CHAPTER 2: REVIEW OF LITERATURE

Literacy is traditionally defined as the ability to read and write. Literacy is considered a process of psychological and linguistic elements of reading and writing that a child develops with the help of meaning. It often begins early, long before children encounter any formal school instruction in reading and writing. Literacy is central to academic achievement and life-long learning. Literacy involves reading and writing as ways of making, interpreting, and communicating meaning wherein reading is defined as the ability to obtain meaning from print (Heath, 1980) and writing as the ability to use print to communicate with others. According to these definitions, reading and writing are more than simply decoding and encoding print; they are ways of constructing and conveying meaning with written language. Becoming literate, is a multifaceted phenomenon that involves more than learning a set of technical skills such as, learning the alphabet, learning how to form letters and spell words, and learning how to decode print that are typically taught in elementary school. Becoming literate includes mastering specific skills related to written language as well as a ‘complex set of understandings, attitudes, expectations and behaviors’ (Erickson, 1984). An individual can be literate in one language or in more than one language. When an individual gains the mastery of the fundamentals of speaking, reading and writing (knowing sound/symbol connections, conventions of print, accessing and conveying meaning through oral or print mode) in two linguistic systems, he/she is considered to be a biliterate (Reyes, 2001).
The term biliteracy\(^1\) is used to describe children’s competencies in two written language, developed at varying degrees, either simultaneously or successively (Dworin, 2003). Specifically, Dworin recommends that use of both the languages should be encouraged and the languages should have comparable status in the classroom (Dworin, 2003). In the recent years, the term “biliteracy” has gained importance in the fields of bilingual education, bilingual literacy and English as a second language (Francis, 1999). Since one learns to read once and subsequently has access to the same text processing and general discourse proficiencies associated with literacy when reading or writing in a second language, there is a strong reason to combine the concepts of “bilingualism” and “literacy” to refer to a unique or peculiar set of language skills in biliterate children.

2.1 Language and Literacy

The word ‘language’ is often used to refer to several kinds of human activity. It primarily focuses on the oral and written medium used to communicate with one another. The term is used especially to refer to human language and to distinguish between language and other forms of communication. A general definition characterizes language as a *system of arbitrary vocal symbols by means of which members of a society interact with one another*. There are primarily four language skills—listening, speaking, reading and writing. Often it is believed that an individual begins with the listening skill before speaking skill and begin with the reading skill before writing skill. A few researchers divide the language skills into

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\(^1\) *Operational definition of ‘biliteracy’ adapted for the present study:*

‘Biliteracy’ or ‘bilingual literacy’ refers to *sequential acquisition* of languages to learn literacy skills at home and in schools. Here, the first acquired language i.e. L1 is the native language of the child and the language the child acquires after that at school is considered second language or L2. In the context of the present study, Kannada becomes L1 and English becomes L2.
two broad groups- receptive and expressive skills. Listening and reading are considered receptive skills, while speaking and writing are considered expressive skills. Thus, by definition ‘language’ also, comprises of ‘reading and writing skills’ which are the components of ‘literacy skills’.

Language acquisition is defined as a less deliberate, subconscious process of mastering a language, and is often associated with the manner in which children acquire their native or first language. First language is also referred to as L1 in the literature. L2 is the second language. While, children acquire language, they are unaware of the grammatical rules. In order to acquire language, the learner needs a source of natural communication. The context of communication and not the grammatical structure of a given language is crucial for acquisition of language. On the other hand, language learning is largely a mastery of the four language skills, in terms of the phonetic, phonological, morphological (word), syntactic and semantic aspects of the target language. In language learning, learners have conscious knowledge of the new language and can talk about that knowledge. Research has shown, however, that knowing the rules of grammar does not necessarily result in good speaking or writing. It also covers the communicative appropriateness of the structures used, in addition to a mastery of related linguistic information.

2.2 Bilingualism and Second language

Bilingualism refers to the knowledge and use of two languages and an ability to make a meaningful utterance in another language (Harding, Ruth & Riley, 1986). If a speaker is fluent in two languages, then he is said to be a bilingual. The commonly held image of a bilingual person is of someone brought up in a culture where he/she is exposed to two languages from birth. Weinrich (1953) proposed
three types of bilingualism depending on the way in which the two languages are learned.

a) A *compound* bilingual learns two languages in the same environment so that he/she acquires one notion with two verbal expressions.

b) A *coordinate* bilingual acquires the two languages in different contexts (e.g., home and school), and therefore, the words of the two languages belong to two separate and independent systems.

c) In a *sub-ordinate* bilingual, one language dominates the other.

Bialystok and Hakuta (1994) made a distinction between *simultaneous* (L1 and L2 learned about the same time), *early sequential* (L1 learned first and L2 relatively early in childhood) and *late* (from adolescence onwards) bilingualism. Early sequential bilinguals form the largest group worldwide and the number is increasing. By convention, the language learned first is called *L1* and the language learned second is called *L2*. Sometimes L1 and L2 are learnt simultaneously. The term second language\(^2\) is often used to mean a language that is learned after the first or native language is relatively established. The term is not applicable in the case of a child learning two languages simultaneously, in a bilingual setting. This term is also used to refer to learning a foreign language. Learning a new language in a

\(^2\) *Second language (L2) v/s English as a second language (ESL)*

Learning to read in a second language can mean different things in different situations and settings. For instance, the situation of a bilingual child learning to read English as a second language (ESL) is qualitatively different from that of an adult ESL learner learning to read English for literacy purposes (Pang & Kamil, 2004). In the literature, we encounter different terms for describing children who are developing literacy in more than one language, for example: “bilingual students,” “English language learners (ELL),” “language minority students,” “English-as-a-second-language students,” “second-language learners,” “limited-English-proficient students,” and “limited-English-speaking (LES) students”.

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foreign language context (studying English as a second language in Japan) as well as learning a new language in the host environment (learning French as a second language in France) is covered by this term. This term may refer to languages learnt after the first language. However, in the changing global scenario, it is plausible that the language learnt first turn out to be the secondary language of use in later life and therefore a rigid definition of terminology is not advisable.

The age of acquisition of L1 and L2 is also debated for long. Lenneberg (1967) proposed that learning a first language, starts around the first year of life and ends at puberty when the brain maturation reaches the adult level. Snow and Hoefnagel-Hohle (1978), Bialystok and Hakuta (1999), Flege (1999) have argued against the critical period in a second language, supporting the fact that adults acquire native-like fluency only if the optimum context (one similar to that for children) is provided to them to learn a second language. The counter argument for the critical period hypothesis is further supported by the linguistic interdependence hypothesis proposed by Cummins (1979, 1999). It states that the skills developed in the first language transfer to the second language. He distinguished between basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP) and theorized that while children may acquire native-like BICS by two years, they take time 5–10 years to catch up academically in English (Collier, 1987; Cummins, 1999). Cummins (1999) also theorized that the transfer of skills occurs only after a certain linguistic competence in the second language is attained which he termed as ‘threshold hypotheses’.

To summarize, language acquisition in a bilingual is a process of mastering of two or more languages by children. Some children acquire two or more languages
simultaneously in the same environment and later on learn other languages in different environments such as in schools. Research in the past few decades have suggested the influence of L1 on L2 and vice versa for spoken language skills. A few researchers talk about influence of L2 to be more on L1 when L2 is introduced intensively. However, various other researchers argue that influence of L2 can lead to cognitive disadvantage in the child’s literacy skills in L1. A few other researchers attribute this cognitive disadvantage to the acquisition of second language that has writing systems different from that of the first language.

2.3 Writing systems, orthographies, and scripts

A grapheme refers to the letter or combination of letters that represent a phoneme. Writing systems reflect design principles and not appearances of letters. The script is nothing but the visual forms of writing — the basic unit size for the mapping of graphic units to language units. Written language systems or scripts around the world can be grouped in the following way:

a) **Alphabetic scripts**: The written language most familiar to speakers of English and other European languages are alphabetic scripts. In alphabetic scripts, the basic unit represented by a grapheme is essentially a phoneme. In languages such as English, this relation can be one-to-many in both directions. A phoneme can be realized by different graphemes and a grapheme can be realized by many different phonemes. The nature of this correspondence can vary. In transparent languages such as Serbo-Croatian, Italian, Indian language like Hindi and Kannada, majority of graphemes show one-to-one grapheme-to-phoneme correspondence (GPC). Some languages lie between these extremes. In French, correspondences between graphemes and phonemes are quite
regular, but a phoneme may have different graphemic realizations (e.g. the grapheme “о”, “au”, “eau”, “aux”, and “eaux” all represent the same sounds).

b) **Consonantal scripts:** In consonantal scripts such as Hebrew and Arabic, not all sounds are represented, as vowels are not written down.

c) **Syllabic scripts:** In syllabic scripts (such as Cherokee and the Japanese script Kana, Indian scripts like Hindi and Kannada), the written units represent syllables.

d) **Logographic scripts:** Some languages do not represent any sounds. In logographic language (sometimes also called ideographic languages) such as Chinese and the Japanese script Kanji, each symbol is equivalent to a morpheme.

*Orthography* is a writing system designed for a specific language. Thus, while referring to written English, it is understood that it is not a distinct writing system but it has a distinctive orthography, differing from Italian, Korean and other orthographies within the alphabetic writing system. Within the alphabetic writing system, orthographies vary in the transparency of mappings between letters and phonemes; While, Italian and Finnish are very transparent, English is relatively nontransparent and Danish lies in-between the two.

The writing system that a language uses is found to affect children’s acquisition of literacy because each system is based on a different set of symbolic relations and requires different cognitive skills (Coulmas, 1989). These relations place different demands on children’s analysis of spoken language and their recording of the language in print. The task of learning to read in each of these writing systems is the effect of bilingualism on learning to read in each of these
systems. This depends on the type of writing system employed in the target language (Bialystok, Luk & Kuwan, 2005). Further, understanding these systems with different symbolic relations will need different processing mechanisms in order to acquire literacy in those languages.

2.3.1 Theoretical framework

Reading and writing involves various processing mechanisms in children. There are many hypotheses and assumptions put forth by researchers on reading and its relation to the processing of different writing systems existing in the world. In order to understand the processing mechanisms of different aspects of literacy in bilingual children, Geva and Wang (2001) have reviewed the evidence for underlying universal principles which facilitate children’s use of processing strategies in second language and bilingual literacy learning. In the L2, the rapid and automatized processing of orthographic-phonological correspondences sustains skillful decoding and comprehension (Birch, 2002), just as it does in L1 reading (Adams, 1990; Perfetti, 1994). Bernhardt (2005), Grabe and Stoller (2002) and Stanovich (2000) surveyed and found that L2 readers’ phonological representation of words during decoding need not be native-like or complete for the purpose of processing for meaning. If word decoding continues to be effortful and laborious for beginning and intermediate L2 learners, it will be further difficult for higher order, sentence-level processing meaning (Saiegh-Haddad & Elinor, 2003).

Geva, Wade-Wooley and Shany (1997) assumed that the cognitive processes that underlie first language reading development also apply to the development of an individual’s second language. Not all researchers are in consensus with such a common cognitive process for learning all the languages in the world. This may be true because languages differ in terms of the regularity between written symbols
(letters/graphemes) and sounds/phoneme i.e., the transparency of orthography is different for different languages. Therefore, an individual may require specific cognitive processes for learning such scripts. Snowling (2000) assumed that children may present different levels of difficulty for reading, especially when they are acquiring literacy skills in different languages. Therefore, he believed that component processes utilized during the acquisition of literacy in different languages cannot be assumed to be the same, and theories that make this assumption require empirical evidence. In general, Geva and colleagues (Geva & Siegel, 2000; Gholamain & Geva, 1999) proposed that the main theoretical positions can be reduced to two competing perspectives as the script dependent hypothesis and central processing hypothesis.

a) The Script Dependent Hypothesis

The script dependent hypothesis posits that reading acquisition varies across languages. Under this general viewpoint are those theories that propose that reading development should vary with the transparency of a particular orthography. Accurate word recognition skills are assumed to develop more slowly in less transparent orthographies than they do in more transparent orthographies. Transparent orthographies permit a simple direct one-to-one correspondence between letters and sounds of words. Less transparent orthographies, however, use more complex relationships between letters and sounds. These differences in letter-sound correspondence rules have led to variations in the prevalence and patterns of reading difficulties from one language to another, as well as to differences in the development of reading processes and skills between languages. It is believed that, less transparent the orthography more complicated the process of phonetic encoding, the slower the acquisition of literacy and ultimately, the more prevalent and severe
the reading problems. Liow (1999) reported that decoding strategies varied among Chinese-English bilinguals/biscriptals, depending on which language/script was used for initial literacy instruction. Wang, Koda and Perfetti (2003), in a study of Korean and Chinese English-language learners, showed how differences in students’ L1 orthography (alphabetic and morpho-syllabic, in this case) impact on L2 decoding strategies. In this regard, examples of “strategy transfer” (Liow, 1999) point to language specific, script-dependent factors that deserve further investigation (Bialystok, 2002).

