



Written productivity in fourth grade Kannada-English children with Learning Disability

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Abstract

Most of the studies in biliterate children with Learning disability have mainly concentrated on reading, whereas little attention has been given to studying correlates for written language development. Thus the objectives of the present study were to investigate and compare written productivity in Kannada-English biliterate children with Learning Disability in each of their two languages. The participants of the study included fifteen emerging biliterate children with Learning Disability in the fourth grade and thirty age and language matched typically developing children. The children were asked to produce a written narrative for a pictorial prompt in Kannada and English. The written compositions of children were analyzed for three measures of productivity using the SALT software. Between language comparisons in children with Learning disability ($p < 0.01$) and typically developing children ($p < 0.01$) showed that total number of words were greater in English in both the groups. Typically developing children performed significantly better than children with Learning disability ($p < 0.05$) on all the measures of written productivity in Kannada. The study emphasizes the importance of assessing two languages in biliterate children. The results of the study also highlight the influence of proficiency/use of language and the amount of exposure to a particular language on the written productivity of children.

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Introduction

Writing is a form of communication which is complicated in nature requiring a myriad of processing abilities. Appropriate development of written language is crucial in a child's life since children are often assessed based on their written performances in school (Hooper, 2002). It has been well established that oral language development plays a very important role in the development of written language (Perfetti & Dunlap, 2008). Research has also shown that writing is also an orthographic skill (Abbott & Berninger, 1993). Thus it can be inferred that writing is not purely a motor skill, as it is often presumed to be, but it is also a linguistic skill relying heavily upon the linguistic competence of the writer. Therefore, evaluation and management of written language disorders comes under the purview of Speech Language Pathologists since they are trained and have knowledge about development and disorders of language (Puranik, Lombardino & Altmann, 2008).

Written productivity refers to that characteristic of written language that describes the length of writing produced according to the task and context. Typically, the measures used to assess written productivity include the total number of words, ideas or sentences and the number of different words produced (e.g., Abbott & Berninger, 1993; Kim, Al

Otaiba, Puranik, Sidler, Grulich & Wagner, 2011; Puranik, Lombardino & Altmann, 2008; Wagner, Puranik, Foorman, Foster, Tschinkel, & Kantor, 2011). But it has to be clarified that though lengthy writing is not the definitive goal of writing or writing instruction/remediation, a certain amount of length in writing is necessary to explain one's ideas clearly and thoroughly. Research has also shown that some of the measures of written productivity such as the Total number of words are a very good indicator of development (McMaster & Espin, 2007; Nelson & Van Meter, 2007; Wagner et al., 2011). Children acquire writing skills during their beginning school years when they learn to write alphabets, spelling etc. Development of written language has been linked to a child's overall development (Grigorenko, 2007). Development of writing abilities follows hierarchically the development of other linguistic abilities namely listening, speaking and reading (Johnson & Myklebust, 1967; Myklebust, 1965, 1973). Litowitz (1981) suggests that there are several psychological and cognitive abilities underlying the linguistic capabilities namely memory, selective attention, categorization, problem solving, perception etc. Writing involves not only lower levels skills such as transcription but also involves higher level skills such as composition and a fine amalgamation of both the skills. Thus a disorder of written expression may result from a break-

down in any of the linguistic precursors to writing (listening, speaking and reading) and/ or the specific cognitive or psychological abilities required for information processing (attention, perception, reasoning etc).

Several models of written language have been suggested, the most influential among them being Hayes and Flower's model (1980). According to this model, composing a written text involves the steps which include generating ideas (planning), systematically arranging these ideas (organizing), encoding the ideas in terms of words, phrases, clauses, sentences etc to convey meaning (generation), and finally to review and modify the encoded ideas to conform to the conventions of written language (revision). This model is still very relevant in understanding the development of composition skills in children. According to Berninger (2000), for composition skills to develop, the development of lower level transcription skills to the point of automaticity is very crucial so that cognitive resources are free for the higher level processes such as planning, generating and revising. Planning and revising stages in younger elementary grade children, i.e., those studying in the first to fourth grades are bound by their limited transcription skills (Berninger, 2000). Development of composition skills is highly dependent on the growth of processing abilities, working memory, storage capacity in addition to the development of meta-linguistic and meta-cognitive abilities in children (Kellogg, 2008). According to Almargot and Fayol (2009), children begin to learn written production at 5-6 years of age and acquire basic composition skills by approximately 10 years of age.

Development of written composition occurs from kindergarten to middle school in predictable stages similar to how oral language development occurs starting from one word stage moving on to word combinations and further lengthier and more complex utterances (Berninger, Fuller, & Whitaker, 1996). This is followed by genre specific discourse structures for narrative and expository writing (Berninger, Abbott, Jones, Wolf, Gould, Anderson-Youngstrom, Shimada & Apel, 2006).

Sheetal and Sangeetha (2010) investigated the written language skills of typically developing Indian children in comparison with children with LD studying in the first to fifth grades. The children had Kannada as their native language and English as the medium of instruction in schools. An expository writing task in English was used for assessment of written language skills. Analysis of results showed that children with LD produced fewer Total Number of words and Number of T-units calculated using the SALT software. The results indicated that children with LD performed poorer than age matched peers on measures of written productivity along with deficiencies in measures of accuracy and syntactic complexity. The author concludes that children with LD

manifest deficits in either one or many levels of processing in addition to deficits in written productivity. In this study, though children were Kannada-English biliterates, written language was assessed only in English probably since it was the medium of instruction.

