature on morphological awareness, concluded that morphology may offer a compensatory path of training poor readers and children with dyslexia, and may also be the means by which certain individuals overcome dyslexia. In the study done by Wiig et al. (1973), they found that unlike the typically developing age matches, children with dyslexia aged 8- to 10- years of age were never able to correctly produce ‘y’ or a diminutive suffix ‘let’, for nonsense roots. Studies have also identified poor readers in middle and high school as well as in college to have a poor grasp over derivational suffixes (Nagy et al., 2006). A meta-analysis of morphologic intervention studies observed a significant effect on literacy using morphological awareness instruction (Bowers, Kirby, & Deacon, 2010). The authors concluded that along with phonological awareness, morphological awareness may also be effective. Considering that morphological processing plays a vital role in reading, Berthiaume and Daigle (2014) examined the sensitivity to morphological word structures by using a judgement task. The participants for the study were 26 children with dyslexia (aged 9 – 12 years), 30 younger participants of the same reading age, and 26 chronological age-matched controls. Here the participants had to determine which of the two pseudo-words most resembled a real word in French. In addition to this, the participants were also required to extract the base forms of complex morphological words using a decomposition task. The results revealed better performance by the control groups when compared to the children with dyslexia.

**Figurative Language**

The period of adolescence is a peak phase for the usage of a range of expressions pertaining to figurative/metaphorical language. Figurative language which has an essence of beauty and style, is a more effective way of saying what is meant than a direct statement. It brings a vague idea alive, surpassing the literal interpretation of the words, and stimulating the development of later language. It may provide a fresh effect or new understanding into a subject or an idea. In addition, figurative expression creates opportunity to develop imagery and creativity (Hoffman & Honeck, 1980). Perrine and Arp (1982) convey the effectiveness of figurative language by suggesting that the usage of such language indulges the readers to have an imaginative outlook towards literacy materials, converting informative statements loaded with emotional intensity, adding attitudes with information, all of which are conveyed in a brief
manner. The requirement for students to acquire these sophisticated linguistic expressions in both written and spoken modalities has become the highest priority for instructors in certain countries, resulting in stronger emphasis on literary accomplishment in educational setups. Though the usage of figurative language is not crucial for daily survival, such expressions are vital during the learning and thinking processes. Being competent with the usage of figurative language is an essential aspect of becoming a socially literate and a linguistically superior person (Nippold, 1998a). Nikitina and Furuoka (2008) have considered figurative expressions as a research tool in the fields of general education and language pedagogy.

The understanding of figurative language includes many domains of semantics, language comprehension and use. According to Nippold, Allen, and Kirsch (2000), the figurative language comprehension encompasses higher-order cognitive processing, requiring an integration of processes such as understanding the context of occurrence of figurative expressions, understanding linguistic information that includes the abstract sense of words, and inferring from real-world experiences. Using figurative expressions elaborates an idea and pursues to highlight and organize the meaning of word/phrase based on something familiar to the discourse partner, paving way to achieve a special meaning (Abkarian, Jones, & West, 1992). It is suggested that older children do understand and begin using language with a figurative sense (Nippold, Moran, & Schwarz, 2001), and such use of figurative expressions forms an intimacy between the discourse partners (Bukatko & Daehler, 2001) while excluding other partners (Gerrig & Gibbs Jr., 1988). The understanding of proverbial expressions, in addition to the usage of similes, slangs, metaphors and idioms are considered to be a good indicator for achieving success in school (Nippold, Hegel, Uhden, & Bustamante, 1998; Nippold, Uhden, & Schwarz, 1997), especially in terms of their reading and listening skills (Nippold, Moran, et al., 2001a; Nippold, Moran, & Schwarz, 2001b).

Barlow, Fine, Pollio, and Pollio (1977) noted the presence of four figures of speech per speaking rate. The students come across figurative expressions in their textbooks and classrooms, though the usage of such expressions are limited in outdoor social situations (Kerbel & Grunwell, 1997). Such expressions are used in any form of communication, be it in daily conversations, advertisements, articles in newspapers, poems, novels, etc. With reference to this, Nippold (1990) reviewed the student’s books on literature and mentioned that atleast one idiom
did occur in an average of 6% of sentences during the third grade, which did increase up to 10% by the eighth grade. Colston and Kuiper (2002) reported a quantitative content analysis of metaphors of the popular children’s literature across genre, audience-age and historical variables, and found 54 metaphors per 1000 words. An additional finding was that more metaphorical expressions were found in the books targeted at very young children compared to books targeted for the older children, with nonfiction books containing lesser metaphorical expressions than fiction books. Surprisingly, another study done by Graesser, Mio, and Millis (1989) did report prevalence of metaphors in adult language, comprising of 40 distinctive metaphors per 1000 words of discourse. Hollingsed (1958) evaluated four series of intermediate school readers and found 107 and 310 figures of speech in each reader. Similes were exceeded by metaphors, making up one fourths of the total number of figures of speech. In support of this, Groesbeck (1961) found abundance of similes and metaphors (1200 – 1800 figures of speech) in material written for children of grade four and five.

Research highlights on the significance of children’s literature that may serve as a context to language processing, with its influence on the cognitive development and other processes. Colston and Kuiper (2002) were concerned regarding the possible discrepancy between the linguistic content of the popular children’s literature and the children’s skill in processing language. They pointed uneven difficulty of language content in books that are primarily targeted for readers of different age groups, with clarity missing on the influence of this on processing abilities. In addition to the influence the children’s popular literature lays on the processing of figurative language, their processing skills are affected by social cognition (Dodge, 1983) and social interaction (Damon & Hart, 1988). The role of context may also affect the salience of conventional meanings. In the instance of a word that has two meanings retrieved directly from the lexicon, the more popular, ideal, familiar or more often used meaning in a certain community will be more salient or the meaning triggered or made probable by preceding context is the more salient one. The context has also shown to have a facilitatory effect on the lexical access. Research has revealed that the context determines the recognition of words (Tyler & Wessels, 1983, 1985), may facilitate activation of the meaning of a word, and activates salient (frequent) meanings. The characteristics of a word or an utterance may be determined by its familiarity (Blasko & Connine, 1993), frequency (Neill, Hilliard, & Cooper, 1988), and conventionality
(Gibbs, 1980). A study done by Keysar and Bly (1995) revealed that the activation of either literal or metaphorical meaning also depends on its saliency, and that the transparency of idioms depends on its conventional use. The aspect of transparency depends upon the recently learned meaning which automatically would become salient in nature. Children having poor comprehension of written text were found to have poor inference making skills than stronger readers who were able to produce more figurative interpretations of dual expressions (Cain, Oakhill, Barnes, & Byant, 2001; Cain, Oakhill, & Lemmon, 2005; Levrato, Nesi, & Cacciari, 2004).

**Types of Figurative Expressions**

McArthur (1992) suggested that figurative language contains figures of speech, which are rhetorical devices that use words in distinctive ways to achieve a special effect. With reference to this, Perrine and Arp (1982) argue that, such figures of speech should not be taken literally as they aid to give an extended meaning to words, phrases or sentences. Hence, they propose seven classifications of figures of speech, namely metaphor, simile, personification, metonymy, paradox, overstatement, understatement, irony and allusion. McArthur (1992) on the other hand, said that figurative language is that language in which figures of speech such as metaphor and similes occur freely. Other such expressions are verbal humor, proverbs, and idioms. According to Honeck (1986), clear-cut distinction concerning figurative utterances is not easy. Kreuz and Roberts (1993) reported as many as eight different types of nonliteral language to have emerged such as hyperbole, idiom, indirect request, irony, understatement, metaphor, rhetorical question and simile. According to Rosch, Mervis, Gray, Johnson, and Boyes-Braem (1976), these eight figures of speech form the rudimentary categories of nonliteral language. Apart from the above mentioned figures of speech, metaphors, similes, idioms and proverbs does comprise of a literal and figurative term. The literal term is what one compares to something else, conveying the direct and real meaning of the expression; whereas, the figurative term is what is being compared to the literal counterpart.

