Characterizing language proficiency in Hindi and English language: Implications for bilingual research

Running head: Bilingual Language proficiency

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Citation for this paper is as follows: Dash, T. & Kar, B. R. (In Press). Characterizing language proficiency in Hindi and English language: Implications for bilingual research. *International Journal of Mind Brain and Cognition*

Abstract

Bilingual context is characterized by linguistic diversity, different patterns of language acquisition and variations in language use across contexts. We examined the nature of language proficiency with one of the dominant language combinations (Hindi-English) in north India. The present study is one of the first attempts to examine the nature of language proficiency in Indian bilingual context. The organization of language skills was examined across the spoken/understanding and reading/writing domains in Hindi (L1) and English (L2) languages, a combination which follows different patterns of acquisition and use. The correspondence between the subjective and objective measures of language proficiency was analyzed to understand how language history would predict differences in proficiency levels. An indigenous tool for testing language skills in Hindi and English was administered to 85 Hindi-English bilingual adults along with a Language History Questionnaire. There was no significant correlation between self reported information on age of acquisition and objective measures of language proficiency. The factor structure of L1 showed task based and not domain based clustering whereas L2 language skills showed clustering within and across domains. Greater interdependence of L1 and L2 was observed for the reading/writing domain. Results of the current study highlight the diversity within Indian Language combinations which ought to vary from Western pattern of language acquisition i.e. simultaneous/sequential acquisition. Thus, use of a comprehensive tool is justified for the bilingual and multicultural population. Present study highlights the use of objective measures of language proficiency. Proficiency in L1 and L2 languages emerged as a continuous rather than a discrete or categorical variable. Findings of this study have implications for participant selection procedures and interpretation of experimental data in bilingual research particularly for language combinations where L1 is acquired informally and L2 is learnt through formal instruction.

Keywords: Bilingualism, language proficiency, Hindi-English.

Introduction:

Bi/multilingualism is a multifaceted phenomenon. The complex nature of this phenomenon requires greater understanding at the level of defining/profiling bilingual population, bilingual language acquisition, measures of bilingualism, and language representation. Current knowledge of bilingualism is predominantly based on Western norms which may not be applicable in a bilingual context of India. Indian bilingual context is characterized by linguistic diversity, various combinations of two languages, different patterns of acquisition (formal vs informal/ both languages acquired early or late), and different patterns of use across contexts. There is a greater need to study the organization of bilingual language skills in Indian context (Vasanta, 2011). The present study is one of the first attempts to systematically profile bilinguals using both subjective and objective measures.We examined the organization of language skills across domains of speaking/understanding and reading/writing in Hindi-English bilingual individuals. Such studies are important to determine the procedures for participant selection and for interpretation of experimental results in bilingual research.

Research on second language (L2) acquisition has long been focusing on the age of acquisition (AoA) and second language proficiency. Much evidence points to the notion that AoA is a primary predictor for the L2 proficiency (Johnson & Newport, 1989; Stevens, 1999; Weber-Fox & Neville, 1996). Many studies regarding L2 acquisition underline the importance of other variables, such as use of the language and level of first language (L1) proficiency (Herman, Bongaerts, De Bot & Schrender, 1998; Flege, Yeni-Komshian, & Liu, 1999). Karanth (2012) has highlighted the differences in bilingual language acquisition in Indian context as compared to the

West. Language proficiency has emerged as a useful measure of bilingualism in recent past and it refers to the degree to which an individual exhibits control over the rules of a language (i.e. levels of language-phonology, semantics, syntax, pragmatics, metalinguistic knowledge). In the past, there have been many studies which take into account different skills as a measure of language proficiency, including confrontation naming, read aloud task (Oyama, 1976) grammaticality judgment task (Johnson & Newport, 1989), verbal fluency, category generation task, oral comprehension task (Bahrick, Hall, Goggin, Bahrick & Berger 1994) and self rated questionnaire (Coppieters, 1987; Marian, Blumenfeld, & Kaushanskaya, 2007). Grosjean (1998) suggested certain requirements as necessary while profiling bilinguals, which include language history and language relationship, language stability, function/use of languages, language proficiency and language modes. Bialystok (2001) pointed out that questions such as the nature of language proficiency, its components, norms for language competence and the range of variation across language skills have rarely been explicitly addressed by researchers. Such studies are certainly needed in the Indian context and only recently such systematic efforts have been initiated to understand bilingualism. One such study with Telegu-English bilinguals showed that language exposure has a significant effect on language skills such as vowel consonant contrast discrimination. The present study is one of the very few attempts in Indian context (Venkatesh & Vasanta, 2010 as cited in Vasanta, 2011).

Language proficiency measures used in the non English speaking countries in the West have been developed for English as L2 (or L1). Similar tools are not available for most of the Indian languages. Even the tools developed and standardized for English language in the West would not be applicable for Indian population as the acquisition, frequency of use, pattern of

use, nature of exposure, and the contexts in which the language is used varies in Indian context. Exposure to English is mostly in terms of passive listening during the initial years in school and gradually picks up as a spoken language. In contrast, L2 (English) can also be actively learnt and used which can result in differences in language processing abilities. In the current study we have employed both subjective (i.e. self report) and objective performance on language skills tests to understand the organization of language skills. It is not only the variability in the organisation of language skills in L2 but also in L1 that may influence bilingual language processing. Moreover, language proficiency in bilingual research is frequently quantified with the help of questionnaires, interview schedules as well as language tasks that tap naming skills/ fluency/ grammatical skills thus making such measures either highly subjective or open to response bias or biased towards a particular language skill. One such questionnaire seeking participants' self-reports of their language history across domains, provide information about the nature of multilingualism in India (Vasanta, Suvarna, Sireesha, & Raju, 2010). Profiling a bilingual individual can be adapted to a more comprehensive assessment of language proficiency rather than relying on self reported information. Most of the studies have predominantly focused on L2 proficiency and not much importance has been given to L1 proficiency. The assessment tools that have been employed are based on the literature in the West and not based on any objective data on the nature of bilingualism in Indian context. Hence, we examined both L1 and L2 proficiencies to lay out the factor structure of L1 and L2 among Hindi-English bilingual adults and its correspondence with self reported language history. It is important for participant selection in bilingual research, to measure the differences in proficiency levels among bilinguals as well as to understand the effect of proficiency based predictors on bilingual language

processing. In addition, L1 and L2 proficiency may influence each other particularly in the context of such language combinations where L1 is acquired informally and L2 is primarily learnt through formal instruction. The order of acquisition of language skills across the domains of spoken/understanding and reading/writing is also different for both. For instance spoken/understanding skills in L1 (Hindi) may be acquired first and reading writing skills may be acquired later with formal schooling. On the other hand, L2 acquisition may begin with literacy skills first with formal schooling and spoken/understanding skills may develop much later and would mostly be associated with literacy skills.

Primitive bilingual research started with bilingualism as a consequence (Saer, 1923, Darcy, 1946, cited in Bialystok, 2001). Since last 30 years, bilingual advantage over monolinguals in various cognitive abilities has been appreciated (Ben- Zeev, 1977; Bialystok, 2012; Bialystok & Feng, 2009; Costa, Hernander & Sabastia-Galle, 2008; Peal & Lambert, 1962 as cited in Bialystok, 1997;; Siegal, Lozzi & Lurian, 2009;). From a methodological point of view comparison groups have changed from time to time depending on the focus of the study. Many recent studies in the field of cognitive science continue to compare monolinguals and bilinguals (Bialystok & Feng, 2009; Costa, Hernander & Sabastia-Galle, 2008; Siegal, Iozzi & Lurian, 2009;). Hakuta and Suben (1985) in the past, highlighted the work by Ducan and De Avila (1979) suggesting that comparison of sub groups within the samples of bilinguals could act as a valid method of control in an experiment. Most of the work stated here has predominantly considered bilinguals from two extreme populations varying with respect to a particular aspect (age of acquisition: early vs. late, proficiency: balanced vs. unbalanced/ high vs. low proficient; or based on use: i.e. to consider them as dominant bilinguals). Clinical research also requires information on

level of bilingualism and language status to provide sound base for assessment and rehabilitation of various communication disorders.