Puranik, Lombardino and Altmann (2008) studied the development of the micro-structural elements of written language in typically developing children studying in grades three to six. A story retelling task was used for the study. The measures comprised of total number of ideas expressed, mean length of T-unit, number of T-units, total number of words, number of clauses, percentage of grammatical T-units, clause density, percentage of spelling errors, and errors in writing conventions. The analysis of their results indicated that the measures mentioned can be classified as accuracy, syntactic complexity and written productivity measures. The results of their study also showed that there was a developmental progression for the written productivity measures such as total number of words and total number of ideas expressed. No such trend was noticed for syntactic complexity and mixed results were obtained for accuracy measures.

Children with Learning Disability and written language

Children with Learning Disability (LD) may face problems in one or more of the stages of writing mentioned earlier. According to DSM-V, Specific Learning Disability (SLD) is a disorder neurodevelopmental in origin, which hampers the development as well as use of certain academic skills such as reading, writing, arithmetic etc which form the foundation for other academic learning. The two major changes incorporated in DSM V include: 1) inclusion of comprehensive 'specifiers' or criteria for the identification of SLD and 2) elimination of IQ- achievement discrepancy criteria and replacement with four criteria (A to D) and all of them must be met for a diagnosis (IDEA, 2018). In the present study, the term Learning Disability (LD) is operationally defined to a condition in developing children who have difficulties in both reading and writing.

Though LD is usually thought of as primarily a reading disorder, on assessment it was found that both children and adults with learning disabilities manifested equal difficulties in both reading and writing (Berninger, Abbott, Thomson & Raskind, 2001). But the writing difficulties in these children are often not identified and therefore not treated. Presently, there are very few standardized tests, protocols or universally accepted standards for identifying children with written language difficulties (Lyon, 1996; Katusic, Colligan, Weaver & Barbaresi, 2009). As far as research is concerned, research on disorders of written language has often taken a backseat compared to research on reading difficulties (

Katusic , Colligan , Barbaresi , Schaid & Jacobsen, 2001). Heath , Toste and Roberts (2007) analyzed the amount of research conducted during a ten year period in the core area of Learning Disability in well-known LD journals and found that published research on reading disabilities were around 20% compared to research on written language disorders which was less than 1%. Research on written language difficulties in children with Learning disabilities is evolving only since the past two decades (Hooper, 2002). The particulars of written language disorders have not been researched thoroughly and such research is warranted even more since written language disorders are a heterogeneous group (Hooper, 2002; Katusic, Colligan, Weaver & Barbaresi, 2009).

Many research studies have demonstrated that children with LD manifest deficits in written productivity. Houck and Billingsley (1989) investigated the writing samples of participants studying in grade 4, 8 and 11. The results of their study showed that compared to typically developing children, children with LD wrote fewer number of words and sentences, higher number of words per sentence, fewer longer words (words with or more than seven letters) and also showed higher percentage of capitalization and spelling errors. The authors conclude that the written language difficulties in these children were persistent across grades.

Development of written language in biliterates

Another factor compounding the development of written productivity is the aspect of children having to develop written language in more than one language. But the available research in the area of written language development has mostly concentrated on one language (Gort, 2006). Grosjean (1985, 1989) has condemned the application of monolingual research to bilingual children by suggesting that it is a fractional or monolingual view of a bilingual. This is especially relevant in a multilingual and multicultural country like India. In India children are exposed to at least two languages, one being the regional language and the other being English, which is most often the medium of instruction in school settings. Therefore most children are growing up to be biliterate and facing the challenges of developing writing in two distinct languages.

Hopewell and Escamilla (2014) define biliteracy as the development of reading, writing, listening, speaking and thinking competencies in more than one language. The development of biliteracy is far more complex than the development of monoliteracy since in biliteracy, language learning occurs in diverse and constantly changing situations (Hopewell & Escamilla, 2014). Research has indicated that children being educated in more than one language would exhibit greater academic development due to increased

learning opportunities (Lindholm- Leary & Genesee, 2014). Thus, the credibility of generalization of results obtained for monolinguals to bilinguals becomes questionable. Thus, the importance of systematic studies on the influence of L1 skills on the acquisition of L2 written language skills cannot be understated. The knowledge about how children acquire written language skills in two different languages is very important so that assessment and treatment techniques can be developed that are developmentally, culturally and linguistically appropriate for biliterate children with written language difficulties (De Silva, 1998). Such studies would also help us in understanding the cognitive, intellectual and cultural outcomes of biliteracy (Dworin, 2003). Kannada follows a semi syllabic and transparent script and the script of English alphabetic and opaque. Thus understanding of how written language develops simultaneously in these two languages with distinct writing systems would be interesting.

More recent studies in various languages and different orthographies have revealed that the system of writing in a language influences how literacy develops (e. g. Cossu et al, 1988; Katz and Frost, 1992) Growing research has also led to the understanding that different relationships between phonology and orthography in different languages may result in different developmental processes of literacy. A study conducted by Karanth (1992) found that there was difference in the way two languages were learnt. Indian Kannada-English emerging biliterate children in the study were found to have specific difficulties in learning to read English. This difficulty was reasoned out to be due to the writing system of English, which is opaque, in comparison to the transparent script of Kannada. Shanbal (2010) investigated the development of biliteracy in Kannada-English typically developing bilingual-biliterate children studying in the fifth, sixth and the seventh grade. Children with LD were also included in the study. Phonological awareness, rapid verbal naming, reading, listening comprehension and written language skills were assessed. An expository writing task was used to assess the written language skills of children. Shanbal (2010), among other written language measures, used Total Number of words and Number of T- Units in order to assess the written productivity in children. The results of the study revealed that the total number of words and the number of T-units were found to be greater in English compared to Kannada. The author attributes these findings to the difference between the structures of the two languages. The agglutinative nature of Kannada (i.e. fusion of morphemes in a word) allows for the use of fewer number of words to convey information. On the other hand, English requires the use of different words to convey information thus leading to greater number of words to convey the same meaning as a sentence with fewer words in Kannada.