**Assessment and Development of Figurative Language**

A universal method to study language processing in children does involve the presentation of artificial utterances that are created by adult experimenters following different
criteria. Researchers have considered adult proficiency as a goal to compare the performance of children, which will help them determine the degree of the children’s comprehension of the utterances. Broderick (1992) doubted whether the children’s literature would serve as a suitable referent inorder to determine the ecological validity of research materials. Hence he proposed the need to develop an understanding of children’s normal experience with figurative language, suggesting that children’s literature should always take a back row when it comes to validity based measures. Although Colston and Kuiper (2002) do not support the use of children’s literature as an appropriate referent, they do suggest that such materials being accessible serve as an objective means of assessment. However, a great deal of variability may be present in the children’s experience with it. Colston and Kuiper also conveyed that the children of diverse cultures and regions would not necessarily have exposure to the same literature. They concluded that research techniques used to study figurative language processing can often conceal processing abilities, underestimating children’s metaphorical and other figurative language skills. Harris, Friel, and Mickelson (2006) claimed that the studies on figurative language have become twofold, comprehension and production. Harris et al. (2006) state that studies related to comprehension aspects have been in the forefront, when compared to production.

Studies on figurative expressions such as similes, metaphors, idioms, and proverbs that occur frequently in conversational speech (Hoffman & Honeck, 1980) as well as in literary contexts have lately been the area of research interest. These expressions occur among the lower to upper grade elementary school children (Lockhart, 1972). Dual function words such as similes and metaphors are understood and used by children and adolescents before the full appreciation and use of proverbs and idioms. According to Hollingsed (1958), three most common figures of speech exist – metaphor, simile and personification. These were accurately interpreted only 53 – 59 % of the time by grade 4 through grade 6 students. This reduced accuracy rate compared to adults is attributed to the fact that, the abstract thinking required to interpret these similes is complex, requiring a mental manipulation with more than one idea. The developmental trajectories of each of the type of figurative language have their own course of expansion. Several studies done on typically developing children in the understanding of the types of figurative language conclude that, the refinement of the skill to comprehend figurative expressions happens during the early adulthood period, though the basic ability are observed even during their preschool stage. The preadolescent years, ages 9 through 12, exhibits an abrupt
acceleration in competency (Pollio & Pickens, 1980) with a parallel advancement into the formal operations stage of cognitive development (Inhelder & Piaget, 1958).

**Similes/Metaphors**

Originally the term metaphor comes from the Greek word meaning ‘transfer’. It is also a derivative of ‘meta’ which implies a change, and ‘pherein’ which means to bear or to carry. According to Gentner and Bowdle (2001), metaphors form mappings between concepts from unrelated areas of knowledge, being the key basis of contextual change. It compares two different things, without using ‘like’ or ‘as’. Metaphoric expressions allow one to construct the understanding of unclear concrete concepts. Metaphors also act as analogies, as these figurative expressions establish links between abstract systems in the base and target areas. Metaphors give added structure to challenging target concepts, thus making these ideas unambiguous and richer (Bowdle & Gentner, 1997). Traditional concepts of language processing consider metaphors as deviations of literal language that are governed by linguistic norms. And such deviations must be corrected for an understanding to occur. In terms of deviance, metaphors are treated as unusual expressions which interrupts semantic or syntactic rules (Kintsch, 1974); or as expressions that are literally false that interrupt communication (Grice, 1978; Searle, 1979). Three key elements comprise a metaphor – the topic, which is being compared; the image, which the topic is being compared to; and the point of similarity, which is the similar characteristic that the topic and image share. In addition, Gentner and Bowdle (2001) state that the listener should begin a three-phase comprehension process that involves namely, identifying the source of the literal interpretation of the statement, measuring the accuracy of the literal interpretation within the context of the statement, and finally the derivation of a metaphoric interpretation, that is if the literal one is found to be atypical or false.

Al-Hasnawi (2007) defines figure of speech as “an expression such as a simile, in which words do not have their literal meaning, but are categorized as multi-word expressions that act in the text as units”. The term ‘simile’ is a derivative of the Latin word ‘Simile’, this means ‘likenesses and resemblance’. Similes consist of a subject, vehicle, link and commonality. The ‘subject’ of the simile is a word or words that represents the referred entity or which is described by the simile. The ‘vehicle’ is a word or words that represent what the subject has been linked to. This brings the reader to the sense of association of the subject of the simile. The ‘link’ can be
either ‘as’ or ‘like’ that is used to associate the subject with the vehicle. ‘Commonalities’ are the qualities that are shared by the subject and the vehicle. And finally the term ‘tenor’ refers to the overall meaning the person tries to convey to the reader using a simile. Such expressions follow a syntactic form – ‘*A Topic is as Ground as a Vehicle*’ – delivering a ready-made frame that speakers can fill with their own modified vehicles (Moon, 2008). Similarly similes being explicit comparators help connect the source and target entities. These figurative expressions are considered to have a similarity between two aspects in either one or two of the features (Shamisa, 2004). Though similes can be reversed from a conceptual viewpoint, it may not be pragmatically feasible to do so. In addition, the ability to clearly state the grounds of a comparison permits a speaker to use vehicles that are neither apparent or completely to the point. Metaphors use clear systems of mappings to include the topic as a member of the vehicle category; whereas, similes are used artistically by speaker, as long as the ground is successfully communicated. This indicates that similes provide a freer and more innovative means of expression than metaphor (Hanks, 2004). According to Gentner, Bowdle, Wolff, and Boronat (2001), due to the presence of words such as ‘like’ or ‘as’ which acts as cues, the comprehension of similes are easier.

The aptness and interpretability of metaphors depends upon the degree of likeness between the base and the target (Marschark, Katz, & Paivio, 1983), and the speed of the comprehension of metaphors (Gentner & Wolff, 1997). Asch and Nerlove (1967) investigated the comprehension children had of terms (deep, bright, hard) that could function both in a physical and psychological sense, and the results revealed that the children seemed first to grasp the physical senses. The understanding of the psychological sense of the terms did increase at each age level, as did the understanding of the relationship between the physical and psychological senses of these terms. The study done by Colston and Kuiper (2002) did show that until children reach roughly 7 or 8 years of age, they do not show a thorough adult proficiency in the understanding of metaphors. However, the younger children may show some understanding of metaphors only if it is a familiar topic along with a less demanding testing condition.

**Simile - metaphor distinction.** Ever since the time of Aristotle, scholars have defined simile and metaphor based on observing similarity in items that are dissimilar. Metaphors and
Similes can be conveyed in different ways – in metaphor form (A is B) and in simile form (A is like B); both comprising the association of two concepts in order to enrich appreciation of one of them, differing only in the absence or presence of the word ‘like’. Fogelin (1988) states that simile is a metaphor which differs only from the way it is put, and since it consists of a longer sentence compared to a metaphor, it is considered to be less attractive. Glucksberg and Keysar (1990) proposed that the metaphoric form is the basic form of figurative statement, similes being the variant of a metaphor. Metaphors have been considered as an expression that considers the topic as sharing a representative category with the vehicle, while similes being expressions that emphasize likeness between the topic and the vehicle, without any assignment into the same category. Hence, simile expresses a relative but segregated relationship, while the metaphor expresses category specific and identical relationship between the vehicle and topic. Metaphor and simile are alike and appear to be two forms of the same expression, though having different pragmatic aspects. Studies have used sentences comprising of metaphors and similes in order to investigate the similarity in cognitive processes and the evaluation of the likeness that exists between the topic and vehicle (Bowdle & Gentner, 2005; Jones & Estes, 2006; Utsumi, 2007). Studies have treated metaphors as statements used as categorization rather than comparison as seen in similes (Bowdle & Gentner, 1999). In contrast to metaphors, similes are always clear, permitting the listener to instantly and explicitly interpret them as comparisons (Hanks, 2004). People claim that metaphoric expressions are deeper and convey stronger claims. Whereas similes refer to encoded concepts whose form triggers the listener to actively consider comparison, indicating that sophisticated analogies can be considered at par with the simile form.

