

## THE HIDDEN CHARACTERISTICS OF GIFTEDNESS AMONG CHILDREN AND ADULTS

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### Abstract

Since the beginning of the 20th century, many books and articles have been written about gifted children. However, there has been comparatively little focus in the literature on the characteristics and psychological traits of gifted adults. 639 students participated in three separate studies using four different scales and a qualitative interview in order to investigate the hidden characteristics of giftedness. The study was also searching for explanations behind the “disappearance” of gifted children into the vast territory of adulthood. The results show that creativity is a self-decision factor that is based on psychological characteristics such as self-regulation, internal motivation, self-awareness, and interest. In addition, creativity is viewed and defined differently between children and adults.

Key words: Hidden Characteristics الأبداع Creativity. الخصائص المخفية. Giftedness الموهبة. Gifted موهوب. Children الأطفال. Adults الراشدين. Psychological Characterises الخصائص النفسية

## الخصائص المخفية للموهوبين بين الأطفال والراشدين

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### ملخص :

منذ بداية القرن العشرين العديد من الكتب والمقالات تم كتابتها عن الأطفال الموهوبين، مع ذلك وجد تركيز قليل نسبيا في التراث على الخصائص والسمات النفسية للموهوبين الراشدين . تمت الدراسة على عينة مكونة من 639 طالب شاركوا في ثلاث دراسات منفصلة ، وتم استخدام 4 مقاييس مختلفة بالإضافة إلى المقابلة النوعية للتعرف على الخصائص المخفية للموهوبين. الدراسة أيضا بحثت في التفسيرات خلف اختفاء الأطفال الموهوبين في منطقة شاسعة في مرحلة الرشد. وقد أظهرت النتائج أن الابداع قرار ذاتي والذي يعتمد على الخصائص النفسية مثل التنظيم الذاتي والدافعية الداخلية والوعي بالذات والاهتمام. بالإضافة أظهرت النتائج أن الابداع ينظر إليه ويعرف بشكل مختلف بين الأطفال والراشدين.

## Introduction

Currently, there is no shortage of theories of creativity in the literature. Some of these theories include behaviourism (Skinner, 1971), self-actualization (humanistic theory of creativity; Maslow, 1968), cognitive theory (Amabile, 1983; Guilford, 1967; Hermann, 1993), and investment theory (R. Sternberg & Lubart, 1993). Other researchers focused on the four components of creativity: the creative person, the creative product, the creative process, and the creative environment as being the driving force of giftedness (Isaksen, Dorval, & Treffinger, 2000; Tardif & Sternberg, 1988).

There are also a large number of definitions of creativity and giftedness. Several of these definitions focus on the relationship between creativity and intelligence. Some of these associate creativity with high IQ (Anastasi & Schaefer, 1969). Others suggest that a high IQ does not imply high creativity (Cropley, 1999; Thorndike, 1966). In an interview, Dr. E Paul Torrance answered a question about how creativity relates to intelligence. He said that there is consistent research over 30 or 40 years that says that if we give children in school a creativity test and an intelligence test, there is only about a 30% overlap. Therefore by just measuring intelligence, we miss 70% of the creative students (Psychology online journal, 2000). Meanwhile, although Simonton (1978) stated that a base level of intellectual ability (IQ about 120) is essential for creative productivity, he admitted that there is virtually no relationship between measured intelligence and creativity.

Other investigators have found connections between creativity and: self-esteem (Gerrard, Poterat, & Ironsmith, 1996), motivation (Amabile, 1989), self-actualization (Maslow, 1968), cognition (Martin, 1974), motivation (Amabile, 1983; Boekarts, Pintrich, & Zeidner, 2000; Bronson, 2000; Shaw & Runco, 1994), self-awareness (Joireman, 1999; Laallee & Campbell, 1995), interest (Martin & Tesser, 1996), and self-regulation (Al-Dhobaiban & Iran-Nejad, 2004).