To sum up, we aimed to analyze the relationship between objective measure of L1 and L2 language proficiency within and across language skills. Since, subjective measures provide biased self reported information, justifying subjective information with some form of objective measures could certainly strengthen the way bilingualism is considered in a particular study. Independence as well as interdependence of language skills between L1 and L2 was expected in case of Hindi and English, though the two languages follow different modes of acquisition. It is expected that language proficiency would emerge as an important and a continuous rather than a discrete measure of bilingualism.

Method

This study aimed to explore the nature of language proficiency in L1 (Hindi) and L2 (English) through the use of modified version of Language Background Questionnaire (Vasanta, Suvarna, Sireesha, & Bapi Raju, 2010) and indigenously developed test of language proficiency. Organization of language skills across domains for Hindi and English was also examined.

Participants

Eighty-five Hindi-English Bilingual adults participated in the study (M=20.84 years, range: 18 - 26 years; 52 males and 33 females). Only those participants were selected who had completed a preliminary screening which indicated that their L1 was Hindi and L2 was English,

which was used on day to day basis and they had at least 7 years of basic education in both the languages with no significant history of sensory, motor or neurological disorders. Participants included student volunteers from Allahabad University and neighbouring Institutions.

Material

Language Background Questionnaire (Vasanta, Suvarna, Sireesha, & Bapi Raju, 2010) was employed to collect information about the languages in use, frequency of use; self reported proficiency, linguistic environment at home, work etc. Domains assessed in the questionnaire include acquisition history (age of acquisition and at what age they became fluent), contexts of acquisition (modality: oral/written/both; environment of acquisition: informal/formal/both), precent language use (%), language preference (1-3 rating scale; where 1= never, 2= sometimes, 3=most of the time) and proficiency rating (0-10 rating scale). Apart from these questions contribution of various other factors such as use of language with family, friends, extended family, and neighbours were assessed by asking the participants to name the language predominantly used and hours of usage (per day). Participants also indicated the medium of instruction and self reported proficiency level in different domains (1-5 point rating).

An indigenous Test of Language proficiency in Hindi and English was employed to examine language proficiency in Hindi and English. Proficiency in all domains of language function (i.e. speaking, understanding, reading and writing) was examined.

Speaking/ Understanding domain

The goal of the tasks under this domain is to tap the crucial aspects of bilingual language proficiency, in terms of speaking and understanding skills which indicates oral and aural proficiency. Hindi and English versions were matched with respect to kind of task, number of items as well as the scoring method. Appendix 1 presents the scoring process.

- Confrontation Naming Task: In this task participants were provided with 30 pictures consisting of high as well as low frequency nouns and were asked to name them. Pictures used for confrontation naming were taken from IPNP (Abbate & LaChappelle, 1984), developed by the UCSD.

- Spoken discourse task: In this task participants were instructed to describe a picture carefully by focusing on the overall theme of the picture along with individual items in that particular picture. A grand rubric score (Appendix 1a) is calculated by summing the scores on the following aspects: overall impact and achievement of purpose (whether the participant establishes main idea), organization and techniques (coherence and cohesion with test, method of organization) and mechanics (focusing on grammar, pronunciation, presence of pause). Pictures were selected from Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 1983) and Western Aphasia Battery (Kertesz, 1987) for English and Hindi respectively.

- Auditory comprehension task: This task was chosen to assess participants' ability to understand the content aurally. To assess, 5 questions were asked related to the passage and the questions were formulated based on main idea of the passage, cause and effect

relationship and inference generated. Passages were selected from www.en.wikipedia.org/wiki/2010_Commonwealth_Games and 'Test of language proficiency: Hindi' (Subbiah, 2005) for English and Hindi respectively.

- Convergent production task/synonym task: This was the only section which had 2 different tasks for both Hindi and English versions with similar scoring process. The English convergent production task required the participants to name as many words with different meanings possible for a particular word (Thorum, 1986). E.g. By*/ bye/buy have three different meanings. Hindi counterpart for this task was the synonym task where the participants were asked to provide synonyms (at least 3) of a given word (Subbiah, 2005). Though convergent production and synonym tasks are not the same yet both demonstrate one's knowledge for word meaning.

Reading/ Writing domain

- Reading comprehension task: This task assessed the ability of the participants to read and understand what is stated or implied in a written passage, and then to answer questions based on it. Each passage contains 159 and 208 words respectively in Hindi and English (Shipley & McAfee, 2008; Pon Subbiah, 2005) which was followed by 5 questions. The questions were formulated to tap the main idea of the passage, cause and effect relationship and inference generated in the passage.

- Reading fluency: The passage read in the previous task was used to assess reading fluency by using the Fluency Rubric (Zutell & Rasinski, 1991). A grand rubric score was calculated by summing-up the scores on the following aspects: smoothness and pacing

(punctuations and break), confidence, accuracy (with respect to pronunciation) and expression (with respect to change in voice with content). (Appendix 1b supplementary material)

- Phonological awareness skills: Participants were asked to perform simple meta-linguistic tasks at phonemic and syllabic levels. The tasks involved segmentation, blending, rhyming and counting of sounds. In the segmentation task, participants were given a word and were asked to segment into sounds and syllables. In the blending task experimenter provided the sounds or syllables and participants were required to blend them and form a word. In the counting task, participants were asked to count the sounds and letters in the word. Number of letters and sounds could be different for English whereas both were same for Hindi. Participants were given examples and practice with 1-2 words before administering the task.

- Written Discourse analysis: In this task participants were asked to write about a given procedure. The participants were clearly instructed to write a paragraph with a good beginning and end. A grand rubric score (appendix 1c) was calculated by summing the scores on the following aspects: overall impact and achievement of purpose (whether the participant establishes main idea), organization and techniques (coherence and cohesion with test, method of organization) and mechanics (focusing on grammar, spelling mistake).

Scoring method for each task is presented in Appendix 3.

Administration of the language background questionnaire and test of language proficiency was completed in a quiet testing room. Order of administration was counterbalanced across participants with respect to Hindi and English languages. Recording was done for the discourse and reading sample. Total scores were calculated for the speaking and understanding domain including spoken discourse score, confrontation naming score, convergent production and auditory language comprehension score. Similarly total reading and writing score consisted of reading comprehension, reading fluency score, phonological awareness score and written discourse score.

Results

The present study aimed to characterize language proficiency in Hindi (L1) and English (L2) language and to determine the correspondence between subjective and objective measures of language skills. A modified version of Language Background Questionnaire (Vasanta et al 2010) and indigenously developed Test of language proficiency were administered on H-E bilinguals. Correlation and regression analysis were performed within and across languages as well as between subjective (self report) and objective measures. Factor analysis was performed to establish the factorial validity for the language proficiency test as well as to find out how different tasks were correlated with each other within and across languages. Cronbach's alpha was calculated as a measure of the reliability of the language proficiency test. Q-Q plots were generated as a measure of normality in the language skills.

Language Background in L1 and L2

Information based on language background questionnaire was categorized as: a) age related information which consisted of age of acquisition in school and age of fluency in reading and writing skills; b) language use related information included task based scores, percentage of exposure and use of a particular language; c) self reported proficiency ratings in reading, writing, speaking and understanding skills. Descriptive analysis (means and standard deviations) based on the questionnaire is presented in Appendix: 2.

Data based on language background information suggested that exposure to Hindi at home was since birth, whereas English was predominantly introduced during the school years. Participants reported predominant use of L1 in their day to day life (Mean (L1) = 69.52% Mean (L2) = 33.11%). Age of learning L2 in school varied from 4 to 11 years (Mean (L1) = 4.32 years; Mean (L2) =5.37 years). Variance among participants was more for both L1 and L2 while reporting the age at which they became fluent in a particular language (Mean (L1) = 7.37 years and (L2) = 10.78 years).

In an attempt to address the issue of language proficiency being continuous or discrete variable Q-Q plots as well as normal probability distributions were plotted with the total scores in speaking/understanding domain and reading/writing domain for both L1 and L2. The Q-Q plot showed the expected distribution of the standardized observed value (X axis) across the total scores which were compared to the expected normal values (Y axis). Any deviation from the X=Y line implied deviation from the normal distribution, which was not the case as evident in Figures 1a, 1b, 2a and 2b.

<Insert Figures 1a, 1b, 2a, and 2b here>

To sum up, total scores of L1 and L2 on the measures of speaking/understanding and reading/writing domain showed normal probability distribution.

