

# Field Independent Dependent Cognitive Style: Import of Impulsivity and Nature of Family

Dr. Bithi Ahiri, Muralidhar Girls' College, India.

Prof. (Dr.) Mallika Banerjee, University of Calcutta, Kolkata, India.

**Abstract -** This is an explorative study that investigated the impact of impulsivity and nature of family on field independent and dependent cognitive style of college students. Initially a pilot study was conducted to adapt certain items of the UPPS Impulsive Behavior Scale following purposive sampling. Other than this Embedded Figure Test was used. In the principal work 200 college students were taken through quota sampling. Research questions were answered using frequency and mean. Hypotheses were test using chi-square and t-test. A significantly higher proportion of field independent students are non-impulsive while on the other hand a higher proportion of field dependent respondents are impulsive. The findings further revealed that nature of family not momentarily contribute to the measures of field independent/ dependent cognitive style.

**Keywords:** impulsivity, nature of family, field independent/ dependent cognitive style

## I. INTRODUCTION

Cognitive style is coined by Babalola (1989) as the control process or style that is conscious, self-generated, situationally determined, transient activity that a learner uses to organize, receive, regulate, and transmit incoming information. One of the most extensively explored cognitive style construct is Field dependent-independent cognitive style. Witkin & Goodenough (1981) viewed this construct as one of the most significant factors. The concept was first introduced by Witkin and his associates in 1954. 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. Field dependent people, on the other hand, 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. Field independent (FI) individuals are generally follow hypothesis-testing approach during the processing of information. After analysis they impose structure in an inherently chaotic field. Their attention directed on task-relevant information, while ignoring the distracters. Having greater disembedding ability in perceptual functioning, they can extract elements from its complex background. They enjoy better cognitive restructuring than the field dependent individuals (Jones, 1993). They maintain more distance while communicating with others, are less sensitive to social cues, and have been characterized as being demanding, inconsiderate, manipulative, cold and distant in relationship (Witkin & Goodenough, 1981). Field dependent (FD) individuals are generally passive in perceiving information and consider the structure of a field as it really exists. They are less

flexible in their search strategies, and are failure to consider the relevant cues. They require more explicit instructions and feedback under taking problem solving tasks, fond of more detailed descriptions about the instructional goals and objectives and enjoy more external reinforcement than the field independent learners (Witkin et al., 1977).

To the best of our knowledge, there is a dearth of adequate exploration on field independent / dependent cognitive style as a dependent variable and can be influenced by other personality factors like impulsivity. Impulsivity is an important, multi-factorial psychological construct (Evensen, 1999), appears almost every major system of personality. Depue and Collins (1999) note, "impulsivity comprises a heterogeneous cluster of lower-order traits that includes terms such as impulsivity, sensation seeking, risk-taking, novelty seeking, boldness, adventuresome, boredom susceptibility, unreliability and unorderliness." It is also assumed in the present endeavor that the way of processing information can be varied according to the brought up of an individual. Hence, a supposition has also been made on a relatively less explored arena on field independent/ dependent cognitive style as contingent on nature of family. With these reasoning behind, we derive the following empirically testable hypotheses:

H1: There is no effect of impulsivity on Field independent/ dependent cognitive style of the students.

H2: There is no effect of nature of family on field independent/ dependent cognitive style of the students.

## II. METHOD

### Sample:

Pilot study: A purposive sample of 10 university teachers (having at least 5 years of experiences), from different

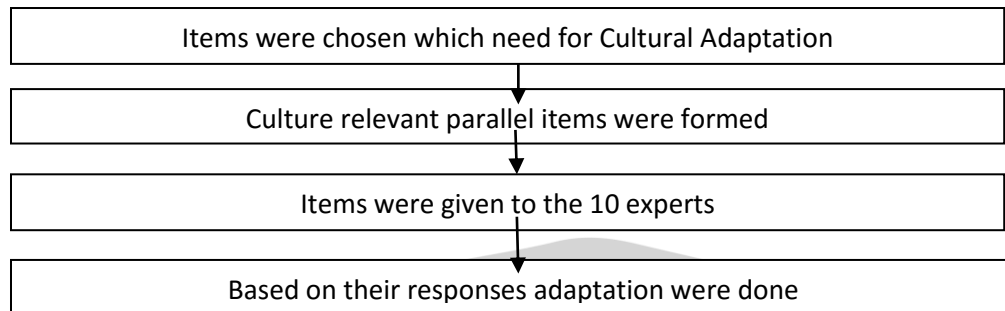
disciplines of Kolkata, participated as experts in the present pilot study to adapt few items of the UPPS impulsive behavior scale.