Emerging research evidence in support of the script dependent hypothesis shows that the complexity of orthography alters the rate of literacy acquisition in a transparent and a less transparent orthography. Veil and Everatt (2005) attempted to study reading by children in two different languages with different scripts, Hebrew and English. English was the more dominant language and Hebrew, the less dominant language in these children. They found that reading accuracy and the type of reading errors varied across the languages. Their study also revealed that improvements in reading accuracy were faster in Hebrew, the less dominant second language, than in English. The authors attributed this phenomenon to the fact that voweled Hebrew is relatively transparent and therefore easier to decode than English. They also found that age, predicted accurate word recognition in English more than it did in Hebrew. Again they attributed this to the transparency of Hebrew for higher reading accuracy in young children. This they explained with the script dependent viewpoint by arguing that accurate word reading in Hebrew reaches good levels of performance early in learning, whereas English requires more learning and greater experience, leading to a larger relationship with age. This means the older the child, the greater their experience, the more is their ability to perform on
measures of English word recognition. These data, therefore, were consistent with faster rates of acquisition being associated with more transparent orthographies (Hebrew in this case) as predicted by the script dependent hypothesis.

Leker and Brian (1999) described a patient with an acquired reading difficulty in Hebrew who showed no difficulties when reading in English, and Wydell and Butterworth (1999) reported the single case of a child who presented evidence of dyslexia in his first language (English) but not in the second language (Japanese). In a larger scale study, Kline and Lee (1972) assessed a group of Canadian children who were learning to acquire literacy in both English and Chinese. These data identified children who presented problems with learning Chinese but not English, and others who had difficulties with English but not Chinese. Similarly, Miller-Guron and Lundberg (2000) identified Swedish children who were demonstrating deficits with literacy skills in their native language, but who showed evidence of succeeding, relative to their peers, with literacy in English. The results of their study suggested that the children presented evidence of problems with developing ‘advanced’ phonological skills, such as phoneme awareness and manipulation skills that are necessary for the successful acquisition of Swedish literacy. The researchers also attributed that the children could have used alternative strategies, such as whole word approaches, when reading in English.

Everatt, Smythe, Ocampo and Veii (2002) also report bilingual children presenting evidence of single word reading difficulties in a language with a less transparent orthography (English) without comparable deficits in another language with a much more transparent orthography (the Fillipino language of Tagalog). There is ample research conducted which argue for different processes distinguishing good and poor readers from differing languages/scripts backgrounds.
(Everatt, Smythe, Ocampo & Gyarmathy, 2004; Karanth, 1992; Smythe, Everatt, Gyarmathy, Ho & Groeger, 2003). Karanth (1992) described two biliterate children with reading disability. Both were multilinguals learning to read and write three different scripts, one an alphabetic script English and the other two the semi-syllabic scripts Kannada and Hindi. She found more spelling and writing errors in English than in Kannada or Hindi. Therefore she concluded that in developmental biliterate dyslexics, differential patterns may be seen in two or more scripts, depending upon the strategy that is demanded by the nature of scripts. Everatt et al., (2004) found that process which predicts literacy skills for one language may not be able to predict the same in another language. They found that phonological awareness processes could distinguish Grade 3 children with good versus poor English literacy skills more than the same processes that distinguished children with good versus poor Hungarian literacy skills.

Francis (1997, 2000), Francis and Navarrete Gomez (2000) found that children who were bilingual readers and writers were applying phonological and orthographic processing skills learned through the medium of the official academic language (Spanish) to an indigenous proficient language (Nahuatl). They attributed this to the high levels of proficiency in each language and the close relation between alphabetic systems of the two languages which facilitated access to these processing skills. A separate assessment of children’s metaphonological awareness related to their knowledge of each language (Francis, 1998) provided indices that correlated positively within literacy skills in each language, measured separately. The pattern of results was found consistent with the findings from L2 readers, some aspects or sub-components that form part of skilled, automatized decoding, applied to the lower-level processes, learnt earlier and were available for application to decoding
tasks in another language. This principle was found to be acceptable in those cases in which the orthographies in question are of the same type (e.g. alphabetic, Roman) (Francis, 1998).

Hence, there is research evidence to argue that reading acquisition varies across languages with different writing systems or scripts. However, another group of researchers do not believe in script dependency for acquisition of literacy in children and believe in universality in reading.

\(b\) The Central processing hypothesis

The central processing hypothesis, assumes a universal approach to literacy acquisition. It proposes that reading development is not contingent upon the type and the nature of the orthography. Rather, common underlying linguistic and cognitive processes (such as working memory, verbal ability, naming and phonological skills) influence the development of reading across all languages. Therefore, children deficient in such processes are more at risk for developing reading difficulties than those with good skills in these areas.

Various sources have evidences in support of the central processing hypothesis. Geva (2000) cited clinical case studies by Wiss (1987), Obler (1989) where bilingual children with reading disability (Geva, 2000) presented difficulties in both their first and second languages. The findings of these case studies suggested that despite the differences in orthographies, bilinguals who presented decoding difficulties in their native language also had decoding difficulties in their second language. Furthermore, Stevenson, Stigler, Lucker, Hsu and Kitamura (1982) showed that reading skills and reading difficulties differed between children learning an alphabetic script and those learning logographic symbols. They opined that individual differences in underlying cognitive factors provided a basis to understand
children’s reading development in either of these different types of orthography. These findings argue against views on the acquisition of reading skills across languages varying in their use of logographic vs. alphabetic symbols, and also questions the claim that phonological process is irrelevant to reading a more logographic orthography (Leong, Cheng & Mulcahy, 1987; Perfetti & Zhang, 1991; Seidenberg, Waters, Barnes & Tanenhaus, 1984).

Gholamain and Geva (1999) assessed the role of orthographic and cognitive factors in the development of basic reading skills in Persian (a relatively transparent orthography) and English (a less transparent orthography). They found basic reading skills in Persian-speaking Canadian children correlated positively and significantly with their reading skills in English. That is, they found that children who did well on English reading measures and English cognitive skills were more likely to perform better in Persian. In particular, the results provided evidence for the role of verbal working memory and rapid automatized naming in predicting reading development in both English and Persian despite the orthographic differences between the two languages. Thus, individual and developmental differences in underlying cognitive factors significantly predicted basic reading development in the two orthographies. These findings provide evidence for the central processing hypothesis.

However, Gholamain and Geva (1999) also presented evidence in support of the script dependent hypothesis. Their results showed that despite limited exposure to Persian, once children acquired knowledge of the Persian alphabet, their accuracy to decode Persian words increased considerably, such that it started to resemble their ability to decode English words. Furthermore, they believed that once children acquired grapheme-phoneme correspondence rules of the Persian language, they could read unfamiliar Persian words differing in length nearly as accurately as
familiar Persian words. Such evidence for differential development and commonality of predictors led Geva and Siegel (2000) to conclude that the central processing and script dependent viewpoints are complementary rather than contradictory. The two theories are combined to formulate a cross-linguistic theory of reading development in bilingual children. Higher order discourse organizing structures are freely accessible to both L1 and L2 because at this level they are not language specific. However, it might not be the same when phonological and syntactic systems are considered (Pearson, 2002). Even within these, skilled phonological processing in the L1 predicted skilled decoding in the L2, while measures of performance related to L1 syntax have not provided any such evidences (Pearson, 2002; Siegel, 2002).

In bilingual literacy, not all language related competencies, processing mechanisms, and other necessary kinds of knowledge structure are accessed and shared in the same way between the L1 and L2. Cummins (2000) found evidence in favor of common underlying processors that facilitate decoding in beginning L2 readers with the development of linguistic subsystems including phonological knowledge. This can be considered as an evidence for central and language independent nature. Another strong candidate for reading ability that depends largely on central and language-independent knowledge structures is text/discourse organizing. In reading comprehension, the integration of other components determines its effect on L2 phonological processing. Some of these components are more or less independent (from L1 and L2) while others are found to be more highly language dependent (Cummins, 2000).
2.4 Acquisition of literacy and biliteracy skills

It is clear that attaining high levels of literacy in a second-language is possible. But, it is less clear, however, how initial exposure to literacy in a second-language affects the subsequent development of literacy skills in that language. The National Research Council’s report, Preventing Reading Difficulties (Snow, Burns, & Griffin, 1998), highlight the lack of and need for straightforward, data-based answers to questions about bilingual literacy development. Their report also accepted that there is no clear information on who benefits from bilingual programs, whether literacy instruction in a second-language affects the growth of literacy in that language, and the cognitive processes in bilingual literacy.

In an attempt to study bilingual literacy development systematically, Durgunoglu & Öney (1999), Öney & Durgunoglu (1997) proposed a general framework of literacy development. They have used this general framework in their previous studies with children, as well as in developing and evaluating an adult literacy program (Durgunoglu, Öney, & Kuscul, 1995). According to Durgunoglu and Öney (1999) and Öney and Durgunoglu (1997), acquisition of literacy skills is dependent on certain types of language skills. They believed that in preschoolers, language skills most apt to develop literacy are those related to print and oral language skills that support emergent literacy namely, letter-sound correspondence, rhyming, using language to talk about language, and contact with print. Moreover, there are also some language skills associated with written language that need to be developed at this stage in order to support reading and writing at a later stage. They opined that in order to understand the different processes of literacy development, a clearer understanding of models of literacy development is essential.
Models are found to help understand the development of literacy skills in relation to different factors responsible for literacy development. The models help us to look for and analyze the factors responsible for difficulties in learning literacy skills. One such model was framed by Durgunoglu and Öney (2000), which is derived from all the other available models of reading and writing (Adams, 1990; Gough & Tunmer, 1986; Juel, Griffith, & Gough, 1986; Lomax & McGee, 1987; Tunmer, Herriman & Nesdale, 1988; Tunmer & Nesdale, 1985). Figure 2.1 shows a model for literacy development (Durgunoglu & Öney, 2000) derived and summed from the above studies.

Because most of the previous studies were found to be correlational in nature, the arrows in Figure 2.1 are intended to indicate relationships rather than cause and effect.

![Figure 2.1: A Model for Literacy Development](Source: Cited in Durgunoglu & Öney, 2000)

The three major components of this model - outcomes comprising of reading and writing skills, building blocks comprising of decoding and listening comprehension and facilitators comprising of phonological awareness, functional awareness, and syntactic awareness.
awareness and syntactic awareness and their inter-relationships coupled with basic cognitive abilities, home environment and schooling.

a) Outcomes: Reading and Writing: The final outcomes in the model were reading and writing fluently and effectively. In addition to understanding a text, responding to it and learning from it, are considered as some other hallmarks of good reading. Likewise, writing proficiency includes not only the mechanics of writing, but also expressing thoughts coherently and appropriately using the relevant genre organization. To read and write fluently, a child needs to understand the spoken language and understand how this spoken language is represented in the written form (Juel, Griffith, & Gough, 1986; Perfetti, 1985). Listening comprehension and decoding, respectively, are found to be the two tasks reflecting the operation of reading and writing, even in different cultural contexts (Gough & Tunmer, 1986).

b) Building Blocks: Listening Comprehension and Decoding: Listening comprehension and decoding are considered as the building blocks of literacy acquisition. The common denominator in listening and reading is the comprehension of the language. Although listening skills are usually well-developed much before children start school with exposure to spoken language, skills required for reading comprehension are not limited to understanding the semantic and syntactic aspects of spoken language (Durgunoglu & Öney, 2000). Gee (1999) calls the ability to comprehend decontextualized language as ‘school-based forms of literate language’ that is essential for acquisition of literacy is developed in the school context. Yet another dimension of listening comprehension reported important for bilingual children is vocabulary and background knowledge. Vocabulary
knowledge grows through a child’s experiences with oral and written language, and is affected by cognitive variables such as memory and categorization (Gathercole & Baddeley, 1989). Background knowledge is also related to experiences with language and culture, especially in the family and through schooling.

In reading, unlike listening, phonological information is extracted from print, using orthographic decoding skills. Quick and effortless recognition of words is found to be an integral component of fluent reading, and unskilled decoding is regularly associated with poor comprehension. When the individual words of a text are read inaccurately or too slowly, comprehension is found to suffer because integrative processes are disturbed (Shankweiler, 1989; Stanovich, 1986). Likewise, it is found that when spelling is laborious, it interferes with the quality of writing (Berninger et al., 1998). In addition, spelling performance can be used to understand a child’s knowledge of linguistic structures, especially how orthography represents phonology (Moats, 1995; Treiman, 1993).

c) Facilitators: Metalinguistic skills: Before a child can progress to the analytic stage and begin to systematically use the correspondences between graphemes and phonemes, several developments need to occur. The child needs to understand the use of written language, be familiar with the symbols used in the written language, be aware of certain characteristics of spoken language, and understand the systematic relationship between the components of spoken language and written language. These insights are grouped under the metalinguistic skills of phonological awareness, functional
awareness, and syntactic awareness. They are considered the facilitators of decoding and listening comprehension skills, as well as mutual facilitators.

