

# Learning Style Preferences and Academic Achievement among Researchers

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**ABSTRACT**— *The present study aimed at exploring the predominant learning styles within researchers in National Research Center of Egypt (NRC), in order to improve their learning and enhance their career. A convenient sample of 72 from different specialties in the NRC comprised the study sample. A questionnaire modeled after Myers-Briggs Type Indicator (MBTI) and based on Jung's theoretical functional types was used. Statistical computation included percentage distribution for interesting variables using Chi square test for significance. Thinking and Feeling types predominated with 40% each. The Sensing personality represented 14.3%, with 5.7% for the Intuitive. Predominant learning styles within population of academic researchers matched reported distribution of types in normal population. Functional types appeared to be more related to guiding tendencies rather than improving achievement. Dual brained types after Katherine Benziger -as introduced in this study- could add to individual learning characterization in light of Jung typological functions and hemispheric dominance.*

**Keywords**— Learning Style, Academic achievement, Hemispheric dominance, Dual brained, Jung Typology

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## 1. INTRODUCTION

As indicated by Felder and Henriques (1995), way in which an individual characteristically acquires, retains, and retrieves information is collectively termed the individual's learning style [1]. According to accumulating data, people learn or perhaps prefer to learn in different ways, where a learner processes and develops information in a style that permits personal understanding [2]. Moreover, it was reported by Dunn and Griggs (1998) that many researches demonstrated that both low and average achievers earn higher scores on standardized achievement tests and attitude tests when taught through their learning style preferences [3].

Consequently, it is of crucial importance to acknowledge *how* an individual needs to learn, not only *what* he needs to learn, to improve his educative performance [2]. In other words, we have to insist on *learner-centered*, not only *subject-centered* learning as stated by the humanistic approach of learning style theory after Johnson [4]. Such an approach which agrees with Keefe [5], as he stated that learning style diagnosis opens the door to placing individualized instruction on a more rational basis to achieve a truly modern approach to education [2].

A lot of *learning style models* exist in literature [6]. Coffield et al. classified learning style models into 5 families [7]. Families included a category which referred to learning styles as one component of a relatively stable *personality type* [6].

*Jung's theory of psychological type* [8] is one of the most comprehensive theories developed to explain human personality [9]. Korolenko highlighted its great importance in affecting psychological adaptation [10]. Besides, it was reported that the expression of maladaptation in students is dependent on Jung typological functions [11]. Despite, Jung himself wrote about the "vividness" of the psychological type [12] yet a lot were inspired by his theory of type.

According to Jung, people are categorized into four basic mental functions or processes; Sensing, Intuition, Thinking, and Feeling. Jung believed that in order for individuals to function well they must have a way to perceive a stimulus (Sensing or Intuition), and a way to make an adequate response to that perception by making a decision or judgment (Thinking or Feeling) [13].

Carl Jung described Sensing as preference to focus on concrete aspects of a situation by using one or more of the five senses. Alternately, Intuition describes the focus of attention on abstract ideas made through possibilities, meanings, and relationships associated with a concrete situation. Thinking as one category of judgment is a function which links ideas together through logical connections and leads to an impersonal finding. Feeling, on the other hand, describes a rational act of evaluation using subjective values and relative merits of the issues for judgment and decision making [9].

The Myers-Briggs theory of personality type grew out of the work of Carl Jung by Katharine Briggs and her daughter Isabel Briggs Myers [14]. They developed the Myers-Briggs Type Indicator (MBTI) which is a widely used psychological self-report instrument used to assess people's orientation toward the Jungian types [14]. The MBTI, is now widely used in educational, career, and family counseling settings [14], with reported validity and reliability [15]. It is one of the best personality assessments for non-psychiatric populations [16]. The MBTI was also examined by Jensen and DiTiberio (1989) for its relevance in the teaching of writing [17]. Provost and Anchors (1987) were concerned with the MBTI in higher education [18]. The MBTI could also be used to develop teaching methods to meet the needs of different types.