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,

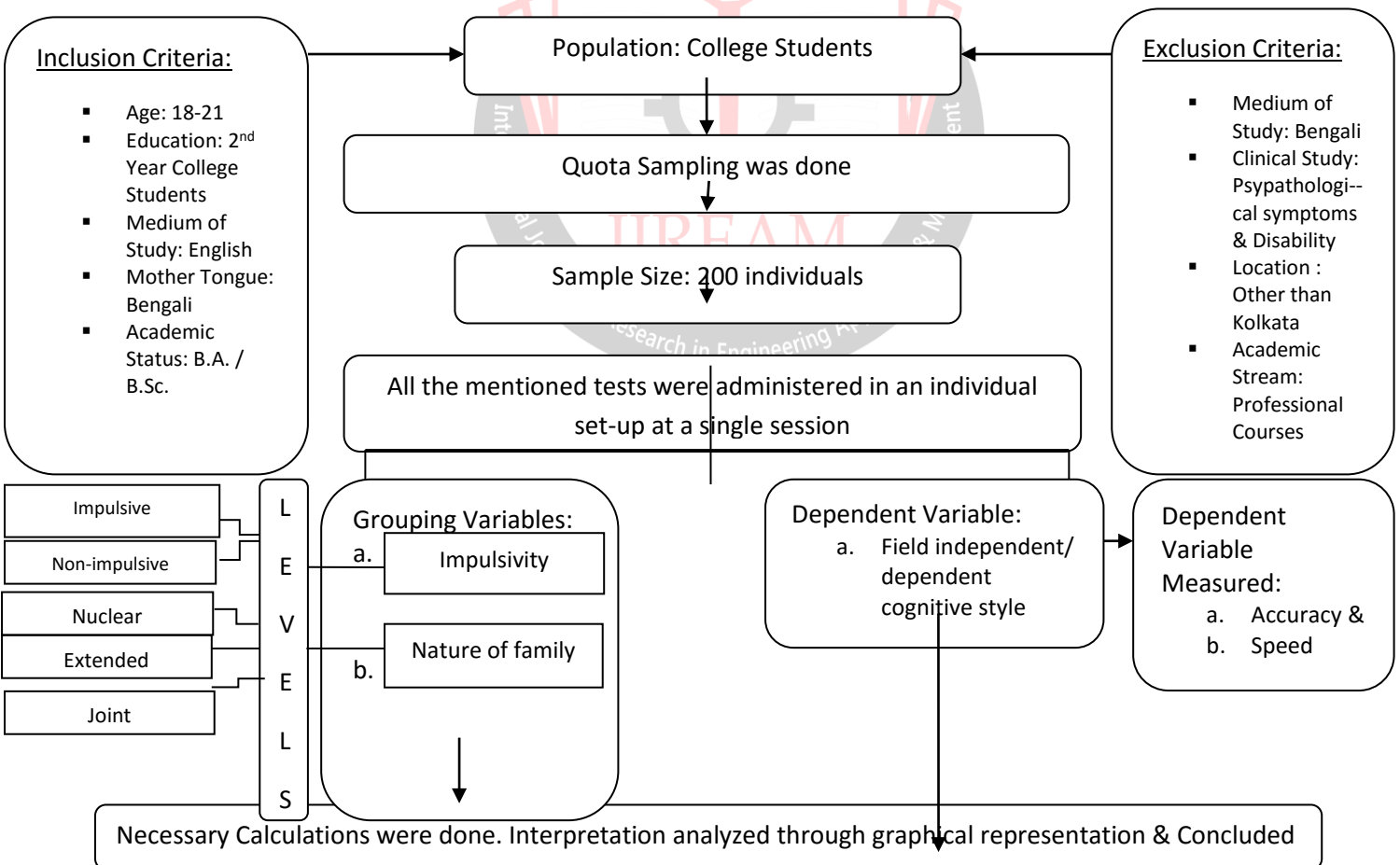
Plan:

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.

