

Impact of Field Independent / Dependent Cognitive Style on Word Fluency and Writing Speed of Stripling: An Exploratory Approach

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Abstract - Cognitive Style is the way that people see the world around them and interact with it. Like a stable personality pattern is the distinctive learners' attitude, strategies for information processing, typical mode of thinking and uncovering new concepts. The present endeavor explores the impact of most well-known cognitive style field-dependent and field-independent cognitive style on word fluency and writing speed. In this vista of search, 200 college students (including both male and female) were non-randomly selected who responded to Embedded Figures Test for forming groups. The data analysis conducted by using t-test unearthed that field-independent students are significantly better than field-dependent pupils in both word fluency and writing speed.

Keywords: cognitive style, field dependent/ independent cognitive style, word fluency, writing speed.

I. INTRODUCTION

The titanic power of youth is the inordinate wealth and strength of a nation. The booming future of a nation enrooted in the hands of its posterity. Hence the present vista of search viewed on academic skills like word fluency and writing speed of the youth revolvers. Word Fluency is the cognitive and neuro-psychologically widely used construct is the ability to use word accurately, quickly, and with proper expression. It is the speed language – not only the speedy delivery of words. Hence, it is a capacity to list words swiftly in specific classifications. The processing of this ability starts at the early childhood stage while a young learns spelling and is closely linked with fluid intelligence (Roca et al., 2012). Researchers hint that regarding verbal fluency, accurate and automatic word recognition processed are involved in this skill. In American Psychometrician Louis Thurstone (1938), while theorized the construct intelligence consists of seven primary mental abilities and word fluency is one of them. He mentioned that it is the ability to find and use words readily in communication. This word generation task is related with frontal and temporal lobe areas. The contribution of the former being more important in the phonemic variant and the latter in the semantic variant (Baldo and others, 2006). Multiple brain regions are critically involved in this task like, fluency performance can be disrupted by lesions in temporal lobe (Corcoran and Upton, 1993) or frontal lobes (Stuss et al., 1998). Again, functional brain imaging studies reveal that both of the above mentioned areas are involved in word fluency task in a together fashion. While one performs fluency task, the individual will typically generate words with in a subcategory, and when this subcategory is exhausted, he or she will switch to a new one. Troyer et al.,

(1997) opines cognitive components as – Clustering (a temporal lobe process, phonemic analysis on phonemic fluency and semantic categorization on semantic fluency), Switching (a frontal lobe process, includes strategic search processes, cognitive flexibility in shifting from one subcategory to another). Verbal Fluency test is a short test of verbal functioning. Such test generally consists of two components, they are: Category fluency (sometimes called semantic fluency; Benton, 1968) and Letter fluency (sometimes called phonemic fluency; Newcombe, 1969).

Writing is a process to convey the meaning which is complicated and requires coordination of various metacognitive skills. To produce a narrative writing, a writer must be able to organize and generate ideas, develop plans for ideas, review and revise what you have written and monitor performance in writing (Olinghouse & Leaird, 2009). Writing is also a behaviour which serves to recall an event in a form that is understandable using letters and words. Through writing, learner s' thinking can be highlighted through their preparation, consolidation and development of ideas and seeks a relationship that can help learner s understand their thinking organizations (Marohaini, 1999). In college learning the pervasive nature of note taking and note reviewing and the assumption that such activities are a necessary part, experience have encouraged researchers to investigate how students go about taking and reviewing notes and how these activities might be improved (Grabe, 2005). According to Van Meter, Yokoi, and Pressley (1994), college students reported that they believe in the act of taking notes that facilitates attending to the lecture, comprehension of the material to be learned, and the following subsequent recall (Kobayashi, 2005). Slotte and Lonka (1999) found that those who wrote

