SUMMARY AND CONCLUSIONS

In the recent years, acquisition of biliteracy 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 need not necessarily be the disability in the real sense. Of late, the number of children with literacy failures who avail consultation from Speech-Language Pathologists in India 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 are from monolingual community, a few others from bi/multilingual community learning to become biliterate. Research studies investigating biliteracy acquisition in other languages have documented that structures of languages play a major role in the differential pattern of biliteracy acquisition. This necessitates the need to understand acquisition of biliteracy in children particularly to identify those factors within the languages that may affect the acquisition of biliteracy leading to literacy failures or reading or learning disability in such children.
There were four research questions put forth for the present study.

7. 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.

8. 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).

9. 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 literacy development.

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

An extended objective of the study was to examine a small group of clinical population (children with learning disability-LD) in order to check for the relevance of ABC tool as a clinical tool.
A cross-sectional population of ninety Kannada-English biliterate children (Male=45; Female=45) from Grades V through VII studying in schools with English as medium of instruction were selected from three different schools of Mysore city (30 children from each school; 30 from each grade). All the children were assessed on the tool for acquisition of biliteracy in children (ABC tool) after suitable pilot testing. The ABC tool comprised of various subtests for listening comprehension, phonological awareness, rapid verbal naming, reading and written language skill. The ABC tool was also administered on a small group of children with Learning disability (N=10; 3 children from Grades V and VI; 4 children from Grade VII) in order to check for its relevance.

The data obtained on 90 children was subjected to various statistical analyses such as two-way repeated measures ANOVA, correlation, regression and discriminant function analyses.

**Developmental pattern in the acquisition of biliteracy**

The results indicated a clear developmental pattern across listening comprehension, phonological awareness, rapid verbal naming, reading and written language skill both Kannada and English. A few common predictors and a few differential predictors were found for Kannada and English. The common predictors were listening comprehension which significantly correlated with reading in both Kannada and English. Rapid verbal naming was yet another skill which predicted written language in both Kannada and English. Written language in both Kannada and English was in turn predicted by phonological awareness that served as a stronger predictor of written language in English than for Kannada. These predictors indicated the need for deriving two separate models for acquisition of biliteracy in
children. Two separate models were derived for Kannada and English (Figures 4.6.18 and 4.6.19).

**Importance of underlying skills to literacy acquisition in biliterate children**

While in the monolingual/monoliterate studies in Kannada, it is suggested that phonological awareness is not so crucial for literacy acquisition in Kannada (Karanth, 1998; Prakash, Rekha, Nigam & Karanth, 1993; Prakash & Rekha, 1992; Prakash, 2003; Prema & Karanth, 2003). The findings of the present study and the derived models (Figures 4.6.18 and 4.6.19) suggest that phonological awareness is significant for written language in Kannada-English biliterate children, though at different degrees in Kannada and in English (see Tables 4.6.2 and 4.6.3). Phonological awareness was found to be a predictor for reading in English but not for reading in Kannada. But, phonological awareness that was found to be an important contributor for written language in Kannada also contributed to written language and reading in English along with other skills such as rapid verbal naming and listening comprehension skills (see Figures 4.6.18 and 4.6.19). Therefore, Kannada-English biliterate children are equipped with skills (such as phonological awareness, rapid verbal naming and listening comprehension skills) or strategies that would become advantageous for learning to read and write English. Kannada-English biliterate children appear to transfer strategies to read and write in either of the languages with the common underlying processing skills such as phonological awareness, rapid verbal naming and listening comprehension. Their cumulative contribution to written language and reading in Kannada and English seem to be advantageous to strengthen cross-language transfer in biliterate children.
Cross-language transfer of literacy skills in biliterate children

The findings of the study also show the direction of cross-language language transfer of skills in learning literacy in Kannada and English. Transfer of a few skills such as reading and writing irregular nonwords of first language appeared to interfere with literacy in second language or at times, facilitated second language learning.