Another inadequacy in the area of biliterate written language research is that most studies that have evaluated written compositions in these children have done so on older children especially adolescents (e.g., Danzak, 2011a, Danzak, 2011b, Hedman, 2012 etc.). Berninger (2000) stated that the stages of planning and revising in writing of elementary school children (children studying in the first to fourth grades) are restricted by their limited transcription skills. Also, Alamargot and Fayol (2009) reported that learning of written production begins at around 5-6 years of age and the acquisition of basic composition skills starts around 10 years of age. Since the acquisition of composition skills begin to be acquired by around 9 to 10 years of age, by studying older biliterate children, we may miss out on crucial information on how biliterate written language acquisition may take place in younger children. Furthermore, most of the studies conducted in the area of bilingual/ biliterate writing have been qualitative (Fitzgerald, 2006).

In summary, through the review of past literature we can understand that studies on the biliterate population have focused on the development of early processes such as phonological processing, inventive spelling and word reading required for literacy (Bialystok, 2007; Geva, 2006; Shanahan & Beck, 2006) and very few have focused on written composition. Also, majority of studies conducted in emerging biliterates have focused mostly on reading. Moreover, the studies which have focused on written language in biliterates have focused on older children (mainly adolescents) and not on younger children. There is a dearth of studies investigating written language in Indian biliterate children who learn writing in a non-alphabetic script (Kannada) and an alphabetic script (English) simultaneously. Also, studies on a clinical population, mainly LD, who are emerging Kannada-English biliterates are lacking. With this background, examination of written productivity in biliterate children with LD is of utmost importance so that it guides appropriate instruction. Thus the objectives of the present study were to investigate and compare written productivity in Kannada-English biliterate children with Learning Disability (LD) in each of their two languages. In the present study, a narrative writing task was used. This is because narrative tasks provide information about discourse units beyond the level of the sentence (Griffith, Ripich & Dastoli, 1986). Griffith, Ripich and Dastoli (1986) further report that narrative written tasks also provide information about the child's skill of logically ordering and presenting ideas; connecting past experiences with the present task at hand; using suitable linguistic devices to produce a coherent text and consider the needs/ knowledge of the reader.

Method

Participants

The participants of the study included fifteen children with LD and thirty TDC. All the participants were studying in the fourth grade within the age range of 9 to 10 years ($9.0 \text{ years} \leq A < 10.0 \text{ years}$, where 'A' is the age of the child; Mean age: 9.5 years). There were equal number of males and females in the TDC group i.e. 15 males and 15 females. The LD group included three females and twelve males. Kannada was the native language and English was the medium of instruction (in school) for all the participants. All the participants were sequential bilinguals who learnt Kannada at home and were later slowly exposed to English predominantly in school settings. All the participants had approximately six to seven years of English exposure. All the participants in the study knew how to read and write in both Kannada and English. In academic settings, Kannada was one of the subjects to be studied while English was the language through which children learnt the rest of the subjects (medium of instruction). Children in the TDC group were screened using the the WHO Ten Questions Disability Screening Checklist (Singhi, Kumar, Malhi & Kumar, 2007) to exclude those with neurological, behavioural or sensory problems and or a history of delay in development. The TDC were also screened using the Tool for screening children with writing difficulties (ToSc-WD) (Shanbal, 2003) to rule out any written language difficulties.

A random sample of children with LD within the age range considered was selected for the study from those who came to seek Speech and Language services at our institute. A written informed consent was obtained after the parents of both TDC and children with LD were familiarized with the study. Children with LD were diagnosed by Speech Language Pathologists (SLPs) in collaboration with Clinical Psychologists. SLPs assessed children with LD using the 'Test of Early Reading Skills' for Indian children developed by Loomba (1995). Those children who were found to function at the level of two grades below their actual grades on the Test of Early reading skills were included for the study. Clinical psychologists assessed the IQ of children with LD and only those children who demonstrated a Performance Intelligence Quotient (PIQ) greater than 80 on Ravens Progressive matrices were selected as participants for the study.

Children with LD who had a history of language delay were not included for the study but the children performed poorly on the syntax section of the Linguistic Profile test in Kannada (Karanth, Ahuja, Nagaraja, Pandit & Shivashankar, 1991) scoring somewhere between 55.95 to 69.07. These scores indicated that children with LD performed at the 7 to 8 year age range in terms of syntax. Besides, all the chil-

dren with LD had difficulties in reading and writing both English and Kannada.

All the children selected for the study belonged to the middle socio-economic status which was ascertained through the use of revised version of the NIMH Socio-economic status scale (Venkatesan, 2011). The pattern of language use in all the children was assessed through the use of 'Language use questionnaire' (Shanbal, 2010). The parents rated the amount of exposure, use and the proficiency of their children in Kannada and English. The overall results of the questionnaire indicated that most of the children were exposed more to Kannada (75% to 100%) and less to English (25% to 50%) at home settings. On the contrary, children were exposed more to English (75% to 100%) and less to Kannada (25% to 50%) at school. Additionally, it was also found that children had better receptive and expressive abilities of spoken language in Kannada (75% to 100%) in comparison with English (25% to 50%).

Stimuli/Material and procedure

All the participants in the study were instructed to write a story in response to a sequence of pictures portraying a child falling from a tree. Researchers such as Cain and Oakhill (1996) have reported that with the use of picture prompts, children with LD produced more causally related narrative compositions compared to verbal prompts. Additionally, to decrease the complexity of the task and to reduce the anxiety of children related to novel written tasks, pictorial prompts were used in the present study. The picture prompts used were adapted from the picture stimuli (cited in Carretti, Maria Re & Arfe, 2013) developed by Tressoldi and Cornoldi (1991) as a part of a standardized Italian battery for the assessment of written language skills in children.