summaries knowing that they could not use them later probably believed that note-taking alone facilitates the process of understanding and organizing the learning material. In this phase the synthesis of learnt material also gets fulfilled. In the study of Aghverdi, Biria & Karimi, (2010) the results revealed that note-taking strategy instruction had significant effects on the students' achievement. These findings support the view that in academic performance, the process effect of note-taking is of great importance. The typical example of academic writing is – writing research papers, journals, or knowledge papers. Academic writing is writing whose purpose is to further the discourse within the/an academic system. It is meant to communicate ideas amongst members of the academic community in some standard conventions and formal way. Apart from cultural rigid expectations, academic writing is strongly structured by specialist vocabulary as recorded by each academic discipline. The academic is writing to fellow scholars, and often, depending on the journal or publication, to the general public. Good academic writing is not enough - teach ability is the most important factor. Academic writing primarily deals with topics and thesis statements regarding a variety of academic fields, such as literature or psychology with its appropriate grammatical usage. There is a higher standard of comprehension when writing academic works and is generally ornamented by argumentations, research evidences and references. Thoughts are made through a trained and practiced manner. Academic papers are mainly educational regarding ideas, technology, or events. The substance of academic writing must be based on solid evidence and logical analysis, and presented as a concise, accurate argument. There is often a misconception that academic writing needs to be complex in structure involving long sentences and complicated in vocabulary. Though, academic writing needs to be clear in structure and concise in order to aid the reader's understanding. Each subject discipline will have certain writing conventions, vocabulary and types of discourse that one will become familiar with over the course of degree. However, there is some general characteristics of academic writing that are relevant across all disciplines. Henry and Crawford (2004) connoted that verbal fluency performance reflected working memory (Rende et al., 2002), inhibition (see and Hirshorn and Thompson-Schill, 2006) and effortful self-initiation.

To the best of our knowledge, there is a dearth of adequate exploration on word fluency and writing speed in the Indian socio-cultural context. The endeavor of student-centric approach is celebrated in the present study by focusing on the cognitive style as an influential factor for the mentioned academic skills. In this regard, Witkin's concept of field independent / dependent cognitive style tends to tap features of grouping variable. According to Witkin and Goodenough (1981), field independent people are able to abstract an element from its context, or background field. Field independents tend approach problems in a more analytical way. On the other hand, field dependent people are more likely to be better at recalling social information such as conversation and relationships. Field dependences have a tendency to approach problems in a more global way by perceiving the total picture in a given context. With these reasoning behind, we derive the following empirically testable hypotheses:

H1: There is no effect of Field Independent/ Dependent Cognitive Style on word fluency.

H2: There is no effect of Field Independent/ Dependent Cognitive Style on writing speed of the students.

II. METHOD

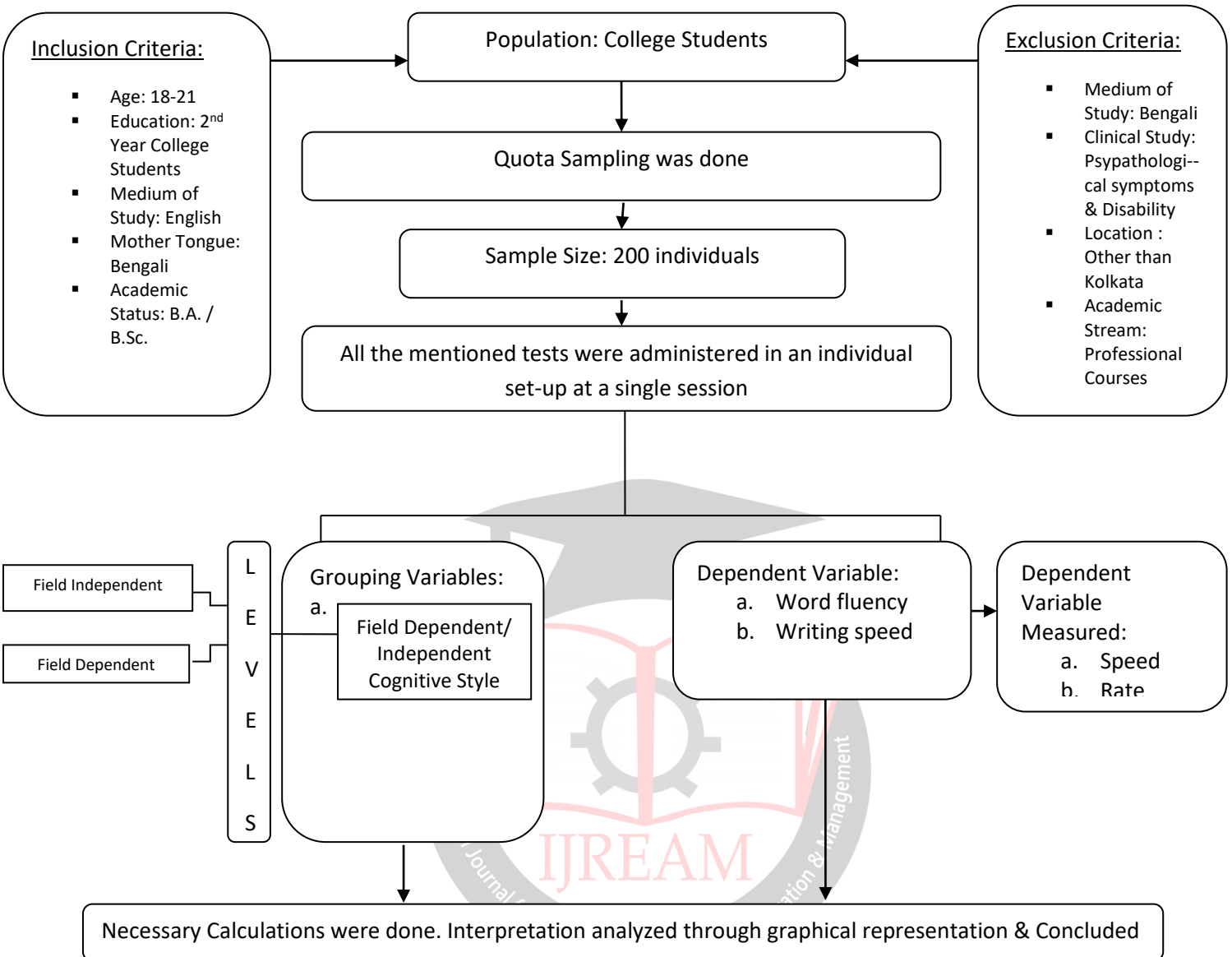
Sample:

A purposive sample of 300 students undergoing a three-year under graduate course from reputed colleges of Kolkata participated as subjects in the study. Sample is within the age range of 18 to 21 years, uniform with respect to gender (male=150, female =150) from different disciplines, under regular courses.

Principal study: The sample comprised of 100 male (mean age= 18.83 years, SD= 1.23) and 100 female (mean age=19.39 years, SD= 1.24) together N=200 second year college students were taken from four colleges of Kolkata through quota sampling technique by sectioning the north, south, east and west region respectively. All were presently studying in English version, having the mother tongue of Bengali. The participants were undergoing a three-year under graduate of either B.A. or B.Sc. course. Subjects were excluded if from any professional course. Subjects were classified into field independent (N= 79, mean age = 19.01 years, SD= 1.02) and field dependent (N= 78, mean age =19.26 years, SD= 0.89) category.

Plan:

Fig-1: Representing the plan of Principal Study:



III. MEASURES

Embedded Figure Test: This test is developed by Witkin, Oltman, Raskin & Karp (1971) to assess field independent/dependent cognitive style. The subject has to find out a simple figure within a relatively more complex figure with in certain time. There are three sets of cards: two sets of 12 cards with Complex Figures, numbered consecutively in order to test presentation, and a set of 8 cards with simple forms, designated by letters A to H and two practice cards. This is a non-verbal test and requires only a minimum level of language skill for performing the tasks (Cakan, 2003). Reliabilities for the 12-figure, 3-minutes format are all based on data obtained by recomputing scores for tests given in the original full 24-figure, 5-minutes form. High odd-even reliabilities have been found for the original full form of the test: Linton (1952), .90 (for college men),

Longenecker (1956), .92 (for college men); Gardner, Jackson & Messick (1960), .95 (for college women). The alpha coefficient of the Group Embedded Figures Test has been reported as .82 (Witkin et al., 1981). Kepner and Neimark (1984) reported test-retest reliability coefficients over three different intervals as between .78 and .92. Additionally, the Group Embedded Figures Test exhibited criterion validity by correlations with the Embedded Figures Test and the Rod and Frame Test (Witkin et al., 1981). The field independent individuals are better performers, are able to complete the task in a comparatively less time. They are capable to disembed information from context or surrounding gestalt.

Thurstone/ Chicago Word Fluency Test is a widely used neuropsychological instrument developed in the year 1983.

It consists of two sections, the first one is for 5-minutes, need to write four-lettered words begin with letter ‘S’ and the second is for 4-minutes, need to write four-lettered words begin with letter ‘C’. Cohen and Stanczak (2000) reported that Thurstone’s Word Fluency Test is a complex cognitive task test, the successful performance depends upon a constellation of cognitive abilities, including attention/concentration, psychomotor speed, and memory. The test asks the subject to write as many words as possible beginning with the letter ‘S’ within a 5-minute limit, then as many words as possible beginning with letter ‘C’ within 4 minute limit. The total number of ‘S’ and ‘C’ words produced, minus the number of rule-breaking and perseverative responses, yield the patients’ measure of verbal fluency. The interrater reliability of the word fluency test has been found to be 0.98 (Cohen and Stanczak, 2000). The construct validity of word fluency test has been found to be 0.66, 0.72 with Controlled Oral Word Association Test (COWA), and 0.81 with F-A-S Test (Cohen and Stanczak, 2000). This very test is used to measure a participant’s symbolic verbal fluency.