## Background

Since the beginning of the 21st century, a large number of books and articles have been written about gifted children, (e.g., Burks, Jensen, & Terman, 1930; Carroll, 1940; DeHaan & Havighurst, 1957; Gross, 1992; Hirt, 1922; Hollingworth, 1926; Piirto, 1994; Stedman, 1924; Terman, 1925; Webb, Meckstroth, & Tolan, 1982; Witty & Jenkins, 1935; Zorbaugh & Boardman, 1936). Organizations of educators, parents, and others have been formed to protect, preserve, and develop the potential of gifted children (Hall & Skinner, 1980; Krueger, 1978). Factions have argued about definitions and terms, about whether it is nature or nurture or both that creates unusual intelligence, and whether

gifted children need or deserve special programs and educational resources (Burks et al., 1930; Galton, 1869; Margolin, 1994; Renzulli, 1978; Sapon-Shevin, 1987; Sternberg & Davidson, 1986; Witty, 1951; Yoder, 1894).

Sternberg (2003) stated that a number of researchers, such as Sternberg (1999), and R. Sternberg and Lubart (1993) agreed on the definition that views creativity as the ability to produce work that is novel (that is, original and unexpected), high in quality, and appropriate (that is, useful and meets task constraints). Torrance provided another definition, which views creativity as “the process of sensing problems or gaps in information, forming ideas or hypotheses, testing and modifying these hypotheses, and communicating results” (Davis, 1985, p. 16). However, almost all of these definitions are directed toward children. The criteria of definitions change from internal processing for children to unusual external production for adults. Shurkin (1992) best described it by stating that teachers usually assess youngsters on the basis of learning ability, but “assess adults by more worldly measure of financial standing and recognition by a public” (Shurkin, 1992, p. 269). This change in definition does not distinguish between knaves and fools and good public servants. Due to this view, great scientists such as Einstein, Darwin, and Edison were never identified or even perceived as gifted when they were children. Even among children, many educators measure giftedness by achievement rather than potential (Dunn, Dunn & Treffinger, 1992).

Creativity is more than using one’s imagination. It is a lifestyle, a personality trait, a way of perceiving the world, and a way of living and growing. Being creative is exploring new ideas, new places, and new activities. It is also developing a sensitivity to the problems of mankind (Kubie, 1958, pp. 104-136). *Britannica Encyclopaedia* (2005) defines creativity as “the ability to produce something new through imaginative skill, whether a new solution to a problem, a new method or device, or a new artistic object or form.” The term generally refers to a richness of ideas and originality of thinking. Psychological studies of highly creative people have shown that many individuals may possess an exceptionally deep, broad, and flexible awareness of themselves.

Allen (1962) stated that creativity is a quality existing in all persons. He asserted that “factors of creativity seem to vary from person to person both in the amount of initial deposit, and in the degree to which this potential is realized and developed” ( p. 61), because creativity will flourish greatly with nurturing, understanding, respect, opportunities, and freedom. Creativity has been defined in terms of imagination, divergent thinking, fantasy, intuition, curiosity, problem solving (to name a few), and in terms of different combinations of these factors. In addition, the

lack of a single reliable method for assessing creativity has made it even more difficult and complicated to measure (Allen, 1962).

These different views lead to the conclusion that creativity is more than just a mental ability: It's a psychological issue and a self-decision. Nevertheless, the biofunctional theory makes the unusual claim that creativity is a function of the interaction between two antithetical modes of functioning shared by all individuals in varying degree. These modes of functioning are called simply active and habitual modes. More creative individuals find ways to optimize the interaction by actively resisting the usual, for example (Iran-Nejad & Winsler, 2000). creative individuals also draw on multiple sources targeted by the biofunctional theory are learner intuitions, flexibility, and artistic quality. Iran-Nejad and Winsler stated that "in biofunctional theory, learning is growth in the ability to take advantage of internal sources of self-regulation to (re)create ongoing knowledge and to do so with increasing efficiency, intuitive flexibility, and technical fluency" (p. 31). Taking advantage of internal sources is essential not only for learning, but also for effective functioning. Thus, internal sources of self-regulation are pulled to the center stage as are artistic motivation and creativity. The person recreates knowledge and disposition to facilitate problem solving, or even the creation of obstacles, in a way that benefits learner creative thinking (Iran-Nejad & Winsler, 2000).

Understanding the psychological effects on creativity gives us an explanation for how different people with the same amount of knowledge and level of intelligence solve problems differently (Boekarts, Pintrich, & Zeidner, 2000; Mayers, 2003; Ormrod, 2003). Consequently, biofunctional theory describes the brain as functioning by evolutionary design in a creative-versus-habitual mode. The brain's creative mode of functioning is "energy-mobilizing," making the physical brain itself a direct source of motivation and giving the internal world as well as the physical brain of the learner its natural momentum toward change, exploration, action, and approaching challenge (Iran-Nejad, 2000). This creative mode of functioning is governed by the unknown side of the indeterminate zone of practice (Schon, 1987). Therefore, the biofunctional theory takes a major step beyond traditional theories because it recognizes the active (executive) as well as the dynamic (nonexecutive) sources of internal self-regulation of learning processes (Iran-Nejad & Chissom, 1992).