The picture stimulus consisted of a sequence of six pictures depicting a child climbing a tree to take the nest, the branch breaking, and the child falling and ending up in a hospital with his leg fractured and band aid to his head. The picture stimulus was used for the present study after modifying it to suit the Indian context. Some of the modifications made included changing the colour of the bedspread in the hospital scene from white to green, addition of a drip set next to the bed and a blood stained band aid on the head of the child so that Indian children would get a better idea that the child landed in a hospital after falling from the tree. Also, an extra picture was added to clearly show the child falling due to the branch of the tree breaking. The colour of the hospital wall was changed to blue from a pale orange so that the white plaster on the fractured leg of the child is highlighted in a better way. Children were instructed to write as if they are narrating the story to a friend. The children were instructed to complete the task within a span of thirty minutes. The children were asked to write the story in Kannada and

English on two different occasions and the order of presentation was counterbalanced. The procedures used in the study adhered to the ethical considerations stated by Helsinki (2014) and was approved by our institutional review board.

Analyses

The Systematic Analysis of Language Transcripts (SALT; Miller & Chapman, 2001) software was used to analyze the written samples of the participants. The measures used by Puranik, Lombardino and Altmann (2008) and Shanbal (2010) for assessing productivity of written language in children was modified and used in the present study. The measures of productivity included:

- 1) Total number of words (TNW): The written samples were transcribed and coded into SALT software and the TNW in the entire composition was automatically calculated by the software.
- 2) Number of T- units (No T-Unit): For a T-unit, one sentence was considered with all the subordinate clauses embedded in it according to the criteria suggested by Hunt (1965).
- 3) Number of Different words (NDW): NDW is a vocabulary productivity measure that is often used in the written language assessments of biliterate children (e.g., Danzak, 2011; Miller, Heilmann, Nockerts, Iglesias, Fabiano, & Francis, 2006; Paradis, Crago, Genesee, & Rice, 2003). The written samples were transcribed and coded into SALT software and the NDW was automatically calculated by the software.

Results

The written samples were subjected to analysis using the SALT software. The parameters were examined for both languages in both the groups (i.e., TDC and children with LD). Non parametric statistics were used for statistical analyses as the results of Shapiro-Wilk's test revealed that most of the parameters followed a non-normal distribution ($p < 0.05$). The non parametric tests were administered to compare between the groups and across languages in both the groups. Wilcoxon signed rank test was administered to check for differences in the performance of TDC in English and Kannada and to check for differences in the performance of children with LD in English and Kannada. Mann Whitney test was administered to compare the performance of TDC and children with LD. Table 1 shows the Mean, Median and Standard Deviation values of the measures on SALT for TDC and LD in Kannada and English.

Performance of children with TDC and LD across languages

Wilcoxon signed rank test was administered to check for differences in the performance across English and Kannada of TDC and LD groups separately. The results of pair wise comparisons using

Table 1: Mean, Median and Standard Deviation values of the measures on SALT for TDC and LD in Kannada and English languages.

Sl.No	Parameters	TDC				LD			
		Kannada	Mean	Median	SD	Inter-quartile range	Mean	Median	SD
1.	TNW	42.37	44.00	14.81	20.50	30.73	29.00	10.37	12.00
2.	No T-Unit	7.87	7.50	2.32	3.00	5.60	6.00	1.64	3.00
3.	NDW	33.90	35.00	10.51	14.00	24.87	25	6.24	6.00
English									
4.	TNW	55.47	56	18.61	24.50	63.27	67.00	24.76	49.00
5.	No T-Unit	6.47	6.00	2.29	3.00	6.93	5.00	2.89	5.00
6.	NDW	33.87	34.50	9.53	12.50	38.40	40.00	16.42	28.00

Note: TNW: Total number of Words, No T-Unit: Number of T-Units, NDW: Number of Different Words.

the Wilcoxon's signed rank test revealed a significant difference between the following parameters: Total number of words ($p < 0.01$, $Z=4.425$, $\eta^2 = 0.81$) with Total number of words being greater in English (Median = 56.00, SD= 18.61) compared to Kannada (Median = 44.00, SD = 14.81) in TDC (see Table 1). A similar trend was also seen in the LD group with TNW ($p < 0.01$, $Z= 3.408$, $\eta^2 = 0.88$) being greater in English (Median = 67.00, SD= 24.76) compared to Kannada (Median = 29.00, SD= 10.37) (see Table 1). Additionally, in TDC, there was a significant difference between number of T-units in Kannada and English ($p < 0.01$, $Z=3.283$, $\eta^2 = 0.60$), with number of T-units being greater in Kannada (Mean = 7.87, SD= 2.32) compared to English (Mean = 6.00, SD= 2.29) (see Table 1). But in the LD group, there was no significant difference between Kannada and English on the Number of T-units ($p= 0.053$, $Z=1.934$, $\eta^2 = 0.50$). The results also revealed that there was no significant difference in number of different words ($p > 0.05$, $Z=0.076$, $\eta^2 = 0.01$) between Kannada and English in the TDC group. In contrast, there was a significant difference ($p < 0.01$, $Z=3.159$, $\eta^2 = 0.82$) between Kannada and English in the LD group for NDW, with more different words in English (Median = 40.00, SD= 16.42) than in Kannada (Median = 25, SD= 6.24) (see Table 1).