For reading nonwords in English, children are required to employ the grapheme-phoneme correspondence rules of English. But, the errors while reading irregular nonwords in English (opaque orthography) may be due to the orthographic principles that are employed for Kannada (transparent orthography) is being transferred to reading irregular nonwords in English.

The transfer of skills from transparent (Kannada) to opaque (English) language is likely to show a disadvantage to decode second language (English) in the present study. On the other hand children are better on reading comprehension in English than in Kannada, suggesting that the Kannada-English biliterate children are not entirely dependent on decoding words but derive clues from the context as it is done while reading Kannada. Therefore, while teaching biliterate children one should teach words in a context so that decontextualized reading effects may be nullified. Facilitating reading comprehension for biliterate children is recommended so that they have a context to learn words in the classroom situation. Depending on these issues there is a need to orient educators as well as Speech-Language Pathologists on planning remedial programs for biliterate children.
**Processing mechanisms in biliteracy acquisition**

Results on biliterate children revealed that, while phonological awareness, nonword reading and nonword writing were found to be script dependent, listening comprehension and reading comprehension appeared to be dependent on central processing. These findings suggested that though the two processing mechanisms, are complementary to each other as suggested by Geva and Siegel (2000), learning two different types of scripts such as Kannada and English involve central processing mechanism which is subserved by script specificity and hence, differential results on Kannada and English tasks indicated that even though they are developed as parallel tasks for ABC tool, they need to be viewed from two different ways for Kannada and English. An understanding of the model for literacy acquisition in Kannada-English biliterate children suggested how differently, few skills such as listening comprehension and writing to dictation are crucial for literacy acquisition in English and reading comprehension and writing are crucial for Kannada. This model is inferred and designed based on results obtained from a host of statistical analyses. Better accuracy for listening comprehension, reading comprehension, expository writing, nonword reading and writing in Kannada, and ‘phonological sensitivity’ in Kannada, suggest that children follow a lexical semantic route for reading and writing in Kannada; poor accuracy for nonword reading and writing in English (regularization of irregular nonwords), listening comprehension, reading comprehension, expository writing and ‘phonological awareness’ suggest that the lexical semantic route fails to facilitate reading and writing in English in Kannada-English biliterate children. Therefore they may neither employ phonological route to read and write English (as is the case in the majority of monoliterate children learning to read and write English) nor able to
employ lexical-semantic route owing to the nature of English script (alphabetic). Therefore, the acquisition of reading and writing skills is slower but gets facilitated by transfer of strategies and skills over a period of time in higher grades. The study contributed to the existing models of biliteracy acquisition and disorders from the perspective of language and script structures. A further empirical testing of the model could reveal the units or the levels that may be disintegrated in a biliterate child with learning disability.

**ABC tool for screening and diagnostic purposes**

The results of the present study strengthen the need for an assessment tool for acquisition of biliteracy in the Indian context. The significant functions derived from discriminant function analysis indicated that, while in Kannada writing to dictation was predicted by reading comprehension, in English writing to dictation is predicted by listening comprehension. Writing to dictation in Kannada and English may be used as a screening tool to identify literacy difficulties in Kannada-English biliterate children. The other tasks that may be included in the screening tool could be rapid verbal naming and reading single words and nonwords in both Kannada and English. Rapid verbal naming task would approximately take 10 minutes and reading words-nonwords would take 10-15 minutes to complete the respective tasks. Phonological awareness can be included as part of the diagnostic tool itself as the assessment takes longer time for administration. From the 90 children selected for the study with strict inclusion criteria (refer to page nos. 88-89) and assessed using the ABC tool, two children (a child from Grade V and Grade VII) appeared to perform below their peer group. Around 2.2% of children from the data emerged as children with literacy difficulties in the group of biliterate children. Prema (1998) reported that around 4% of Kannada monoliterate children were found to show
literacy difficulties. In support of this premise, reports of a retrospective study by Prema and Jayaram (2002) revealed that around 13% (22 children out of 165) of children from the clinical population who were diagnosed as biliterate children with learning disability were over identified. Their study indicated that children with learning disability may have different causation factors. The present study exercised strict criteria for inclusion, and therefore identified 2.2% children with literacy difficulties, as against those studies mentioned in monoliterates (around 10%, Ramaa, 2000). So, ABC tool provides a multidimensional database to a Speech-Language Pathologist and gives a strong foundation for selecting skills for management of children with learning difficulties between languages like Kannada and English. The ABC tool and the screening tool can be used effectively after a systematic validation of the tools. Hence, as a product of this doctoral research, ABC tool for screening and diagnostic purposes emerged.