Two theories have been proposed to explain the simile-metaphor difference – The Career of Metaphor hypothesis (Gentner & Bowdle, 2001) and the Relational Precedence hypothesis (Aisenman, 1999). The ‘Career of Metaphor hypothesis’ is linked with the simile-metaphor distinction, wherein the metaphoric expressions are interpreted by the manner of structural alignment, with the nature of the alignment differing for similes and metaphors, indicating that the simile form is most appropriate to new figurative ideas and the metaphoric form for those that have become familiar and recognized (Bowdle & Gentner, 2005). This change from the comparison (simile) form to the categorization (metaphor) form is dependent on the conventionality of the figurative expressions. Here the figuratives with conventional bases are stated as metaphors, and those with fresh bases are stated as similes. In the simile form, the
alignment of the literal base and target concept is direct, whereas for the metaphor form, the
listener should first access the concept associated with the base, subsequently align it with the
target representation. In support of this explanation, Gentner and Bowdle (2001) found that fresh
metaphors are processed slowly, and may also lead to a false start in processing. This claims that,
repeated alignments can lead to the formation of a concept, and that figurative expressions can
occur in metaphoric form only when there is an existing concept associated with the base. The
‘Relational Precedence hypothesis’ was an extension of Gentner’s distinction between relational
and attributional comparisons. This theory states that the difference between metaphors and
similes are due to the type of interpretation the expression receives. This theory suggested that
the primary use of metaphoric forms was to highlight the common relations between the target
and the base, whereas, the simile forms to highlight common attributes. This indicates that the
metaphoric form is expected to deliver a deeper relation than the simile form. In Aisenman’s
study, she presented the subjects with base and target terms and asked if they preferred placing
sentences with those terms in metaphor or simile form. The result revealed that the preference of
metaphors outweighed similes. This finding was also supported by the study done by Zharikov
and Gentner (2002).

A study done by Chiappe and Kennedy (1999) revealed that the aptness of the expression
predicted the preference between similes and metaphors, with similes preferred for less apt
figurative statements and the metaphor preferred for more apt statements. In another study done
by Miall and Vondruska (1983), the authors tested children with a mean age of 9.8 years and
young adults with a mean age of 19 years on their affective response (metaphors or similes) to
stories in a free choice paradigm. Results revealed that children tended to generate more
responses under the metaphor condition than the simile condition, with a significant difference
(p<0.05) obtained between the two. In contrast, the adults tended to generate more responses
under the simile condition than the metaphor condition, achieving a significant difference
(p>0.05) between the two. Glucksberg and Haught (2006b) suggest that the simile form refers to
the literal concept, whereas the metaphoric form is a superordinate category. They concluded
that rather than the dependence of novelty and conventionality, the referential and semantic
properties are to be considered during interpretation.
Types of similes. Similes can be of different types and classifications. They can either be used in a positive or a negative form. In the positive form, the usage of simile indicates similarity between the associated entities. For example, ‘he is as slow as a tortoise’. On the other hand, the negative form denies similarity between the same. For example, ‘he is not as slow as a tortoise’. Bredin (1998) proposed a scale ranging from the most stereotyped to the most innovative similes. Conventional and stable similes formed the one end of the scale; whereas the other end comprised of creative similes. An intermediate level between the two extremes is the standard and original similes. Oring (2003) did suggest the presence of innovative similes which are frequently used to exemplify or draw together elements of an argument to illustrate a key point. Ortony (1993) looked at this from another perspective, suggesting a semantic difference between literal and non-literal similes, wherein, the topic and vehicle could be reversed and the likeness could not be dropped, when considering the literal similes. However for the non-literal similes, the terms could be reversed and the likeness could be dropped. In addition to this, Fromilhague (1995) offered a difference between subjective and objective similes, stating that the former originates from individual association mechanisms; while the latter stems from concrete physical experience. In addition to this, he also did explain regarding similes being implicit and explicit. According to Moon (2008), the marker ‘about’ has a distinct role in indicating irony. When considering a larger space of creative similes, Veale and Hao (2007) suggest that ‘about’ does not always indicate irony but also indicates an attempt by a speaker to be vague, witty and innovative. To conclude Veale and Hao suggest ‘about’ to be a very reliable predictor of a simile’s true emotional sense.

A well-constructed humorous simile can convey much of the same pragmatic and semantic punch as a narrative joke. According to Giora (1995), irony is form of double expression in which the speaker indicates the opposite of what is conveyed. It is often considered as an irrational and a risky way of communicating meaning (Sperber & Wilson, 1992). When using ironic expressions, the audience should actually see past this pretense inorder to comprehend the speaker’s actual meaning. Though ironic expressions can be used to soften a criticism with a funny side to it, these expressions may be understood or misunderstood by audience. Such expressions are apparent in ironic similes that convey the same.
Assessment and development of similes in adolescents. A study done by Fadaee (2011) revealed that among similes, metaphors and symbols, implicit similes were used more than explicit similes, indicating that the writer wanted to address the novel in an implicit way. According to the author, similes are overt expressions which clearly and accurately explain the object. According to Roncero, Kennedy, and Smyth (2006), similes that are found on the internet are more common than metaphors that are accompanied by explicit explanations. Another study done by Chiappe, Kennedy, and Smykowsk (2003) revealed that the aptness of the relationship of metaphoric expressions is linked strongly with the ease of understanding figurative expressions, with similes improving both their comprehensibility and their aptness. According to Veale, Hao, and Guofu (2008) similes allow rapid identification of important stereotypes of a culture and language, and also those that are commonly seen in different language cultures such as English and Chinese. Hashemian and Iravani (2011) systematically investigated the discourse goals perceived by Iranian L2 English learners as the motives of the usage of figurative language. Forty participants who were undergraduates between the ages of 20-25 years were selected for their study. Results revealed that the participant chose the discourse goal of ‘compare similarities’ for similes than for metaphors. This was in contrast to another study done by Roberts and Kreuz (1994) who found the discourse goal of ‘Be humorous’ to be chosen more for similes. With regard to the preference of modality, the results revealed a dominance of bimodality compared to auditory and visual modalities alone.

In a study done by Reynolds and Ortony (1980), the authors assessed the metaphorical abilities in elementary school children (aged 7 to 12 years). The participants selected the accurate alternatives more frequently when they were given the set of similes than metaphors. They also made more accurate selections when the alternatives precisely denoted the referent of the figurative comparison than when the identity of the referent had to be inferred. The use of explicit comparators prompts similes to assign category membership drawing attention to certain properties that are shared; this nature of similes can also signal a lack of confidence in the suitability of the comparable categorization. Veale and Hao (2007) in their study exposed a computational agent with a large quantity of self-explanatory similes from the web. They described how the categorization concept required by metaphor can be assimilated from exposure to similes. The results demonstrated that this knowledge proposes a richer and a more detailed picture of category structure than that attained from other sources. The authors
concluded that as a basis of knowledge, similes combine received understanding and bias in equal measure, imparting information that is pragmatically useful, but which can never be acquired from a dictionary. This knowledge acquired from similes may also permit a cognitive agent to steadily develop a more sophisticated knowledge of irony. However similes that use either irony or mockery are often clearly marked with semantic vagueness such as ‘about’. A study done by Veale (2013), described the construction and analysed a large database of creative similes, and revealed that humorous similes display many of the similar structural and semantic features that are considered typical of poetic similes, though none appear either essential or adequate to make a simile not just innovative, but humorously innovative.

Studies were done focusing on the conventionality, comprehensibility and aptness of metaphors and similes. The conventionality reflects the familiarity of a metaphor. Chiappe, Kennedy, and Chiappe (2003) defines aptness as “the extent to which a comparison captures important features of the topic”. Chiappe et al. (2003) proposed that the main factor that defines the comprehensibility of a figurative expression is based on how readily individuals can categorize appropriate properties of the vehicle that are attributable to the topic. These aspects can be considered to explain variation in metaphor processing fluency, the ease and speed with which individuals’ process a metaphor (Bowdle & Gentner, 2005; Glucksberg & Haught, 2006a, 2006b; Jones & Estes, 2005, 2006). There is ample support from other studies (Taira & Kusumi, 2009a, 2009b) as well. Gerring and Healy (1983) suggested that certain factors could affect the comprehensibility without affecting the judgement of aptness. They concluded that the order in which the figurative and literal components of sentences appear, did affect the time it took for the participants to state that they had understood the metaphors. The child’s experience seems to be a crucial factor in the ability of interpreting similes. Burt (1971) revealed that some experiences (reading experiences) were positively related to the number of correct responses on the Similes Test. Groesbeck (1961) and Horne (1966) revealed a positive relationship between the knowledge of figurative language and the reading ability, intelligence quotient and vocabulary level, out of which the intelligence quotient was the greatest predictor of success in understanding figurative language. In a recent study done by Karuppali and Bhat (2015), the authors studied the development of the comprehension of simile based figurative expressions in adolescents between 10 - 15 years, and found a steady improvement with age, suggesting that the
amount and quality of knowledge that a child possesses concerning a figurative expression, does play an important role in the child's comprehension of such higher language aspects.