Patoss Hand Writing Speed Test is developed by Patoss, is the Professional Association for Teachers and Assessors of Students with Specific Learning Difficulties (2017). This very test is aimed to find out the writing speed of the individuals. At first, topics (like: holiday, sports, pet, favorite person or something you like or hate) are to be given to the subjects from which they will select one. Participants are to be allowed to think about their chosen topic for 2-minutes and during this time they can make any notes, plans, and spider grams. They are asked to write on the very topic for 20 minutes at exam speed. Before 5-minutes, they are given an alarm. After counting all the words they are dividing by 20, to find out the average speed of the participants. Thus the interpretable score is considered average value of writing speed in the form of ‘words/ minute’. The interrater reliability of the test has been found as 1.00. This very test is used to assess the writing speed of the participants.

IV. PROCEDURE

Principal study: At first, Kolkata – the City of Joy was theoretically segmented into four different halves according to the directions (i.e. north-south and east-west). One college from each four halves was chosen and 50 data from each halves were collected. The respondents were approached on the basis of personal contact with them. Each subject was administered all the above mentioned tests in an individual set-up. Sufficient time gap was provided in order to avoid any order effect on the part of the subjects. The information schedule was administered to gather personal information about the respondents. Finally, the subjects were administered the Embedded Figure Test, Thurstone/ Chicago Word Fluency Test and Patoss Hand

Writing Speed Test. Subjects were given instructions regarding the handling of the tools before initiating that very set of data collection. The respondents were also asked to be feel free and honest in their answer to every question.

V. RESULTS

The present study has brought out the following significant features within its periphery. The overall results showed some significant differences between the selected variables.

Table 1 reveals that field independent / dependent cognitive style has significant effect on reading comprehension scores (p<0.01). The Levene’s F indicates equality of variances for the mentioned variable calculated for two groups.

Table-1. Descriptive statistics along with independent sample t-test that shows the difference between the field dependent/ independent students in their word fluency and writing speed scores.

DV [Academic Skills]	Categories	N	Group Statistics		Levene’s F	“t”	Df
			Mean	S.D.			
Word Fluency	Field Independent	79	34.62	10.16	6.33	5.66*	155
	Field Dependent	78	22.78	9.11			
Writing Speed	Field Independent	79	21.07	5.49	.09	3.61*	155
	Field Dependent	78	17.97	5.23			

** Significant at 0.01 level of significance.

Independent sample t-test was computed to study the effect of field independent/ dependent cognitive style on word fluency and writing speed of college students. It has been found that field independent individuals are significantly better than their dependent counterparts in both cases.

The first hypothesis which states that “There is no effect of Field Independent/ Dependent Cognitive Style on word fluency” is hereby rejected by the findings and in this way, the first objective of the study is achieved. The finding is similar with the study done by Longoni, Zoccolotti & Speranz,1980 who reported that the more field independent; the higher the word fluency.

The second hypothesis which states that “There is no effect of Field Independent/ Dependent Cognitive Style on writing speed” is hereby rejected by the findings and in this way, the first objective of the study is achieved. The finding is similar with the study done by Davis& Frank, 1979 who reported that the more field independent; the higher the writing speed than their dependent counterparts.

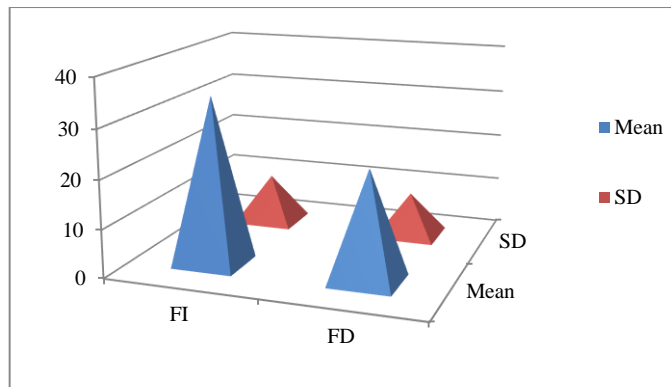
VI. DISCUSSION

The primary objective of this study was to examine the impact of field independent/ dependent cognitive style on reading comprehension of the college students. The total set of data was analyzed in terms of the descriptive statistics of mean and standard deviations of all the selected groups of samples. The significant differences obtained from t-test in many instances of the selected variables of the study that satisfied the assumptions: the possible reasons behind the obtained differences may be offered in following fashion along with the graphical representation:

Word Fluency

Statistical analysis indicates significant differences in field independent and field dependent cognitive style context with respect to word fluency also (Table no.1).