To a greater extent than is immediately apparent, success is associated with learners' level and nature of their relationships to themselves (Iran-Nejad & Gregg, 2001). An individual who has a high level of internal psychological awareness is more likely to trust him- or

herself, leading to better self-confidence to use personal intuition and create special products (Boekarts, Pintrich, & Zeidner, 2000; Mayers, 2003; Ormrod, 2003; Pintrich, 2003). In short, biofunctionalism gives due consideration to both internal and external factors essential for optimizing creativity.

### **Purpose of the Study**

The main objectives of the study were to discover the psychological characteristics of creative and talented people. In order to do so, a correct understanding of creativity and giftedness among children and adults is needed to be reached. A perceptiveness of why children are more recognized and identified as gifted and talented than adults was also investigated.

Although there are a number of perspectives to choose from, scientists have paid little or not enough attention to psychological effects on creativity. However, the biofunctional theory was one of the few theories the researcher was able to find in the literature to fill this gap. Hopefully, the results of this study will provide additional information and expand the body of knowledge in educational psychology by examining the role of psychological effects on creativity among college-level students.

Furthermore, the findings of this study can be used in the development of the educational system by helping educators develop curricula that address some of the psychological factors that promote creativity and contribute to better teaching methods. In addition, academic policy makers and other educational firms might benefit from the results of this study in their planning. Furthermore, the results of this study are expected to provide some guidelines or data that might be useful for educational implementation strategies.

### **Perspectives and Theoretical Framework**

This study drew on several principles and perspectives. The significant role played by psychological effects, such as self-regulation, in the actualization of creativity, as emphasised by the biofunctional science (Iran-Nejad & Gregg, 2001), was highlighted. It was felt that there was a need to recognise that traditional cognitive theories could not provide a complete solution for understanding the driving force of creative abilities because they were only looking at students' cognitive development. Many of the theories that discussed creativity acknowledge the limitations of their perspectives, asserting that they cannot be generalized to all creative and talented individuals (children and adults).

One exception is the biofunctional theory, which presumes that better understanding of the function of the brain and the mind can be reached once psychological and neuroscientific researches start

addressing each other. Iran-Nejad, Hidi, and Wittrock, (1992) stated that just as modern medicine is focused on the way that the rest of the body functions, research in education should be focused on the way that the human brain and mind function as a physical system. The biofunctional theory aims at carefully coordinating brain activities with students' mindful strategies in order to maximize the possibility for students to learn.

The educational side of the biofunctional theory uses a *wholetheme* approach in teaching students. The ultimate goal of this method is to assist the development of intuitive flexibility in learners. It helps them to “understand (a) themselves, (b) the inexhaustible resources of their own nervous and bodily systems, (c) the role of their own brain-mind cycle of reflection, (d) the contribution of their own dispositional modes of functioning, and (e) the illuminating power of multiple perspectives” (Iran-Nejad & Gregg, 2001, p. 886).

By giving the big picture, we can use the wholetheme approach to promote active learning that can fulfil students' curiosities. Unlike the piecemeal approach, which contributes to the gap between what is taught and students' real experiences of the world, the wholetheme approach “assumes that persons tend to perceive objects or events holistically in an authentic context” (Chen & Iran-Nejad, 2002, p. 403).

The biofunctional theory of multisource self-regulation assumes that learning is the reorganization of the individual's intuitive knowledge base, as controlled by the three sources of self-regulation: external (stimulation-based), active (effort-based), and dynamic (interest-based; Chen, Rovegno, & Iran-Nejad, 2002). In the brain, all microsystems have the capacity to regulate themselves dynamically. This kind of self-regulation undertakes a wholetheme reorganization of information. This reorganization requires the brain microsystems to undergo a simultaneous and flexible self-adjustment in a context of an ongoing whole-brain coordination pattern. However, whereas dynamic self-regulation events can occur simultaneously in many different parts of the brain, active self-regulation events can only occur one at a time or sequentially (Iran-Nejad, 1989, 1990).