**Phonological awareness:** Before children can understand how orthography represents spoken language, they need to be aware of the relevant units in spoken language. This insight includes a child’s awareness of phonological units such as words, syllables, onset-rimes and phonemes. Evidence from a variety of sources suggests that phonological awareness is highly correlated with word recognition and spelling (Goswami & Bryant, 1990).

**Syntactic awareness:** This metalinguistic insight refers to the child’s ability to reflect upon the internal grammatical structure of the sentences. Even though unable to articulate a relevant rule, a child may still be aware of the systematicities in a language. Syntactic awareness can affect decoding and listening comprehension in several different ways (Tunmer, 1990). It enables readers to monitor ongoing comprehension and notice when a word does not fit the ongoing representation of the text. It also influences reading by enhancing or verifying the incomplete visual and phonological information that an inexperienced reader has extracted when reading an unfamiliar word in a text. Currently, there is some controversy about how much syntactic awareness contributes to the decoding process, especially after phonological awareness is taken into consideration (Bowey & Patel, 1988).

**Functional awareness:** This metalinguistic insight includes children’s developing notions about the functions and conventions of written language. Through interactions with written language, children develop the concepts about print (Clay, 1979). This awareness also includes an understanding of when and why print is used and the symbols of the language community (e.g.
alphabet). Research has shown that functional awareness, knowing about the functions of print, is related to letter discrimination ability and phonological awareness (Lomax & McGee, 1987). In sum, functional awareness seemed to affect the building blocks, as well as some of the other facilitators.

*Contexts of Development- Home Environment, Schooling, and Basic Cognitive Processes:* The overall cognitive ability of the child is also found to play a role in this interaction. These three factors are included in the model as the contexts of literacy development. Thus, the constructs of the model in Figure 1 are enclosed within these contexts of development. As several researchers have discussed, home experiences play an important role in developing language skills, and through them, literacy skills (Chaney, 1992, 1994; Dickinson & Snow, 1987; Hart & Risley, 1995; Heath, 1983; Teale, 1986). Through their experiences with both oral and written language, children become familiar with the characteristics of their language and develop an understanding of the functions of literacy. Home literacy practices contribute to the development of metalinguistic insights, or what we call the facilitators in the model. Cunningham and Stanovich (1998) reported that knowledge of book titles (indicating print exposure at home or in school) was a good predictor of subsequent reading achievement.

The model of literacy development proposed by Durgunoglu & Öney (2000) suggests that the essential components of literacy development as building blocks and facilitators may be grouped as:

1) Listening skills

2) Phonological awareness skills
3) Reading skills and
4) Written language skills.

The above components are considered as crucial components for literacy acquisition. However, there are sub-skills within these components, which are mutually related to each other and contribute for literacy development in children. These components are explained in the following sections. Durgunoglu and Öney (2000) attempted to study the development of literacy skills in children learning literacy through two languages.

The above model is adopted to explain the concept of “biliteracy in children” and its development in biliterate children within the framework of a host of skills and sub-skills of literacy. A review of sub-skills of literacy is warranted at this stage to understand the differential influence and the inter-relationships among the skills in each of the languages. Very few studies are reported on acquisition of literacy skills in biliterate children. The following literature review attempts to describe reports of a few investigators on the pattern of acquisition in biliterate children learning to read and write different languages with differential script structures.

2.4.1 Listening skills

(a) Auditory discrimination

Auditory discrimination skills can be defined as the ability to identify and distinguish between different sounds. The development of auditory discrimination skills is a step-by-step process. As children grow, they develop ability to discriminate speech sounds. Kramer, Schell and Rubison (1983) believed that typical English-speaking children have considerable knowledge available for analyzing language when they enter school: several thousand words in their
vocabularies, some exposure to rhymes and alliterations, practice in writing their own names and “reading” environmental print, and other sources of information about language. Whereas, children who are non English speakers may have problems in listening attributed to their limited English proficiency. For example, for Spanish-speaking children from Latin America, there are eight English phonemes absent from Latin American Spanish (for example, the English short vowels as in “pit,” “pet,” “puf” have no counterparts in Spanish). Also, between 46 and 53 consonant clusters in English appear in the initial position of the word and more than 36 consonant clusters appear in the final position, while Spanish is limited to 12 consonant clusters that can occur both in the initial word and syllable position. In addition, Spanish has no final consonant clusters such as “ld” and “sk” (Kramer, Schell & Rubison, 1983). These differences in languages may have an influence on their listening skills to either of the languages under study.

Two studies have indicated that children can be taught to hear sounds that do not appear in their first language. Kramer, Schell and Rubison (1983) investigated the effectiveness of a four-week auditory discrimination training program in English for Spanish-speaking children with regard to four contrasting pairs of sounds taught and fourteen other sound pairs not taught. The subjects were 15 Mexican American students in first, second, and third grades from two urban public schools in Kansas. All the subjects had reading levels above the primer level but not above the first grade level. The program focused on 36 word pairs that contrasted English sounds difficult for Spanish-speaking children to distinguish. During testing, subjects were asked to identify whether minimally contrasting word pairs sounded the same or different, e.g., sheet-cheat. Training lasted 30 minutes a day, 4 days a week, for 4 weeks. The teacher showed pictures of characters with particular sounds in their
names (i.e., Chile Choo for ch). The results of the study on auditory discrimination posttest showed that experimental subjects performed significantly better than controls on total score, sounds taught, and sounds not taught. The findings demonstrated a positive effect of a brief ear-training program for the development of overall auditory discrimination. They also found that there was also a transfer effect to sounds that were not taught to these children.

(b) Listening comprehension skills

Apart from auditory discrimination, yet another important skill to listening is the listening comprehension skill. Listening comprehension refers to the process by which words, sentences, and discourses are interpreted (Gough & Tunmer, 1986). The common denominator in listening and reading is the comprehension of language. The skills of listening and reading are described as decoding functions, whereas speaking and writing are encoding functions in the communicative process. Listening differs from just hearing, which is a physiological process that does not involve interpretation of the information. Although listening skills are generally well developed when children start school, skills required for reading comprehension are not limited to understanding the semantic and syntactic aspects of spoken language. The ability to comprehend decontextualized language was referred to as the school-based forms of literate language which is essential for literacy acquisition in children (Gee, 1999). It is a basic skill that can be improved through teaching and practice. Listening comprehension of an average child begins to develop around 12 months of age and continues to grow. Listening comprehension continues to grow during the elementary years. Thus, a typical 3rd-grader can comprehend more complex oral stories, expositions, etc., than a typical 1st-grader. If comprehension problems in children with reading disability were only because of word decoding problems, then
they would be expected to show deficits in reading comprehension, but not listening comprehension. However, it is now clear that many children with reading disability have comprehension problems not just when they are reading but also when they are listening (Betjemann, Keenan, Fazendeiro & Olson, 2002; Betjemann, Keenan & Olson, 2003; Catts et al., 2003; Conners & Olson, 1990; Keenan, Betjemann & Fazendeiro, 2002; Mann, Liberman & Shankweiler, 1980; Mann, Shankweiler & Smith, 1984; Nation, Clarke, Marshall & Durand, 2004). Some have suggested that these deficits in listening comprehension may be because of task demands on phonological working memory, and thus caused directly by phonological deficits (Crain & Shankweiler, 1990; Shankweiler & Crain, 1986; Shankweiler, Smith & Mann, 1984; Spring & French, 1990). However, even when they controlled for phonological working memory, some deficits in listening comprehension remained. In sum, the evidence clearly suggests that while decoding deficits may contribute to reading comprehension difficulties, particularly in the early grades, comprehension difficulties may have additional causes. Comprehension difficulties can occur without decoding problems, as in children with comprehension deficit, and comprehension difficulties can occur for children with reading disability even when no word decoding is involved. Independence in the contributions of word decoding and comprehension skill to reading comprehension was recognized by Hoover and Gough (1990) in their ‘simple model’ of reading. According to the simple model, reading comprehension is the product of a child’s skill in decoding and his/her skill in listening comprehension.

Enhancement of listening skills is relatively less focused in literacy training in comparison to the skills of speaking, reading and writing. In India, most schools do not consider it as important to include listening comprehension as a formal
component of English Language Teaching (ELT) in the syllabus (Belasco, 1971). It is known that no language learning can take place without listening comprehension and it is included in majority of models on literacy acquisition. It is generally believed that listening would develop automatically in the course of learning other skills and therefore, tends to get neglected. There is enough evidence from studies on second language learning to show that listening comprehension does not develop automatically alongside production. Few children were found to often misinterpret instructions and fail to comprehend the information because of poor listening. In view of the above study, it can be speculated that listening comprehension is of particular significance in learning English by children in India. The larger number of different varieties of English that exist in India, for e.g., Tamil-English, Bengali-English, Punjabi-English, etc., become mutually incomprehensible, even if partially, if learners are not trained to listen to the sounds of standard Indian English (Sadanand & Sahgal, 1988).

Existing literature suggests that listening comprehension skills do not find a primary focus in majority of the studies on biliterate groups. Drawing evidences from learners of English as second language, it is vital to incorporate this component along with decoding skills in reading assessment battery for biliterate children.

2.4.2 Decoding skills

Decoding and listening comprehension are considered as two important components of reading skill (Gough & Tunmer, 1986). Reading skill in academic learning encompasses the decoding skill and reading comprehension skills. Decoding refers to word recognition processes that transform print to words (Gough & Tunmer, 1986). In reading alphabetic scripts, unlike listening, phonological
information has to be extracted from print, using orthographic decoding skills. Quick and effortless recognition of words is an integral component of fluent reading, and unskilled decoding is found to be associated with poor comprehension (Shankweiler, 1989; Stanovich, 1986). Likewise, when spelling is laborious, it interferes with the quality of writing (Berninger et al., 1998). In addition, spelling performance can be used to understand a child's knowledge of linguistic structures, especially how orthography represents phonology (Moats, 1995; Treiman, 1993) if the target language has opaque orthography. In transparent orthography, children can learn letters (letters are fused symbols of consonant and vowel as in /ka/ ‘κ’ in Kannada /k/+/a/). Letters do not demand for analysis of phoneme-grapheme correspondence (P-G-C), whereas, spellings in opaque orthographies place demands on a child’s P-G-C abilities. Öney and Durgunoglu (1997) assessed first-grade Turkish children for letter recognition, word and pseudoword recognition and listening comprehension skills in the beginning of the school year. Results suggested that the phonologically transparent orthography in Turkish facilitated the earlier development of word recognition skills. Öney, Peter and Katz (1997) studied children in 2nd and 5th grade. These children learnt to read and write in Turkish and English as Second Language (ESL). Durgunoglu and Öney (1999) also studied these two languages and found that Turkish children performed better on decoding (including word and pseudoword recognition and spelling tasks) tasks in Turkish compared to English (ESL) and that the 5th grade children performed better compared to 2nd grade children on all the decoding tasks. When there was no difference in the children's word recognition performance, only listening comprehension ability distinguished children on the basis of different levels of reading comprehension. The results
suggest that assessment of only decoding skill is not adequate, but listening comprehension should also be incorporated in the assessment process.

Karanth and Prakash (1996) opined that a transparent orthography facilitates comprehension, as decoding is less demanding, for example they reviewed and found that reading comprehension of an Italian child was higher than that of English. But Posner and Kar (personal communication) believed that this cannot be generalized to Indian context as Indian children have more aksharas to learn and they need to master the akshara principle. Karanth (2006) believed that a reader of an Indian script does not learn the vowel component and consonant component separately and then combine them to form a syllable. Rather, the child first learns the basic syllabary with primary forms of vowels and consonants and then the entire syllabary containing all possible CV combinations is taught by rote. Padakannaya and Mohanty (2004) found akshara awareness to be a good criterion for identification of good and poor readers. Posner and Kar (personal communication) explained that writing systems which are alphabetic in nature with a small set of graphemes often have a high proportion of irregular words as compared to alphasyllabaries which have more number of graphemes with close correspondence to the phonemes. They believed that script specific components are involved in literacy acquisition.

2.4.3 Metalinguistic Awareness

Metalinguistic awareness refers to the ability to reflect on the structure and properties of language. Learning a second language involves a conscious and deliberate effort, which is said to promote a level of linguistic awareness in a bilingual that is qualitatively different from that of a monolingual (Garcia, Jimenez,
& Pearson, 1998; Vygotsky, 1962). One of the most robust findings on bilingual children is found to be related to their enhanced metalinguistic awareness. This awareness is demonstrated in various ways, such as sensitivity to word shapes and word length, onset-rime awareness, and knowledge of sentence grammaticality. In a number of studies, it was found that bilingual children consistently outperformed monolingual children on tasks measuring metalinguistic awareness (Bialystok, 1997, 2001). This is attributed in bilingual children as a heightened awareness of the symbolic nature of language encoded in text, and they seem to be able to transfer this knowledge from one language to another (Bialystok, 1997). Bialystok’s (2001) analysis of the research on monolingual and bilingual differences in metalinguistic ability suggested that bilingual children excel in the control of attention when presented with misleading information, but tasks that place demands for analysis are not solved better by either monolinguals or bilinguals (Bialystok, 2001).