**Fig-1: Representing the plan of Pilot study: Cultural Adaptation of Items for the UPPS impulsive behavior scale [for the use in different country, same language].**



**Fig-2: 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 within a 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.

**The UPPS Impulsive Behavior Scale:** Whiteside, Lynam (2001) developed the test to assess the impulsivity of the subjects. The entire test has four sub-sections, such as, premeditation (11 items), urgency (12 items), sensation seeking (12 items) and perseverance (10 items). There are 5 reverse-scored items, two of which under premeditation (item number 3 and 10), one in urgency (item number 11), two items in perseverance (item number 2 and 10). This test was developed by Whiteside, Lynam (2001) utilizing the Five Factor Model of personality (FFM; McCrae & Costa, 1990) to clarify the multi-faceted nature of impulsivity. Exploratory factor analysis of NEO-PI-R and other commonly used impulsivity tests were done and they found four distinct personality facets like urgency, (lack of) premeditation, (lack of) perseverance, and sensation seeking and finally each of these traits were marked by a different facets of the FFM. There is no time-limit to complete it. Except five items all are directly scored in a five-point scale. Higher score indicates 'non-impulsive' and lower score indicates 'impulsive' individual. Internal consistency of the scale has been found to be 0.90 with Tellegen's (1982) MP Control, 0.81 with Jackson's (1984) PRF-E Impulsivity, 0.89 with Zuckerman (1994) Boredom Susceptibility, 0.80 with NEO Self-discipline and Deliberation. In the present study, the UPPS Impulsive Behavior Scale is used among the subjects to form the groups of impulsive and non-impulsive learners.

### IV. PROCEDURE

**Pilot study for cultural adaptation of items in the UPPS Impulsive Behavior Scale [for the use in different country, same language]:** At first, items were chosen that need for cultural adaptation. To fulfill the purpose, culture relevant parallel items were formed. Then, 10 experts of university teachers from different academic disciplines were selected for judging the comparative value of those items. Based on their responses, adaptation of the mentioned scale was done and lastly, the scale was completely prepared for final administration.

**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 and the UPPS impulsive behavior scale.

### 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 propounds the subjects' prevalence under these selected factors in terms of frequency.

**Table-1: Field independent/ dependent cognitive style and Impulsivity Level:**

Factor/s	Non-Impulsive	Average	Impulsive	Total
Field Independent	53	9	17	79
Field Dependent	22	12	44	78
Average	16	13	14	43
Total	91	34	75	200

It was seen that among 79 Field Independent individuals 53 were Non-Impulsive & 17 were Impulsive. In case of 78 Field Dependent Individuals, there were 22 Non- Impulsive and 44 Impulsive. Among 43 students [who scored Average in Field Dependency Cognitive Style], 16 were Non-Impulsive & 14 were Impulsive.

On the basis of above mentioned individuals’ scores on field independent/ dependent cognitive style dimension, investigation has been made on the impact of impulsivity on field independent/ dependent cognitive style through inferential statistics like t-test and the calculated value is divulged in Table-2, below:

**Table-2: Independent sample t-test that shows the effect of impulsivity on the field independent/ dependent cognitive style:**

Dependent Variable	Categories	N	Descriptive		Leven’s F	“t”	DF
			Mean	SD			
FI/ FD	Non Impulsive	75	75.97	37.7	1.12	5.92**	148
	Impulsive	75	105.04	38.09			

\*p<0.05, \*\*p<0.01, [High Score=FD, Low Score=FI]

Table-2 reveals that impulsivity has significant effect on the field independent/ dependent cognitive style (p<0.01). The Levene’s F indicates equality of variances for the mentioned variable calculated for two groups. The first hypothesis which states that “there is no effect of impulsivity on field independent/ dependent cognitive style of the students” is hereby rejected by the findings and in this way, the inference has been drawn about the first objective. The finding is similar with the study done by Loo and Townsend (1977) who found that field independence was associated with low impulsivity and slow decision making which implies a tend toward reflectivity.