### **Methods and Modes of Enquiry**

In spite of the considerable amount of research, Iran-Nejad and Gregg (2001) argued that a quick look at the way schools teach gives a clear indication that they are trying hard to establish the habitual way of thinking over the creative way of thinking. Students are given as much ready-made information as they can take and are asked to store it in their minds through the use of rehearsal and memorization. Anderson (2000) accused schools of trying to establish “pictures in the heads” of young

students so they can be ready for recall whenever they are needed. At the same time, the current educational system simply neglected the fact that students' problems and limitations appear in the habitual motor-function, whereas their best is demonstrated in the creative motor-function when all the senses are in their active mode. Yet in spite of all roadblocks, creativity still exists (Iran-Nejad & Gregg, 2001).

The biofunctional theory and its wholetheme approach to teaching and learning is a new perspective for viewing creative education. This theory defines learning "not as a piecemeal internalization of external knowledge, but as a wholetheme reorganization of the learner's own intuitive knowledge base through, optimally speaking, a series of self-guided insights" (Iran-Nejad, 2000, p. 79). The biofunctional theory assumes that learning is a multisource operation by nature that requires the contribution of the three sources of self-regulation (Chen, Rovegno, & Iran-Nejad, 2002). Some of these internal or dynamic functions are curiosity, interest, motivation, and creativity.

An important benefit of the brain-mind cycle of reflection is that it promotes in every person the ability to reach his/her possible selves, providing a conceptual link between cognition and psychology. It is human nature to change for the better, and the brain-mind cycle of reflection can help people accomplish this goal. Once learners know how to have positive self-awareness and self-regulation, they can motivate themselves to become creative. Elkind, Deblinger, and Adler (1970) tested the relationship between motivation and creativity and their impact on learning. They concluded their study by stating that the results highlighted the importance of considering motivational effects whenever we evaluate educational performances.

Instead of providing students with ready answers, students should be involved in searching for these answers themselves. Learners' interest and emotions must be ignited and respected. In addition, educators should set high standards and expectations for their students and encourage them to do their best to accomplish them. In other words, students should be in the creative mode of function. The reason behind this strategy is to gain students' attention and interest and to involve the brain in dynamic thinking, because "learning occurs best when organizing learners' intuitive knowledge base and putting learners in the context of real-life experiences in which their interests and their effort are dynamically involved" (Chen, Rovegno, & Iran-Nejad, 2002, p. 405).

Finally, it is imperative to note that Amabile (1983) and Gardner (1983) suggested the existence of the creative spirit in all children, which makes them look at the world creatively until the third or fourth grade; then all enthusiasm to explore and investigate suddenly drops drastically.



The two researchers believe that schools practice what they call “creativity killers” by using surveillance, evaluation, reward, and competition. They complain that many teachers do too much for their students and do not give them a chance to find out what they are good at. It should be pointed out here that some rewards do enhance creativity (Eisenberger & Shanock., 1994).

### **Participants**

A total of 639 students participated in this study. A basic question of “who is the gifted and talented?” was asked to 220 gifted students engaged in a summer program for the gifted and talented in Saudi Arabia. These gifted students were middle school, high school, and college level students in six programs in five cities across Saudi Arabia. Another 200 teachers, professors, trainers, and staff members working in six universities in Saudi Arabia were asked whether they feel they are creative?, whether they use their creative abilities at work?, and whether they find support and encouragement from their superiors or peers? The rest of the participants (219) were undergraduate and graduate students at an American university. They answered a questionnaire that contains two sets of scales.

### **Data Sources (Instruments)**

In order to best identify the psychological characteristics behind creativity and giftedness, this study gathered information using four different scales, in addition to personal interviews with the gifted students and educators mentioned in the previous paragraph. The four scales are (1) the Learning and Study Strategies Inventory (LASSI); (2) a modified version of LASSI, called Wholetheme Learning Inventory (WLI); (3) the Test Your Creativity Level Scale (TYCL); and (4) the Khatena Torrance Creativity Perception Inventory (KTCPI). The first two scales are designed to identify some of the important psychological characteristics of creativity according to previous research. The other two are creativity scales. A brief description of each of these instruments follows.

The LASSI consists of 10 subscales and 80 items. The instrument is organized in a 5-point Likert scale format that ranged from *strongly agree* to *strongly disagree*. The focus of the scale is on both implicit and explicit thoughts, behaviors, attitudes, motivations, and beliefs. The scale provides standardized scores and national norms for 10 different scales. The scale also provides researchers as well as students with a diagnosis of their strengths and weaknesses compared to other college students in the areas covered by the 10 scales.