Fig: 1 showing the word fluency scores of field independent and field dependent cognitive style groups.



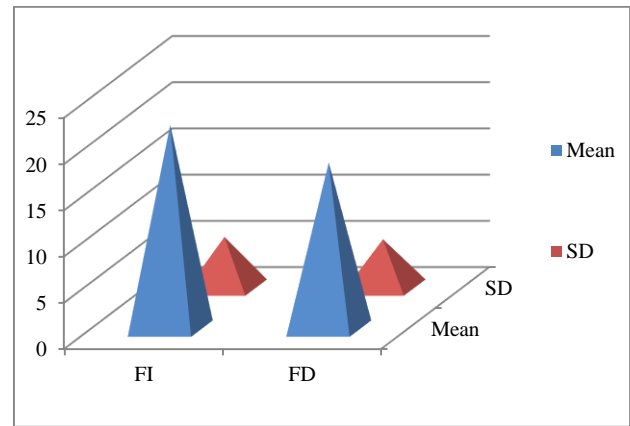
Field independent students were found to be significantly better in word fluency scores (Mean=34.62, SD= 10.16) than their dependent counter parts (Mean=22.78, SD=9.11). Field independent subjects respond more rapidly than their dependent counterpart (Longoni, Zoccolotti,& Speranaz,1980). It may be due to the fact that fluency process is a multifactorial cognitive process and field independent individuals are cognitively more adroit than their dependent ones.

Naimie, Abuzaid, Siraj, Shagholi, and Hejailie’s (2010) finding that field dependent and independent cognitive style can be considered as an important factor which affect on language learning strategies. Above all, Ramlah and Md. Nasir (2007) and Poh , Melissa Ng & Yen (2006) found that there exists a significant positive relationship between field independency level and successful academic achievement.

Writing Speed

Statistical analysis indicates significant differences in field independent and field dependent cognitive style context with respect to writing speed also (Table no.1).

Fig: 2. showing the writing speed scores of field independent and field dependent cognitive style groups.



Field independent students were found to be better in writing speed scores (Mean=22.07, SD= 5.49) than their dependent counter parts (Mean=17.97, SD=5.23). It may be due to the fact field independent students can cluster more than their field dependent counterparts (Davis& Frank, 1979). And not only that field independent learners have better recall than the dependent individuals when given the opportunity to organize the material.

Speedy writing is a skill, cluster of grammar sequencing, structure of language, thought organization. In this regard, Students analytically organize their thoughts through brainstorming, design their opinion through explanations, arguments and plans. For Field Dependent Students difficulty arises while learning process claims structuring demands. This is the leading cause resultant a significant difference between the Field Dependent and Independent Students in Writing Speed. In this rumination, concept extended by Jones (1993) could be mentioned, that field dependents are disadvantaged in unstructured situations whereas the field independent individuals tend to provide their own structure more easily.

The reason behind this finding may be explained by the fact as proposed by Davis and Cochran (1982). They confer that field independent and dependent learners differ in their nature of working memory as the field independent individuals have larger working memory capacity, more accomplished in cognitive restructuring. These virtues influence the verbal task performances of field independent learners.

VII. CONCLUSION

The major highlights of the study as already reported appear to converge at certain points on the basis of which the following conclusions may be drawn:

Field-independent striplings have significantly higher scores in word fluency in comparison to the field-dependent learners.

Field-independent shavers are significantly better in writing speed, than their field-dependent counterparts.

Implications

- **“Everything comes to us that belongs to us if we create the capacity to”**
 - **Rabindranath Tagore**

In our country, probably no such systematic large scale study incorporating the mosaic pattern of the selected variables in respect of the psychology of teaching-learning of youths, has been conducted before, so the research might be a contribution, reflected through this study and can definitely be claimed to be a new and original one in this arena through which students can improve their academic performance.

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