The meta-linguistic skills necessary for learning to read and write can be grouped as **phonological awareness skill, syllabic awareness skill, syntactic awareness skill** and **functional awareness skill** (Durgunoglu & Öney, 1999).

### 2.4.3.1 Phonological Awareness

While, metalinguistic awareness refers to the ability to reflect on the structure and properties of language, phonological awareness is a form of metalinguistic awareness that refers to the ability to carry out mental operations on speech (Morais, 1991; Tunmer & Herriman, 1984; Tunmer & Rohl, 1991). Treiman and Zukowski (1991) stated that phonological awareness does not constitute a homogeneous entity, but rather is expressed as awareness of different linguistic units. However, there are different views on the use of the term ‘phonological awareness’.
Tunmer and Rohl (1991) used the term to refer exclusively to phonemic awareness, while Mann (1991) and Morais, Alegría and Content (1987) include syllabic awareness in addition to the above. On the other hand, Treiman (1991) interprets phonological awareness to mean awareness of any phonological unit, be it syllables, onsets, rhymes or phonemes. Phonological awareness is a general term that refers to sensitivity to different sound components within speech, while phonemic awareness facilitates manipulation of individual phonemes in the speech stream. For example, a child learning to read and write an alphabetic script needs to understand that the continuous stream of spoken speech could be broken up into sounds, which are then related to letters or strings of letters (the alphabetic principle). Stanovich (2000) suggested separating ‘phonological sensitivity’ from ‘phonological awareness’. He opined that ‘phonological sensitivity’ refers to a continuum from a shallow sensitivity of large phonological units (syllable) to ‘phonological awareness’ which refers to a deep sensitivity of smaller phonological units (Stanovich, 2000).

According to Ziegler and Goswami (2005), phonological awareness, is also referred to as phonological sensitivity, comprising the ability to recognize, identify, or manipulate any phonological unit within a word, be it phoneme, rime, or syllable. Ziegler and Goswami (2005) tried to explain the psycholinguistic grain size theory (see Figure 2.2) with special emphasis on the development and use of different grain sizes across visual and auditory domains and across languages.
The emergence of phonological awareness is best described along a continuum from shallow sensitivity of large phonological units to a deep awareness of small phonological units (Stanovich, 1992). Anthony, Lonigan, Driscoll, Phillips and Burgesset (2003) used a large group of children in the age range of 2–6 years to investigate the order of acquisition of phonological sensitivity skills at various grain sizes while holding constant the type of operation that was performed (e.g., blending, deletion). Their findings revealed that children’s progression of sensitivity to linguistic units followed the hierarchical model of word structure shown in Figure 2.2. That is, children generally mastered word-level skills before they mastered syllable-level skills, syllable-level skills before onset–rime skills, and onset–rime-level skills before phoneme-level skills, controlling for task complexity.

For languages such as English and Spanish, the ability to manipulate individual sound units is expected to occur at the lexical and sub-lexical level. Children who have phonological awareness skills are able to segment words into syllables, onset-rime units, and phonemes. Many studies comparing the levels of syllables and phonemes demonstrated that syllabic awareness precedes phonemic awareness (Cossu, Shankweiler, Liberman, Ratz & Tola, 1988; Liberman & Shankweiler, 1977; Liberman, Shankweiler, Fischer & Carter, 1974; Rosner & Simon, 1971; Treiman & Zukowski, 1991). The findings suggested the existence of

Figure 2.2: A schematic depiction of different psycholinguistic grain sizes. (Source: Ziegler & Goswami, 2005)
developmental progression from syllable awareness to intrasyllabic units awareness (onset-rhyme), and finally, to phonemic awareness. Phonemic awareness refers to the ability to segment speech into individual phonemes and to blend phonemes to form syllables or words. In English, the mapping of speech to written language occurs at the level of phonemes. Phonological awareness can be grouped into different types:

- **Syllabic awareness**: Awareness of the syllabic structure of words, for example, in English, ‘Cat’ has one syllable, ‘hap-py’ two, and ‘but-ter-fly’ three syllables.

- **Phonemic awareness**: Awareness of phonemes, or the constituent sounds of a word, for example, ‘seat’ has three sounds /s-i:-t/.

- **Awareness of intrasyllabic units**: It is proposed that syllables have an internal structure of onset and rime, for example, ‘seat’ would split into /s-it/, with /s/ as the onset, and /it/ as the rime (the rime can further be split into nucleus, usually the vowel, /i/ and the coda, /t/ in the given example). Awareness of onsets can be assessed through alliteration (same onset), playing on the first sound(s) of a word (e.g., *seat, sat, sun*), while awareness of rime is demonstrated by ability to recognize and produce rimes (rime, e.g., *seat, meet, beat, feet*).

Phonemic awareness is a key component of many tests of general phonological awareness skills. Phonemic awareness is considered to be one of the best predictors of learning to read and spell as reported by studies on monolingual children (National Reading Panel, 2000). Studies have shown strong correlations between phonemic awareness skills and word recognition. Juel, Griffith and Gough (1986) reported that phonemic awareness is a stronger predictor of reading
achievement, than traditional measures of reading readiness. However, the
importance of phonological and phonemic awareness in L2 reading is less well
established. Durgunoglu, Nagy, and Hancin-Bhatt (1993) investigated the factors
influencing the word identification performance of Spanish-speaking beginning
readers. They found that phonological awareness in Spanish significantly correlated
not only with the number of common English words read but was also highly
correlated with performance on two transfer tests, English-like pseudoword reading
and English decoding.

Mastering phonological awareness skill was found to help children master
both phonics and reading (Calfee & Norman, 1998; Chard & Dickson, 1999).
Goswami and Bryant (1990) suggested that phonological awareness is highly
correlated with word recognition and spelling. More specifically it refers to the
ability to store, access, retrieve, and manipulate phonological representations.
Studies that explore the links between different levels of phonological awareness
and literacy acquisition are widely carried out on preschool and young school-aged
children (Bradley & Bryant, 1983; Cataldo & Ellis, 1988). Öney and Durgunoglu
(1997) assessed first-grade Turkish children on phonological awareness and
syntactic awareness skills in the beginning of the school year. They found that
phonological awareness contributed to word recognition in the early stages of
reading, as with English.

Studies on other bilingual populations with different native and second
languages—for example, Turkish and Dutch (Verhoeven, 1994), English and French
(Comeau, Cormier, Grandmaison, & Lacroix, 1999)— showed a significant
relationship between phonological awareness in one language and word recognition
or word reading skills in another. This even was true for students learning English
whose first language had a nonalphabetic orthography such as Cantonese (Gottardo, Yan, Siegel, & Wade-Woolley, 2001). The research on phonological awareness suggests that, for L2 students who are already literate, reading instruction, would build on their existing phonological knowledge, and is not delayed until they are highly proficient in L2. Reading instruction in L2 would seek advantage of a child’s knowledge of L1 literacy, when it exists, because phonological knowledge appears to transfer across languages. They opined that the degree of transfer is likely to be variable, depending on factors such as individual differences, as well as the amount of overlap in the linguistic and orthographic systems of the bilingual child’s two languages.

Studies across different languages indicate that despite differences in the phonological structure of the languages being learned, preschoolers typically demonstrate good phonological awareness of syllables, onsets, and rimes in most languages. Syllable awareness is present by about age 3 to 4 years, and onset–rime awareness is present by about age 4 to 5. Phoneme awareness develops once children are taught to read and write, irrespective of the age at which reading and writing is taught (Goswami & Bryant, 1990). Some findings of studies in different languages are summarized by Ziegler and Goswami (2005) in Table 2.1 below.

Studies on phonological awareness in English and other languages in separate groups of children (Cossu et al, 1988; Caravolas & Bruck, 1993; Borzone de Manrique & Signorini, 1994) have shown that phonological awareness in a particular language is linked to the sound system of that language. Stuart-Smith & Martin (1999) studied phonological awareness in English and Punjabi in Birmingham, United Kingdom. They were of the notion that a child following bilingual literacy should be assessed in each of their languages to study the effect of
one language on the other. Hence, they devised a phonological assessment tool comprising tasks of phonemic awareness and syllabic awareness in English and Punjabi. They administered the test on Punjabi-English bilingual children in the age range of 6-7 years of age. They found that a few tasks like the phonemic segmentation are language specific and this was reflected when children did not perform well in Punjabi. They opined that certain tasks like the phonemic segmentation commonly used for English cannot be usefully assessed in Punjabi.

Table 2.1: Data (% Correct) From Syllable and Phoneme Counting Tasks in Kindergarten and First-Grade Children across Different Languages (Cited in Ziegler & Goswami, 2005)

<table>
<thead>
<tr>
<th>Language</th>
<th>Study</th>
<th>Kindergarten</th>
<th>First grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Syllable</td>
<td>Phoneme</td>
</tr>
<tr>
<td>Turkish</td>
<td>Durgunoglu &amp; Öney (1999)</td>
<td>94</td>
<td>67</td>
</tr>
<tr>
<td>Italian</td>
<td>Cossu, Shankweiler, Liberman, Katz, &amp; Tola (1988)</td>
<td>80</td>
<td>27</td>
</tr>
<tr>
<td>Greek</td>
<td>Harris &amp; Giannouli (1999)</td>
<td>85</td>
<td>0</td>
</tr>
<tr>
<td>French</td>
<td>Demont &amp; Gombert (1996)</td>
<td>69</td>
<td>2</td>
</tr>
<tr>
<td>English</td>
<td>Liberman, Shankweiler, Fischer, &amp; Carter (1974)</td>
<td>48</td>
<td>17</td>
</tr>
</tbody>
</table>

Meta-linguistic awareness and literacy development in monolingual English-speaking children has been widely investigated over the decades. There is now an increasing interest to explore metalinguistic awareness in languages other than English. For example, Mann (1986) studied in Japanese language; Cossu et al, (1988) in Italian; Caravolas and Bruck (1993) in Czech; Borzone de Manrique and Signorini (1994) in Spanish; Huang and Hanley (1994) in Chinese: Mandarin & Cantonese. There are a few Indian studies available to date on metalinguistic skills...
and reading development in Indian children. Prema (1998) studied meta-
phonological skills such as rhyming, syllable and phoneme related skills in Kannada
speaking children. Similar studies are conducted on monolingual children speaking
Tamil (Akila, 2000), Malayalam (Seetha, 2002; Ponnumani, 2003) and Kannada
(Namrata, 2003). The reports revealed the importance of metalinguistic skills for
reading acquisition in Indian children. Studies related to literacy acquisition in India
are conducted mostly on monolingual children, however, very few studies are
documented that explore the interaction of skills between the languages in biliterate
children.

There is a general consensus that successful early readers develop an
awareness of phonology, syntax, and functional uses of language. Current theories
maintain that to read and write fluently, a child needs to understand the spoken
language and understand how this spoken language is represented in written form.
The child also needs to understand how and why written language is used and has to
be familiar with the symbols used in the written language, to be aware of certain
characteristics of spoken language, and to understand the systematic relationship
between the components of spoken language and the concepts of written language.
Such awareness is highly correlated with word recognition and spelling. Listening
comprehension and decoding encompass some of the basic cognitive processes
required in reading and writing. While, decoding and listening comprehension (e.g.,
monitoring on-going comprehension, enhancing or verifying incomplete visual and
phonological information) are reported to be influenced by ‘syntactic awareness’,
(i.e., word order and grammar), syntactic awareness is also said to play a role in the
prediction of spelling performance. Functional awareness of print, i.e., written
conventions of language, is related to the ability to discriminate letters and
phonological awareness. Knowledge of onset and rime facilitates both decoding of words in reading and learning to spell and write words correctly (Durgunoglu & Öney, 2000).

Studies on literacy with respect to orthographic system in a given language report that the unique structure of orthography of different languages greatly impact the relationship between the orthography, phonology, morphology and meaning in the processing of print (Durgunoglu & Öney, 2000). For example, Turkish literacy skills appear to develop as they do in English. However as a result of different orthographies and phonologies, a few reading skills develop at different rates in the two languages. This is also true for German, Czech, and Italian monolingual speakers (Durgunoglu & Öney, 2000). They found that phonological awareness in Turkish only contributes to word recognition in the early stages of reading as it does in English. As word recognition skills become highly developed, only listening comprehension can differentiate between readers at different levels of reading comprehension (Öney, Peter, & Katz, 1997). Access to two languages and the possibility of contrasting those languages are insights that can facilitate understanding of literacy development (Durgunoglu & Öney, 2000).

2.4.3.2 Functional awareness/ written language awareness/ Print awareness

Expressive language is of two types- spoken and written. There is a notion that man acquired ability to use the spoken form of language before he learned to read and write (Diringer, 1962). Writing is clearly a system of human inter communication by means of conventional visible marks Gelb (1963). The study of written language has lagged well behind other literacy components such as listening, speaking, and reading, particularly with respect to the investigation of its development, behavioral expression, and neuro-cognitive underpinnings. Written
language is more integrated and syntactically complex than spoken language. Writing competence is based on successful orchestration of many abilities, including those needed for lower level transcription skills as well as those essential for higher level composing abilities. Among those who model writing process, there is unanimous agreement that it is a complex process compared to speaking as it requires a high level of abstraction, elaboration, conscious reflection and self regulation (Bereiter & Scardanalia, 1987; Gombert, 1992; Graham & Harris, 1994). Written language awareness or orthographic awareness refers to the awareness of graphic representation in a language (Bialystok, 1997).