Idioms

An idiom is often defined indistinctly, lacking specific boundaries, whose meanings have to be deciphered in terms of cognitive operations. It involves the retrieval of a particular conventional interpretation and, hence not in truth figurative at all (Burbules, Schraw, & Trathern, 1989). Seidl and McMordie (1978) defines idioms as “a number of words which, taken together, mean something different from the individual words of the idiom when they stand alone”. Similarly, Swinney and Cutler (1979) also considered idiom to be a string of two or more words for which the meaning is not derived from the meanings of the specific words comprising that string. These figurative expressions are complex meanings in short, colorful and interesting ways (Bromley, 1984), which has an interpretation which is not dependent on the literal meaning of the individual words (Zempleni, Haverkort, Renken, & Stowe, 2007). Other authors have also advocated idioms to have strings of words, whose conventional meaning can never be derived from the meaning of its individual constituents (Fernando, 1996). According to Sinclair (1991), idiom is a group of two or more words that are chosen together to produce a particular meaning or effect in writing or speech. These expressions are used to refer to constituents that range from phrasal expressions to proverbs. Idioms also considered as multiword prefabricated chunks (Lewis, 1997), are definite to one language and culture, with their meaning peculiar to that language. These chunks which are also called ‘formulaic language’, include idioms and semi-fixed expressions, and may occupy an important role in language facilitation (Schmitt, 2000). Rowe (2004) opined that these expressions cannot be translated easily into another language. According to McDevitt (1993), idioms are considered to be an indicator of one’s fluency in his/her language, irrespective of the language spoken. Though they are diverse in nature, and may manifest itself semantically, syntactically and pragmatically, these meanings may change in time, or may be neglected (Urdang & LaRoche, 1980). During idiom comprehension, semantic analyzability dominates over the syntactic form of the expression. Hence idioms have become syntactically distinctive having fixed expressions resulting in poor syntactic flexibility.

Loelene, Maureen, Huber-Okrainec, and Dennis (2003) suggest that idioms are expressions whose figurative interpretations cannot be a derivative of their literal meanings.
According to Nippold and Rudzinski (1993) and Sprenger, Levelt, and Kempen (2006), there can be different levels of associations (closely related, somewhat related or not related) between the non-literal and literal meaning. The processing strategies are more demanding when it comes to idioms compared to the non-idiomatic expressions which are of the same length. This difficulty in processing may be due to the selection and inhibition of alternative meanings (Romero Lauro, Tettamanti, Cappa, & Papagno, 2008). Idioms also lay influence on reading and social communication along with language. The presence of idioms may help children have more experiences with these expressions as they progress to higher grades in school. These expressions are apparent in social peer interactions, academic reading materials and also in oral instructions of the classroom. A positive relationship exists between academic attainment and the understanding of idioms, indicating the importance of achieving literacy.

Many investigators agree that the children’s comprehension of idioms is dependent on the development of cognitive processes and that older children seem to understand idioms better than younger ones. Galera Masegosa (2010) suggests that idiomatic expressions carry information that can be understood with the help of cognitive mechanisms, but may still be learned as a whole. In her study, she concluded that these expressions varied based on the complexity of the necessary cognitive mechanisms for the understanding of their meanings. Many other studies have also focused on the influence of cognition on idioms (Herrero Ruiz, 2009; Ruiz de Mendoza, 2011; Ruiz de Mendoza Ibáñez & Peña, Cervel, 2005; Ruiz de Mendoza & Pérez, 2003). According to Romero Lauro et al. (2008), compared to the non-idiomatic expressions having similar length of idioms, the processing of idioms are more demanding, which may be due to the processes of selecting an alternate meaning while inhibiting the other.

Cain, Oakhill, Barnes, and Byrant (2001) propose that the two most prominent processing strategies utilized by the minds of developing children are the interpretation of semantics and contextual analysis. This indicates that comprehending idioms can be considered as an extended process in development, involving contextual processing (top-down processes) and semantic analysis (bottom up processing) (Nippold, 2001). In line with this, Levorato and Cacciari (1999) concluded that the 9 year olds used more of semantic based analysis; whereas the 7 year olds relied more on context inorder to attain the meaning of novel words. Though the older children
also did benefit from context, many literal interpretations did result due to the semantic analysis by the younger children. Other studies have also revealed that the interpretation of idioms are affected by lexical structures (Nippold & Duthie, 2003).

Transparency which is considered as a scale of the relatedness between the nonliteral and literal meanings of an idiom is also found to influence the comprehension of idioms. Norbury (2004) suggested that the idiom comprehension depended on the transparency and opaqueness of the expressions. Gibbs (1987) suggested that the explanation tasks might be more sensitive to subtle factors that may affect idiom comprehension than the forced choice tasks. Glucksberg (2001) discusses the transparency of idioms in terms of the level of decomposition, indicating that the meaning of each word sums up to the holistic meaning i.e. if it’s a more decompositional idiom. This suggests that each semantic part is more meaningful than being meaningless, increasing the possibility of modifications within the idiom (Sprenger et al., 2006). However, when it comes to non-compositional idioms, similar alterations within the idiom may not be possible (Glucksberg, 2001). Highly familiar idioms were understood with higher accuracy in typically developing older children (Nippold et al., 2001; Nippold & Taylor, 2002). Laval (2003) reported that French 9 years-old children did depend on the familiarity to a larger extent for the understanding of idioms. He also indicated that the metapragmatic knowledge varies with context and linguistic aspects. Cain, Oakhill, and Lemmon (2005) did reveal the influence of familiarity in addition to transparency and written text for the comprehension of idiomatic expressions. They claimed that the presentation of idioms within a written context were easier to understand than those presented in isolation. The authors also suggested that the context did provide the essential semantic information from the extraction of non-literal intent that is appropriate for the situation (Qualls, 2003). When encountered an unfamiliar idiom, contextual cues are more important, be it the written or oral modality, especially if they are opaque idioms (Qualls, 2003). Adults who have lived longer, and having much more life experiences, exhibited better familiarity with idioms than adolescents (Chan & Marinellie, 2008; Nippold & Taylor, 2002). The exposure to the idioms may also influence the idiom understanding implying that having more experience with idiomatic expressions may improve the saliency of the idioms (Norbury, 2004). Other conflicting results on familiarity with particular idioms have also been reported. Keil (1986) suggested that there was no guarantee that children would comprehend an
idiom even with frequent exposure to the expression. Levorato and Cacciari (1992) did convey that familiarity did play a negligible role in the comprehension of idioms for older children.

Idiom comprehension is facilitated using contextual cues, which especially helps the elementary school-age children and above (Levorato & Cacciari, 1992). This could be because younger children may have trouble using the linguistic context provided (Levorato, Nesi, & Cacciari, 2004). The performance of idiom interpretation in story contexts also enhances idiom comprehension rather than presenting in isolated sentences (Levorato & Cacciari, 1999). Like other aspects of the lexicon, factors such as familiarity and transparency are subjected to constant change. Cain, Towse, and Knight (2009) compared 7 through 10 year olds’ with 11 and 12 year olds as well as adults, on their ability to infer from context using semantic analysis for the comprehension of idioms using a multiple choice task targeting familiarity/novelty and transparency/opaqueness. Results did reveal that the youngest children were able to use semantic based analysis for the interpretation of transparent idioms as well as using contextual meaning. These results did provide support for the Global Elaboration hypothesis. Another study done by Hsieh and Hsu (2010) examined the effect of familiarity, linguistic aspects and context, on the understanding of idioms in Mandarin speaking children. The results showed that the familiarity did begin to first appear in the responses at age 6; the linguistic convention started from age 6, having a significant effect at the age of 9 years; the context was noted to play an important role in the understanding of idioms having different effects on different age groups; and the metapragmatic knowledge that was demonstrated exhibited at the age of 6 years could be apparent even in younger age.

