EFFECT OF BILINGUALISM ON CREATIVITY–AN EXPLORATORY STUDY

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Abstract

Bilingualism is the process of knowing or using two languages with equal or nearly equal fluency. Research evidences have suggested that cognition specifically creativity is affected by the process of learning one or more languages. In this context, the current study was aimed to investigate the creative abilities of bilingual and monolingual adolescents. A total of 24 participants (12 monolinguals and 12 bilinguals) were considered for the study. Four verbal subtests from the Passi test of creativity and two nonverbal subtests of creativity developed by Veena and Bhavani (2002) were administered on the selected participants. The responses obtained from both the groups were scored as per the instructions provided in the manual of the tests. The scores were averaged across participants of both the groups and were subjected to statistical analysis. The results of the present study revealed that bilinguals outperformed the monolinguals in all the subtests of creativity which indicated that the bilinguals were more creative than monolinguals. There was a definite advantage of bilingualism on the creative abilities of the individuals considered in the study. The results of this study helps us to refine our understanding of the thought process in bilingual individuals and may contribute towards reframing the notion in people's mind that bilingualism hampers the development of the child. Further research is warranted considering a large sample of subjects, in different languages, in different age groups and in different types of bilinguals to discover the exact relationship between bilingualism and creativity.

Key words: *Creativity, bilinguals, monolinguals*

Bilingualism has been an area of great interest in the field of research for the past few decades and has been receiving increasing attention. Bilinguals are individuals who are fluent in two languages; or individuals who actively use, or attempt to use more than one language, even if they have not achieved fluency in their second language (Kroll & de Groot, 1997). The bilinguals are different from monolinguals in many ways. The differences are evident in the way they acquire language, age of acquisition, proficiency in the language etc. Bilinguals are constantly involved in the process of comparing and contrasting the two languages, for example; comparing nonsense of meaning, attending to different grammatical forms. They may be persistently vigilant over their languages, inspecting them and, resolving interference between the languages. Bilinguals are also different from monolinguals in terms of language storage in their brain. Vaid and Hull (2002) found left hemisphere dominance for language processing in monolinguals whereas bilateral involvement was pronounced in early fluent bilinguals. Thus, bilinguals appeared to be less left lateralized than monolinguals which suggested that learning a second language increases the density of grey matter (Mechelli, Crinion, Noppeney, O'Doherty, Asburner, Frackowiak, & Price, 2004).

It is a common view that one's personality grows with the extra languages- particularly among those who are already bilingual.

Apart from the influence on personality, the knowledge of extra languages also influences other domains such as linguistic and metalinguistic skills, cognition, and academics (Ianco-Worrall, 1972; Cummins & Gulutsan, 1974; Ben-Zeev, 1977a, 1977b; Cummins, 1978; Bialystok, 1991, 1999, 2001). These domains are closely related and interlinked to each other (Vygotsky, 1986). There is a growing body of literature on how bilingualism affects an individual's linguistic, metalinguistic, cognitive and academic performance.

In the early 1900s, there were claims that teaching a child a second language could suppress intellectual function and cause emotional problems (Hakuta, 1986). The period where research accented detrimental effects on bilingualism lasted from approximately the 1920's to the 1960's. While the dominant result was that bilinguals were inferior to monolinguals particularly on verbal Intelligence Quotient (IQ), these early studies share various limitations and methodological flaws and hence, the conclusions cannot be accepted (Grosjean, 1998). Modern research suggests that the bilinguals have no cognitive disadvantages compared to the

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monolinguals. Further, there are ample numbers of studies which were carried out subsequently that supported the view that speaking two languages does not tax either the cognitive or the linguistic system; rather bilingualism confers advantages upon children with respect to various cognitive and linguistic abilities. Bilingualism influences the cognitive processes including the conscious functioning and the unconscious automatic cognitive processing such as creativity that requires no attentional control. Creativity is usually considered to be a mental process which involves the generation of new ideas or new connections between existing ideas. Creativity can be manifested in the production of creative outcomes that are both original and useful (Simonton, 2008; Saul & Leikin, 2010). An alternative, more common conception of creativity suggests that it is simply the act of making something new and different from what others are making (Leikin, 2009).