The ensuing section explores the assorted effects of nature of family on the mentioned chosen constructs using Chi-square test. In this regard, Table-3 imparts the subjects’ prevalence under these selected factors in terms of frequency.

**Table-3: Distribution of the sample in respect to nature of family:**

Socio-demographic factor	Categories	N	Field Independent	Average	Field Dependent	Total
Family	Joint	66	21	15	30	66
	Extended	67	31	18	18	67
	Nuclear	67	27	10	30	67

Considering the distribution of the sample with respect to nature of family, it has been evidently seen that approximately an equal number of participants have been chosen from each family pattern. There are 66 participants from joint family, among which 21 Field Independent and 30 Field Dependent. There are 67 participants from extended families, among which 31 Field Independent and 18 Field Dependent. There are 67 participants from nuclear families, among which 27 Field Independent and 30 Field Dependent.

On the basis of the above mentioned data inspection has been rendered on the impact of nature of family on field independent/ dependent cognitive style through chi-square test and the calculated value is proclaimed in Table-4, below:

**Table-4: Chi-square test that reveals the effect of nature of family on field independent field dependent Cognitive Style:**

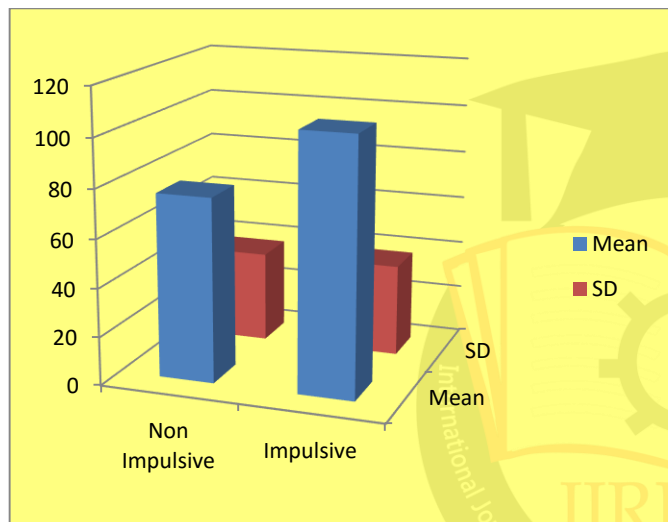
DV	Factor [Family Pattern]	N	Level of Significance	Critical Value	Df	Chi-square value	Decision
FI	Joint	21	0.05	5.99	2	5.13	Not Significant
	Extended	31					
	Nuclear	27					
FD	Joint	30	0.01	9.21			
	Extended	18					
	Nuclear	30					

Table-4 reveals that nature of family has no effect on the field independent/ dependent cognitive style. The second hypothesis which states that “there is no effect of nature of family on field independent/ dependent cognitive style of the students.” is hereby accepted by the findings and in this way, the first objective of the study has been achieved. The presumed reason may be that rather than family pattern broader aspect of cultural phenomena is responsible for developing field dependent/ independent pattern of thinking in a child. This segment of the search may specify the resolution as delineated by Riding & Rayner, 1998 that cognitive styles are connected to culture.

## 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 present study also explores gender differences in reading comprehension. 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 and chi-square 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:

**Fig-1: Graphical representation ratifying the influence of impulsivity level on field-dependent and field-independent cognitive style.**



The present research reveals that non-impulsive (Mean=72.97, SD=37.70) students were significantly more field independent than impulsive students (Mean=108.04, SD=38.09). it may be due to the fact that field-independent learners, being analytic thinker are more reflective, more independent of others, more concerned with mastery, more cautious, and less easily distractible in the class room (Vernon, 1972).