Print-related factors such as, understanding the functions and conventions of print, as well as understanding how print represents the spoken language (e.g., the alphabet and its mappings to the spoken language), are found to be specific to written language. Studies have shown that decoding (both word recognition and spelling) and functional awareness skills depend on print-related factors of a language. This meta-linguistic skill includes children's developing notions about the functions and conventions of written language. Through interactions with written language, children develop concepts about print (Clay, 1979). This awareness also includes an understanding of when and why print is used and the symbols of the language (e.g. alphabet). Print awareness and its functions are related to letter discrimination ability and phonological awareness (Lomax & McGee, 1987). Existing research suggests that structural characteristics of different writing systems influence the relationships between orthography, phonology, morphology and meaning in processing written language.
2.4.5 Rapid verbal naming skills

Apart from awareness to the phonological constituents of speech sounds or the characteristics of a writing system, the speed with which an individual performs on a phonological task serves as a measure of one’s phonological processing abilities. Such a skill termed as Rapid verbal naming skill, generally measured through naming speed indicates phonological processing ability. Rapid verbal naming refers to the ability to rapidly name a small number of items as quickly as possible. Rapid naming ability is linked with phonological processing ability—namely, the ability to retrieve phonological codes from long-term memory (Wagner & Torgesen, 1987). Rapid verbal naming is otherwise also referred to as verbal fluency (Cohen, Morgan, Vaughn, Riccio & Hall, 1999). The most common verbal fluency tasks used in research are letter fluency, phonological fluency and semantic fluency. The term rapid naming is viewed by investigators as either rapid verbal naming, verbal fluency for letter, phonological, and/or semantic units and rapid automatized naming (RAN).

RAN tasks are found to be the most popular methods for assessing naming speed in children. It is considered and proved to be one of the best predictors of reading in children. In this view, naming speed uses the visual, auditory, and motor processes used in reading but in a less complex fashion. Developmentally it is found that naming through the RAN task is more crucial and a better predictor of reading in younger children than older children (McBride-Chang & Manis, 1996; Torgesen et al., 1997). Hence, in the present study rapid naming task is studied as assessing rapid verbal naming\(^3\) (RVN) using a phonological fluency task in order to further assess phonological processing skill in children. A few researchers have found that

\(^3\)Operational definition of rapid verbal naming (RVN): In the present study, RVN refers to the ability to rapidly name a small number of items (like naming as many words as possible with the phoneme /k/) as quickly as possible in a specified time with a given phoneme.
verbal fluency increases with age and approaches adult level by 10 years (Regard, Strauss, & Knapp, 1982) whereas others (Welsh, Pennington & Groisser, 1991) have reported that children as old as 12 years were significantly less fluent than the adult group suggesting that verbal fluency as measured by phonological fluency continues to develop into adolescence. Cohen et al., (1999) have found that rapid verbal naming improves significantly between 6 and 12 years of age, thus indicating a developmental trend.

Naming speed differences across scripts have proved to be a crucial factor in predicting the reading ability of children learning to read and write in more than one language. Patel, Snowling and de Jong (2004) attempted to study orthographic and phonemic differences in two different languages with different script structures, English (following alphabetic script) and Dutch (following non-alphabetic script). They predicted reading ability of children in the age range of 7-11 years in these two languages through the rapid automatized naming (RAN) tasks. RAN task was tested separately for children with Dutch as the mother tongue and in children with English as the mother tongue. Reaction time measurements were done and they found that English reading children had a better rapid naming response time when compared to Dutch reading children. Research shows that rapid naming skill could be different in languages with different script structures.

Traditionally, rapid naming is interpreted as a phonological processing ability-namely, the ability to retrieve phonological codes from long-term memory (Wagner & Torgesen, 1987). According to this view, the deficit in rapid naming skills exhibited by dyslexic children and adults is just another manifestation of these individuals’ well-known phonological difficulties. In contrast, Wolf and Bowers (1999) suggested that processing in rapid naming leads to a specific source of
reading ability or disability, that is, a source that is independent of phonological processing. Their findings on rapid naming, as measured by continuous naming of familiar visual stimuli explains unique variation to reading and spelling ability, that is, variation that cannot be accounted for by differences in phoneme awareness.

There are reports to suggest that the effect of rapid naming skills may be limited to the beginning phases of alphabetic literacy acquisition. Torgesen et al., (1997) investigated the relative contribution of rapid naming and phoneme awareness to later reading ability in three developmental periods: from kindergarten to second grade, from first to third grade, and from second to fourth grade. They found that rapid naming skills contributed independent variation to word reading ability only in the first two developmental periods. McBride-Chang and Manis (1996) supported the view that rapid naming skills can differentiate poor v/s good readers or children at risk for reading difficulties (Ackerman & Dykman, 1993; Cornwall, 1992; Felton & Brown, 1990; Meyer, Wood, Hart, & Felton, 1998; Scarborough, 1998). There is evidence that among poor readers (Scarborough, 1998) and children at high-risk of developing reading difficulties (Felton & Brown, 1990), rapid naming is a better predictor of later reading ability than phoneme awareness.

Debate on the effect of rapid naming skills being limited to the beginning phases of alphabetic literacy acquisition is argued with the support of two theories. While Ehri (1992) argues that the ability to learn to read by phonological recoding plays a major role in learning about orthographic patterns at both the word and subword levels, Torgesen et al., (1997) found that rapid naming skills contributed independent variation to word reading ability in kindergarten to second grade and first to third grade developmental periods.
Wimmer (1993) and Wimmer, Maryinger, and Landerl (1998, 2000), study on dyslexic children shows different influences of rapid naming and phoneme awareness in more consistent orthographies. Dyslexic children exhibited severe naming speed deficit but little phonological recoding difficulties. Research with reference to rapid naming of familiar visual symbols indicates the ability to learn about the orthography of words through learning to code arbitrary symbol–name associations. According to Bowers and Wolf (1993), slow visual recognition of letters may jeopardize the formation of inter-letter associations at both the subword and word levels.

2.4.6 Reading skills

Reading is a complex cognitive process. It involves the co-ordination of a series of functions which include visual functions such as orthographic (word form) analyses and verbal or language functions such as phonological, semantic and syntactic coding in addition to other cognitive functions like memory, attention and motor skills. Various models are proposed to study reading and reading development in children. A few models are quoted in the following sections in order to understand development of reading in children.

i) Marsh, Friedman, Welch and Desberg (1981) proposed a model with four stages of development of reading in children (see Figure 2.3).

**Stage 1: Linguistic Guessing**

Children are able to read words if they are always presented in the same way. For example the first words that a child can read are often names of shops or brand names. The child cannot guess at words out of context but if given a context the child’s guess will be based on syntactic and semantic information rather than any visual information from the target.
Stage 2: Discrimination net guessing

The child uses graphemic cues to recognise words but only to the extent that is necessary to differentiate all the words in the sight vocabulary. Reading errors are semantically, syntactically and graphemically based.

Stage 3: Sequential Decoding

The child begins to use grapheme phoneme correspondences. The child decodes words grapheme by grapheme from the left to the right. The child can still only cope with one-to-one correspondences and reading errors reflect this.

Stage 4: Hierarchical Decoding

Decoding is no longer grapheme by grapheme. Children can use analogies and conditional rules (such as ‘magic’).

ii) Frith’s Model (Frith, 1985)

Frith modified Marsh’s model in order to make more apparent the links with models of skilled reading. In Frith’s model new strategies are used in addition to older strategies rather than replacing them (see Figure 2.4).
Figure 2.4: Schematic representation of Frith’s (1985) model

**Stage 1: Logographic**

The child recognizes words using salient graphic cues. The child cannot read novel or non-words.

**Stage 2: Alphabetic**

The child uses individual grapheme to phoneme correspondences. Later the child can use conditional rules.

**Stage 3: Orthographic**

The child recognizes strings of letters and accesses pronunciations without decoding these strings. This is very much like analogy theory except the strings that the child uses are whole morphemes rather than onsets and rimes.

A number of researchers (Chall, 1979; Ehri, 1993, 1994) have developed stage models of reading development. There is a general acceptance among empirical researchers that the sequence of development of the word identification system moves from logographic to alphabetic to orthographic. In the first stage, the beginning reader learns to recognize a visual pattern by its shape (a letter landscape). The shape is recognized holistically, and significant alterations to the letter structure may be made without altering the child’s response (e.g., Pepsi signs changed to Zepsi without beginning readers noticing any change). At this stage, the child has not learned to analyze the written word structure. The movement to the alphabetic
stage is probably driven by the gradual awareness of speech segmentation which the child induces or is taught (Adams, 1990). This phoneme awareness may more readily be invoked in children whose earlier experiences have included a focus on the structure of the spoken word, albeit in larger units such as rhymes, syllables, onset and rimes. Some children do not develop this awareness unaided (Chall, 1989) and without assistance may remain at this early stage, reliant on memory of the letter landscapes or contextual guessing strategies (Spear-Swerling & Sternberg, 1994). Share and Stanovich (1995) believed that such readers find it difficult as the demands of a rapidly increasing visual vocabulary increase in middle to upper primary school.

In the alphabetic stage, simple letter pattern-to-sound conversion provides a means of decoding unknown words. Initially only partial letter-sound cues (Spear-Swerling & Sternberg, 1994) are employed until the insight to alphabets arrive (Byrne, 1991). This strategy becomes reliable, at least with regular words, and continues to provide some clues for irregular words (Goulandris & Snowling, 1995). In irregular words, it is vowels that are found to provide the quality of irregularity, but consonants remain regular for the most part, and it is the consonants that are most important in word recognition (Share & Stanovich, 1995). Hence this phonological recoding strategy enables cues for decoding a high proportion of words along the regular-irregular continuum.

Share (1995) opined that the alphabetic period is crucial and he opined that each successful decoding encounters with an unfamiliar word which provides an opportunity to acquire orthographic information specific to a word. And this becomes the foundation of skilled word recognition and spelling (Share & Stanovich, 1995). This gradual “lexicalization” occurs through repeated
opportunities to use letter-sound correspondences for decoding. Share (1995) found that the strategy is used with less frequency as the range of familiar word patterns increases, through a self-teaching mechanism. The phonological recoding strategy is found to be useful for decoding unfamiliar words, and provides the opportunities for the formation of orthographic representations in reading.

2.4.6.1 Reading words

Research on word reading has distinguished several ways to read words (Ehri, 1991, 1994). Ehri (1994) found that decoding words which were never read before, involved transforming graphemes into phonemes and then blending the phonemes to form words with recognizable meanings. Letters might be individual letters, or digraphs such as TH, SH, or OI, or phonograms such as ER, IGHT, OW, or spellings of common rimes (the vowel and consonants that follow a beginning consonant in a word) such as -AP, -OT, -ICK. A second way to read words is by analogy to new words. Ehri (1992) reported that for individual words to be represented in memory, beginning readers are thought to form connections between graphemes and phonemes in the word. These connections bond spellings to their pronunciations in memory. Another way is prediction in which readers use context clues, their linguistic and background knowledge, and memory for the text to anticipate or guess the identities of unknown words. Text reading is found to be the easiest when readers have learned to read most of the words by sight because little attention or effort is required to process the words and this enables readers to attend to meaning.

Grabe (1991) found that the difficulty children face is when they have already read in their first language and some graphemes represent different sounds in the second language as between English and Spanish. For example, the /b/ in
English can be pronounced as either a /v/ or /b/ in Spanish, and the “i” in English as in the word “it” is pronounced in Spanish like the vowel in “eat.” Children whose first language has a different orthography than English (e.g., Russian or Arabic speakers) are found to face an additional challenge. Rayner and Pollatsek (1989) have found that direction-of-reading, punctuation, and spacing differences between languages do not appear to cause difficulty. More than these aspects, they found that readers use context clues, their linguistic and background knowledge, and memory for the text to identify unknown words. Thus, they found that English speakers making initial attempts at reading, read words they know and sentences they could understand. They were found to use context and probabilities effectively, and could correct themselves efficiently. Rayner and Pollatsek (1989) speculated that Non-English speakers do not have this basis for knowing if they are reading correctly because the crucial meaning making process is affected by a lack of language knowledge.