The Wholetheme Learning Inventory (WLI) was built to closely parallel LASSI (Iran-Nejad & Al-Dhobaiban, 2004). For each item on

LASSI, a parallel item was created to capture and incorporate as best possible within the limitations of a parallel scale the insights from the biofunctional theory. Therefore, as a “modified LASSI,” it, too, is hypothesized to consist of 10 subscales and 80 items and is also organized in a 5-point Likert scale format that ranges from 1 (*strongly agree*) to 5 (*strongly disagree*). In other words, the WLI gets its 10 subscales and 80 items by inheritance, not by design. The original LASSI views self-regulation as an active (person-regulated) process. The strength of this view is that it captures well intentional, deliberate, strategic, or, in short, mind-regulated self-regulation. The focus of WLI is on students’ artistic disposition, persistence, divergent thinking, and flow of thoughts.

However, there is much more to the capacity for self-regulation than active self-regulation, as just described, can capture. The nervous and other bodily systems themselves contribute vastly to self-regulation, and this source of self-regulation is not always only mind-mediated or active, but also dynamic.

WLI is based on biofunctional science, which states that learning occurs best in a creative mode of functioning, where the three sources of self-regulation reach a level of interaction most suitable for the particular learning context (Iran-Nejad & Chissom, 1992). In other words, the difference between LASSI and WLI is what control sources play the predominant role in learning.

The third instrument used in this study was the Test Your Creativity Level scale. This instrument consists of 50 items organized in a 5-points Likert scale format that ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). In the past, creativity among people was differentiated by kind, whereas now the direction is to measure it by level. This level is not always fixed because it increases or decreases according to a number of issues, such as the person’s interests in a topic, hard work, self-esteem, self-awareness, self-regulation, and intuitive knowledge-base (Hammadi, 1999; Suwaidan, 2001).

The fourth instrument is the Khatena Torrance Creativity Perception Inventory (KTCPI). Like the Test Your Creativity Level scale, The KTCPI consists of 50 items that require yes or no answers. This instrument was developed by two of the most influential researchers in the field of creativity during the past few decades—Khatena, and Torrance. The Khatena-Torrance Creative Perception Inventory (1998) is based on the rationale that creative functioning is reflected in the personality characteristics of the individual, in the way he/she thinks or the kind of thinking strategies he/she employs, and in the products that emerge as a result of his/her creative strivings. The scale presents

statements to which participants are required to respond. The responses reflect the extent to which the respondents function in creative ways.

The four instruments were used in two separate studies. Study 1 used the following three scales: the LASSI, WLI, and TYCL. Study 2 used the creativity scale KTCPI with LASSI and WLI. It is noteworthy that 119 students participated in Study 1, and 100 participated in Study 2. These two sample groups are mutually exclusive. The study was repeated twice with different creativity scales in order to strengthen the results and provide stronger validity to the scales used.

### **Operational Definition of Creativity**

The operational definition of creativity in this study reflects the belief that all people are creative in different ways and degrees. Creativity is an understanding of a person's ability to solve problems in a creative yet socially acceptable way. Creativity is not the superiority in only one facet of life: It is the ability to think and produce original ideas in different aspects of life.

As with the TYCL, the authors of the KTCPI suggested that "creative people could be identified through their personality characteristics of 'person,' their thinking operations or 'process,' their productions or 'products,' and their response to stress situations or 'press'" (Khatena and Torrance, 1998, p. 21). Therefore, creativity is reflected in the psychological characteristics of the individual, in the kind of thinking he/she employs, and in the products that emerge as a result of his/her creative striving. The 50 items of the checklist represent three categories of creative functioning—personality traits, use of creative thinking, and creative production. Therefore, both creativity scales (TYCL and KTCPI) provide the same function and perception of creativity.

The biofunctional theory affirms that creativity is the act of the whole person integrated, unified, and totally involved in the three sources of self-regulation. Creativity occurs in the creative mode of functioning, which implies that every person is naturally creative. From this implication, the researcher used these two creativity scales. An example from the TYCL creativity scale that exemplifies the meaning is the following item: "I rely on my inner feelings when initiating or trying to solve a problem." Another example, from the KTCPI creativity scale, that exemplifies its meaning is the following: "I am very interested in and open to the ideas of others."