In a trial for establishing a neurophysiologic model for Jung's four functions, Katherine Benziger [19] stated that Jung's four functions are to be rooted in four distinct areas of the cortex. The Thinking is housed in the left frontal lobe, the Intuition is housed in the right frontal lobe, the Sensing is housed in the left posterior convexity and the Feeling is housed in the right posterior convexity. Moreover, based on the measurement of brain function and energy consumption in the brain, Benziger assumed that some people develop a particular combination of modes (dual brained). People with the Thinking and the Intuitive acquiring the first and second preferences in priority are double frontals, while the Sensing and the Feeling occupying the first two preferences are double basals. Similarly, the double rights characterized by the Intuitive and the Feeling as the predominant functions, while the double lefts show predominant Thinking and Sensing functional types.

Academic researchers are in a continuous state of learning. Given the potential that knowing an individual's psychological type may have effect on facilitating learning and improving academic achievement, our study aimed at examining psychological functions predominance –as one perspective of learning styles- within the community of researchers to guide their educative panel and hence enhance their career. As a secondary objective; we aimed at identifying the hemispheric brain dominance from tools designed for typological function assessment. This approach may introduce a new application for the theory of type and provide more profound description for the different styles denoting individual learning characteristics.

## **2. METHODS**

The current work was a pilot cross-sectional study. Convenient sample of 72 researchers from different specialties in the National Research Center of Egypt (NRC) comprised the study sample. Inclusion criteria enclosed age above 25 with high educational level (candidates of master or doctoral degrees). Both sexes males (n=36) and females (n=36) were represented in the study with equal proportions in order to investigate gender differences. Demographic information included gender, age, and highest educational degree attained to ensure the sample to be statistically convenient and representative. The profession was also collected with the other data to investigate associations between prevalent learning style preferences and the different disciplines. Data were filled by the participants in the self-reported instrument some computer based and some paper based according to availability.

Individuals selected for participation in this study were given a one page self-reported questionnaire adapted after the MBTI [20]. The adapted tool differed from the original MBTI in the scoring system with reduction in the number of items to increase the feasibility of the tool. The questionnaire was divided into four sets of sentences. Each set described one of the four psychological types of Jung in six sentences. Participants were asked to arrange the four sets according to preference priorities. The questionnaire targeted Jung's psychological functions (Sensing, Intuitive, Thinking, Feeling), but not parameters naming Jung's attitude (Introvert/Extrovert and Perceiving/Judging dichotomies). Modification on the MBTI included translation of sentences included in the questionnaire into Arabic; the native language of the study sample. Cultural differences were also taken in consideration in choosing adequate words and expressions in the translation.

Chi square test for significance as statistical method was used to find percentage distribution of the four Jungian functional types as different styles of learning, as well as finding the distribution of the different types of the dual brained learners. Chi square test is a simple and popular test used for descriptive studies. Analysis was performed using the Statistical Package for the Social Sciences (SPSS) 19.0 (SPSS Inc., Chicago, IL, USA).

## **3. RESULTS**

Descriptive data illustrated by Table 1 showed distribution of the four psychological functions among studied group. Both the Thinking and the Feeling functions showed to be the most preferred learning styles among study group with

equal percentage of 40%. The other two styles declined in representation to show 14.3% and 5.7% for the Sensing and the Intuitive respectively.

**Table 1:** Distribution of psychological functions among studied group

Psychological function	Number	Percentage
Thinking	28	40%
Intuitive	4	5.7%
Feeling	28	40%
Sensing	10	14.3%

Results showed no significant difference between males and females in functional predominance as illustrated in Table 2. Despite, females were found to be relatively higher in the Feeling function than males with a percentage of 48.6% compared to 34.1% in the male population. Also the Sensing function was discriminately different between the two genders. It showed to be promptly higher in males with 22.9% while it did not exceed 5.7% within females. The Intuitive type showed to be non significantly higher in females with 8.6% compared to 2.9% in males.

**Table 2:** Distribution of psychological functions among different sexes

Psychological function	Male (N,%)		Female (N,%)	
Thinking	15	42.9%	13	37.1%
Intuitive	1	2.9%	3	8.6%
Feeling	11	31.4%	17	48.6%
Sensing	8	22.9%	2	5.7%

Data computation - as shown in Table 3 - showed that 68% of the study group manifested characteristic hemispheric dominance. On the contrary 32% had no hemispheric prevalence i.e. no dual brained types. Right brain learners (dual rights) were expressed by the least percentage which was 8.3%. Followed by front brain learners (double frontals) who comprised only 11% of the sample. Both the base brain (dual basals) and the left brain (dual lefts) predominance appeared to be preferentially used by a wider population. Their percentages showed to be 25% and 23.6% respectively.