Apart from reading the word or the text, it is important to read text quickly, accurately, and with proper expression which is nothing but the reading fluency. Thurlow and van den Broek (1997) believe that fluency extends beyond word recognition and may help the comprehension processes as well. Fluency requires the rapid use of punctuation, and the determination of where to place emphasis or where to pause to make sense of a text. Thus, fluency affects reading comprehension in the absence of utilizing cognitive resources for interpretation, but it is also implicated in the process of comprehension, as it necessarily includes preliminary steps for interpreting the text (Thurlow & van den Broek, 1997).
2.4.6.2 Reading comprehension

Efficient word recognition is associated with improved comprehension. Comprehension is the ability to interpret and understand the decoded words. The ability to comprehend what one reads is based on experience. According to the National Reading Panel (2000), an important development in theories of reading comprehension arose in the 1970s. Durkin (1993) believed that reading comprehension is passive, receptive process, but is more an intentional thinking during which meaning is constructed through interactions with text and reader. According to this view a reader reads a text to understand the text, construct memory representations that are understood, and to put this understanding to use (National Reading Panel, 2000). In doing this, the reader draws on background knowledge or knowledge of the world. The development of reading comprehension is not only critical to good literacy skills, but also to all academic learning. Reading comprehension is not a passive process, but it requires readers to think about the text they read. Reading comprehension is multifaceted and requires the synchrony of a number of reading related processes in order to derive meaning from text. To succeed at reading, a child is expected to identify or read printed words and to understand the story or text composed of those words. Both identifying words and understanding text are critical to reading success to Beimiller (2003).

Relationship between word decoding, fluency and reading comprehension is explored by Curtis (1980). She found that while word decoding and reading comprehension are very highly correlated in beginning readers, this correlation declines in the later grades, although it remains significant. This decline in the correlation may in part reflect the fact that some children make adequate early progress in word decoding during beginning reading instruction, but then fail in
reading comprehension when the primary focus shifts from ‘learning to read’ to ‘reading to learn’ around the fourth grade (Catts, Hogan & Adolf, 2005; Leach, Scarborough & Riscorla, 2003; Scarborough, 2005). The existence of children who do not have problems in development of word reading accuracy and fluency but have problems in reading comprehension was noted by Oakhill (1994) and Yuill and Oakhill (1991). A number of studies in recent years have shown that these children appear to have deficits in all of the component skills of comprehension except word decoding (Cain, Oakhill & Bryant, 2000; Catts, Hogan & Fey, 2003; Nation, 2005; Oakhill, Cain & Bryant, 2003). These deficits demonstrate that reading comprehension deficits are not just byproducts of phonological and orthographic processing deficits, but may be an offshoot of deficits in decoding and comprehension skills (Perfetti, Landi & Oakhill, 2005; Scarborough, 2005).

Apart from these, Rayner and Pollatsek (1989) found that language structure may also play a role in comprehension. It is speculated that skilled readers may be using syntactic information unconsciously to make the reading process more efficient, for example by fixating on high-information items in the text. Bernhardt (1987) believed that because high information items differ from language to language, this practice can lead to inefficient fixation patterns when reading in a second language, perhaps disrupting the fluency that facilitates comprehension. Grabe (1991) also found evidence that language structure plays a role in reading in a second language. He has found that word-order variation, relative clause formation, complex noun phrases, and other complex structural differences among languages can mislead the ESL reader, especially in the early stages. Researchers (Garcia, 1991; Jiménez et al., 1995, 1996) have documented that bilingual children generally know less about topics in second language texts. Garcia (1991) reported that
Spanish-speaking Latino and monolingual Anglo (non-Latino White) children in fifth and sixth grades who were in the United States of America and in the same English-speaking classrooms for two years, differed in their background knowledge for standardized reading text passages. Latino students were found to know less about specific topics. When the differences in prior knowledge were controlled, the two groups were not found to differ significantly in reading test performance. Research has also found that comprehension is enhanced in both young and adult readers when what they read had culturally familiar content (Rigg, 1986; Steffenson & Anderson, 1979).

A series of studies find that the best entry into literacy is through the use of a child's native language (Clay, 1993; Snow, Burns, & Griffin, 1998). This is consistent with the research which was reported earlier noting the importance of establishing the sound-letter relationships and beginning to relate the structures of oral language to print, as well as oral comprehension to reading comprehension. Very young children in initial reading are found to use knowledge of these skills in their primary language (L1). Literacy in a child's home language provides knowledge, concepts and skills that transfer to reading in a second language (L2), e.g., English (Carter & Chatfield, 1986; Collier & Thomas, 1992; Cummins, 1989; Escamilla, 1987; Modiano, 1968; Rodríguez, 1988;). This is supported by research showing that proficiency in L1 literacy skills is highly correlated with the development of literacy skills in L2 (Collier & Thomas, 1992; Krashen & Biber, 1987; Leshere-Madrid & García, 1985; Ramírez, Yuen, & Ramey, 1991).

Researchers (Dochy, Segers, & Buehl, 1999; García, 1991; Stahl & Jacobson, 1986; Tobias, 1994) opined that reading comprehension among bilingual children increases as their familiarity with the topic increases. Durgunoglu & Öney
(2000) believed that in novice bilinguals, lexical links between two languages are stronger than conceptual links, making it easier to access lexical links. This implies that, in the early stages of literacy development in a second language, one may rely upon the first language to maximize conceptual development. In support of this, they found that word recognition in a second language develops faster when the concepts are first developed in the primary language.

2.4.7 Written language skills

Writing task is complex in nature. This requires the simultaneous use of semantic, syntactic, and graphophonic information within the framework of linguistic and non-linguistic factors such as graphomotor co-ordination. In a normal child the processes required for writing develop in an orderly pattern. By the time a child is approximately 6 years of age, he/she is ready to write with the development of skills for visual and auditory discrimination and visuo-motor integration. Hayes and Flower (1980, 1987) identified three stages of writing: Planning stage where the goals are set, ideas are generated and information is retrieved from long-term memory and then organized into a plan to write; the Translation stage, where the written language is produced from the representation in memory. The plan has to be turned into sentences; the Reviewing stage, where the writer reads and edits what is written. In the early primary grades text generation and writing quality are most constrained by a child’s handwriting fluency (Berninger & Swanson, 1994). Because children who have not yet mastered handwriting must direct attention to letter formation, they do not generate much text. By the intermediate grades, when handwriting is automatized for most children, its constraint on text generation is minimized and written texts become longer with improvement in quality (Berninger & Swanson, 1994; Shanbal, 2003; Yeshoda, 1994).
Most of the studies of written language in children have compared various dimensions of writing in typical and atypical language learners and have concluded that children with language based disabilities exhibit reduced written productivity as measured by total number of words, total number of utterances or total number of ideas (Barenbaum, Newcomer & Nodine, 1987; Houck and Billingsley, 1989; Laughton & Morris, 1989; Puranik, Lombardino & Altmann, 2007; Scott and Windsor, 2000). Similarly children with language based disabilities have also shown difficulties in writing complexity as measured by average length of T-units, number of different words, and percentage of complex sentences (Fey, Catts, Proctor-Williams, Tombling & Zhang, 2004; Gillam & Johnston, 1992; Houck & Billingsley, 1989; Mackei & Dockrell, 2004; Morris & Crump, 1982; Puranik et al., 2007; Scott & Windsor, 2000), and accuracy as measured by number of spelling or mechanical errors and number of syntax errors (Altmann, Lombardino & Puranik, 2008; Mcarthur & Graham, 1987; Nelson & Van Meter, 2003; Puranik et al., 2007).

Further Berninger and her colleagues (Berninger, 1999; Berninger & Hooper, 1993; Berninger et al., 1992) have expanded this model to children. They proposed that translating process in children includes two subcomponents: text generation and transcription. These subcomponents are together called microstructural elements of writing (Scott, 2005). Text generation refers to the process by which the writer translates his or her planned ideas into meaningful chunks of sentences, phrases and words. Transcription refers to the actual mechanics of converting sentences, phrases and words into written symbols and includes spelling, handwriting, and punctuation. Berninger (2000) found that in elementary school children, translation constrains the planning and revising components of writing. Hunt (1965, 1970) and Loban (1976) collected developmental data on writing to understand the level of syntactic
complexity in school age children from Grades 3 to 12. They provided the basic techniques for measurement of writing skills in children and their procedure helped in studying the discourse contexts like school compositions (Scott, 1988).

Although several researchers have used a variety of procedures to collect written language samples, interpretation and applicability of these procedures are limited as they do not explain the different tasks used in different situations to understand the progression of these skills in children (Scott, 1994; Scott & Windsor, 2000). There is no consensus in literature regarding the best way to collect a written language sample (Hudson, Lane & Mercer, 2005). Puranik, Lombarino and Altmann (2008) used a story retelling task to measure the microstructural elements of written language. The written language sample was collected from children in Grades 3 to 6. They included 9 measures, total number of words, total number of ideas expressed, number of T-units, mean length of T-unit, number of clauses, clause density, percentage of grammatical T-units, percentage of spelling errors, and writing conventions. Their analysis revealed that the above measures can be classified as productivity, complexity and accuracy. Their analysis suggested that there was a developmental trend observed in measures of productivity like total number of words and ideas. However, there was no trend reported for complexity and mixed results were observed for accuracy.

The study of written language and of its relationship to spoken language is crucial to any discussion on biliteracy (Francis, 1999). Research reports on language and literacy rejected the early versions which argue against the idea that writing is not language but its transcription. Studies on literacy in L1 and L2 emphasize on the importance of higher order processes associated with language structures. Francis (1999) found that written expression appeared to reflect into higher order processes
for two reasons. First, metalinguistic awareness would play a greater role in composing tasks (Cummins, 1990). Second, widespread lexical borrowing (say from Spanish in Nahuatl writing) is a cue to examine the manipulation of language patterns that are peculiar to bilinguals, a phenomenon unique to biliteracy. Francis (1999) studied written language skills of 45 bilingual children who spoke Spanish and Nahuatl in the second, fourth and sixth grades in the local elementary school of Central Mexico. He reported that when writing Nahuatl, the children in the upper grades showed a tendency to avoid borrowing nouns and verbs from Spanish. The tendency to substitute Nahuatl vocabulary for Spanish content word borrowings in the fourth and sixth graders’ Nahuatl written production is consistent with earlier findings (Francis, 1997) from the language dominance assessments. The opposite trend under the category of discourse connectors (prepositions, conjunction and adverbs) reflected the need on the part of the fourth and the sixth graders to resort to this linguistic device and to construct their more sophisticated narratives.

2.5 **Literacy skills in Non-alphabetic scripts**

All writing systems represent spoken language, but differences in the mappings between orthography, phonology and semantics give rise to three main types of scripts: alphabetic, syllabic, and morpho-syllabic. The scripts that are used for major European languages are all alphabetic, but there are small differences in their transparency (Goswami, Ziegler, Dalton & Schneider, 2001; Wimmer & Hummer, 1990). Ziegler and Goswami (2005) proposed the psycholingusitic grain size theory which suggests that differences in reading accuracy across languages reflect fundamental differences in the phonology of the languages and the reading strategies that are developed in response to orthography of that particular language. This is explained for more orthographically consistent alphabetic languages like
Greek, German, Spanish or Italian in comparison to less orthographically consistent alphabet language such as English. The orthographically consistent languages may rely more on grapheme-phoneme recoding strategies because grapheme-phoneme correspondences are relatively consistent, whereas in English, children cannot use smaller grain sizes as easily because inconsistency is found to be much higher for smaller grapheme units than for larger units (Treiman et al., 1995). As a result, for English, they need to use a variety of strategies supplementing grapheme-phoneme conversion strategies which can aid them in reading. Ziegler and Goswami (2005) believed that languages vary in the consistency with which phonology is represented in their orthography. According to them this can result in developmental differences in the grain size of lexical representations and accompanying differences in development of reading strategies in children across orthographies. Various researchers (Elbro & Pallesen, 2002; Perfetti, 1992; Wydell & Butterworth, 1999) discussed on the phonological system which is already structured prior to reading, and therefore the quality and grain size of phonological representations play a major role in reading acquisition prior to reading itself. Ziegler & Gosawmi (2005) opined that in the beginning of reading acquisition children face with three major problems- availability, consistency, and granularity of spelling-to-sound mappings (Figure 2.5).
Accordingly they defined each of these different levels of difficulty that can affect reading development. When there is difficulty at the *availability level*, all the phonological units are consciously inaccessible prior to reading. Consequently, connecting orthographic units to phonological units that are not available require cognitive development. Difficulty at the *consistency level* reflects that some orthographic units may have multiple pronunciations and that some phonological units may have multiple spellings (Glushko, 1979; Seidenberg & McClelland, 1989; Ziegler, Stone, & Jacobs, 1997). Both types of inconsistencies are assumed to slow reading development. Ziegler and Gosawmi (2005) opined that degree of inconsistency varies both between languages and for different types of orthographic units and are to lead to differences in reading development across languages. Finally, difficulty at the *granularity level* reflects that there are many more orthographic units to learn when access to the phonological system is based on bigger grain sizes as opposed to smaller grain sizes. That is, there are more words

*Figure 2.5: Schematic depiction of the three main problems of reading acquisition: availability, consistency, and granularity*  
(Source: Cited by Ziegler & Gosawmi, 2005)
than there are syllables, more syllables than there are rimes, more rimes than there are graphemes, and more graphemes than there are letters.