In psychometric tradition, creative thinking is perceived as an ability to initiate multiple cycles of divergent and convergent thinking (Guilford, 1967), which creates an active, attention-demanding process that allows generation of new, alternative solutions (Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991). Guilford (1967) introduced a distinction between convergent and divergent thinking. The fundamental difference between these two processes is that convergent thinking is a conscious, attention demanding process, whereas divergent thinking occurs in the unconscious mind, where attention is defocused (Mendelsohn, 1976; Kasof, 1997) and thought is associative (Koestler, 1964; Mednick & Mednick, 1967; Ward, Smith, & Vaid, 1997). Divergent thinking involves a broad search for information and the generation of numerous novel alternative answers or solutions to a problem (Guilford, 1967). Divergent thinking is sometimes used as a synonym for creativity in psychology literature. Other researchers have occasionally used the term flexible thinking (Tranter & Koutstaal, 2008).

According to Guilford (1967) divergent thinking is associated with four main characteristics: fluency (the ability to rapidly produce a large number of ideas or solutions to a problem); flexibility (the capacity to consider a variety of approaches to a problem simultaneously); elaboration (the ability to think through the details of an idea and carry it out); and originality (the tendency to produce ideas different from those of most other people).

Several researchers investigated the relationship between bilingualism and creative thought. The literature is abundant, albeit controversial, with evidence of negative, positive, or neutral influence of bilingualism on the development of different specific cognitive abilities and processes, including different forms of creativity (Ricciardelli, 1992a; Bialystok, 2005; Simonton, 2008). According to many researchers, bilingualism can indirectly stimulate the creative process that is dependent on cognitive capacities. The advantages of bilingualism have been reported across a variety of domains, such as creativity and flexibility, (Torrance, 1966, 1974; Landry, 1973; Bruck, Lambert, & Tucker, 1976; Kessler & Quinn, 1987; Ricciardelli, 1992a; 1992b; Simonton, 2008) and perceptual disembedding (Duncan & De Avila, 1979). A review of the available literature shows a tendency for bilinguals to perform better than their monolingual counterparts on various test of creative thinking.

Balkan (1970) reported of some advantages in thinking, ranging from creative thinking to measures of cognitive flexibility, creativity or divergent thought to faster progress in early cognitive development and greater sensitivity in communication in bilinguals. Peal and Lambert (1962) compared 10 year old French-Canadian balanced bilinguals with their English or French counterparts on measures of nonverbal and verbal intelligence. The results revealed that on both the intelligence measures, the bilingual group performed better than the monolingual group. The bilinguals were also rated better than the monolinguals in general school achievement. They concluded that bilingualism provides greater mental flexibility in terms of thinking more abstractly and more independently of words. The bilingualism also facilitated superiority in concept formation and development of IQ.

Cummins and Gulutsan (1974) replicated the study of Peal and Lambert (1962) in Western Canada in which balanced bilingual group matched with a monolingual control group on socioeconomic status, gender and age performed better than the controls on verbal and nonverbal ability measures and on verbal originality measure of divergent thinking. Landry (1974) assessed creativity in bilinguals and reported that when a second language was learned at a critical age, performance on measures of figural and verbal fluency, flexibility and originality was significantly better compared to monolinguals.

Ben-Zeev (1977a) studied Hebrew-English and Spanish-English bilingual children and concluded that bilinguals process the semantic information more deeply than monolinguals.

They thus show greater cognitive flexibility and greater ability to use more complex analytical strategies in their approach to language operations. Bilingualism created advantages in terms of cognitive abilities. It extended the individuals' capabilities and promotes mental processing (problem solving, thinking, flexibility and creativity) (Kormi-Nouri, Moniri, & Nilsson, 2003). Bilinguals can extend the range of meanings, associations and images, and think more fluently, flexibly, elaborately and creatively.

Kharkhurin (2008) evaluated the performance of Russian-English bilinguals and English monolinguals on divergent thinking tasks. The results revealed that the bilinguals who acquired their second language earlier, those with high proficiency in both the languages and with longer exposure to the new cultural settings tended to outperform their counterparts who acquired second language later in life, and with less proficiency on the measures of fluency and flexibility in divergent thinking. He proposed that age of second language acquisition, linguistic proficiency, and length of exposure to a new cultural environment might influence the performance of bilinguals.