Nippold and Duthie (2003) studied mental imagery in relation to the incongruity between opaque and transparent expression and indicated that the school age children were able to report appropriate mental images for idioms, however their images were less sophisticated when compared to adults. Their expressions were also more likely to be concrete reflecting only a partial comprehension of the expressions. However in adults, the images reported were more figurative in nature. The authors concluded that the mental images of idioms reported by individuals may indicate the depth of their comprehension of the expressions. Other studies have also demonstrated this link between mental imagery and figurative comprehension of idioms (Bortfeld, 2002; Nippold & Duthie, 2003). Levorato, Nesi, and Cacciari (2004) have suggested
the reading comprehension to be one of the strong predictors of idiom understanding, with the child, adolescent or adult having stronger reading ability outperforming weaker readers on tasks of idiom understanding (Cain et al., 2005; Cain & Towse, 2008; Nippold, Moran, et al., 2001a; Qualls & Harris, 2003). The association between idiom comprehension and written text was also assessed in a longitudinal study done by Levorato, Roch, and Nesi (2007), who assessed the children with poor text comprehension skills. The results did reveal that with improvement in text comprehension, the children did exhibit an improvement in idiom comprehension as well. Studies done by Benneli, Belacchi, Gini, and Lugangeli (2006) and Levorato and Cacciari (2002) on idiom processing abilities in children has conveyed that the ability to use figurative expressions (including idioms) did correlate with the age of the child and years of schooling. This was noted to be associated with the skill to infer from context and the metalinguistic awareness. Idioms that occur in the context of jokes/riddles have also found to be an influencing aspect for the comprehension of idioms. Another factor depends on the speaker intention. Research done by Mueller and Gibbs (1987) and Prinz (1983) reveals that idiomatic expressions is better understood on multiple tasks than explanation based tasks, which may be more demanding on the child’s metalinguistic skills. This does indicate that the type of task used to evaluate the comprehension does seem to affect the results.

Models/theories of idioms. Idioms which comprises of a higher-linguistic processing system, are explained on the basis of various theories and models.

- The Idiom List Hypothesis, being the first non-compositional model of idiom processing which was proposed by Bobrow and Bell (1973) supports the view that idioms are stored in a special list which is not part of the regular lexicon, and hence these expressions are fixed in memory and have to be learned by heart leaving no scope for any kind of cognitive processing. Though the exact manner in which idioms are processed in this model are still vaguely defined, it is suggested that a literal analysis is always triggered first compared to the figurative processing.

- Subsequent to this Swinney and Cutler (1979) proposed the Lexical Representation Hypothesis indicating that instead of idioms being stored in a mental idiom list, the idioms were considered as long words in the lexicon that were stored along the side of other words in the lexicon. They suggested that the meanings of idioms were processed
simultaneously as literal and figurative. The activation of the idiom is brought about when the literal meaning fails to deliver an appropriate meaning for the expression.

- The Direct Access Hypothesis (Cacciari & Tabossi, 1988; Gibbs, Nayak, & Cutting, 1989; Glucksberg, 1993) suggests that only when the figurative meaning is interpreted inappropriately does the literal meaning of an idiom get activation. The rapid activation of the figurative sense makes it possible for idioms to be stored as giant lexical units in memory, and not processed as individual components.

- According to the Configuration Hypothesis (Cacciari & Glucksberg, 1991; Van de Voort, 1995), the idioms are processed literally until the point at which the perceiver has adequate information to identify the idiomatic expression. This hypothesis suggests that the processing of the literal meaning of individual words takes place, even though it may not be pertinent for the comprehension of the entire expression.

- In 1990, Gibbs suggested a compositional model which is the Idiom Decomposition Hypothesis, which reveals the representation of idioms in the mental lexicon in different ways depending on the aspect of analyzing the individual semantic components. If the idioms are depicted by only a single semantic concept, then the flexibility of the syntactic form are difficult to be explained. According to Ortony et al. (1978), the link between the figurative and literal meanings of an idiomatic expression is minimal, and hence being aware of the literal meaning may not be beneficial in learning its figurative counterpart. The considerations based on the processing operations of idioms have evolved considerably, with the cognitive theorists advocating a similarity between literal and figurative language.

- Also according to the Global Elaboration Hypothesis, proposed by Levorato and Cacciari (1995), individuals will understand all figures of speech including idiomatic expressions only when they are able to go beyond a piece-by-piece elaboration of the text searching for a general meaning that is coherent in nature. Levorato et al. (2007) suggests that the level of the idiom’s semantic analyzability relies on the association between the literal meaning of the individual components in an idiom and the idiom’s figurative meaning. The interpreted semantic representations are then assimilated and compared with the writers/speaker’s intended sense as conveyed in the figurative expression. However the
study done by Crutchley (2007) did not reveal a developmental pattern for the figurative and literal interpretations, which was against the Global Elaboration Hypothesis.

- Crutchley (2007) suggested a Need-only analysis hypothesis, which indicated that children break down language chunks into their constituent parts only on requirement basis.

- The Hybrid Model proposed by Titon and Connine (1999) suggested that both the compositional and non-compositional models are essential for idiom comprehension. This model follows the view that during the comprehension of idioms, both the figurative and literal meanings are activated; in which the processing of the non-decomposable idioms takes a longer time than the decomposable idioms. This may be because it takes longer to assimilate the correct sense into idiomatic context and intended meaning.

- This model was later supported by Abel (2003) who introduced the Dual idiom representation model. This model suggested that the non-decomposable idioms were accessed from an idiom entry, while the decomposable idioms were represented by constituent entries. He advocated that idiom entry should be regarded as supplementary information about frequently occurring linguistic units. In addition he also suggested that frequency being an essential aspect in language processing, should also be part of every model of idiom comprehension. Studies have also been conducted on the written and oral idiom comprehension of bilingual children (Abel, 2003; Laufer, 2000; Liontas, 2002).

**Types of idiomatic expressions.** Mueller and Gibbs (1987) described idioms of having literal meanings that are different from their figurative meanings; idioms having meanings that are closely related to the figurative meanings; and finally idioms that have no literal interpretation. However research based on the development of idiomatic meaning in children has primarily used idioms that have both a literal and an idiomatic interpretation. This may have resulted due to the fact that these idioms have been observed to be easier to access because of their literal counterparts. According to Stathi (2006), idiomatic expressions have fixed meanings that are conventional in nature, which is a product of years of recurrent usage (Ackerman, 1982). Fillmore et al. (1988) suggested that an idiomatic expression indicates a specific meaning by the discourse partners, with each expression being classified into encoding and decoding idioms. The former being idiomatic expressions that can be understood by speakers of their respective
language, without having learned them earlier (e.g., pull the windows down). The latter being expressions that require to be learnt previously itself to understand their meaning (e.g., he has green fingers). Another classification of idioms by Gibbs (1991) suggests the existence of opaque and transparent idioms. Opaque idioms (“he is pulling your leg,” “beat around the bush”) are a special case of idioms, conveying little relationship between figurative and literal meanings. These expressions consist of grammatical properties and meanings that are exclusively related to the form that comprises them. On the other end of the spectrum, are the transparent idioms (“hit the nail on the head”, “hold your tongues”), in which the figurative interpretation is an extension of the literal sense. These expressions are more likely to be understood by using cognitive mechanisms as the key tool to study. In addition to opaque and transparent idioms, Galera Masegosa (2010) suggests an intermediate group of idiomatic expressions whose parts express information that can someway be understood with the help of cognitive mechanisms, but may still be learned as a whole (“spill the beans”).

Based on syntax, idioms can vary from being a single word to multiword productions that may include noun phrases, verb phrases, adverb phrases, adjective phrases and independent clauses. According to McMarthy and O’Dell (2008), idioms may also be semantically represented in categories as diverse as animals (e.g., hit the bulls-eye), sports (e.g., ball is in your court), people (e.g., split people up) and places (e.g., fall in place), hearing (e.g., all ears), sight (e.g., all eyes), smell (e.g., count noses), touch (e.g., a magic touch), taste (e.g., a taste for something), foods (e.g., apple of the eye), clothing (e.g., beat the pants off), body parts (e.g., hands are tied), plants (e.g., green fingers) and colors (e.g., into the blue). And finally pragmatically, idioms can aid in a wide range of communicative functions such as providing caution (e.g., It was a close call), praising (e.g., He went and had a sweet talk with her), and expressing humor (Isn't he a bit old for this type of schoolboy humor). Although some idioms occur more often in formal language contexts such as lectures and textbooks (e.g., thrust of the argument), other more colloquial expressions are confined mainly to informal conversational settings (e.g., you got it). According to Vulchanova, Vulchanov, and Stankova (2011), though idioms differ from words, they do function as large words which can be replaced, deleted and inserted very much like regular words. These idiomatic expressions can semantically participate as relations of similarity (synonyms) as well as opposition (antonymy).
According to Popiel and McRae (1988), though particular idioms may vary in frequency of use, these expressions commonly occur in both written and spoken forms of language. Idioms generally occur quite often in language spoken to the children and in the written contexts (Kerbel & Grunwell, 1997). According to Gibbs, Wilson, and Bryant (2012), idioms commonly occur in everyday written and spoken communication including conversations, newspapers, television shows, internet, books, lectures and magazines. Hollingsed (1950) opined that every elementary book contained between 100 and 300 idiomatic expressions. Lazar et al. (1989) assessed the utterances of 5400 classroom teachers, found at least one idiom in 11% of all utterances, and that as the grade level increased there was a corresponding increase in the frequency of idioms, ranging from 4.65% at kindergarten to 20.3% by the eighth grade. Johnson-Laird (1993) conveyed that it is difficult to speak spontaneously without ending up using an idiom. The occurrence of idioms was also found to be 6.7% in all sentences, in reading programmes of third through eighth grades (Nippold, 1995).