Comparison of performance between TDC and children with LD

Mann Whitney test was administered to compare the performance of Typically Developing Children (TDC) and children with LD. The results revealed (see Table 1) that there was a significant difference between the performance of TDC and children with LD on the following measures in Kannada language : number of T-units ($p < 0.01$, $Z= 2.973$, $\eta^2 = 0.44$) with TDC (Mean = 7.87, SD= 2.32) showing a higher number of T-units than children with LD (Mean = 5.60, SD= 1.64) (see Table1), Total number of words ($p < 0.05$, $Z=2.578$, $\eta^2 = 0.38$) with TDC (Median = 44.00, SD= 14.81) showing a higher total number of words compared to children with LD (Median = 29.00, SD= 10.37) (see Table

1); Number of Different words ($p < 0.01$, $Z=2.941$, $\eta^2 = 0.44$) where TDC (Median = 35.00, SD= 10.51) produced more number of different words in comparison with children with LD (Median = 25, SD= 6.24). The results also revealed that there was no significant difference between the performance of TDC and children with LD in the English language: Number of T-units ($p > 0.05$, $Z=0.438$, $\eta^2 = 0.07$); Total number of words ($p > 0.05$, $Z=0.964$, $\eta^2 = 0.14$) and Number of different words ($p > 0.05$, $Z=0.627$, $\eta^2 = 0.09$).

Discussion

In TDC and children with LD, TNW was found to be greater in English compared to Kannada. This result could be due to the structural differences between Kannada and English. Words in Kannada are formed by the fusion of morphemes into single word, whereas, English requires more number of words to convey the same meaning (Shanbal, 2010). For example, the sentence in Kannada, /na:nu ja:lege ho:gabEku/ contains three words with three free morphemes and two bound morphemes. The same sentence in English, "I have to go to school" contains six words. The agglutinative nature (i.e., fusion of many morphemes to form a single word) of Kannada, as mentioned before, may have led to the production of fewer number of words in Kannada compared to English. Therefore in Kannada, information through writing can be conveyed via fewer number of words. On the other hand, English requires the usage of more number of words to convey the same information (Shanbal, 2010).

The results of the present study also showed that the number of T-Units were greater in Kannada compared to English in TDC. This can be thought to be due to greater proficiency the children had in their L1 i.e., Kannada compared to their L2 i.e., English since they were successive bilinguals. The children had more number of years of exposure to Kannada at home whereas they were mostly exposed to English only after entering school. This finding also

supports the claim that written language is dependent on the oral language abilities of children (Baker, Gersten, & Graham, 2003; Berninger & Swanson, 1994; Berninger & Abbott, 2010; Kim, Al Otaiba, Puranik, et al., 2011; Shanbal, 2010; Sulzby & Teale, 2003). Children with LD, however, did not show a significant difference between the number of T-units in both Kannada and English. But they demonstrated significantly fewer number of T-units than TDC. This could be due to deficits in written productivity in these children which was demonstrated both in Kannada and English. Presence of language deficits in children with LD is reflected through poor written productivity in these children. Further, children with LD demonstrated lower scores on LPT in the syntax section indicating that their linguistic performance was similar to almost two years younger typical children. This inherent syntactic deficit may have resulted in fewer T-units in children with LD in both Kannada and English, though children with LD had higher exposure to Kannada similar to TDC. Children with LD are known to have difficulties in written syntax and forming sentences and paragraphs (Akcin, 2012). Several research studies suggest that children with LD have linguistic, especially, syntactic deficits (e.g., Scarborough, 1990; Catts, Fey, Zhang & Tomblin, 1999; Amoolya & Shanbal, 2012 etc.). Previous studies which have examined written productivity in children with LD have demonstrated that children with LD produced fewer T-units compared to age matched typically developing children indicating poorer written productivity in children with LD (Sheetal & Sangeetha, 2010; Shanbal, 2010; Houck & Billingsley, 1989). Kim, Al Otaiba, et al. (2011) found that oral language skill, measured by vocabulary and knowledge of grammar had direct correlation with written productivity at the end of kindergarten.

There was no significant difference found between the NDW between Kannada and English in TDC. This could be because NDW could be on the same points of continuum of development in both Kannada and English. In other words, the number of different words could be in the same stage of development in both the languages in TDC. However, in children with LD, NDW was found to be greater in English compared to Kannada.

In Kannada, TDC showed more number of T-units compared to children with LD. Children with LD manifest difficulties in the planning, organization, transcription and revision stages of writing (according to the Hayes & Flower's, 1980 model of written language). Reduced No T-Units could be due to deficit at the planning stage, where there is a problem either with the number of ideas generated or in transforming the ideas from a pre-verbal to a verbal form. This finding is supported by the results of several studies which have demonstrated that children with language based LD exhibited written pro-

ductivity deficits by producing reduced Total number of utterances compared to age matched children (e.g., Barenbaum, Newcomer & Nodine, 1987; Houck & Billingsley, 1989; Laughton & Morris, 1989; Newcomer, Barenbaum & Nodine, 1988; Nodine, Barenbaum & Newcomer, 1985; Puranik, Lombardino & Altmann, 2007; Scott & Windsor, 2000; Sheetal & Sangeeta, 2010; Vallecorsa & Garriss, 1990).

In the present study, children with LD exhibited fewer TNW and fewer NDW in Kannada compared to TDC. Limitations in vocabulary use in writing of these children may be due to the limited reading experiences of children with LD (Gregg & Mather, 2002). In other words, their reading and decoding difficulties hampers their vocabulary development, which does not develop similar to their age matched peers. Gregg and Mather (2002) also note that in certain children with LD, quick recall of words they already know may be affected. This is similar to a word finding problem. Therefore, children might use certain "non-specific words" (p.13) more often than necessary and also repeat certain words just to fill space. So, children who cannot use diverse words to express their ideas, are found to have narrower vocabulary and may not know how to use the appropriate strategies to retrieve words while writing (Gould, 1991). Such unnecessary repetition of the same words in the written samples in the present study might have led to fewer NDW in children with LD compared to TDC. The finding of the present study is supported by several research studies which have found that the writing of children with LD is concise, is less extensive and has fewer number of words per composition (Graham & Harris, 2003; Harris, Graham, & Mason, 2003; Newcomer, Barenbaum, & Nodine, 1989; Saddler, 2006; Troia, 2006; Vallecorsa & Garriss, 1990).