Kharkhurin (2009) compared the performances of Farsi-English bilinguals living in the UAE and Farsi monolinguals living in Iran on the Culture Fair Intelligence Test battery and two creativity tests. The findings revealed that bilingualism facilitated the innovative capacity, i.e., the ability to extract novel and unique ideas. However it was found that bilingualism did not facilitate the ability to generate and process a large number of unrelated ideas. Bilingualism was related to higher originality scores for the divergent thinking test and the tendency to break away from standard category properties in the structured imagination task.

To account for bilingual advantages on creative performance, Kharkhurin (2009) proposed a Language Mediated Concept Activation (LMCA) model. He argued that LMCA may activate unrelated concepts in bilingual memory which could facilitate the generative capacity in bilinguals. The basic conception of the model is that the specific architecture of bilingual memory may facilitate the greater spreading activation between concepts. Variations in the conceptual representation of translation equivalence may result in the simultaneous activation of additional concepts. This may produce a large pattern of activation over unrelated concepts from different categories. Thus elaborative LMCA may allow bilinguals to process large unrelated concepts from different categories simultaneously, which in turn results in their superior generative capacity. More recent findings showed that the superior innovative capacity of the bilinguals may be determined by various factors in their socio-cultural environment.

Other studies have found the bilingual advantage only on certain aspects of creativity, while some others have found no difference between bilinguals and monolinguals on creativity. Okoh (1980) administered a battery of tests of verbal and nonverbal creativity, verbal intelligence and language proficiency on bilingual vs. monolingual children. It was found that bilingual children scored significantly higher in the verbal creativity tests than their monolingual counterparts, however there was no significant difference between the two groups in the nonverbal creativity tests. Kharkhurin (2010a) found significant differences between nonverbal and verbal creativity in the bilingual context. Positive influence of bilingualism on nonverbal creative behavior was shown; while in verbal creativity measures monolinguals were found to be better than bilinguals.

Stephens, Advisor, Esquivel, and Giselle (1997) investigated the effect of bilingualism on creativity by administering the Torrance Test of Creative Thinking (Torrance, 1966) and on social problem-solving skills using the Preschool Interpersonal Problem Solving Scale. The study was carried out on a group of Spanish-English bilinguals and Spanish monolinguals. The results indicated that the bilingual children performed superior to their monolingual counterparts in the area of social problem solving, but not in the area of creativity.

Need for the study

A look into the literature revealed mixed findings with respect to bilingualism and creativity. Although some studies report a positive relationship between the two, others have only found the effect of bilingualism on certain types of creativity (verbal vs. nonverbal), while a few others have found no difference between bilinguals and monolinguals on creative thinking. Most of the studies have incorporated either verbal or nonverbal measures to assess creativity. The correlation between bilingualism and creativity is a mere spurious upshot of underlying factors of experimental openness of the economy; bilingualism is likely to become more rather than less prominent. Therefore it is essential to learn what the consequences of that trend might be including whether the creative activity is likely to grow, stagnate, or decline.

Further, most of these studies have been carried out especially in children in the west. There are reports which state that there are differences in the linguistic and cognitive functions across races and cultures (Sosa, Albanese, & Prince, 2009). The influence of these factors on language and cognition of individuals cannot be undermined. Further, if the knowledge of more than one language has a significant impact on measures of creativity, scientific research in such domains of bilingualism should take place in abundance in countries like India which is known for its rich multilingual nature. But there has been dearth of studies conducted despite such opportunities especially in domains of creativity. Till date there has been no research conducted on the aspect of creativity in bilinguals in the Indian context. Keeping this in view, the present study was planned and carried out. It is hoped that the results of the study would help open up a new horizon for research in the field of bilingualism in India which is a land known for its rich multi-language culture. The aim of the study was to investigate the creative thinking abilities in bilingual and monolingual adolescents.

Method

Participants: Twenty four female participants in the age range of 15-16 years were selected for the study. They were native speakers of Kannada and were divided into two groups. The group I consisted of 12 Kannada speaking monolingual participants and the group II comprised of 12 Kannada-English bilingual participants. Although the monolingual group had some exposure to English, it was very minimal. The participants were selected from various schools in the city of Mysore. All ethical standards were met for subject selection and their participation.