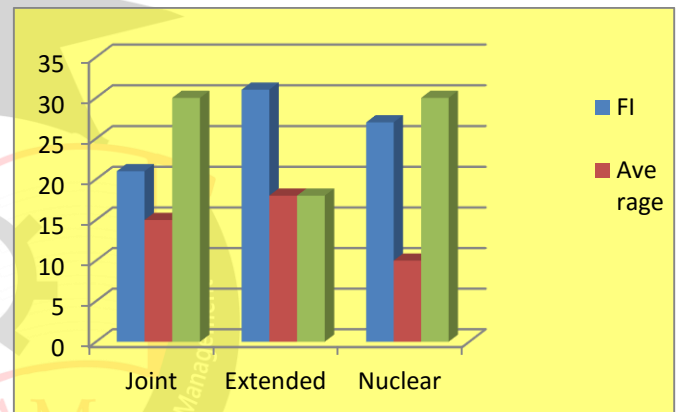
Earlier findings of Massari (1975), Feij (1976), Loo & Townsend (1977), Rastegar and Honarmand (2016) confirmed the same by stating that field independence had a significant positive correlation with reflectivity, and field dependence also had a significant positive correlation with impulsivity.

Rozenchwajgand and Corroyer (2005) empirically established that field dependent individuals and impulsive individuals both use a holistic, global processing mode and field independent individuals and reflective individuals both use an analytic processing mode, thus it is difficult to differentiate the two cognitive styles. In regard with the

current findings, Loo and Townsend (1977) found that field independence was associated with low impulsivity and slow decision making which implies reflectivity.

Tinajero and Paramo (1998) indicated that field-dependent subjects did not do as well as the field-independent persons on standardized multiple-choice tests across five disciplines. Field dependent people are usually impulsive and tend to be affected by approving or disapproving comments and they have dividing performance in anxiety provoking situations (Anderson, 1988). In learning tasks, field-dependent learners need learning activities that are explicitly placed within a social context and they need interaction with peers who serve as skill models, reinforces of learning and counselors in times of crisis.

**Fig-2: Representing the pervasiveness of each group namely, joint family, extended family, and nuclear family on the basis of their belongingness in field – independent and field-dependent cognitive style.**



In this respect, though it was statistically established that there exists no effect of family pattern on field dependent/ independent cognitive style, it was found that more extended family members belong to the field independent category (joint=21, extended=31, nuclear=27). It was also evidently seen that lesser amount of extended family members belong to the field dependent category (joint=30, extended=18, nuclear=30) in compare to the others (Table-4.1.3, 4.1.4). The presumed reason may be that rather than family pattern broader aspect of cultural phenomena is responsible for developing field dependent/ independent pattern of thinking in a child. A cultural perspective of cognition is assumes that humans are not only prepared biologically with a variety of physiological and psychological components but also with socially shaped propensities and cultural processes. Through the culture specific adaptation and adjustment, individuals' cognition may shape and transpire in the production of action in particular ways in each culture. Further existing anthropological and psychological researches hint that cognitive styles are connected to culture (Riding & Rayner, 1998).

Literature suggests that there are very few studies that unravel significant relationships of child-rearing practices

and parental attitudes with children's cognitive styles (Goodenough & Witkin, 1977). Witkin emphasized on independence from parental controls (Korchin, 1986). He believed that strong emphasis on obedience to parental authority and external control of impulses, lead the child to become field dependent. Encouragement to develop separate, autonomous functioning within the family make the child relatively field independent.

## 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:

- Impulsive learners are significantly more field-dependent than their non-impulsive counter parts.
- There exists no significant effect of nature of family on field independent/ dependent cognitive style.