Relationship among age of acquisition, language use, self reported proficiency and objective measures of language proficiency

Bivariate correlation and regression analysis were performed to evaluate the degree of relationship within and across objective (i.e. task performance) and subjective measures (self reported measure) of language proficiency. Results of correlation and regression analysis are discussed with respect to speaking/understanding and reading/writing domains. Multiple regression analysis was performed by using simultaneous method as there was no theoretical model.

On initial inspection the total score on speaking/understanding domain for L1 showed statistically significant correlation, r = .25, $p < 0.05$, n = 85, with only one predictor variable under the broad subgroup related to self reported proficiency (composite score of self reported performance on certain language tasks in L1). Self reported measure of proficiency in the form of composite scores on tasks predicted 6.7 % of variance (R square =.067, adjusted R square =.055). The model was significant, F (1, 84) = 5.92, $p < 0.05$. Within the speaking/ understanding domain for L1, age related information showed no correlation with the task performance. Since, predictor variables such as self reported reading, writing, speaking and understanding related proficiency did not correlate with speaking/understanding tasks, they were not subjected to regression analysis.

<Insert Table 1a>

<Insert Table 1b>

By using simultaneous method of regression analysis, model including use related predictor variables and percentage of exposure in L1 predicted 12% of the variances on spoken discourse (R square = 0.12, adjusted R square = 0.129) and was significant, $F(2, 82) = 6.08$, $p < .01$.

As shown in table 1, in the domain of reading and writing for L1 there was no significant correlation between the total scores of the objective tasks and the subjective measures of proficiency. Individual scores of L1 reading fluency were significantly correlated with self reported measure of reading and writing proficiency with $r = 0.253$ and 0.327 at $p < 0.05$ and 0.01 respectively for n = 85. Further, self reported measure of reading and writing skills predicted 10.8% of the variance, (R square = 0.108, adjusted R square = 0.086) and was also significant $F(2, 82) = 4.94$, $p < 0.01$.

'Insert Table 2a'

'Insert Table 2b'

Results presented in table 2a indicate that use related information (percentage of exposure and composite score of the task based scores) predicted 16.4% of the variance in the total scores of L2 speaking understanding domain (R square= 0.164, adjusted R square= 0.144) and the model was significant, $F(2,82)= 8.050$, $p < 0.01$. On the other hand, proficiency related self reported information could predict 32.5% of variance in the total score of speaking

understanding (R square =0.325, adjusted R square= .282) and the model was significant, $F(5,79) = 7.599$, $p < .001$. Similar analysis was done for reading writing domain and age of acquisition information was excluded from regression analysis because the correlation between the two variables was not significant (Table 2b). Use related self reported information predicted 33.3% of variance in the total score on reading/writing domain (R square=0.111, adjusted R square=.089), whereas self reported proficiency predicted 31.8% of variance in the total score (R square= .318, adjusted R square= .275) and both models were statistically significant.

<Insert Table 3a>

<Insert Table 3b>

Finally, correlation analysis was performed between objective test scores of L1 and L2 for speaking/understanding as well as reading/writing domains. Spoken Discourse analysis for L1 correlated with most of the L2 speaking/understanding tasks. There was a low but statistically significant correlation between speaking understanding total score for L1 and L2 (Table 3a, 3b). Regression analysis was also computed to find out if L1 proficiency in a particular domain would predict L2 proficiency and vice versa.

To sum up, age related information as a predictor variable showed no significant correlation with any of the domains or languages. Use related information and proficiency related information (i.e. percentage exposure, composite task based scores for use and self reported proficiency on speaking/understanding, reading/writing) predicted performance on the respective languages. Use related information and proficiency related self report as a combined predictor variable accounted for maximum variance on L2 tasks as compared to L1. Overall,

scores on the tests of the reading/writing domain were able to account for the variance more appropriately as compared to the tests of the speaking/understanding domain.

Factor analysis across sub skills in L1 and L2

Factor analysis was performed to learn if the observed variables can be explained largely or entirely in terms of factors which are a cluster of two or more individual variables by using principle component analysis as extraction method. It would inform about the organization of language skills and also whether the tasks across and within language domains as well as across and within the two languages could be combined.

Within domain (i.e. speaking and understanding domain or reading and writing domain)

Under spoken-understanding domain for L1, 6 components were extracted from the data set by means of factor analysis (Table 4a). Of these factors, the first 2 components had Eigen values greater than 1 and accounted for 62.6 % of all variance. These components accounted for 33.04% and 29.6% of variance respectively. Under the domain of speaking and understanding in L1, tasks on oral and aural aspects of discourse were clustered under one factor and tasks on naming skills (semantic aspects of language) clustered as the other. All the tasks under spoken-understanding domain in L2 emerged as one component. Similar findings were also evident for reading and writing domain, where L2 had one single component whereas factor analysis of L1 reading and writing tasks led to 3 components.

Out of the 6 initial components that were extracted, first 3 had Eigen values greater than 1 and accounted for 79.71% of variance. Table 4a presents all these components. 30.96%, 26.9%

and 21.76% were the respective variances of the 3 components for L1 reading and writing tasks. Discourse tasks in reading writing domain also clustered together under one component. As the phonological awareness task intends to measure the metalinguistic ability of the individual, its presence as a separate component was probable. The within domain factor analysis of L1 showed different components. Discourse skills (production and comprehension) and naming skills (convergent production, confrontation naming) emerged as two components in speaking/understanding domain. Discourse (reading and written discourse understanding), reading fluency, speed and phonological awareness were separate components in the reading/writing domain.

To sum up, L2 tasks clustered under one component for both speaking/ understanding and reading/writing domains whereas L1 tasks showed clear distinction between different language skills i.e. discourse skills, semantic skills (naming, convergent production), reading skills (fluency and speed) and metalinguistic skills (phonological awareness).

<Insert Table 4a>

<Insert Table 4b>

Across domains (speaking and understanding domain vs. reading and writing domain)

Twelve components were extracted from L1 data set. Of these factors, the first 5 components had Eigen values greater than 1 and accounted for 74.71% of all variances. These 5 components were assigned construct names indicative of characteristics and are listed in terms of variance in Table 5a. There was no segregation with respect to domains rather it was task specific for L1. L1

naming tasks were grouped under one component, whereas L1 discourse tasks were clustered according to whether it was a production or an understanding task. Similarly, L1 showed more scatter as compared to L2.

<Insert Table 5a>

<Insert Table 5b>

Tasks in L2 yielded 3 components. First component accounted for maximum of 43.41% variance and included all the tasks of proficiency for L2 except for phonological awareness, which was the only variable in 2nd component explaining 14.88% of variance followed by the 3rd component comprising of discourse understanding in both domains (Table 5b).

To sum up, for both the languages task specific grouping of variables was observed rather than domain specific i.e. production tasks as one component and comprehension tasks as other.

Influence of L1 and L2 language skills on each other

In an attempt to find out the influence of both L1 and L2 on each other on the test of language proficiency, regression analysis was conducted. On speaking understanding domain total score of L2 was able to predict 21.2% of variance with respect to total score of L1($r= 0.461$) and the model was significant with $F = 4.202$, $p=0.002$. Same was not observed from L1 to L2 i.e. L1 total scores were not able to predict performance on L2 language proficiency tasks. However, performance on L1 reading writing domain predicted performance on L2 and vice versa. Total scores of L1 and L2 both showed high correlation with task of reading and writing $r= 0.512$, $r = 0.501$ respectively.

Greater interdependence of L1 and L2 was observed for the reading writing domain as compared to the speaking understanding domain.

Validity and reliability of the test of language proficiency

Factorial validity and reliability were also measured to assess the extent to which tasks captured similar information (i.e. language proficiency). Factor analysis showed that grouping of each task under different components makes intuitive sense i.e. L1 tasks clustered into meaningful groups, which was evident through the grouping of discourse tasks as one common component. Tasks requiring semantic information access were grouped together for L1 whereas L2 tasks formed a single construct for both speaking/understanding as well as reading/writing domain. Cronbach's alpha as a measure of internal consistency was found to be 0.646 for 24 items including both L1 and L2 tasks. This suggests a fair amount of reliability for the test of language proficiency in Hindi and English.