Participant selection criteria: The participants meeting the following criteria were included in the study:

1. No history of language, speech, hearing, neurological, developmental, academic and intellectual disorders, which was ensured using the 'WHO ten question disability screening checklist' (Singhi, Kumar, Malhi, & Kumar, 2007)

2. Sequential bilinguals with Kannada as mother tongue and English as second language as participants for the group II.

3. A score of 1 and 3 in terms of proficiency in English in ISLPR for the participants of the group I and II respectively. The International Second Language Proficiency Rating (ISLPR) scale developed by Ingram (1985) was used to check the language proficiency in the second language English. ISLPR describes language performance at eight points along the continuum from zero to native like proficiency in each of the four macro skills (speaking, listening, reading and writing). The scale is divided into primary (speaking and listening) and secondary skills (reading and writing). It has 8 ratings which includes 0, 0+, 1, 1, 2, 3, 4, 5 as rated from a continuum zero proficiency to native like proficiency.

4. Average academic performance as reported by their respective class teachers.

5. Participants belonging to middle socio-economic status which was ensured using the NIMH socioeconomic status scale developed by Venkatesan (2009). The scale has sections such as occupation and education of the parents, annual family income, property, and percapita income to assess the socioeconomic status of the participants.

6. Participants who don't have an exposure to any training classes for drawing and painting and other arts which have an impact on their creative abilities.

Material: The Passi Test of creativity developed by Passi (1979) was administered on the selected participants. It is a test developed for the purpose of measuring creativity. Four verbal subtests of creativity from the Passi Test of Creativity were administered on the selected participants. The four subtests were as follows: The seeing problems test, the unusual uses test, the consequences test and the test of inquisitiveness. The details of the subtest and the instructions provided to the participants have been mentioned below:

1. The seeing problems test: The test included four items, namely, shoe, pen, chair and postcard. The subjects were instructed to think and write down briefly as many defects and problems as they can point out in connection with these four items. The maximum time limit provided was 8 minutes, two minutes for each item.

2. The unusual uses test: This test included two items namely, cloth and bottle which could be used for numerous purposes. The participants were expected to write as many interesting and unusual uses as possible for each item. The maximum time limit for the test was 8 minutes; 4 minutes allotted for each item.

3. The consequences test: The test included four items/instances viz. if the human beings start flying like birds, if all houses start flying, if all people become mad and if all females become males. The participants were expected to write down as many consequences of the above

mentioned items as possible. The maximum time limit provided was 8 minutes, two minutes allotted for each item.

4. The test of inquisitiveness: The participants were shown a covered object and were expected to imagine and write as many questions as possible that arise in their mind about the object within 6 minutes. They were also told that the questions should be mutually exclusive to one another in content and meaning.

Subsequent to this, two nonverbal subtests of creativity developed by Veena and Bhavani (2002) was administered on the participants. The details of the tests included were as follows:

1. Completion of figure: The participants were expected to make as many figures as possible from a given shape. Repetitions of figures were not allowed. The participants were given a time span of five minutes to perform the task.

2. Draw the person: The participants were expected to draw a person either girl or boy within a time span of eight minutes. They were given the freedom to draw the picture with all accessories as creatively as they can.

The tests permitted freedom of responses both qualitative and quantitative within specified time limit thus ensuring the suitability of the tools for measuring divergent thinking.

Procedure

The participants were made to sit comfortably in a quiet room with no distractions and instructions were given in Kannada for each task. Rapport was built with the participant before the assessment. The subtests were administered one at a time. A time span of one hour was required to administer the test. The allotted time for each task was according to the instructions given in the manual of both the tests. The written responses of the subjects were recorded in answer sheets provided with the tests. The participants were given reinforcement after the completion of the tasks. The subtests were scored as per the scoring procedure provided in the test for each item. The total score for each subtest of the Passi test was 10. For the first four subtests the answers of the participants were compared with the list of possible answers given in the test material and was scored accordingly. For the subtest on completing the figure, each figure was scored. Figures of alphabets and numbers were excluded and not scored. For the subtest on drawing a person, full score was given if the picture drawn was complete in terms of all body parts, dress and accessories.

Consequently the total score for each of the subtest for each participant was tabulated and was compared with the norms provided in the test. The data thus obtained was averaged across all participants and was subjected to appropriate statistical analysis using a commercially available SPSS package (version 16.0). Statistical procedures such as independent samples t- test was used to compare the performance of the two groups on various subtests of creativity. Descriptive statistics was used to obtain mean and standard deviation in the two groups. An independent samples t-test was used to check for the significant difference, if any between the two groups.