**Table 3:** Distribution of hemispheric predominance among studied group

Dual brained	Number	Percentage
Double frontals	8	11%
Double rights	6	8.3%
Double basals	18	25%
Double lefts	17	23.6%
None	23	32%

#### 4. DISCUSSION AND CONCLUSION

In the present study we tried to explore predominant personality types -as an indicator of learning style preferences- to help us in improving learning conditions for academic researchers. Despite post-graduation, all psychological types were represented by different proportions in a profile simulating normal population and different from that of the gifted.

Concerning the perceptive dichotomy (S/N) our results showed a proportion between the Intuitive (5.7%) and the Sensing (14.3) that agrees with research which reveals that most of the general population (70%) prefer Sensing over Intuition [21-25]. Findings of Myre [26] in this concern asserted that the possibility of one's being Intuitive increases as academic giftedness increases which was not the case here. For the (T/F) dichotomy, gifted adolescents' preference of Thinking is slightly higher than Feeling [15] which also differed from the case in the study group where both the Feeling and the Thinking were represented in equal proportion with 40% each.

*In consequence, we can conclude that we have to differentiate between academic achievement and academic giftedness where the former is more related to intelligence (cognitive capacity) while the later is the one which could be attributed to the functional type (cognitive processing).*

Wankat and Oreovicz [27] in their book 'Teaching Engineering' emphasized on that same idea, according to their words "... it is important to remember that type theory does not make judgments on intelligence: All types can succeed in

any area, and all types are represented in every area. What is important is that every type can learn to survive in the academic world" (p.254). Then they continued to say: "The fact that certain types predominate in certain careers says more about a type's attraction to the field than whether he or she will succeed in it" (p.254).

*Therefore, we can conclude that; knowing the prevalent psychological function or the natural lead for each individual can help him in choosing the career in consistence with his tendencies. At the same time knowing the least preferred functions can figure out the undesirable kind of tasks for such an individual which are the characteristics of that function. Consequently, the former could be very effective as a preventive methodology to guard against falsification [8] which proved to show serious consequences and hazardous outcomes as for PASS or Prolonged Adaptation Stress Syndrome [28]. Moreover, the later could be of crucial importance in specifying skills which need to be improved for each individual in particular.*

*Also we can conclude from the study outcomes that no specific strategies and methodologies should be namely applied for academic researchers since they did not show any difference in their learning style preferences than normal population.*

Dual brained preferences, could explain more about the learning characteristics of researchers. Campbell and Kain [29] investigated whether some types prefer certain forms of information presentation in problem solving. They found that NT's and NF's were the most time-efficient types yet the least accurate. For SF and ST types they tended to be more accurate but took longer to achieve their accuracy. Academic researchers in the present study showed to belong to the second type where the dual basals (SF) and the dual lefts (ST) together compromised nearly half the study sample at the time in which both the dual frontals (NT) and the dual rights (NF) did not exceed 20% of the sample. These results agreed with Keirseay and Bates where the NT and NF temperament types each represented roughly 12% of the general population [30]. Frankly, we can say that most of the study group are base brained and left brained respectively. *This emphasizes on the conclusion that academic researchers do not differ in their learning styles from the normal population. Moreover we can conclude that classifying people into four hemispheric brained learners; front brained, right brained, base brained and left brained after the theory of type and the extended work of Benziger -in my speculation- could add to categorizing and understanding human learning.*

## 5. LIMITATIONS AND RECOMMENDATIONS

Concerning limitations, further work on larger population would be of crucial importance to emphasize on the significance of the present findings, and to provide a better estimation of the learning profiles of postgraduate learners. IQ testing in addition to learning style assessment may add to the research outcomes. Categorizing the sample with respect to different *disciplines* could help in investigating associations with the various *psychological functions* as they are named to describe tendencies rather than abilities. Although it was intended to be done in this study yet the great diversity of disciplines did not allow us to obtain meaningful results and that is why we did not mention anything about it. 32% of the sample did not show any of the *dual brained* styles as combination of modes, this emphasizes on the concept of mono-modal, bi-modal and triple-modal learners as described by Katherine Benziger which needs both theoretical explanation and empirical justification as extended research. The four hemispheric thinking styles based on the previously introduced theoretical background as introduced by this work deserves extensive care and a lot of further research as a new trend for exploring learning styles.