Discussion

Research on bilingualism focusing on language representation, language processing, second language acquisition, cognitive control (Bialystok, 2007; Chauncey, Holcomb & Grainger, 2009; Colzato, et al., 2008; Kroll, Bobb, Misra & Guo, 2008; Van Hell & Tokowicz, 2010) and mechanisms of language recovery in bilingual Aphasia (Chengappa, 2009) requires appropriate methods for profiling and selection of bilingual participants. Dearth of such data in Indian languages, especially those language combinations which follow different modes and patterns of acquisition, the current paper examined language history and proficiency across language skills in Hindi and English. Moreover, language organization and interdependence of

L1 and L2 in the domains of speaking/understanding and reading/writing remain underspecified in Indian bilingual context. Advantage of language proficiency is that it can be quantified, which has been done in the past but only certain language skills (like confrontation naming/ comprehension/ translation) were considered (Bahrick et al 1994; Johnson & Newport, 1989; Oyama, 1976). The present study examined language skills at semantic, syntactic and discourse levels in both the languages.

It was evident in the current study that the expected level of proficiency varied across language skills in the native language also in L2, which may be because of the varying patterns of native language use. In today's bi/multilingual world effective communication demands for a trade off between the languages which influences the language use pattern and this is subject to individual variations. One would expect different levels of bilingualism based on the trade off between domains as well as between languages. For example, one person would be categorized as high proficient in spoken/understanding domain in both his languages and low proficient in reading/writing domain in his second language. On the other hand, we may also have a bilingual who is at the intermediate level of proficiency in native language and highly proficient in second language. This sort of distinction would create a 6*2 matrix with individual language proficiency levels (i.e. high, mid, low) across the two domains. This has been theoretically described in Bialystok and Cummins' work, where Cummins (1991) accounts for two different types of language proficiency: Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency. Bialystok (2001) conceptualized bilingualism through cognitive dimensions of language proficiency. She states the relationship among use of language and

underlying cognitive requirements, where analysis of representation, structure and control of attention create the orthogonal axes.

Correspondence between subjective and objective measures of language proficiency

Our findings based on the language background questionnaire and assessment of language proficiency in Hindi and English suggest that the information obtained with subjective measures may or may not correspond with objective measures. Many of the psycholinguistic/sociolinguistic studies define bilinguals only on the basis of questionnaire based information (Coppieters, 1987; Marian et al, 2007). One such attempt by Marian et al (2007) resulted in the development of Language Experience and Proficiency Questionnaire (LEAP –Q), where they have probed separately for language proficiency, language dominance and language preference. This questionnaire elicits proficiency ratings in speaking, listening, reading and writing domains. The current study also assesses different language skills as a measure of language proficiency.

One of the important findings of the current study is that age related information had no significant correlation with objective performance on language proficiency tasks. This could be because of the variability in language skills and poor reportability of L1 in particular. However, the finding that age of acquisition did not predict objective performance on language proficiency raises concerns about the use of age related information as a holistic measure while categorizing bilinguals. On the other hand, use related information and self reported proficiency accounted for less than 50% of the variance in performance on language proficiency tasks. There was a correlation between speaking/understanding domain of L2 and age of fluency in reading and

writing which can be attributed to the fact that reading/writing fluency was achieved at a later age resulting in better reportability for the same. It is also interesting to note that reportability of native language is less than the language (L2) learnt in a structured setup. Our study shows that self reported measures alone are not sufficient to reliably inform about all the aspects of language skills and differences in proficiency levels.

The other salient finding is that correspondence between subjective measures and language proficiency tasks in L1 (Hindi) showed different patterns as compared to that observed for L2. For example, the correlation between language use (subjective measure) and discourse skills (objective measure) in L1 could be due to the fact that discourse skills are based on our ability to communicate, thereby, influencing the reportability of L1 use and its relationship with performance on tasks like spoken discourse. Unlike L1, subjective measures predicted task performance for most of the language skills in L2. Proficiency can indicate an individual's language skills even if the use of L2 is limited.

Since we lack systematic efforts to look at the nature of language proficiency in Indian context such data are important to determine the appropriate tool for language proficiency assessment. For example, our study shows that discourse could be a valid tool for both Hindi and English language as compared to the naming task as it has shown within and across domain (discourse in the spoken and written domain) clustering as well as being strongly predicted by self reported language use and overall proficiency. This is particularly important when we use language both as an independent variable or a dependent variable in our experiments in bilingual research. Our results also demonstrate greater interaction between the two languages with respect

to the reading/writing skills and discourse. Vasanta (2011) has addressed issues related to bi/multilingualism and language processing abilities in Indian context primarily looking at language learning environments. She points out that… "It is a common practice to assume that first language (L1) is a static entity fixed in the minds' of bilinguals and it needs to be changed". We have found variability in language skills in L1 as evident in our results based on factor analysis. In addition, data based on tests of sub-skills in oral and literacy skills in L1 were also found to be normally distributed showing variability in performance, and not showing any ceiling effects.

To sum up, out of all the tasks of language proficiency, confrontation naming, discourse analysis and reading comprehension were found to be better correlated with subjective measures and thus can be used as screening measures of language proficiency. Self report of L2 corresponds well with objective performance of L2 which is not the case with L1. Age related factors do not predict performance on language skills across domains for L1; same was predictive in case of L2 suggesting stronger reportability of age related factors for the language which is learnt through instruction.

Organization of language skills in Hindi and English

The factor structure of Hindi as L1 and English as L2 showed that L2 tasks in the domain of speaking/understanding as well as reading/writing were clustered under one common factor, which was not the case for L1. Such kind of clustering could be because L1 is acquired and L2 is learnt through instruction. In addition, use of L1 is more in the spoken/understanding domain whereas use of L2 is more in the reading/writing domain for the population under study.

Language which is acquired has no strict way of experiential pattern. The dynamic nature of this exposure leads to the variability in reportability of acquisition related information whereas hierarchical increments in every grade add some sort of consistency while learning the second language. Results based on factor analysis in L1 and L2 tasks imply that language organisation is task specific (i.e. naming task, comprehension task) and reading/writing and speaking/understanding as domains cannot be segregated as two broad domains. It indicates that our language representation is interwoven within and across both the domains. Oral and aural segregation in tasks may indicate difference at the level of language representation and processing mechanisms. Experimental work with bilingualism may get influenced by such findings in a way that researchers may expect a task specific (visual word recognition, spoken production) correlation with a measure of language proficiency. We also find a lot of scatter in the L1 tasks which justifies the use of a comprehensive tool including all language domains for the determination of language proficiency in L1.

In addition, correlation between L1 and L2 on the discourse task suggests that knowing L2 enhances the skills at discourse level for L1, which pertains to the organization of information in L1. It's been implicated in many studies that L1 acquisition helps in L2 performance (Sparks, Patton, Ganschow & Humbach, 2009). However, in the current study there was an overall correlation of discourse task in L1 with all L2 tasks. Performance on L2 discourse task predicted L1 task performance. Thus the ability to process two languages appears to enhance the higher level language skills such as discourse production.

Findings of the current study have implications for bilingual research. Most of the research on bilingualism focuses on L2 proficiency as a predictor variable, i.e. L2 proficiency influences performance on experimental and non experimental non-linguistic/linguistic tasks. But distinction observed in factor structure of L1 and L2 implies that proficiency in both the languages could independently as well as interactively influence experimental results. Thus proficiency as a predictor variable could have language specific, task specific or domain specific effects. In our current studies we are empirically testing this hypothesis.