**Assessment and development of idioms in adolescents.** The acquisition of idioms is a steady process in which the interpretation of a particular phrase is at first literal, but is eventually expanded with increase in the child’s age to include its figurative counterpart. Research in the past has indicated that the comprehension of idioms begins in early childhood and progresses steadily throughout early childhood, adolescent years and well into adulthood (Nippold, 2006). Lodge and Leach (1975) showed that the 6 and 9 year olds have significant difficulty with figurative interpretations. The 12 year olds understood few of the figurative meanings, while the 21 year olds seemed to master them. This study also indicated the lack of semantic duality in younger children compared to older ones.

A study done by Ackerman (1982) did reveal that while the 6 year olds had difficulty in the interpretation of sentences alone, the 8 year olds were able to understand the sentences within figurative contexts. In contrast, both the 10 year olds and the adults were able to understand the sentences within figurative contexts as well as in literal and neutral contexts. Hence, the authors concluded that the younger children did rely on linguistic contexts to a greater extent than older children, for the interpretation of idioms. In his study, Gibbs (1991) hypothesized that opaque idioms were more difficult to interpret than transparent idioms and revealed that idioms present in isolation were more difficult to comprehend than idioms present in a context. The opaque
idioms were more difficult than the transparent idioms (mostly in the explanation task with context being present); and the multiple-choice task being easier than the explanation task. However, it was also observed that the performance on both the response modes did gradually improve with age, with the oldest children still being unaware of all the idioms. The understanding of transparency and opaqueness of idioms were also studied in the adolescent population by Nippold and Rudzinski (1993).

Kempler, Van Lancker, Marchman, and Bates (1999) found that children (aged 10-11 years) begin to attain adult like knowledge of idioms. The authors suggested that the understanding of idioms did follow an irregular path which is closely linked to the vocabulary spurt between the second and third year. When considering idiom usage, this process takes nearly four times longer with a peak at around 11 years. Nippold and Taylor (2002) studied the idiom comprehension, transparency and familiarity judgement in children (aged 11 years) and adolescents (aged 16 years). The participants were presented 20 idioms in a multiple-choice task. The results showed that the children were unable to perform better than the adolescents in terms of familiarity judgement of idioms as well as idiom comprehension. However the children’s transparency judgement did not vary from those of the adolescents. In the study done by Cain et al. (2009) who compared 7 through 10 year olds’ with 11 and 12 year olds as well as adults, on their ability to perform idiom understanding tasks with and without a story context, did reveal that the linguistic processing skills that help in the understanding of idioms were still not fully developed in the 11 and 12 year olds.

The development of idiomatic expressions was studied throughout the lifespan as well. An extended age group was targeted by Brasseur and Jimenez (1989) inorder to study the comprehension of idioms. The results revealed an improvement in the performance with age, indicating that the idiom explanation persists to progress throughout adolescence and well into adulthood. Similarly, Hung and Nippold (2014) examined the idiom comprehension skills of adults in their 20s, 40s, 60s and 80s (n=30 per group). The task consisted of the participants judging and explaining the meaning of each idiom, selecting the appropriate interpretation from a set of choices, and describing the context where the idiom could have been used. The results did not reveal any age related decline on any of the tasks; however it was noted that the 60s group offered better explanations and had greater familiarity than the 20s group.
Unlike the several studies done on English speaking children on the comprehension of idiomatic expressions, researchers have also attempted to see if the traditional pattern of results obtained can also be extended to other cross-cultural populations. A study was conducted by Levorato et al. (2004) on Italian school going children with different reading comprehension skills. The authors theorized that the level of a child’s written text comprehension skills should be able to predict his/her ability to understand idioms. After an initial phase of assessing the ability of second and fourth graders to comprehend written texts, the children were presented with familiar idioms which also had a literal meaning. These idioms were embedded in stories and followed a multiple choice task (idiomatic, literal and neutral answers). The results exhibited that the ability to understand a text did indeed predict children’s understanding of idioms in context. Fuste-Herrmann (2008) investigated the relationship of text comprehension and idiom comprehension in bilingual (Spanish-English) adolescents and their monolingual peers. The author assessed the idiomatic familiarity, contextual support and semantic transparency, along with three linguistic measures (reading comprehension, a synonyms task and an error detection task). With the monolingual outperforming the bilinguals in all measures, the results revealed a three-way interaction among idiomatic familiarity, contextual support and semantic transparency. In addition, the three linguistic measures also did predict the amount of English experience in bilinguals, with differences emerging between the simultaneous and sequential language learners. An Indian study done by Karuppali and Bhat (2013) aimed to determine the developmental trend in the interpretation of idiomatic expressions in children between 11 through 14 years of age. A total of 27 idioms were selected and presented to participants in written text. They were asked to read the idiom and select its appropriate interpretation. The participants were given a multiple choice task (literal, figurative and a foil). Results were in accordance with the general notion that with increase in age the performances of figurative interpretations were better. Another study was done by Vulchanova, Vulchanov, and Stankova (2011) on preschoolers (younger children), third graders (older children) and adults, with Bulgarian as their first language. The authors hypothesized that at around age 10, the children’s knowledge of idiomatic expressions begins to approximate adult-like knowledge. The stimuli included 56 frequent idioms following an explanation mode as the type of response. Results did reveal that the younger group displayed basic linguistic skills when compared to the older group which exhibited advanced skills. This indicated that the ability to work with figurative language
did correlate with the age and years of schooling and can be linked to metalinguistic awareness and the ability to deduce from context (Benneli et al., 2006; Levorato & Cacciari, 2002).

**Proverbs**

Proverbs are considered as statements that express the shared beliefs, values, social norms and wisdom and moral concerns of society (Gibbs Jr & Colston, 2012; Nippold, 2007), serving a variety of communicative purposes, such as offering encouragement, giving advice, consoling someone, interpreting behavior, commenting on events and also nurturing attitudes such as humility, optimism and pessimism. Proverbs also can occur in debates, fables, sermons, billboards, plays, conversations, lectures, and poems. The majority of proverbs learnt during the schooling are through fables, which are short stories that convey a message or a moral value. Proverbs also express sentiments rather than complete truths, which may be subject to disagreement due to contextual and personal factors. The interpretation of proverbs is considered to be a metalinguistic skill, reflecting an individual’s abstract reasoning ability, general intelligence, cultural knowledge and verbal competence (Hirsch, Kett, & Trefil, 1988; Van Lancker, 1990). Comprehending proverbs is considered as an analytical task that involves an individual to replicate actively upon the sense of a proverb in relation to the situation in which it was spoken. This skill also requires cognitive flexibility, as proverbs can be used in a range of diverse situations, which permits the referents of the figurative comparisons to shift. The exposure to proverbs is also an important part of cultural learning (Hirsch et al., 1988).