## REFERENCES

- [1] Anderson, J.A. (1988). Cognitive Styles and Multicultural Populations. *Journal of Teacher Education*.  
<http://journals.sagepub.com/doi/abs/10.1177/002248718803900102>
- [2] Babalola, O. A. (1989). Relationship between school certificate. Pupils' cognitive preferences and their achievement in Biology. *Journal of Science Teachers Association of Nigeria*, 16(2), 26-32
- [3] Cakan, M. (2003). Psychometric data on the Group Embedded Figures Test for Turkish undergraduate students. *Perceptual and Motor Skills*, 96, 993-1004.
- [4] Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 491—569.
- [5] Evenden, J. L. (1999). "Varieties of impulsivity". *Psychopharmacology*, 146 (4): 348-61. doi:10.1007/PL00005481. PMID 10550486
- [6] Feij, J. A. (1976). Field independence, impulsiveness, high school training, and academic achievement. *Journal of Educational Psychology*, 68 (6), 793-799. doi: 10.1037/0022-0663.68.6.793
- [7] Gardner, R. W., Jackson, D. N., & Messick, S. J. Personality organization in cognitive controls and intellectual abilities. *Psychological Issues*, 1960. 2 (4). Monograph 8.
- [8] Jackson, D. N. (1984). *Personality research from manual*. Goshen, NY: Research Psychologist Press.
- [9] Jones, S. (1993). Cognitive learning styles: Does awareness help? A review of selected literature. *Language Awareness*, 2(4), 195-207.
- [10] Kepner, M.D., & Neimark, E.D. (1984). Test-retest reliability and differential patterns of score change on the Group Embedded Figures Test. *Journal of Personality and Social Psychology*, 46(6), 1405-1413. <http://d.doi.org/10.1037/0022-3514.46.6.1405>
- [11] Linton, H. B. (1952). Relation between mode of perception and tendency to conform. Unpublished doctoral dissertation. Yale University.
- [12] Longenecker, E. D. Form perception as a function of anxiety, motivation, and the test situation. Unpublished doctoral dissertation, University of Texas, 1956.
- [13] Loo, R., & Townsend, P. J. (1977). Components Underlying the Relation between Field Dependence and Extroversion. *Perceptual and Motor Skills*, 45(2), 528-530.
- [14] Massari, D. J. (1975). The relation of reflection-impulsivity to field dependence-independence and internal-external control in disadvantaged preschool children. *Journal of Genetic Psychology*, 126, 61-67.
- [15] McCrae, R.R., & Costa, P. T. Jr. (1990). *Personality in adulthood*. New York: Guilford.
- [16] Rastegar, M., & Honarmand, N. M. (2016). Field Dependence/Independence, Impulsivity/Reflectivity, Gender, and Cloze Test Performance of Iranian EFL Learners: A Study of Relations. *European Scientific Journal*, 12 (8), ISSN: 1857 -7881 (Print) e -ISSN 1857-7431, doi: 10.19044/esj.2016.v12n8p408
- [17] Riding, R., and Rayner, S. (1998). Cognitive styles and learning strategies: Understanding style differences in learning and behaviour. London: David Fulton.
- [18] Rozencajg, P., & Corroyer, D. (2005). Cognitive processes in the reflective-impulsive cognitive style. *The Journal of Genetic Psychology*, 166 (4), 451-463.
- [19] Tellegen, A. (1982). *Multidimensional Personality Questionnaire manual*. Minneapolis, MN: University of Minnesota Press.
- [20] Tianjero, C., & Paramo, M. F. (1998). Field dependence-independence cognitive style and Academic achievement: A review of research and theory. *European Journal of Psychology of Education*, 13 (2), 227-251.
- [21] Vernon, P.E. (1972). The distinctiveness of field independence. *Journal of Personality*.  
<https://doi.org/10.1111/j.1467-6494.1972.tb00068.x>
- [22] Whiteside, S. P. and Lynam, D. R. (2001). The Five Factor Model and impulsivity: using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, 30 (2001) 669—689.
- [23] Witkin, H. A., Lewis, H. B., Hertzman, M., Machover, K., Meissner, P. B., & Wapner, S. (1954). *Personality through perception*. New York: Harper.
- [24] Witkin, H. A., Moore, C. A., Goodenough, D. R., and Cox, P. W. (1977). Field dependent and field independent cognitive styles and their educational implications. *Review of Educational Research*, 47, 1-64.
- [25] Witkin, H.A., Oltman, P.K., Raskin, E., & Karp, S.A. (1971). *A manual for the Group Embedded Figures Test*. Menlo Park, CA: Mind Garden, Inc.
- [26] Witkin HA, Goodenough DR. (1981). *Cognitive styles: Essence and Origins*. New York: International University Press.
- [27] Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press.