Results

The performance of Kannada speaking monolinguals and Kannada English bilinguals was compared across all subtests of creativity. The mean and Standard Deviation (SD) obtained for each of the subtests have been depicted in Table 1. A comparison of the total mean scores of all the subtests revealed that the bilingual group obtained higher mean scores than the monolingual group which indicated that the bilingual group performed better than the monolingual group. The total mean scores obtained were subjected to independent t- test and the results revealed that there was a significant difference between the monolingual group and the bilingual group at 0.01 level. The t- values have been depicted in Table 1. The performance of the two groups as a whole and on all the subtests has been depicted in Figure 1.

Table 1: *Mean, Standard Deviation (SD) and t values of various subtests of creativity for both the groups.*

Groups	Monolinguals		Bilinguals		t
Subtests of creativity	Mean	SD	Mean	SD	values
Subtest 1	10.33	3.68	16.08	4.64	3.36**
Subtest 2	6.67	2.35	21.17	5.52	8.37**
Subtest 3	4.58	2.97	11.50	3.45	5.26**
Subtest 4	4.25	1.71	13.58	7.30	4.30**
Subtest 5	9.42	3.75	14.25	5.33	2.57*
Subtest 6	15.58	5.74	26.33	11.44	2.91**
Grand total	50.91	12.17	102.92	16.85	8.67**

*p<0.05, **p<0.01

When the mean scores were compared across the subtests, it was seen that both the groups obtained the maximum mean score for the subtest 1 among the verbal subtests which is the 'seeing problems test' and for the subtest 6 which is 'draw a person test' among the nonverbal subtests.

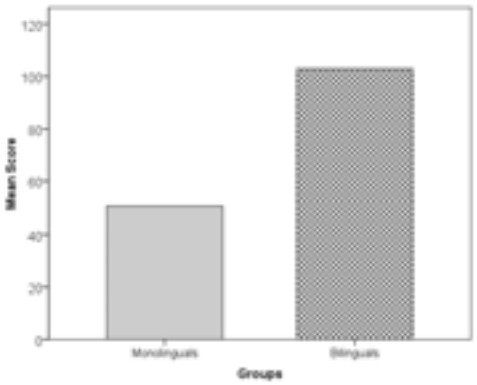

Figure 1: *Performance of the bilinguals and monolinguals on the creativity subtests.*

The mean scores were the least for subtest 3, 4, and 5. A comparison of the mean scores across the groups revealed that the bilingual group obtained higher mean scores on all the subtests which indicated that the bilingual group performed better than the monolingual group on all the verbal and nonverbal subtests. The mean scores of both the groups on each of the subtests were subjected to independent t- test. The results obtained revealed that there was a significant difference between the monolingual group and the bilingual group at 0.01 level for all the subtests except subtest 5 which was significant at 0.05 level. The t- values have been depicted in Table 1. The performance of the two groups on all the subtests has also been depicted in Figure 2.

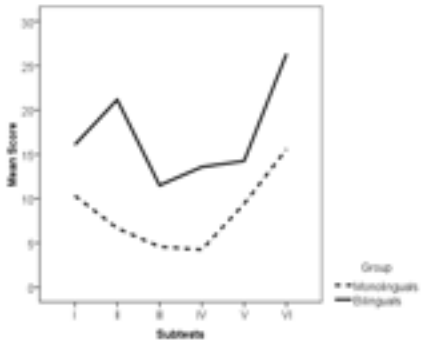

Figure 2*: Performance of both the groups across various subtests of creativity.*

Discussion

The results of the present study revealed that bilingual Kannada English adolescents attained higher scores on all subtests than monolingual Kannada speaking adolescents. This reflects the influence of knowing and using two languages on the creative abilities of the participants. Similar results were obtained by Peal and Lambert (1962), Balkan (1970), Cummins and Gulutsan (1974), Landry (1974), Bruck, Lambert, and Tucker (1976), Ben-Zeev (1977a), Ricciardelli, (1992a; 1992b); Kormi-Nouri, Moniri, and Nilsson (2003), Simonton (2008), and Kharkhurin (2008, 2009). Scott (1973) also reported in his study that the bilinguals have a greater degree of divergent thinking. The study by Kessler and Quinn (1987) revealed that bilingual children performed better on problem solving task than their monolingual counterparts. They interpreted these results as evidence of greater metalinguistic competence and better developed creative process. Studies by Torrance Gowan, Wu, and Aliotti (1970) also have reported that bilingual children show greater originality in creative thinking.