In English, there was no significant difference found between TDC and children with LD on all the productivity measures i.e., TNW, No T-Units and NDW. This was an unexpected finding. The reason for this finding could be that all the participants in the study, including TDC, were developing composers. Their composing abilities in their native language might have developed to an extent but might still be developing in their second language. Thus the absence of a significant difference between the performance of TDC and LD in English may be because the TDC might have not, by themselves demonstrated an optimum level of performance. Though both the groups did not differ significantly in terms of written productivity measures used in the present study, children with LD demonstrated an overall poor quality of writing in terms of syntactic structure.

Conclusions

The present study is a preliminary attempt at studying written language in Kannada- English bilit-

erate children with LD and opens up different avenues for future research in this area. The results of the study support the notion that written language is dependent on oral language skills. It was found that greater proficiency and greater amount of exposure to a particular language lead to better written productivity when two languages are compared in biliterate children. The present study also reiterates the importance of assessing both the languages in biliterate children in order to obtain a complete picture of them as writers.

References

- Abbott, R., & Berninger, V. (1993). Structural equation modeling of relationships among developmental skills and writing skills in primary and intermediate grade writers. *Journal of Educational Psychology, 85*(3), 478-508.
- Akin, N. (2012). The perspectives of primary school teachers on the evaluation and remediation of the compositions of students with Learning Disabilities. *American International Journal of contemporary research, 2* (3), 68- 75.
- Alamargot, D. & Fayol, M. (2009). Modelling the development of written composition. In R. Beard, D. Myhill, M. Nystrand & J. Riley (Eds). *Handbook of Writing Development* (pp.23-47). Sage. United Kingdom.
- Amoolya. G., & Shanbal, J. C. (2012). Sentence comprehension in children with Learning Disabilities. Student Research at A.I.I.S.H. Mysuru (Articles based on dissertations at AIISH), 10, 20-31.
- Baker, S., Gersten, R., & Graham, S. (2003). Teaching expressive writing to students with learning disabilities: Research-based applications and examples. *Journal of Learning Disabilities, 36*,109-123.
- Barenbaum, E., Newcomer, P., & Nodine, B. (1987). Children's ability to write stories as a function of variation in task, age, and developmental level. *Learning Disability Quarterly, 10*, 175-188.
- Berninger, V. (2000). Development of language by hand and its connections with language by ear, mouth, and eye. *Topics in Language Disorders, 20*(4), 65-84.
- Berninger, V. W., & Abbott, R. D. (2010). Listening comprehension, oral expression, reading comprehension, and written expression: Related yet unique language systems in grades 1, 3, 5, and 7. *Journal of Educational Psychology, 102*, 635-651.
- Berninger, V. W., Abbott, R. D., Jones, J., Wolf, B. J., Gould, L., Anderson-Youngstrom, M., Shimada, S., & Apel, K. (2006). Early development of language by hand: Composing, reading, listening, and speaking connections; three letter- writing modes; and fast mapping in spelling. *Developmental Neuropsychology, 29* (1), 61-92.
- Berninger, V., Abbott, R., Thomson, J., & Raskind, W. (2001). Language phenotype for reading and writing disability: A family approach. *Scientific Studies in Reading, 5*, 59-105.
- Berninger, V., Fuller, F., & Whitaker, D. (1996). A process approach to writing development across the life span. *Educational Psychology Review, 8*, 193-218.
- Berninger, V. W., & Swanson, H. L. (1994). Modification of the Hayes and Flower model to explain beginning and developing writing. In E. Butterfield (Ed.), *Advances in cognition and educational practice: Vol. 2. Children's writing: Toward a process theory of development of skilled writing* (pp. 57-81). Greenwich,CT: JAI Press.
- Bialystok, E. (2007). Acquisition of literacy in bilingual children: A framework for research. *Language Learning, 57*, 45-77.
- Cain, K., & Oakhill, J. (1996). The nature of the relationship between comprehension skill and the ability to tell a story. *British Journal of Developmental Psychology, 14*, 187-201.
- Carretti, B., Maria, A. R. & ArfÅ", B. (2013). Reading comprehension and expressive writing: a comparison between good and poor comprehenders. *Journal of Learning Disabilities, 46*(1), 87-96.
- Catts, H. W., Fey, M., Zhang, X. & Tomblin, J. B. (1999). Language basis of reading and reading disabilities: Evidence from a longitudinal investigation. *Scientific studies of reading, 3*, 331-361.
- Cossu, G., Shankweiler, D. Liberman, I.Y., Tola G. & Katz, L. (1988). Awareness of phonological segments and reading ability in Italian children. *Applied Psycholinguistics, 9*, 1-16.
- Danzak, L. R. (2011a). The integration of Lexical, syntactic, and discourse features in bilingual adolescents' writing: An exploratory approach. *Language, Speech and Hearing Services in Schools, 42*, 491-505.
- Danzak, L. R. (2011b). The interface of language proficiency and identity: A profile analysis of bilingual adolescents and their writing. *Language, Speech and Hearing Services in Schools, 42*, 506-519.
- De Silva, A. D. (1998). Emergent Spanish writing of a second grader in a whole language Classroom. In B. PÁŠrez (Ed.) *Sociocultural Contexts of Language and Literacy*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Dworin, J. (2003). Examining Children's Bilinguality in the Classroom. In A. I. Willis, G. E. Garcia,