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## Appendix

### استمارة الاستبيان

رتب المجموعات التالية بحيث تضع المجموعة التي تعبر عنك بقوة في المرتبة الأولى، ثم التي تليها في المرتبة الثانية، ثم التي تليها في المرتبة الثالثة، والمجموعة التي لا تكاد تعبر عنك في المرتبة الرابعة و الأخيرة.

### Questionnaire

Arrange the following groups according to your preferences, such that the group which predominantly represent you takes the first preference. The second group in priority takes the second preference, the third group in priority takes the third preference, while the least group in describing you takes the fourth preference.

#### مجموعة (أ)

- أراني مبنية على المنطق.
- ذهني دوما منشغل بما هو ورائي من مهام.
- آخذ قراراتي بشكل موضوعي و على منهج.
- دائما أعقد المقارنات.
- أحكم عقلي أولا.
- أتميز بالمهارة في التحليل والاختيار بين البدائل عند اتخاذ القرار.

#### Group (A)

- My beliefs are built on logic.
- My mind is always busy with tasks.
- I take my decisions in an objective and systematic way.
- I always make comparisons.
- I judge with my mind before my feelings.
- I am clever at analysis and choosing between alternatives.

#### مجموعة (ب)

- يصفني الآخرون بالقدرة على التجديد والإبداع الفكري.
- لدي أحلام كثيرة للمستقبل.
- أفضل أن أعمل في المجالات النظرية.
- عادة أجد حلولاً للمشكلات بعيدة عن المعتاد.
- يصفني الآخرون بأن لي فلسفة في الحياة.
- لدي دوما رؤية شاملة.

#### Group (B)

- People see me innovative in creating new ideas.
- I have a lot of dreams for the future.
- I prefer to work in theoretical fields.
- I always find unusual solutions to problems.
- Others always say that I have a philosophy in life.
- I always have a holistic vision.

#### مجموعة (ج)

- أضع مشاعر الآخرين دوما في اعتباري عند اتخاذ أي قرار.
- أبحث دوما عن الألفة والتناغم في أي شيء.
- عادة أكون أول من يقصده الآخرون ليشاركهم أفراحهم أو أتراحهم.
- أتعاطف بشدة مع هموم الآخرين.
- أستمتع كثيرا لمشاعري.
- من المهم إظهار المشاعر للآخرين.

#### Group (C)

- I always consider the feelings of others when taking decisions.
- Search for harmony in everything.

- People like share their happiness or sadness with me.
- I feel sympathy with people in trouble.
- I listen a lot to my feelings.
- It is important to show your feelings.

مجموعة (د)

- أفضل المعلومات الواضحة عند اتخاذ القرارات.
- يصفني الآخرون بالمهارة في حل المشكلات العارضة واليومية.
- أعتبر التجربة العملية أفضل وسيلة للتعلم.
- لا أمل من تكرار المحاولة حتى أنجح.
- لا أهتم كثيرا برسم خطط للمستقبل.
- أبني قراراتي بناءا على الواقع المادي الملموس.

Group (D)

- I prefer clear data upon taking decisions.
- People see me clever at accomplishing routine work and solving daily problems.
- I consider practical experimentation the best way for learning.
- While doing something new, I never give up till succeed.
- I don't pay a lot of attention to drawing future plans.
- I take my decisions based on the concrete reality.

ترتيب المجموعات من حيث الأفضلية في التعبير عن ميولي هو:

- ( ) المرتبة الأولى مجموعة
- ( ) المرتبة الثاني مجموعة
- ( ) المرتبة الثالث مجموعة
- ( ) المرتبة الرابع مجموعة

Arranging groups according to my predominant preferences:

- Group of first preference ( )
- Group of second preference ( )
- Group of third preference ( )
- Group of fourth preference ( )

الاسم: ..... السن: .....

الدرجة العلمية: .....

الوظيفة: .....

Name :.....Age .....

Educative level :.....

Profession : .....

المفتاح: أ=المفكر، ب=الحدسي، ج=المشاعري، د=الحسي

Key: A=Thinking, B=Intuitive, C=Feeling and D=Sensing