Language proficiency: categorical or continuous variable

The very nature of treating bilingualism as a categorical variable by manipulating language proficiency, language use and/or age of acquisition related information creates similar sort of selection bias while selecting bilingual participants. Common concerns include, what kind of task should be prepared, selection criteria, basis of such selection etc. The comparison among bilinguals with respect to levels of performance on language proficiency tasks (i.e. high vs. low, balanced vs. unbalanced etc) is biased because it means comparing the extreme ends which are ought to show a difference. Such a comparison is possible if assessment of all bilinguals on certain aspects (AoA, proficiency and use) leads to a bimodal distribution. On the contrary, our results suggest that language proficiency shows a normal probability distribution. It was not just at the total score level but normal probability distribution was also seen on individual task performance level. By doing so, researchers can assess a bilingual on desired aspects of language proficiency and instead of grouping them, treat proficiency as a continuous variable. Grosjean (1998) emphasized on the demerits of considering bilingualism as categorical variable and the

use of bilingual proficiency assessment as a covariate during analysis. Bialystok (2001) also highlighted the continuous nature of bilingualism and the need to consider the type of language proficiency (with respect to the domain) and degree of language proficiency in each language of a given individual. However, this has not been empirically examined. Any method of dealing with bilingualism should have the capability of ideally setting the boundaries of language proficiency as well as acknowledge variability, thereby provide some sort of metric position of the learner in certain skills. Thus, grouping individuals based on some arbitrary cut off point, would automatically exclude certain individuals from the bilingual category though they have certain amount of skills in both their languages (Bialystok, 2001; Grosjean, 1998). As language proficiency varies on a continuum, it could be treated as a predictor variable and need not be manipulated as a categorical/discrete variable. Another reason for this is to remove the methodological bias which can be introduced by dichotomy. However, use of language proficiency as continuous or categorical variable would rely heavily on the research question. Future work needs to empirically test this proposition.

Conclusion

The present study is one of the first attempts to examine the nature of language proficiency in Hindi-English bilinguals. The study highlights the need for proficiency assessment for L1 and L2 language skills in view of the variability observed in the factor structure of the two languages. Self reported information predicted objective performance for L2 but not L1. Greater interdependence of L1 and L2 was observed for the reading/writing domain as compared to the speaking/understanding domain. Continuous nature of language proficiency in bilingualism

demands for treating it as a predictor variable. Varying levels of proficiency across language skills in L1 and L2 may interact with language processing mechanisms addressed in bilingual research, particularly for certain language combinations where L1 and L2 vary with respect to modes of acquisition, organization of language skills and language use.

Acknowledgement

We are thankful to the Department of Science and Technology, Government of India, for funding this study as it is a part of our project on "Bilingualism and cognitive control" funded under the multi-Institutional project on "Language and brain organization in normative multilingualism" under the Cognitive Science Research Initiative of the DST.

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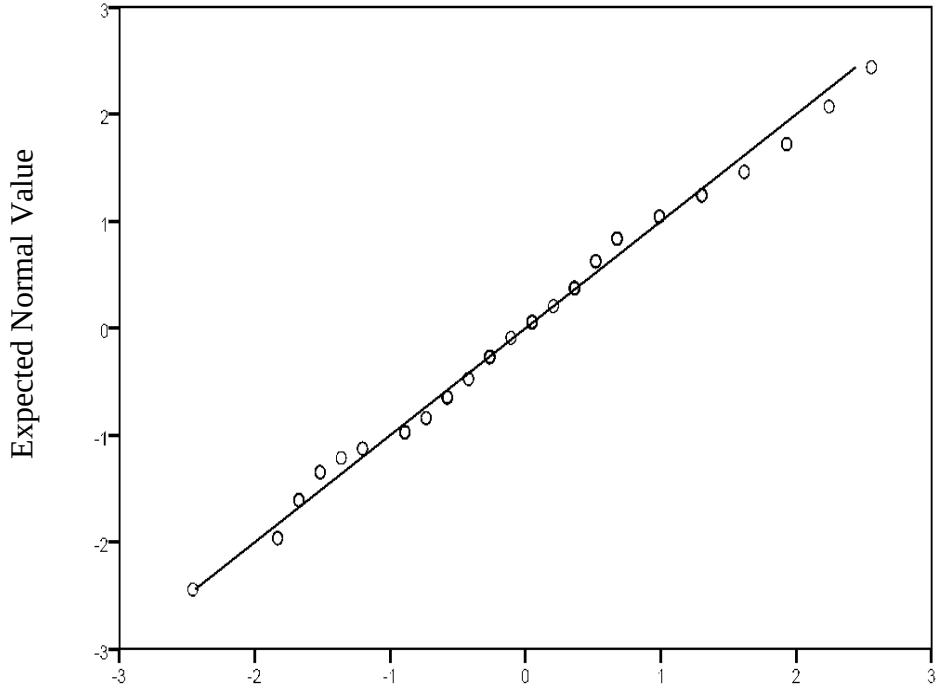
Normal Q-Q plot of total score speaking/understanding (L1)



Total scores on speaking understanding domain (L1)

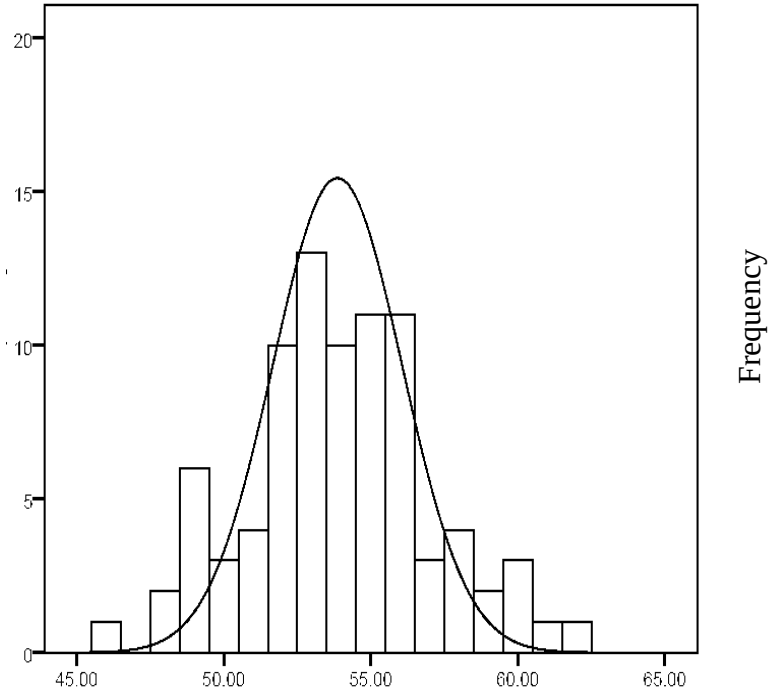
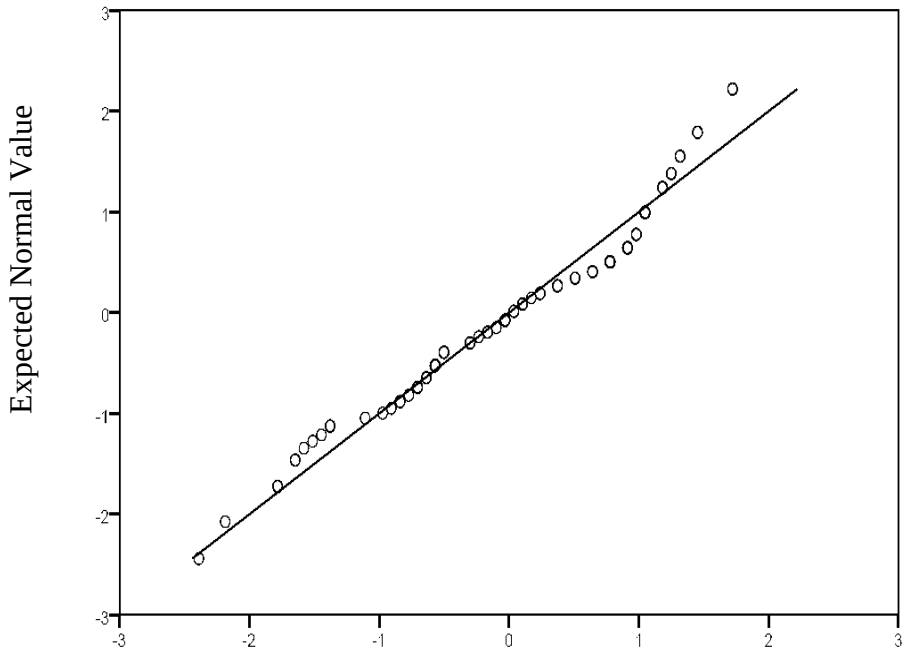


Fig: 1a Normal distribution plots and histogram of the total scores of speaking/understanding domain (L1).