However the results of the present study are not in agreement to the studies by Okoh (1980) who found that there was a significant difference between bilingual children and their monoglot counterparts only on the verbal creativity tests and not on the nonverbal creativity tests and with Kharkhurin (2010a) who found that the monolinguals were better than bilinguals on verbal creativity measures. Stephens, Advisor, Esquivel, and Giselle (1997) also found that the bilingual children did not outperform their monolingual counterparts in the area of creativity.

Bilinguals can comprehend a problem in a number of different ways. The linguistic experience for the bilinguals in the two different languages could aid in this process. The encoding and assessing of concepts and knowledge could be carried out in varied ways. This could have led to the superior performance of the bilingual group in subtests such as the seeing problems test and the consequences test.

Bilinguals can store the same concepts in different linguistic networks. This diversity of association is assumed to be a vital property of creative thinking. This helps to link unrelated concepts from different categories and think differently. This advantage could have helped the bilinguals to perform better on subtests such as the unusual uses test and the test of inquisitiveness compared to monolinguals. Bilingualism facilitates the innovative capacity to generate new ideas and concepts (Kharkhurin, 2009). This could have contributed to superior performance of bilinguals in tests such as completion of figure and draw the person.

Cummins (1976) explained some possible beneficial links between bilingualism and creative thinking. The first explanation is that bilinguals have a wider and more varied range of experiences than monolinguals because they

operate in two languages and possibly in two cultures. The second explanation concerns a switching mechanism. Because bilingual children must switch from one language to another, they may be more flexible in thinking. The third explanation is based on the process of objectification (Cummins & Gulustan, 1974). Bilinguals may be involved in a process of comparing and contrasting two languages, seeking varying language rules and differentiating between word sounds and word meanings.

The repeated switching from one language to another and constant dealing with the two code systems (phonological, phonetic and lexical) may facilitate their metalinguistic awareness which presumably facilitates their cognitive abilities (Pattnaik & Mohanty, 1984; Bialystok, 1988; Galambos & Goldin-Meadow, 1990; Mohanty, 1992). Moreover both cross linguistic and cross cultural experiences could possibly result in the modification in the memory and its structure (Kormi-Nouri et al., 2003). This specific structure may facilitate the diversity of association in bilinguals, because the same concept is linked to two different linguistic codes for conceptual network.

Further the difference in performance could also be attributed to the bilateral hemisphere involvement for language processing in bilinguals (Vaid & Hull, 2002) and the greater density of grey matter in their brain (Mechelli et al., 2004). The results of the present study also extend support to the LMCA model given by Kharkhurin (2009).

Conclusions

The current study was aimed to investigate the creative thinking abilities of bilingual and monolingual adolescents. A total of 24 participants (12 monolinguals and 12 bilinguals) were a part of the study. Four verbal subtests from the Passi test of creativity and two other nonverbal subtests of creativity developed by Veena and Bhavani (2002) were administered on the selected participants. The important finding of the present study was that bilinguals outperformed the monolinguals in all the verbal and nonverbal subtests of creativity which indicated that the bilinguals were more creative than monolinguals. There was a definite advantage of bilingualism on the creative abilities of the individuals considered in the study. Their cross linguistic experience helped them to encode knowledge and think in flexible and divergent ways. However, caution must be taken while generalizing the results to other bilingual population given the number of participants considered for the study. Nevertheless, the study has important implications. The results of this study help us to refine our understanding of bilingual individuals and may contribute towards eradicating the notion in people's mind that bilingualism hampers the development of the individual in all domains. The positive relations found between bilingualism and creativity emphasizes the importance of bilingual education which would lead to the evolution of more creative and productive citizens for the country. This study has some clinical implications too. If the children with communication disorders are potential enough, they also should be made proficient in two languages thus consequently enhancing their creativity.

However, there is a need for more comparative and cross linguistic studies on various types of bilinguals. A longitudinal study of such individuals also could throw light into the pattern of cognitive changes that occur with respect to time. Further, it would also be interesting to study creativity in the communication disordered population.

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