The differences in scripts and association to various grain sizes have been reported in literature (Goswami, 1988, 1999; Hulme, Hatcher, Nation, Brown, Adams & Stuart, 2002). For example, in languages such as Japanese and Korean, the same words can be represented by more than one type of script (Shafiullah & Monsell, 1999; Vaid & Park, 1997). The scripts for many Indian languages are alphabet-syllabary hybrids (Prakash, Rekha, Nigam & Karanth, 1993, on Kannada; Vaid & Gupta, 2002, on Devanagari). On the contrary, English, which follows alphabetic script, has shown a strong link between phonological awareness and literacy acquisition which is widely documented (Ehri, 1997; Goswami & Bryant, 1990; Rayner, Foorman, Perfetti, Pesetsky & Seidenberg, 2001; Wagner & Torgesen, 1987).

Orthographic complexity, differences in teaching methods and task demands may contribute to complexity in explaining the processing for English language. There is less agreement about whether beginners in English start with whole words followed by phonemes (Frith, 1985) or intermediate subsyllabic units such as onsets and rimes (Treiman & Zukowski, 1996). Multiple level models have been found to explain sub-lexical processing by skilled readers (Grainger & Jacobs, 1996; Shallice & Warrington, 1980; Taft, 1994). It may be that children learning to read and write English establish orthographic representations at several different levels, i.e., phoneme, onset-rime, syllable, morpheme, though not necessarily in that order. Treiman and Cassar (1996) found that even Grade 1 readers of English are less likely to omit the ‘n’ when spelling bi-morphemic words such as ‘tuned’ than they are in mono-morphemic words such as ‘brand’. This suggests that beginner spellers
can sometimes use rudimentary knowledge of morphological relationships to support their spelling of final consonant clusters.

Development of phonological awareness in oral/aural language was found to be similar for children growing up in different linguistic settings and begins with syllables (Gombert, 1996; Goswami & Bryant, 1990; Mann, 1986). Whether progression is from the grapheme–phoneme level to the multi-graphemic level, i.e., small to large units (Ehri, 1997; Hulme et al., 2002) or vice-versa (i.e., large to small units, Goswami, 2002) is still being explored. But, the phoneme-syllable progression and/or the syllable-phoneme progression are found to be different for different languages and are not universal for all languages. This difference is also reported to be true across scripts (Goswami, 1999).

A study by Padakannaya, Rekha, Vaid and Joshi (2002) found that in children acquiring literacy in Kannada (a semi-syllabic Indo-Dravidian script) the optimal unit for beginners is the syllable, although only more proficient readers/spellers were found to manipulate phonemes. Cardoso-Martins (2001) who studied Brazilian children learning to read Portuguese, found that that children do not begin at the grapheme–phoneme level unless explicitly instructed in phonemic awareness. The results of both cross-linguistic studies are in consensus with Treiman’s (1993) work on emergent spelling in English. Treiman showed that young children (six- and seven-year-olds) attempt to represent the phonological forms they perceive in speech when they first learn to write (Treiman, 1997; Treiman, Goswami, Tincoff & Leevers, 1997; Treiman & Tincoff, 1997). Padakannaya et al., (2002) showed that the more proficient the children are better is their ability to segment at the phoneme and syllable level in semi-syllabic Kannada. Developmental
changes in skill transfer across languages in bilinguals are less known and need to be explored further.

2.6 Children with Learning Difficulties

Research has shown that most children learning to read ESL or EAL, show relatively little difficulty in developing skills in sounding words out and reading them aloud. Failure to do so after normal teaching is exceptional and, in a child learning may indicate literacy learning difficulties that are not just a result of speaking a different language at home (this presupposes adequate instruction). Cline and Shamsi (2000) reviewed literacy learning difficulties among children learning EAL. They found that children learning EAL showed greater difficulty than the monolingual learners in terms of vocabulary, syntactical knowledge, and cultural reference in the texts used by schools. Thus, their accuracy in reading words aloud was found to be superior to their ability to understand what they are reading, and their relative deficit compared to L1 readers was found to be greater in comprehension than in accuracy.

Obler (1989) enumerated some of the factors responsible for difference in the performance of literacy skills in bilingual biliterate children with dyslexia. These factors include,

- Orthographic structure of language (Chinese & Finish have different orthographic structure).
- Characteristics of the orthographic structures of languages (like direction of reading, idiographic vs. phonologic scripts).
- Factors in the course of acquisition of a second language like age of learning.
- Manner of learning the second language (oral or written).
• Order of acquisition of two different scripts (for example, Chinese first and then Finish).

• Use of the scripts in different situation.

Karanth (1992), as reviewed in the earlier sections, described two biliterate children with reading disability. Both were multilinguals learning to read and write three different scripts, one is an alphabetic script English and the other two were semi syllabic scripts Kannada and Hindi. She found more spelling and writing errors in English than Kannada or Hindi. Therefore she concluded that in developmental biliterate dyslexics, differential patterns may be seen in two or more scripts, depending upon strategies adopted for different scripts.

A situation where a child may fail to develop literacy in one language but not in another is known as differential dyslexia (Smythe & Everatt, 2002). Smythe (2002) attributed literacy difficulties to different underlying cognitive and linguistic causes and that cognitive and linguistic deficits that impact upon one language may not necessarily have the same effect in another language. Veii (2006) opined that, depending on the magnitude of the cognitive and linguistic demands of a language, a bilingual child is likely to present with symptoms of literacy difficulties in the language with more stringent cognitive and linguistic demands rather than in both languages. Findings from studies (Everatt, Smythe, Ocampo, & Veii, 2002; Ocampo, 2002; Veii, 2003) that investigated literacy difficulties in bilingual children appeared to point to the possibility that literacy difficulties may be language-specific. However, individuals presenting with differential literacy difficulties are found to be rare (Everatt, Smythe, Ocampo & Veii, 2002) and further studies are needed before conclusive evidence is found to confirm the existence, or the lack of, a differential diagnosis. Other studies examining differential dyslexia have provided
some evidence for this phenomenon. Leker & Brian (1999) as described earlier reported of a patient who had an acquired reading difficulty in Hebrew but not in English. Wydell & Butterworth (1999) reported a single case of a child who showed evidence of dyslexia in English (L1) but not in Japanese (L2). Kline & Lee (1972) assessed children who were acquiring literacy in English and Chinese and found that the majority of the children had no problems with reading and writing in both the languages, some had trouble with English but not with Chinese while others had trouble with Chinese and not with English. Miller-Guron & Lundberg (1997) identified Swedish children who presented with dyslexia-like deficits in their Swedish (L1) but presented no such deficits in English (L2).

This evidence may be consistent with the script dependent hypothesis of Geva and Siegel (2000) i.e., literacy difficulties will vary from one language to another given the differences in the orthographic depth of the languages. However, a different interpretation of these findings may be reflecting different manifestations of literacy difficulties (dyslexia) across different orthographies; that is, literacy difficulties can occur in different languages or in two languages at the same time as a result of the same deficient cognitive-linguistic processing skills that may occur in both the languages. How these literacy difficulties manifest themselves, however, is considered a function of the orthographic depth of a given language (Veii, 2006; Veii & Everatt, 2005). Veii (2006) studied five Namibian bilingual school children with evidence of poor literacy skills in Grades 3 and 4. They studied their literacy development in Herero and English. These children showed deficiencies in the key areas associated with the development of literacy and literacy difficulties, namely, phonological awareness, verbal short-term memory, rapid naming, and repetition.
The above findings provided evidence for the central processing hypothesis that literacy difficulties are a function of deficient underlying cognitive and linguistic processing skills. However, the findings of two children also indicated acceptance to the script-dependent hypothesis. It was found that when these two children presented with L1 and L2 literacy difficulties at Time 1, by Time 2 only L2 literacy difficulties still persisted, confirming the view that literacy development in less transparent orthographies is slower besides being longer are more severe in nature. Here which is a transparent, regular, or shallow orthography placed less demands on the cognitive and linguistic processing systems of a child in the process of developing literacy. In contrast, however, less transparent, deep, or irregular orthographies such as English placed much greater demands on a child’s cognitive and linguistic processing systems. A situation where a child is developing literacy in two or more languages differing in orthographic depth may result in an uneven development of literacy in each or one of the languages. A child inherently at risk for literacy difficulties developing literacy in an irregular orthography may be at an even much greater disadvantage and, may as a result, be delayed in developing appropriate literacy skills, perhaps more so in the less transparent orthography (Veii, 2006; Veii & Everatt, 2005). Similar findings are expected in children with dyslexia, in the Indian context who learn two different scripts owing to the education policy⁴.

⁴ According to the Three Language Formula (TLF; Secondary Education Commission, 1953; Central Advisory Board of Education & Conference of Chief Ministers (1967), children should be educated in three languages- first, second, and third languages. The forms of bilingual education in India are (a) use of mother tongue or first language as a medium of instruction & other languages as subjects, and (b) use of second language as (MI) and other languages as subjects.
2.7 Biliteracy in the Indian Context

The process of acquisition of literacy becomes complicated when there is a need to acquire languages following different writing systems. Later it is said that they originate from Brahmi. There are many languages which are spoken, written and read in India, but all the four different orthographic families of modern India—Indo-Aryan, Dravidian, Astro-Asiatic (Munda, Santali), and Tibeto-Burman have a common source in Brahmi and therefore share the same salient features. An Indian child’s first language could be one of the Indo-Aryan languages like Hindi, Marathi, Gujarati or Punjabi or Dravidian languages like Kannada, Tamil, Telugu, Malayalam etc., which form the two major groups and the second language introduced in school is most often English. English as a second language is acquired once children start going to school with considerable skill in their first language. Bi/tri/multilingualism is a socio-cultural condition and cannot be ignored in India. Cross-linguistic studies suggest that reading skill develops at a different pace in different orthographies (Karanth, 2003). Less is known about how first language or mother tongue interacts with second language acquisition. Much needs to be learned concerning social factors such as number of languages spoken by the child, relative fluency in all the languages spoken, literacy level of parents, and the extent of preschool exposure to literacy (Karanth, 2001).

Apart from the above, the nature of orthography, its transparency and form of representation can influence the pattern of reading development. English follows an alphabetic and opaque script whereas languages with transparent orthographies like Italian, Spanish, German and Indian languages are considered as alphasyllabaries which depend heavily on grapheme-phoneme correspondence. Most of the research and theory building in reading has focused on alphabetic scripts and
these theories do not fully apply the process of reading acquisition in languages with transparent orthographies. One difference between writing systems related to reading acquisition is that spelling to sound consistency varies across orthographies (Frost, Katz & Bentin, 1987). In some orthographies, one letter or letter cluster can have multiple pronunciations (e.g. English, Danish), whereas in others it is always pronounced the same way (e.g. Hindi, Greek, Italian, Spanish). Similarly, in some orthographies, a phoneme can have multiple spellings (e.g. English, French, Hebrew), whereas in others it is almost always spelled the same way (e.g. Hindi, Italian). It has been demonstrated that grapheme-phoneme recoding skills take longer to develop in less transparent orthographies like English taking about two years of reading experience as compared to more transparent orthographies like Spanish, Greek, Finnish for which word and nonword reading is acquitted in the middle of first grade (Seymor, Aro, & Erskine, 2003).

Indian scripts, derived from Brahmi, fall in between syllabic and alphabetic writing systems. The alphasyllabaries of India share some characteristics of alphabetic scripts yet are distinct since the basic unit of the script is the syllable and not phoneme. The basic written unit in Indian script is akshara that consists of one of three possibilities- an independent vowel, a consonant symbol with inherent or attached diacritic vowel and two or three consonants plus a vowel (Padakannaya & Mohanty, 2004). The transparency of akshara makes decoding simpler but the spatial configuration of akshara makes it time consuming to master.

A transparent orthography is believed to facilitate comprehension, as decoding is less demanding, for example reading comprehension of an Italian child is higher than that of English. But this cannot be generalized to Indian context as Indian children have more aksharas to learn and they need to master the akshara
principle. Akshara awareness has been a good criterion for identification of good and poor readers. Writing systems which are alphabetic in nature with a small set of graphemes often have a high proportion of irregular words as compared to alphasyllabaries which have more number of graphemes with close correspondence to the phonemes. Script specific components are therefore, involved in literacy acquisition.

Literacy acquisition in children is studied in a sequence of three stages: logographic, alphabetic and orthographic phases of development. Frith (1985) proposed that children go through the logographic stage of reading while acquiring literacy in English language, while others (Wimmer & Goswami, 1994; Karanth & Prakash, 1996) believed that phonologically transparent orthographies such as German, Spanish or Hindi do not depend on logographic reading. Orthographic sensitivity is a crucial factor in fluent reading and it does not seem to achieve below a certain age or extent of exposure to the language (Posner & Kar, personal communication). Also, there may be a difference between the processes of reading acquisition in transparent orthographies including Indian scripts as opposed to opaque languages like English. Children are observed to make more spelling errors on vowels than consonants in English. But in transparent scripts such as Italian and German, more spelling errors are committed on consonants than vowels. Generalizing Italian and German findings to Indian context is not appropriate because studies in India show that children commit more mistakes on vowel part of the akshara in Indian orthographies like Gujarati (Patel, 2004).