Normal Q-Q plot of total score speaking/understanding (L2)



Total scores on speaking understanding domain (L2)

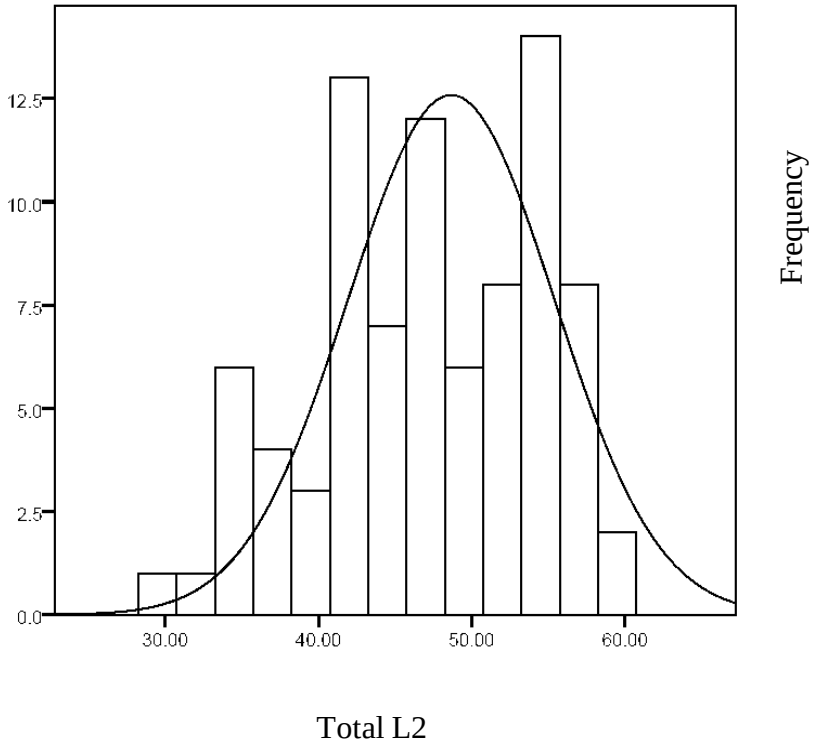


Fig: 1b Normal distribution plots and histogram of the total scores of speaking/understanding domain (L2).

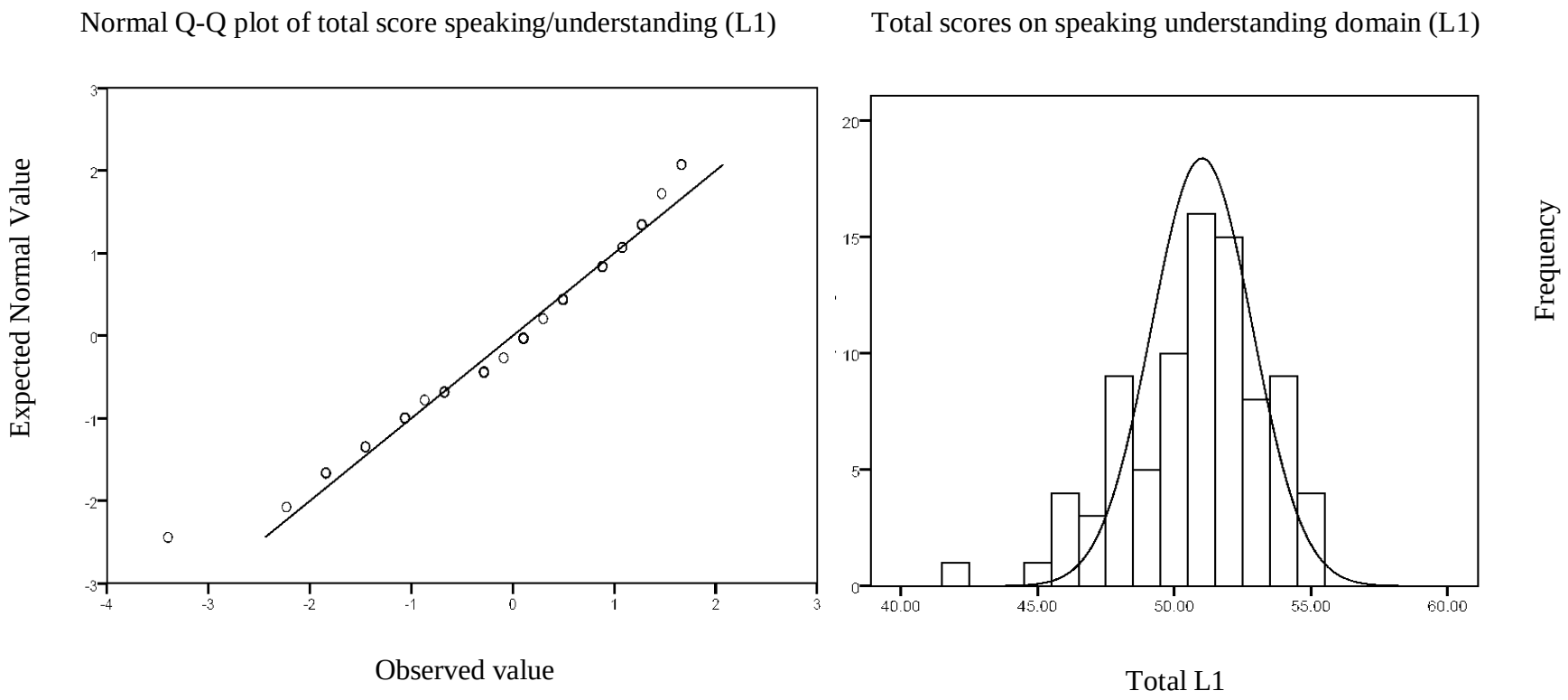


Fig: 2a Normal distribution plots and histogram of the total scores of reading/writing domain (L1).

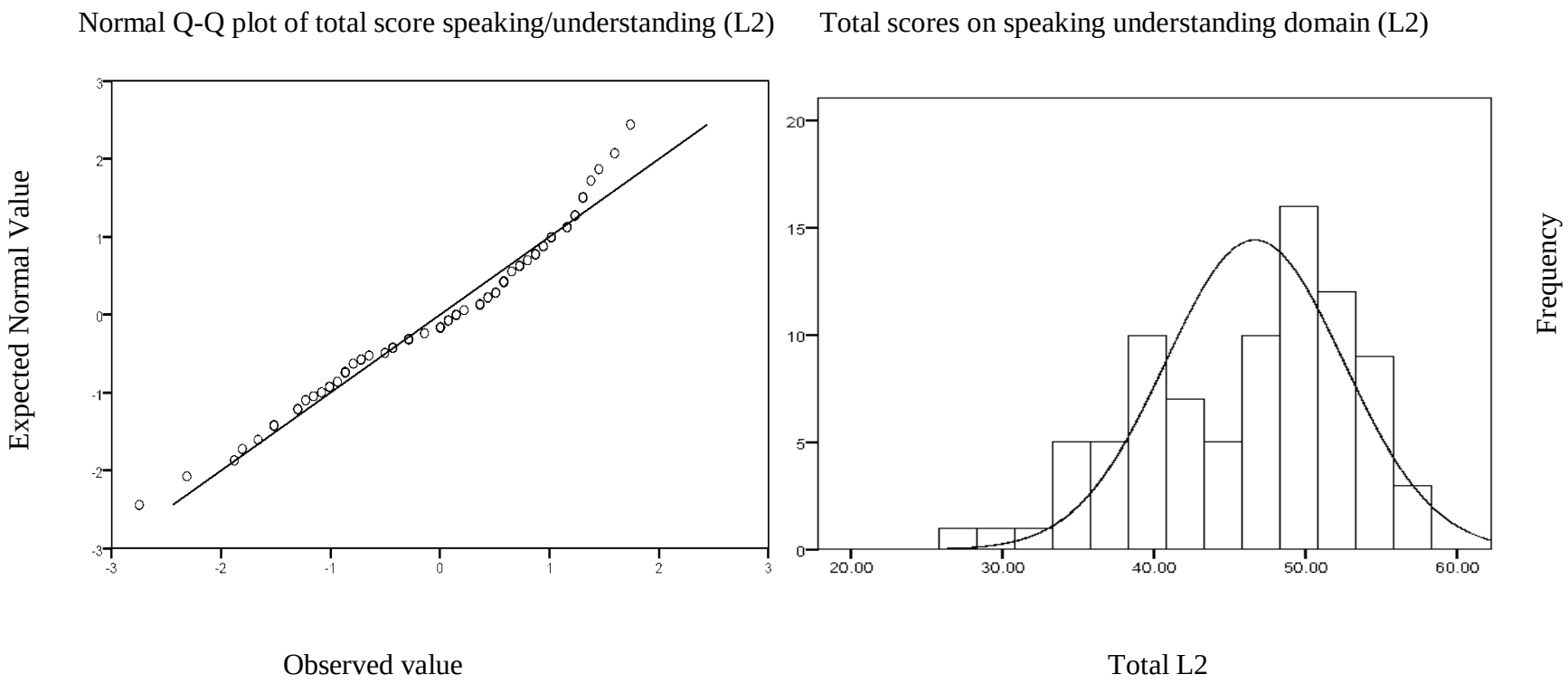


Fig: 2b Normal distribution plots and histogram of the total scores of reading/writing domain (L2).