- R. Barrera & V. J. Harris, (Eds.), *Multicultural Issues in Literacy Research and Practice*. Mahwah, NJ: Lawrence Erlbaum.
- Fitzgerald, J. (2006). Multilingual writing in preschool through 12th grade: The last 15 years. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 337-354). New York, NY: Guilford Press.
- Geva, E. (2006). Second-language oral proficiency and second language literacy. In D. August & T. Shanahan (Eds.), *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth* (pp. 123-140). Mahwah, NJ: Erlbaum.
- Gort, M. (2006). Strategic code-switching, interliteracy, and other phenomena of emergent bilingual writing: Lessons from first-grade dual language classrooms. *Journal of Early Childhood Literacy*, 6(3), 323-354. DOI: 10.1177/1468798406069796
- Gould, B. W. (1991). Curricular strategies for written expression. In A. M. Bain, L. L. Bailet, & L. C. Moats (Eds.), *Written language disorders: Theory into practice* (pp. 129-164). Austin, TX: PRO-ED.
- Graham, S., & Harris, K. R. (2003). Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 323-344). New York, NY: Guilford Press.
- Gregg, N., & Mather, N. (2002). School Is Fun at Recess: Informal Analyses of Written Language for Students with Learning Disabilities. *Journal of Learning Disabilities*, 35(1), 7-22. DOI: 10.1177/002221940203500102
- Griffith, P.L., Ripich, D.N., & Dastoli, S.L. (1986). Story structure, cohesion, and propositions in story recalls by Learning-Disabled and nondisabled children. *Journal of Psycholinguistic Research*, 15(6), 539-555.
- Grigorenko, E. L. (2007). Rethinking disorders of spoken and written language: generating workable hypotheses. *Journal of Developmental and Behavioral Pediatrics*, 28(6), 478-486. [PubMed: 18091095].
- Grosjean, F. (1985). 'The Bilingual as a Competent but Specific Speaker-hearer'. *Journal of Multilingual and Multicultural Development*, 6(6), 467-77.
- Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain and Language*, 36, 3-15. DOI: 10.1016/0093-934X(89)90048-5
- Harris, K. R., Graham, S., & Mason, L. H. (2003). Self-regulated strategy development in the classroom: Part of a balanced approach to writing instruction for students with disabilities. *Focus on Exceptional Children*, 35(7), 1-16.
- Hayes, J., & Flower, L. (1980). Identifying the organization of writing processes. In L. Gregg & E. Steinberg (Eds.), *Cognitive processes in writing: An interdisciplinary approach* (pp. 3-30). Hillsdale, NJ: Erlbaum.
- Heath, N. L., Toste, J. R., & Roberts, E. (2007). Learning disabilities research: Ten years in review. *Thalamus*, 25(1), 9-17.
- Hedman, C. (2012). Profiling dyslexia in bilingual adolescents. *International Journal of Speech-Language Pathology*, 4(6), 529-542.
- Hooper, S. R. (2002). The language of written language: an introduction to the special issue. *Journal of Learning Disabilities*, 35(1), 2-6.
- Hopewell, S. W., & Escamilla, K., (2014). Bilingual development in immersion contexts. *Journal of Immersion and Content-based Language Education*, 2(2), 181-195.
- Houck, C., & Billingsley, B. (1989). Written expression of students with and without learning disabilities: Differences across the grades. *Journal of Learning Disabilities*, 22, 561-565.
- Hunt, K.W. (1965). Grammatical structures written at three grade levels (NCTE Research Report No. 3). Champaign, IL: National Council of Teachers of English.
- IDEA (2018). Retrieved from <https://dyslexiaida.org/dsm-5-changes-in-diagnostic-criteria-for-specific-learning-disabilities-sld1-what-are-the-implications/> on 5/11/2018.
- Johnson, D., & Myklebust, H. (1967). *Learning disabilities: Educational principles and practices*. New York: Grune and Stratton.
- Karant, P. (1992). Developmental dyslexia in bilingual- biliterates. *Reading and Writing*, 4(3), 297-306.
- Karant, P., Ahuja, G. K., Nagaraja, D., Pandit, R. & Shivashankar, N. (1991). Language disorders in Indian neurological patients- A study in neurolinguistics in the Indian context (Project no.5/8/10-1(oto)/84-NCD-I IRIS cell).New Delhi: (Indian Council of Medical Research 8403810).
- Katusic, S. K., Colligan, R. C., Weaver, A. L., & Barbaresi, W. J. (2009). The Forgotten Learning Disability - Epidemiology of Written Language Disorder in a Population-Based Birth Cohort (1976-1982), Rochester, Minnesota. *Pediatrics*, 123(5), 1306-1313.
- Katusic, S.K., Colligan, R. C., Barbaresi, W. J., Schaid, D. J., & Jacobsen, S. J. (2001). *Incidence of reading disability in a population-based birth cohort*, 1976-1982, Rochester, Minnesota. *Mayo Clin Proc*; 76:1081-1092. [PubMed: 11702896]
- Katz, L., & Frost, R. (1992). The reading process