Preschoolers normally encounter proverbs when their parents or care-givers read a short story (fable) to them and later when they are able to read by themselves, thereby being encouraged to abstract the meaning of the proverb by attending to the fable. According to Wood, McDonnell, Pfordresher, Fite, and Lankford (1991), public school going adolescents are expected to read and comprehend proverbial expressions occurring in their literature textbooks, that may test their values and beliefs. Proverbs may exhibit a wide variety of difficulty, with few expressions being much easier to comprehend than others. Research reveals that when receptive tasks are used to evaluate the comprehension of idioms and metaphors, children exhibit an understanding of those figurative expressions several years before they can effectively explain their meaning (Dent, 1984). The frequency with which the figurative expressions occur in the language may affect the ease of proverb understanding in adolescents, with rare proverbs more
difficult than common proverbs. In addition, proverbial expressions often express meanings that involve worldly experience, requiring greater analytical effort from the interpreter. Adolescents with stronger literacy skills and analogical reasoning abilities are found to perform better compared to their peers who are under-achievers (Nippold et al., 1998). Along with reading skills, listening comprehension were also noted to be associated with proverb understanding (Nippold, Moran, et al., 2001b). The presence of a linguistic context may also facilitate the interpretation of the expression. Incongruous proverbs such as the one stated by Hirsch et al. (1988), "Too many cooks spoil the broth" and "Many hands make light work", that may result in confusion by the interpreter, may easily be resolved once the role of context is recognized for the understanding. This may suggest that in different situations, each proverb may be appropriate compared to when the proverbs are used with no contextual role resulting in an unclear or a partially understood phrase. Another significant contribution towards the difficulty of proverb comprehension lies at the syntactic and semantic complexity of the expression. The variety of words used in proverbs may contain concrete nouns which are easier than abstract nouns, which may affect the figurative comprehension (McGhee-Bidlack, 1991; Nippold, 1998a). Similarly studies have also revealed that the most familiar proverbs were the easiest to explain than the less familiar ones (Cunningham, Ridley, & Campbell, 1987; Penn, Jacob, & Brown, 1988).

Nippold and Haq (1996) investigated the role of concreteness and familiarity in proverb comprehension in children and adolescents and found unfamiliar proverbs more difficult to comprehend than familiar concrete proverbs. These results gained further support from other studies (Nippold et al., 2000). Power, Taylor, and Nippold (2001) assessed the role of two types of unfamiliar concrete proverbs (expressions whose literal meanings can and cannot be true in the real world) that were presented in a multiple choice format to children and adolescents aged 9, 11 and 14 years. However, no significant differences were found in the ease of understanding between the two types of proverbs for any age groups. The imageability also does play an important role in the comprehension of proverbs. With reference to this, Higbee and Millard (1983) found that young adults reported that proverbs vary greatly in the degree of mental imagery they evoke, indicating that expressions that contain concrete nouns are more likely to induce strong visual images compared to those containing abstract nouns. The link between mental imagery and proverb comprehension appears to be closely associated in young adults and
that the mental images become more figurative with increasing age (Duthie, Nippold, Billow, & Mansfield, 2008). Another influencing factor for the comprehension of proverbs also seems to be the type of method used to examine the participant’s understanding. Proverbial expressions can vary widely in difficulty; however the comprehension of certain proverbs by individuals does not imply the effective comprehension of other proverbs (Nippold, 1988).

Theories of proverbs. The understanding capabilities between the concrete and abstract proverbs have been taken as a support for the ‘metasemantic hypothesis’. This assumption follows the view that proverbs are learned through a process of analyzing the words they comprise (Nippold et al., 1998, 1997). In contrast to this hypothesis, the traditional view supports that proverbs are learned as a giant lexical unit, with the role of literal meanings limited compared to their figurative counterpart (Gibbs, 1994). According to Honeck, Voegtle, Dorfmueller, and Hoffman (1980), the traditional view follows the process of using rote memory rather than constructing mental activity. Studies done by Cunningham et al. (1987) and Penn et al. (1988) lead support for the ‘language experience hypothesis’ of figurative language which considered that competence in this area is due to the meaningful exposure one has to figurative expressions (Ortony et al., 1985). Other studies have also lent support for the language experience hypothesis (Nippold & Rudzinski, 1993; Nippold & Taylor, 1995). The ‘information processing theory’ proposed by Burgess and Chiarello (1996), have advocated that an active interplay exists between the pragmatic (top-down processes) and semantic (bottom-up processes) aspects, for the understanding of proverbs. The top-down system provides the linguistic context in which the proverb occurs, comprising of the speakers intention in using the expression and the pragmatic information about the situation. Whereas, the bottom-up processes may involve the activation of word features to gain the semantic information of the proverb. Numerous studies have supported the influence of context on proverb comprehension (Mueller & Gibbs, 1987; Nippold, Martin, & Erskine, 1988; Nippold & Martin, 1989). However, limited studies have been done on the role of bottom-up processes in proverb comprehension. In the context of concrete and abstract proverbs – the former invokes stronger mental images than the latter, which is in line with the ‘dual coding theory’ (Gibbs, 1994). This particular theory is a recognized framework in cognitive psychology which helps describe how people get meaning from language (Paivio & Walsh, 1993; Paivio, 1991; Sadoski & Paivio, 2001). The main aspect
of the theory is the difference between verbal information, which includes words and phrases, and nonverbal information, which includes the linked mental images.

**Types of proverbial expressions.** Proverbs can be classified in terms of their concreteness – being concrete and abstract in nature. A proverb is referred to be a concrete one if the expression contains nouns that refer to tangible objects that can easily be visualized. For example, “A rolling stone gathers no moss” is a concrete proverb. In contrast, abstract proverbs are expressions when all their nouns refer to intangible entities that are difficult to visualize. For example, “Failure is the stepping stone to success”. Proverbs may also vary based on their familiarity – familiar/high-familiarity and unfamiliar/low-familiarity proverbs.

**Assessment and development of proverbs in adolescents.** Children appear to have some comprehension of figurative language including proverbs, years before they can completely interpret those meanings. Researchers have argued that children may have little or no understanding of proverbs before adolescence (Lutzer, 1988). Though children are exposed to proverbs at a young age, reports have also indicated that these expressions may be more difficult for them to understand than other types of figurative expressions such as idioms, similes, and metaphors. Strategies that are metasemantic in nature play a crucial role in the development of figurative comprehension throughout school-age and adolescent years (Nippold et al., 1997). Studies were done pertaining to the comparison of proverbs with other types of figurative language. Many proverbs are similar to metaphors, as they involve a comparison of things that are normally regarded as different. The comparison evident in proverbial expressions is more subtle than in metaphors. This is because unlike metaphors, proverbs typically contain more than one vehicle, never stating the topics. These topics of the proverbial expressions are variable and can only be found within a context. The developmental literature does support the metasemantic hypothesis for other varieties of figurative expressions, including metaphors and idioms (Nippold & Taylor, 1995). In the study done by Nippold et al. (1988), the proverbs selected for the study was found to be varying widely in difficulty. In accordance to this, Nippold and Haq (1996) postulated that the familiarity and concreteness of proverbs would affect their ease of comprehension. The students were then asked to select the answer that best conveyed the meaning of the proverb, and revealed a steady improvement in the performance with increase in
grade level. The concrete proverbs were found to be easier than the abstract, and the unfamiliar proverbs were difficult than the familiar proverbs.

In order to examine the probability of further development in proverb comprehension during adulthood, Nippold et al. (1997) indicated that performance on the proverb explanation task improved significantly during adolescence and into early adulthood, reaching a plateau during the 20s, and remaining stable during 30s through 50s, and beginning a slight decline during the 60s, continuing into the 70s. In accordance to the previous studies, the concrete proverbs were found to be easier to explain than the abstract ones for both the adolescents and young adults; however not differing in difficulty for adults in their 30s and older. In view of none of the groups reaching the ceiling on the task, indicated that the task was challenging. A modified version of the study done by Nippold et al. (1998) indicated that the abstract proverbs were more difficult than the concrete proverbs. Considering 90% above as the mastery level, the students were still not able to attain the same until young adulthood. They concluded by suggesting a probable plateau in the development of proverb comprehension, questioning the further improvement which may occur beyond young adulthood. An additional objective of their study was to determine the association between the proverb comprehension and academic achievement and the results did not reveal significant difference, indicating that the proverb understanding in adolescents is related with academic success.