**Literacy breakdown in biliterate children with Learning disability**

The derived models also helped in understanding the breakdown of skills in a sample of children with learning disability (LD). Based on the results of the ABC tool, the clinical group could be sub typed in two groups-LD Group 1 and LD Group 2. Children in LD Group 1 showed difficulty in both Kannada and English and one child in LD Group 2 showed difficulty in English than in Kannada, which was referred to as ‘differential dyslexia’. While, the literacy difficulties in LD Group 1 suggested that these children had breakdown of a central language processing domain that in LD Group 2 (differential dyslexia) is of a script dependent domain. This suggests that when a child learns more than one script, there is the potential phenomenon for uneven literacy acquisition. This idea of ‘differential dyslexia’ that is where the child may be dyslexic in one language but apparently not in another, is
in support of various (Kline & Lee, 1972; Leker & Brian, 1999; Miller-Guron & Lundberg, 2000; Veii, 2006; Wydell & Butterworth, 1999). The results are not necessarily due to a function of language exposure but the way dyslexia manifests itself in different languages, demonstrating that a given underlying weakness may cause difficulties in one language but not another (Smythe & Everatt, 2000). The findings are in support of Smythe and Everatt (2000) who believed that research on existence of differential dyslexia, challenges the notion that an individual with dyslexia individual who experiences difficulties in one language will have difficulties in all languages.

Hence, the findings of the present study answers all the four research questions posed for the present study.

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

- There is a developmental pattern of acquisition for listening comprehension, phonological awareness, rapid verbal naming, reading words-nonwords, reading comprehension and written language skill in both Kannada and English from Grades V through VII. Thus, the primary objective of the study is achieved.

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

- Yes, there is a need to develop an assessment battery for biliterate children. The present study not only provided norms for literacy skills in biliterate children under study but also suggested that part of the ABC tool can also be used by Speech-Language Pathologists for screening biliterate children for literacy difficulties. However, validation for the screening tool is necessary.
before it is used for screening purposes. Hence, the secondary objective of the study is achieved and the mean and SD scores are provided in the Appendix IIIa for further clinical use.

3. Do the existing models of literacy acquisition hold good for biliterate children?

The data obtained on ABC tool were examined and a host of statistical analyses revealed common and different predictors for Kannada and English. Based on the inferential data, two separate models were derived for Kannada and English. The models were derived on the basis of Durgunoglu and Öney (2000) model of literacy acquisition (see Figure 2.1 in the review section in page no. 40). Hence, the tertiary objective of the study was achieved and models of literacy acquisition in biliterate children were derived.

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

The relevance of ABC tool was checked by examining the ABC tool on a small group of clinical population (children with learning disability-LD). The ABC tool was successful in identifying two subtypes of learning disability within the clinical group. While one subtype of children with LD exhibited difficulty in both Kannada and English, other subtype was that of differential dyslexia with difficulty in English than in Kannada. Hence, the extended objective of the study was achieved for the small group of clinical population (children with LD).
The findings of the study suggest that ‘biliterate children’ are a unique group of children who manifest multidimensional skills that often transfer from one language to the other. Despite the commonalities, script features of a given language would require specific skills that are governed by the processing mechanisms. Therefore, it is necessary to identify and assess literacy in biliterate children in all the prerequisite skills.