Table 1a: Correlation analysis of subjective measure and speaking/understanding domain in L1

	Confrontation naming	Discourse analysis	Words per min	Synonym production	Discourse comp	Total
Age related information						
1. Age of learning languages at school	0.129	-0.016	0.085	-0.075	0.108	0.046
2. Age of fluency in reading and writing skills	0.177	-0.203	0.034	0.003	-0.007	-0.013
Use related information						
1. Percentage of exposure	0.05	-.261*	0.07	-0.057	-0.103	-0.165
2. Composite score of the task based scores	0.122	-.311**	0.148	0.209	0.059	0.025
Proficiency related information						
1. Reading	-0.059	-0.008	0.089	.240*	.286**	0.156
2. Writing	0.001	-0.136	0.068	.282**	0.168	0.115
3. Speaking	0.094	-0.034	0.169	0.148	0.102	0.134
4. Understanding	0.003	0.006	.215*	0.006	0.151	0.043
5. Composite score of the task based scores	0.134	-0.118	0.074	.395**	0.178	.258*

**. Correlation is significant at the 0.05 level (2-tailed)*

***. Correlation is significant at the 0.01 level (2-tailed)*

Table 1b: Correlation analysis of subjective measure and reading/writing domain in L1

	Reading comprehension	Words per min	Measure of fluency	Phonological awareness task	Written Discourse	Total
Age related information						
1. Age of learning languages at school	0.048	0.182	0.115	-0.042	-0.015	0.032
2. Age of fluency in reading and writing skills	0.044	-0.012	0.128	-0.033	-0.066	0.01
Use related information						
1. Percentage of exposure	-0.136	0.028	0.025	-0.088	-0.019	-0.08
2. Composite score of the task based scores	-0.098	0.21	0.177	0.023	-0.026	0.061
Proficiency related information						
1. Reading	-0.013	.242*	.253*	-0.027	-0.007	0.099
2. Writing	-0.088	.257*	.327**	-0.153	-0.048	0.02
3. Speaking	0.024	0.14	0.134	0.055	0.019	0.114
4. Understanding	-0.04	0.076	0.178	0.115	0.082	0.194
5. Composite score of the task based scores	0.197	0.159	0.125	-0.086	-0.035	0.031

*. *Correlation is significant at the 0.05 level (2-tailed)*

**. *Correlation is significant at the 0.01 level (2-tailed)*

Table 2a: Correlation analysis of subjective measure and speaking/understanding domain in L2

	Confrontation naming	Discourse analysis	Words per min	Synonym production	Discourse comp	Total
Age related information						
1. Age of learning languages at school	-0.139	-0.093	-0.083	-0.106	-0.1	-0.14
2. Age of fluency in reading and writing skills	-.360**	-0.135	-0.178	-.219*	-0.199	-.298**
Use related information						
1. Percentage of exposure	0.161	.313**	.272*	.304**	0.102	.286**
2. Composite score of the task based scores	.310**	.389**	.388**	.274*	0.2	.397**
Proficiency related information						
1. Reading	.386**	.443**	.317**	0.2	0.205	.445**
2. Writing	0.119	.256*	0.146	0.07	0.089	0.194
3. Speaking	.406**	.529**	.335**	0.127	0.196	.478**
4. Understanding	.410**	.546**	.410**	0.188	0.134	.491**
5. Composite score of the task based scores	.288**	.356**	.246*	.248*	0.11	.357**

**. Correlation is significant at the 0.05 level (2-tailed)*

***. Correlation is significant at the 0.01 level (2-tailed)*

Table 2b: Correlation analysis of subjective measure and reading/writing domain in L2

	Reading comprehension	Words per min	Measure of fluency	Phonological awareness task	Written Discourse	Total
Age related information						
1. Age of learning languages at school	-.259*	0.157	-0.034	-0.135	-0.035	-0.12
2. Age of fluency in reading and writing skills	-.309**	-0.18	-0.17	0.002	-0.042	-0.13
Use related information						
1. Percentage of exposure	0.178	.322**	.257*	0.118	0.175	.243*
2. Composite score of the task based scores	.263*	.375**	.405**	-0.026	.331**	.323**
Proficiency related information						
1. Reading	.296**	.277*	.441**	.333**	.221*	.432**
2. Writing	0.062	.251*	.272*	-0.021	.228*	0.2
3. Speaking	.312**	.229*	.474**	.237*	.322**	.453**
4. Understanding	.386**	.275*	.474**	.265*	.354**	.489**
5. Composite score of the task based scores	0.197	0.159	0.125	-0.086	-0.035	0.031

**. Correlation is significant at the 0.05 level (2-tailed)*

***. Correlation is significant at the 0.01 level (2-tailed)*

Table 3a: Correlation analysis between L1-L2 speaking/understanding tasks

	L1-1	L1-2	L1-3	L1-4	L1-5	L1-6
Confrontation Naming L2	.115	.241*	.028	-.036	.036	.178
Discourse Analysis: Rubric Score L2	-.042	.577**	.036	-.242*	.069	.171
Words Per Min L2	.021	.417**	.253*	-.156	.080	.168
Convergent Production(E)/synonym(H) L2	.182	.310**	.126	.122	.068	.341**
Discourse Understanding L2	.122	.096	-.047	.033	.025	.391
Total L2	.085	.442**	.048	-.098	.064	.242*

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Note: L1-1: Confrontation Naming; L1-2: Discourse Analysis (rubric score); L1-3: words per minute; L1-4: convergent Production (E) /synonym (H); L1-5: Discourse understand; L1-6: Total.

Table 3b: Correlation analysis between L1-L2 reading/writing tasks

	L1-1	L1-2	L1-3	L1-4	L1-5	L1-6
Reading Comprehension L2	.115	.241*	.028	-.036	.036	.178
Words Per Min L2	-.042	.577**	.036	-.242*	.069	.171
Measure Of Fluency: Rubric L2	.021	.417**	.253*	-.156	.080	.168
Phonological Awareness Task L2	.182	.310**	.126	.122	.068	.341**
Written Discourse L2	.122	.096	-.047	.033	.025	.391
Total L2	.085	.442**	.048	-.098	.064	.242*

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Note: L1-1: Reading Comprehension; L1-2: words per minute; L1-3: Measure of Fluency: Rubric; L1-4: Phonological awareness; L1-5: Written discourse; L1-6: Total.

Table 4a: Factor yielded in factor analysis of L1 in Speaking/understanding domain

Factor 1: Naming Skills	Load value	Factor 2: Discourse Skills	Load value
Confrontation Naming	0.748	Discourse analysis: rubric	0.852
Convergent production/Synonym task	0.781	Words per minute	0.477
		Discourse understanding	0.612

Table 4b: Factor yielded in factor analysis of L1 in Reading/writing domain

Factor 1: Fluency measure	Load Value	Factor 2: Discourse skills	Load Value	Factor 3: Metalinguistic skill	Load Value
Words per minute	0.862	Reading Comprehension	0.535	Phonological awareness	0.957
Measure of Fluency: rubric score	0.89	Written discourse	0.911		

Table 5a: Factor yielded in factor analysis across domain in L1

Factor 1: Naming skills	Load Value	Factor 2: Discourse production	Load Value	Factor 3: Fluency skills	Load value
Confrontation naming	0.797	Discourse analysis: rubric	0.774	Reading: Words per minute	0.883
Convergent production/Synonym task	0.547	Written discourse	0.781	Reading: Measure of Fluency	0.875

Factor 4: Metalinguistic skills	Load Value	Factor 5: Discourse comprehension	Load value
Phonological awareness	0.913	Spoken discourse understanding	-0.554
		Reading comprehension	0.774