Another significant finding is that phonological awareness that is crucial for reading alphabetic scripts is neither crucial nor necessary for successful reading acquisition in transparent writing systems. In a study on Indian population with
monoliterates, nonliterates and biliterates (Hindi and English or Kannada and English) on tasks like rhyme recognition, syllable deletion, and phoneme deletion it was observed that only biliterates performed well on phoneme awareness tasks, others performed well on syllable deletion and rhyme recognition tasks (Karanth, 1998; Prakash & Rekha, 1992). In one of the studies (Anurag, Kar & Srinivasan, personal communication) it was found that poor readers (first grade children) outperformed good readers on syllable awareness tasks in Hindi and English whereas poor readers performed very poor on phoneme deletion and reversal tasks in English language. It was also reported that performance on phoneme tasks in English was better than on phoneme tasks in Hindi. These findings suggest that the reader while learning English and an Indian script may incorporate different psycholinguistic processes. Transparent orthographies may demand different strategies when, as in Hindi, the basic unit is a syllable and not a phoneme. In another study on bi/multilingual adults it was observed that differences in phonological awareness relates to whether a particular language being tested is one L1, L2 or L3.

Considering the differences in script features, Karanth (2006) opined on teaching of reading based on script specific methods. The teaching methods followed for alphabetic scripts as opposed to transparent orthographies could be different. Models derived from studies of English have proposed phonics and the method of teaching how to read and this may not be appropriate for transparent orthographies, as it would mean teaching aksharas like alphabets. A reader of an Indian script does not learn the vowel component and consonant component separately and then combine them to form a syllable. Rather, the child first learns the basic syllabary with primary forms of vowels and consonants and then the entire
syllabary containing all possible CV combinations is taught by rote (Karanth, 2006). These aspects are specific to literacy acquisition in Indian context as far as Indian scripts are concerned. An Indian reader also acquires alphabetic script of English language from the time the child enters school at 4 years of age. English being alphabetic may require a different method of teaching reading. Moreover, one must also consider the fact that the child has the vocabulary and mental lexicon for his/her first language. Differences between languages in multilingual persons could be specifically related to the script of the respective languages (Chengappa et al., 2004).

In case of biliteracy i.e., literacy acquisition in first and second language, the child is put in a situation of cross linguistic switching which would involve inhibition, conflict resolution between competing languages when it comes to speaking, reading or comprehension.

Bilingual education or biliteracy refers to the use of two or more languages in education i.e., as an instructional medium and as a curricular subject (Devaki, 1988). According to the information reported by Chaturvedi and Singh (1981), the multilingual nature of India is evident from the fact that they recorded over 200 languages, out of which 15 languages were scheduled as national languages, 58 included in the school curriculum and 47 used as media of instructions in schools. India has preserved such a sort of diversity through various means, one of them being through the system of education in schools. This is by implementing the three-language formula (TLF) through commissions like the Secondary Education Commission (1953), Central Advisory Board of Education & Conference of Chief Ministers (1967). According to TLF, children should be educated in three languages—first, second, and third languages. There are three forms of bilingual education in India namely (a) use of mother tongue or first language as a medium of instruction
& other languages as subjects, (b) use of second language as (MI) and other languages as subjects and (c) use of two languages as medium of instruction (MI). In such an educational system children with different language backgrounds who are monolingual initially enroll to the schools. Due to the prevailing educational policy in India these children have to learn to read and write in at least three languages in school in majority of states of India. These children are required to become bilinguals or multilinguals and biliterates or multiliterates in due course of their learning at school (Prema, Shanbal & Khurana, 2010).

In the 1981 census, 202,400 persons (0.3 percent of the population) gave English as their first language. Less than 1 percent gave English as their second language while 14 percent were reported as bilingual in two of India's many languages. However, the census did not allow for recording more than one second language and is suspected of having significantly underrepresented bilingualism and multilingualism. There are estimates of about 3 percent (some 27 million people) for the number of literates in English. The 1981 census reported 13.3 percent of the population as bilingual (Devaki, 1990).

English as a prestige language and the language of first choice continues to serve as the medium of instruction in elite schools. All large cities and many smaller cities have private, English-language middle schools and high schools. Imposition of such policy on schools in India is inevitable due to the globalization and other related factors. Bilingual education in multilingual India is of two types. In the first type, the mother tongue is used as a medium of instruction and other languages are taught as subjects, the second type, a second language (like English) is used as medium of instruction. However, the impact of these policies on children developing
literacy skills and the influence of two or more languages need to be studied extensively in order to derive a consensus on teaching biliterate children in India. Literacy skills in biliterates in India with diverse script structures are less investigated. Hence, there is a need to study the above and orient the educational policy makers in India towards framing policies for biliterate children. In the recent years, acquisition of literacy in Indian children has received much attention by researchers and educationists. But, a realistic estimate of the prevalence of literacy failures in school children is yet to be made. The estimate suffers from intrinsic factors such as lack of proper definition, failure to incorporate factors that contribute to literacy failures. Influence of language and cultural factors appear to be totally ignored in these surveys.

Of late, the number of children with literacy failures who avail consultation from Speech-Language Pathologist is increasing possibly due to the most prevalent language and cultural diversity in India. Among those who report, not everybody manifests typical literacy failures with disability. There are many children who are backward/slow in reading due to factors not directly related to literacy. Majority of these children happen to be from monolingual community, a few others from bi/multilingual community learning to become biliterate. Given the peculiar situation that exists in our country, it becomes mandatory to develop a tool to assess biliterate children in order to understand the typical characteristics of children with literacy failure and those with learning disability⁵.

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⁵ The World Federation of Neurology definition- Learning disability is difficulty in learning to read and later by erratic spelling and lack of facility in manipulating written as opposed to spoken words. The condition is cognitive in essence and usually genetically determined. It is not due to intellectual inadequacy, or to lack of socio-cultural opportunity, or to emotional factors, or to any known structural brain defect. It probably represents a specific maturational defect, which tends to lessen as child gets older and is capable of considerable improvement, especially when appropriate remedial help is afforded at the earliest opportunity (Cited from Critchley, 1978).
2.8.1 Need for the study

Majority of research on reading pertains to the reading of monolingual speakers of English. However, this body of research has provided an initiation to understand second language (L2) acquisition in children. Research (National Reading Panel [NRP], 2000; Rand Reading Study Group, 2002; Snow, Burns, & Griffin, 1998) has shown that there is a high degree of convergence on the fundamental components in early stages of reading in L1, such as alphabetics (phonemic awareness and phonics), fluency, vocabulary, and comprehension. These components are found to be relevant to the study of L2 reading but vary due to the differences of a second language learner’s knowledge of two languages. Studies report that there is the complexity of learning to read when the learner is not natively proficient in the language. It is reported that since the language of written texts maps onto oral language, L2 learners need to develop some proficiency in the target language (Alderson, 1984). These children need to become aware of the implicit knowledge and norms associated with literate language use as in the native speakers of a language. Also, reports suggest that the L2 learner may have an advantage of accessing knowledge and skills unavailable to the monolingual speaker, including enhanced metalinguistic awareness, code-switching, translation, and, if L1 and L2 are linguistically related languages, knowledge of cognates, etc. Third, for learners who are already literate, some skills are found to transfer to reading in the second language. Finally, other factors like socio-cultural and sociopolitical factors have often been found to play a mediating role in the education of L2 learners and their reading development.

The rationale for the present study followed that of previous work (example Geva & Siegel, 2000; Gholamain & Geva, 1999) who proposed specific predictions
based on the script dependent and central processing hypotheses. The script dependent viewpoint argues for faster rates of literacy acquisition with a more transparent orthography. Faster rates of literacy development with a transparent orthography may be particularly evident when grapheme-phoneme decoding is assessed. Script dependent hypothesis also suggests that if the scripts of languages vary in the depth of orthography, reading ability/disability in one language need not be accompanied by similar levels of ability/disability in another language. It is reported that a child with good reading skills who uses a more transparent orthography need not show the same level of ability with a less transparent script. This may be particularly the case when decoding ability is assessed. Research has shown that individuals with English language literacy disabilities (dyslexia) show evidence of deficits in applying symbol to sound conversion strategies when reading, a deficit that may be related to poor phonological skills but which may be less common in languages with a more transparent orthography (Rack, Snowling & Olson, 1992; Siegel, 1993; Snowling, 2000; Stanovich, 1988).

Keeping in mind the inherent nature of languages and scripts and their influence on acquisition of literacy, it becomes even more essential to study biliteracy acquisition in the Indian context. Children in India follow an education system in which when the mother tongue (such as Kannada) is used as a medium of instruction and other languages are taught as subjects or second language such as English) is used as medium of instruction with the mother tongue (say Kannada) is only taught as a subject. As mentioned earlier, imposition of such a bilingual education policy on schools in India has brought in constraints on the choice of languages in education although it is widely accepted that globalization is possible through the English language. In turn, teaching English as a second language has
become a serious issue for schools in India in order to help children think effectively and operate globally in their future in different endeavors in their lives. However, the impact of these policies on children developing literacy skills and the influence of two or more languages need to be studied extensively in order to derive a consensus on teaching biliterate children in India. Literacy skills in biliterates in India learning to be literate in two or three languages that have diverse script structures are less investigated. Hence, there is a need to study the above and orient the educational policy makers in India towards framing policies for biliterate children.

There are reports in the Western literature on the use of two or more languages in schools for the purpose of education. These languages include Spanish, Hebrew, Hispanic, Turkish, Chinese, etc. As seen in the literature such studies are extensively done in nations like the United States of America, where a huge number of immigrants from different parts of the world are found to encounter wide range of problems with respect to learning English. Similarly as mentioned earlier, India is a nation with a history of cultural and linguistic diversity. Hence, biliteracy or multiliteracy in schools is an accepted scenario in the present Indian context as in a few other countries of the world and here, children are exposed not to one language but to two or more languages for literacy skills. Literature suggests that there is a possibility of differential development of literacy in different languages. A child may perform well in some of the literacy skills in one particular language and perform poorly in few others in the other languages. There are reports on differential development of literacy in a few languages like Spanish, Turkish and Hebrew, which follow the syllabic system in script in contrast to English, which is alphabetic.
However, such studies are limited in the Indian context and there is a need to study and understand the pattern of biliteracy acquisition in Indian children.

In the recent years, acquisition of literacy in Indian children has received much attention by researchers and educationists. But, a realistic estimate of the prevalence of literacy failures in school children is yet to be made. Majority of literacy failures in school children may be due to factors such as language and cultural factors (Prema, Shanbal & Khurana, 2010) but may not be the disability in the real sense. Of late, the number of children with literacy failures who avail consultation from Speech-Language Pathologists is increasing possibly due to the most prevalent language and cultural diversity in India. Among those who report, not everybody manifests typical literacy failures with disability. There are many children who are behind/slow in reading and writing due to factors not directly related to literacy. Majority of these children happen to be from monolingual community, a few others from bi/multilingual community learning to become biliterate. Hence, it is challenging yet, necessary to understand the pattern of literacy acquisition in biliterate children especially in a multilingual and multicultural nation like India where factors influence literacy acquisition as well as literacy failures in children.

It is well known that language and literacy skills are closely related to each other. On one hand, the components of language such as listening comprehension, phonological awareness and rapid verbal naming subserve acquisition of literacy. On the other hand, the script specific aspects such as phonemic, syllabic or morphemic structure of a script for decoding or writing subserve learning language with all its complexities. Thus, language and literacy are related to each other as language or literacy learning is largely considered as a mastery of phonological, morphological
(word), syntactic and semantic aspects of spoken and written language. Broadly researchers divide language skills itself into two broad groups, while listening and reading are considered receptive skills that of speaking and writing are considered as expressive skills. Hence, it is the responsibility of a Speech-Language Pathologist to investigate the phenomenon of acquisition of literacy or biliteracy, more so in the Indian context given the peculiarities of Indian languages and scripts. In order to study acquisition of biliteracy in children in the Indian context, there is a need to develop a tool for the said purpose and examine the relevance of skills for acquisition of literacy in a language with a transparent script (Kannada) and that with an opaque script (English) that are taught across schools in Karnataka state, India. Efforts in the above direction will also help in the development of a model for biliteracy in Indian context, thus contributing to the existing theoretical information.

**Research questions and aims of the study**

1. Is there a developmental pattern of acquisition of literacy skills in biliterate children from Grade V to Grade VII?

   💡 The primary objective was to study the developmental pattern of acquisition of literacy skills in biliterate children from Grade V to Grade VII.

2. Is there a need to develop an assessment battery for Biliterate Children?

   💡 In order to achieve the primary objective of the study, the secondary objective of the study taken up was to develop a tool to assess biliterate children (ABC).

3. Do the existing models of literacy acquisition hold good for biliterate children?
The data obtained on ABC tool would be examined for patterns of responses in order to compare with the existing models of literacy acquisition. Hence, the tertiary objective of the study was to derive a model of literacy acquisition in biliterate children, which will contribute to the existing models for biliteracy development.

4. If a differential pattern of literacy acquisition exists in biliterate children, what is its relevance to biliterate children with learning disability (CLD)?

An extended objective of the study was to examine a small group of clinical population (children with learning disability-CLD) in order to check for the relevance of ABC tool for clinical purposes.