- is different for different orthographies: The orthographic depth hypothesis. In R. Frost & L. Katz (Eds.), *Advances in psychology, Vol. 94. Orthography, phonology, morphology, and meaning* (pp. 67-84). Oxford, England: North-Holland.
- Kellogg, R.T. (2008). Training writing skills: A cognitive developmental perspective. *Journal of Writing Research, 1*(1), 1-26.
- Kim, Y.-S., Al Otaiba, S., Puranik, C., Sidler, J. F., Gruelich, L., & Wagner, R. K. (2011). Componential skills of beginning writing: An exploratory study at the end of kindergarten. *Learning and Individual Differences, 21*, 517-525.
- Laughton, J., & Morris, N. (1989). Story grammar knowledge of learning disabled students. *Learning Disabilities Research, 4*, 87-95.
- Lindholm-Leary, K., & Genesee, F. (2014). Student outcomes in one-way and two-way immersion and indigenous language education. *Journal of Immersion and Content-Based Language Education, 2*(2), 165-180. doi: 10.1075/jicb.2.2.01lin
- Litowitz, B.(1981). Developmental issues in written language. *Topics in Language Disorders, 1*(2),73-89.
- Loomba, M. (1995). Descriptive analysis of the sequential progression of English reading skills among Indian children (Unpublished Masters dissertation). All India Institute of Speech and Hearing, University of Mysore, Mysore.
- Lyon, G. R. (1996). Learning disabilities. *Future Child, 6*(1), 54-76. [PubMed: 8689262]
- McMaster, K., & Espin, C. (2007). Technical features of curriculumbased measures in writing: A literature review. *Journal of Special Education, 41*, 68-85.
- Miller, J. F., Heilmann, J., Nockerts, A., Iglesias, A., Fabiano, L., & Francis, D. J. (2006). Oral language and reading in bilingual children. *Learning Disabilities Research and Practice, 21*, 30-43.
- Miller, J., & Chapman, R. (2001). Systematic Analysis of Language Transcripts (Versions 7.0) [Computer Software]. Madison: University of Wisconsin-Madison, Waisman Center, Language Analysis Laboratory.
- Myklebust, H. (1965). *Development and disorders of written language (Vol 1)*. New York: Grune and Stratton.
- Myklebust, H. (1973). *Development and disorders of written language : Studies of normal and exceptional children (Vols. 1, 2)*. New York: Grune and Stratton.
- Nelson, N. W., & Van Meter, A. M. (2007). Measuring written language ability in narrative samples. *Reading and Writing Quarterly, 23*, 287-309.
- Newcomer, P., Barenbaum, E.,& Nodine, B. (1988). Comparison of the story production of LD, normally achieving, and low achieving children under two modes of production. *Learning Disability Quarterly, 11*, 82-96.
- Nodine, B., Barenbaum, E., & Newcomer, P. (1985). Story composition by learning disabled, reading disabled, and normal children. *Learning Disability Quarterly, 8*, 167-179.
- Paradis, J., Crago, M., Genesee, F., & Rice, M. (2003). French- English bilingual children with SLI: How do they compare with their monolingual peers? *Journal of Speech, Language, and Hearing Research, 46*, 113-127.
- Perfetti, C., & Dunlap, S. (2008). Learning to read: General principles and writing systems variations. In K. Koda & A. Zehler (Eds.), *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development*. New York, NY: Lawrence Erlbaum.
- Poplin, M. S., Gray, R., Larsen, S., & Banikowski A. (1980). A comparison of components of written expression abilities in learning disabled and non learning disabled students at three grade levels. *Learning Disabilities Quarterly, 3*, 46-53.
- Puranik, C., Lombardino, L., & Altmann, L. (2007). Writing through retellings: An exploratory study of language impaired and dyslexic populations. *Reading and Writing: An Interdisciplinary Journal, 20*, 251-272.
- Puranik, C. S., Lombardino, L. J., & Altmann, L. J. P. (2008). Assessing the microstructure of written language using a retelling paradigm. *American Journal of Speech-Language Pathology, Vol. 17*, 107-120.
- Saddler, B. (2006). Increasing story-writing ability through self-regulated strategy development: Effects on young writers with learning problems. *Learning Disability Quarterly, 29*(4), 291-305.
- Scarborough, H. S. (1990). Very early language deficits in dyslexic children. *Child Development, 61*, 1728-1743.
- Scott, C., & Windsor, J. (2000). General language performance measures in spoken and written discourse produced by school age children with and without language learning disabilities. *Journal of Speech, Language, and Hearing Research, 43*, 324-339.
- Shanahan, T., & Beck, I. L. (2006). Effective literacy teaching for English-language learners. In D. August & T. Shanahan (Eds.), *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth* (pp. 415-488). Mahwah, NJ: Erlbaum.

- Shanbal, J. C. (2003). Tool for screening children with writing difficulties (Unpublished Master's dissertation), All India Institute of Speech and Hearing, University of Mysore, Mysore.
- Shanbal, J. C. (2010). Acquisition of biliteracy in children (Unpublished doctoral dissertation), All India Institute of Speech and Hearing, University of Mysore, Mysore.
- Sheetal, R., & Sangeetha, M. (2010). Written Language Skills in Children with Dyslexia. Student research at A.I.I.S.H. Mysore (Articles based on dissertation done at AIISH), 8, 236- 243.
- Singhi, P., Kumar, M., Malhi, P., & Kumar, R. (2007). Utility of the WHO Ten Questions Screen for Disability detection in a rural community- the North Indian experience. *Journal of Tropical Pediatrics*, 53 (6), 383-387.
- Sulzby, E. & Teale, W. (2003). The Development of the Young Child and the Emergence of Literacy. In J. Flood, D. Lapp, J. Squire and J. Jensen (Eds.) *Handbook of Research on Teaching the English Language Arts*, pp. 300-13. Mahwah, NJ: Lawrence Erlbaum.
- Tressoldi, P. E., & Cornoldi, C. (1991). *Batteria per la valutazione della scrittura e della competenza ortografica nella scuola dell'obbligo* [BVSCO, Battery for the assessment of writingskills of children from 7 to 13 years old]. Firenze, Italy: Giunti OS.
- Troia, G. A. (2006). Writing instruction for students with learning disabilities. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 324-336). New York, NY: Guilford Press.
- Vallecorsa, A. L. , & Garriss, E. (1990). Story composition skills of middle-grade students with learning disabilities. *Exceptional Children*, 57, 48-54.
- Venkatesan (2011). NIMH Socio-economic status scale, Revised version. National Institute for the Mentally Handicapped: Secunderabad.
- Wagner, R. K., Puranik, C. S., Foorman, B., Foster, E., Wilson, L. G., Tschinkel, E., & Kantor, P. T. (2011). Modeling the development of written language. *Reading and Writing: An Interdisciplinary Journal*, 24, 203-220.
- World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. General assembly of the world medical association (2014). *The Journal of the American college of Dentists*, 81(3), 14-8.