Table 5b: Factor yielded in factor analysis across domain in L2

Factor1: Production skills	Load value	Factor 2: Metalinguistic skills	Load value	Factor 3: Understanding skills	Load value
Confrontation naming	0.722	Phonological awareness	0.952	Spoken discourse understanding	0.915
Discourse analysis: rubric score	0.852			Reading comprehension	0.555
Discourse: Words per minutes	0.729				
Convergent production/Synonym task	0.57				
Reading: Words per minute	0.719				
Reading: measure of fluency	0.821				
Written Discourse	0.699				

Appendix:

1 (a): Rubric for focused description: For spoken discourse analysis

Strong 3 points	Average 2 points	Weak 1 point
Overall impact and achievement of purpose		
3 Presents a vivid, memorable picture of a person, place or things	**2** presents a clear picture of a person, place, or thing	**1** presents an unclear or confusing picture of a person, place and thing
3 Establishes a dominant, or main, impression of the picture	**2** focuses on important characteristic(s) of the picture	**1** presents an unfocused array of characteristics of the picture
3 Conveys a clear sense of purpose	**2** suggests the speakers purpose	**1** unclear or inadequate indication of speakers' purpose.
Organization and techniques		
3 uses a clear, consistent method of organization of event	**2** Method of organization is usually clear and consistent	**1** method of organization is difficult to identify or follow
3 coherence and cohesion demonstrated through some appropriate use of devices (transitions, pronouns, causal linkage, etc)	**2** coherence and cohesion (sentence to sentence) evident; may depend on holistic structure, most transitions are appropriate	**1** evidence of coherence may depend on sequence. If present, transitions may be simplistic or even redundant
Mechanics		
3 very few, if any errors in grammar, pronunciation and presence of few pauses(filled and unfilled)	**2** small number of errors in grammar, pronunciation and presence of indefinable pauses(filled and unfilled)	**1** numerous errors in grammar, pronunciation and presence of pauses(filled and unfilled)

1 (b): Rubric for fluency measure: For reading fluency

Scores	Smoothness/pacing	Confidence	Accuracy	expression
4	Reader reads all of the familiar text smoothly and continuously. The reader pays attention to punctuation marks, and understands how to break text up into meaning groups of words.	Reader appears relaxed/confident and recovers quickly if a mistake is made	Reader self corrects, or does not make errors when reading familiar text	Reader reads familiar test with appropriate changes in voice pitch/expression that reflect comprehension of the text and add dramatic emphasis to the text
3	Reader reads most of the familiar text smoothly and pays some attention to punctuation marks	Reader appears relaxed/confident, but is slightly agitated/confused by mistakes	Reader makes occasional errors that do not affect the content of the text (e.g. mispronouncing character names)	Reader reads familiar text with appropriate changes in voice pitch/expression that reflect comprehension of the text
2	Reader reads familiar text either too quickly or with awkward pauses.	Reader appears somewhat nervous and is confused/agitated by mistakes	Reader makes occasional errors that affect the content of the text.	Reader reads familiar text with changes in voice pitch/expression that may not match the text meaning
1	Reader reads familiar text with long extended pauses or by slowing sounding out each word	Reader appears nervous and cannot concentrate to read	Reader makes frequent errors when reading familiar text and text appears to be above student's comfortable reading level	Reader reads familiar test in a monotone voice.

1 (c): Rubric for focused description: For written discourse

Strong 3 points	Average 2 points	Weak 1 point
Overall impact and achievement of purpose		
3 Theme/unifying theme explicitly stated	**2** Theme/unifying theme stated in opening or conclusion	**1** Theme/unifying theme may not be present
3 has effective closing and starting phrases	**2** has closing and starting phrases	**1** abrupt starting or ending
Organization and techniques		
3 uses a clear, consistent method of organization of event	**2** Method of organization is usually clear and consistent	**1** method of organization is difficult to identify or follow
3 coherence and cohesion demonstrated through some appropriate use of devices (transitions, pronouns, causal linkage, etc)	**2** coherence and cohesion (sentence to sentence) evident; may depend on holistic structure, most transitions are appropriate	**1** evidence of coherence may depend on sequence. If present, transitions may be simplistic or even redundant
Mechanics		
3 very few, if any errors in grammar, capitalization, punctuation and spelling.	**2** small numbers of errors in grammar, capitalization, punctuation and spelling.	**1** numerous errors in grammar, capitalization, punctuation and spelling.

Appendix 2: Language background questionnaire

	N	Mean L1	Std. Deviation L2	Mean L2	Std. Deviation L2
Age Of Learning Languages At School	85	51.84	11.589	64.45	25.975
Percentage Of Exposure	85	64.49%	16.37%	35.44%	16.40%
Self Reported Reading proficiency	85	4.31	.913	4.12	.865
Self Reported Writing proficiency	85	3.88	1.117	3.96	.919
Self Reported Speaking proficiency	85	4.53	.700	3.39	.952
Self Reported Understanding proficiency	85	4.71	.614	4.01	.982
Age Of Acquisition Of Reading And Writing Skills	85	51.84	11.589	63.74	25.590
Age At Which Became Fluent In Reading And Writing	85	88.45	24.585	129.44	35.269
Language Use Choice: a) Reading Newspaper	85	2.39	.619	2.33	.521
b) Reading Novels/Magazine	85	1.92	.694	2.29	.669
c) Watching Movies	85	2.78	.472	2.06	.585
d) Watching TV Program	85	2.68	.582	1.73	.625
e) Making Shopping List	85	1.76	.766	2.48	.701
f) Listening To Music	85	2.76	.479	2.07	.613
g) In The Place Of Worship	85	2.81	.422	1.44	.606
Language Use Choice: Composite Score Of The Task Based Scores	85	2.298	.3455	2.067	.3337
Percentage of Use Per Day	85	69.52%	13.87%	33.11%	15.90%
Language proficiency on task: a) Count Up To Hundred	85	4.21	1.156	4.99	.108
b) Say The Days Of Week	85	3.88	1.562	4.95	.342
c) Months Of Year	85	3.15	1.701	4.99	.108
d) Enquire Train Timings	85	4.46	.894	4.56	.823
e) Ask For Direction	85	4.65	.719	4.36	.857
f) Describe Yourself	85	4.49	.796	4.29	.884
g) Talk About Hobby	85	4.39	.832	4.24	.972
h) Describe Typical Day	85	4.60	.710	3.93	.949
i) Talk About Academic Topic	85	4.21	1.025	4.28	.983
j) Understand Conversation	85	4.87	.402	4.51	.781
k) Comprehend Jokes/Ironies	85	4.65	.612	4.07	.949
l) Translate	85	4.12	.878	4.22	.905
m) Understand Proverbs/Idiomatic Language	85	4.12	.993	3.84	1.045
Language proficiency on task: Composite Score Of The Task Based Scores	85	4.27	.495	4.36	.650

Appendix 3: Scoring method

Task/subtask	Description	Scoring	Number of items
Speaking/understanding domain			
Naming	Confrontation naming task (consist of both high and low frequency words)	Max S: 30	30
Discourse analysis	Picture description task (achievement of the purpose, organization technique and mechanics) Calculation of words per min	Max S: 18 Words per minute will be calculated	1 per language
Language comprehension	Auditory discourse comprehension test, participants would be asked questions based on the passage.	Max S:5 (Hindi) Max S: 5 (English)	5 5
Convergent production/synonym	For Hindi :synonym task was given For English: convergent production task were participants would be asked to name as many meaning possible of a particular word	Max S:10 Max S: 10	10 10
Reading/writing domain			

Reading comprehension	Participant would be asked to read a passage, five questions will be asked on the passage.	Max S: 5	5
Fluency analysis	Reading fluency would be assessed on following subheads: smoothness/pace, confidence, accuracy and expression; which would provide a rubric score of overall fluency Word per minute would also be calculated	Max S: 16	1
Phonological awareness	In this section, subject would be asked to perform tasks involving segmentation, blending, rhyming and counting number of sounds.	Max S: 20 (for Hindi) Max S: 24 (for English)	20 20
Discourse analysis(written)	In this section, participant would be provided with a topic(procedural description task) and would be required to write on that topic. (achievement of the purpose, organization technique and mechanics)	Max S: 15	1