A series of studies (Nippold & Haq, 1996; Nippold et al., 1998, 1997) were conducted that aimed to develop a tool to assess proverb comprehension in the English speaking youth. One of the versions of this tool was administered in the study done by Nippold, Allen, and Kirsch (2000) who studied 150 participants that were divided into three groups (mean age 12;2, 15;7 and 18;0 years). The authors developed and used a proverb comprehension task and a word knowledge task which were administered on the participants. In the proverb comprehension task, the proverbs contained both abstract and concrete nouns which were rated based on familiarity. The proverbs were presented within a story context and the participants had to select the correct interpretation from a set of four choices provided. Similarly the word knowledge task contained a written multiple choice task that was designed to assess the participant’s knowledge of the abstract and concrete nouns contained in the proverbs on the proverb comprehension task. Each noun on the word knowledge task was followed by four probable definitions, one of which best
explained its meaning. In the proverb comprehension task, there was a steady improvement in the accuracy scores with each successive age group attaining 56%, 70% and 83% respectively. Results did reveal that the word knowledge was found to be closely linked with proverb comprehension in all the groups. Subsequent to the previous study, Nippold, Allen, and Kirsch (2001) studied the proverb understanding through reading in 42 preadolescents (mean age = 12;2 years). Based on their scores on a school-administered achievement test, the participants were further assigned into proficient and less proficient readers. Reading and a nonverbal analogical reasoning task were administered to assess the understanding of unfamiliar abstract and concrete proverbs, as well as the knowledge of nouns contained in the expressions. The results suggested that the proverb understanding was associated with word knowledge, analogical reasoning and reading proficiency, with the proficient readers outperforming the less proficient readers on the comprehension of both types of proverbial expressions. In line with the study done by Nippold, Allen, and Kirsch (2000), a cross cultural study was conducted by (Nippold, Moran, et al., 2001b) who investigated the comprehension of proverbs in 12 and 14 year old students in America (n=100) and New Zealand (n=100). A written comprehension task was administered that contained 20 unfamiliar proverbs (concrete and abstract proverbs). The results revealed that the 12 year olds performed poorer than the 14 year olds, with concrete proverbs being easier than the abstract proverbs. However, no differences in the proverb comprehension task between the age-matched American and New Zealand groups were observed.

**Figurative Language Impairment in Adolescents**

Children with language disorders have deficits in the understanding of figurative expressions (Botting & Adams, 2005; Norbury, 2004). This disordered population includes children with SLI (Botting & Adams, 2005; Norbury, 2004); ASD (Botting & Adams, 2005; MacKay & Shaw, 2004); Semantic Pragmatic Language Disorder (SPLD) (Kerbel & Grunwell, 1998); Williams syndrome (WS) (Naylor & Van Herwegen, 2012; Thomas et al., 2010) and children with hearing impairment (Iran-Nejad, Ortony, & Rittenhouse, 1981).

**Impairment in the comprehension of similes.** A study done by Van Der Merwe (2008) assessed the comprehension of figurative expressions (idioms and similes) in three groups of males (aged 8 and 10 years). Group 1 and 2 consisted of typically developing Afrikaan first language speakers and Afrikaan second language speakers respectively; whereas Group 3
included Afrikaans first language speakers with SLI. A verbal assessment of figurative language was carried out on 18 participants. A total of 25 idioms and 25 similes obtained from a standardized language assessment tool ‘The Afrikaans semantic language evaluation medium’ which was given by Pretorius (1989), were used for the study. The participant was given an idiom and was asked to relay the meaning of the idiom. Similarly, similes were tested using incomplete sentences that were read to the child by the examiner, with the child required to fill in the missing word. According to Pretorius (1989), this simile task intends to measure the child’s skill to define words and categorize, making appropriate comparisons. Results revealed that the comprehension of idioms and similes by Afrikaan-speaking children with SLI was slightly inferior when compared to that of the other two groups. However, no statistically significant differences were found to exist among the three groups.

Thomas et al. (2010) studied the developmental link between figurative language and cognition 117 typically developing children (aged between 4 and 12 years), 19 typically developing adults, 15 children with WS (aged between 5 and 12 years), and 8 adults with WS. The participants were asked to complete categorization and similarity phrases with word pairs formed from items that were perceptually, functionally, or literally similar to the target word. The results indicated that individuals with WS may access different less abstract concepts in figurative language comparisons though they had relatively strong verbal abilities. Subsequent to this, another study was done by Naylor and Van Herwegen (2012), who also investigated the development of figurative language production in WS. The authors assessed different types of figurative expressions in 20 typically developing children and 20 children with WS (aged between 7 and 18 years). The results were in contrast to the previous study, stating that the developmental pattern showed that the production of figurative expressions in typically developing children did not change with age, with the WS group producing a similar amount of figurative expressions compared to the typically developing group. Another study done by Iran-Nejad, Ortony, and Rittenhouse (1981) on profoundly deaf children aged between 9 and 17 years revealed that the children clearly exhibited their ability to comprehend novel metaphorical uses of English and that their metaphorical selection improved with an adequate feedback given during few practice trials.
Impairment in the comprehension of idioms. Students with language disorders frequently exhibited a pattern that was similar to that of younger typically developing children, wherein the interpretations of the figurative expressions were literal. According to Nippold and Martin (1989), students with language disorders having poor reading skills are predominantly disturbed in understanding these expressions, as written text frequently gives clues to the figurative meanings of idioms. Cain et al. (2005) reported that English-speaking monolingual children appear to exhibit a positive relationship between reading comprehension and the level of idiom comprehension at age 9 years. In line with this study Nippold and Martin (1989) also found a relationship between idiom comprehension and the overall academic success in monolingual English speaking adolescents. Studies have also suggested that idioms can often be confusing, especially for adults having suffered a brain injury through trauma or strokes (Papagno & Caporali, 2007). Other studies have also concluded that along with idioms other types of figurative expressions are difficult for children who are language disordered (Spector, 1992). According to Norbury (2004), children with cognitive and/or linguistic impairments have similar interpretation skills like younger children.

Ezell and Goldstein (1991) conducted a study on the comprehension of idiomatic phrases on typically developing and mild mentally challenged children and found significant differences between the children developing normally and those with mild mental retardation, with the former group performing better than the latter group. Vance and Wells (1994) conducted a study on a group of language disordered children and language-age-matched peers, and found no deficits in idiom comprehension for the former group compared to the latter. This suggests that the comprehension of nonliteral language is at par with the general language ability. According to the authors, the high accuracy level for both the groups may be due to the simplicity in the task, which involved choosing the correct figurative interpretation from a display of three pictures. Another study done by Rinaldi (2000) reported poor performance in the comprehension of ambiguous language (including idioms) by 11-14 year old students with language impairment compared to age matched and language age-matched non-impaired students. Norbury (2004) explored the comprehension of idioms in context in 93 children with communication disorders (autism and language impairment) and 39 age-matched peers. Idiom definitions were collected in isolation as well as in context. All children benefited significantly from context, except for the
communication impaired group. In another study, Qualls, Lantz, Pietrzyk, Blood, and Hammer (2004) found that adolescents with language-based learning disabilities in eighth grade had more difficulty understanding written idioms than their reading ability matched and age-matched peers in the same grade, who also were reading below grade level. A strong relationship did emerge between the reading ability and idiom understanding as assessed by the Idiom Comprehension Test (Qualls & Harris, 1999).

**Impairment in the comprehension of proverbs.** Students are expected to understand various figurative expressions, particularly as they progress through their school years. According to Nippold et al. (1998), the preadolescents showed greatest variance in their performance in proverb understanding, indicating that such tasks would be informative to evaluate the preadolescents thoroughly. Such data are essential to identify adolescents with language impairments, having frequent difficulty in the comprehension of proverbs and other types of figurative expressions (Abrahamsen & Sprouse, 1995; Secord & Wiig, 1993; Towne & Entwisle, 1993). In addition to assessing adolescents with language impairments, Nippold, Allen, and Kirsch (2001) indicated in their study that preadolescents who are less skilled in reading, do experience difficulty understanding proverbs and hence have poorer reasoning skills and vocabulary. These tasks of proverb interpretation have also been used to assist in the diagnosis of dementia, and other psychiatric disturbances. Moran, Nippold, and Gillon (2006) studied ten adolescents (aged 12;0 to 21;0 years) who had suffered from a traumatic brain injury prior to the age of 10 years along with ten individually age matched peers with typical development. The participants were presented short paragraphs containing a proverb and were asked to select the correct interpretation from a forced choice task. The analysis revealed that the participants with TBI differed from their non-injured peers in their understanding of the proverbial expressions.

Researchers have time and again advocated the use of semantic and morphologic based tasks to tap upon the development of adolescent language. A few standardized tests incorporating such language tasks are actively been used in the western population, for the identification of adolescents with language disorders. However, the study of language development in adolescence is a relatively new field, especially in India. The present research aimed to develop an assessment tool to assess the adolescent language in the Indian population.