### **Results**

The correlation between self-regulation, as viewed from a cognitive perspective (represented by LASSI), and the wholetheme education perspective of the biofunctional theory (represented by WLI), was tested.

**THE HIDDEN CHARACTERISTICS OF GIFTEDNESS AMONG CHILDREN AND ADULTS**

The study was repeated twice using different creativity scales (TYCL for Study 1 & KTCPI for Study 2) in order to strengthen the results and increase the validity of the scales used.

In Study 1, the test of correlations showed that creativity (as measured by the TYCL) correlates with self-regulation, but only if it used the biofunctional wholetheme approach. TYCL did not correlate with the cognitive strategic approach scale (LASSI). It only correlated with self-regulation as viewed from a biofunctional wholetheme approach. As a matter of fact, the correlation between TYCL and WLI was significant at the .001 level (2-tailed) indicating a moderate positive correlation. Regression analysis confirmed the findings, as TYCL was statistically predicted by WLI but not LASSI. This led us to conclude that creativity can be promoted if the biofunctional wholetheme approach is implemented because it puts students in a clear constructive mode of functioning that promotes creativity (Iran-Nejad, 1990; Iran-Nejad & Chissom, 1992; Iran-Nejad & Gregg, 2001).

Table 1

*Pearson Product Moment Correlation Between the Three Scales in Study 1*

LASSI	WLI	TYCL
LASSI	.738**	.146
WLI	.311**	

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

Table 2

*Multiple Regression Analysis for Predicting Creativity in Study 1*

Model 1.	B	S.E.	t	Sig
(Constant)	-38.652	12.843	-3.009	.003
WLI	18.349	5.175	3.545	.001

Dependant Variable: TYCL

Predictors in the Model: WLI

Excluded Variables: LASSI

The same sequence of statistical analyses were conducted in Study 2 as in Study 1 in order to test the correlations between creativity (as measured by KTCPI) and self-regulation (as measured by LASSI and WLI). Again, the correlation analysis showed that creativity correlated only with wholetheme self-regulation (WLI). The KTCPI did not correlate with the cognitive approach scale (LASSI). Moreover, the regression analysis indicates that creativity (KTPCI) can only be significantly predicted by WLI. The repetition of these results in both studies confirms the claims that the use of the wholetheme approach promotes creativity (Iran-Nejad, 2000). This also validates the distinctive kind of relationships between creativity and self-regulation in that

creative acts recruit the contribution of the whole person, integrated, unified, and totally involved in the three sources of self-regulation—external, active, and dynamic (Iran-Nejad, 1990; Iran-Nejad & Chissom, 1992; Iran-Nejad & Gregg, 2001).

Table 3

*Pearson Product Moment Correlation Between the Three Scales in Study 2*

LASSI	WLI	TYCL
LASSI	.766**	.119
WLI		.275**

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

Table 4

*Multiple Regression Analysis for Predicting Creativity in Study 1*

Model 1.	B	S.E.	t	Sig
(Constant)	4.410	8.969	.492	.624
WLI	.982	.347	2.828	.000

Dependant Variable: TYCL

Predictors in the Model: WLI

Excluded Variables: LASSI

On the other hand 96% of the 220 gifted students who were asked to define creativity according to their perspectives gave answers that include self-decision, dedication, persistence, determination, and working against the odds.

More than 75% of all teachers, professors and staff members who were asked whether they feel they are creative provided positive answers and the remaining 25% indicated that they do not know because they were never given the opportunity to discover themselves in the workplace. However, 10% said they use their creative abilities in the workplace but in a very limited way. 93% of the total population of this sample said they do not find support or encouragement from their superiors or peers. On the contrary, they indicated that they are forced to hide or control their abilities because the system prefer people who follow rules and routine more than people who come up with new ideas that effect persons comfort zones. The rest (7%) admit that they find support and encouragement because they have personal relationships with their superiors, such as kinship or friendship.

## Discussion

In both quantitative studies, statistical analysis showed the nonexistence of correlations between LASSI and both creativity scales. A possible reason for these results is that creativity needs freedom from strategies, restraints, and rules. Creative people are curious, tolerant of

ambiguity, willing to persist despite obstacles, willing to sustain motivation, and take risks (Kames & Bean, 2001; Starko, 2001; R. Steinberg & Lubart, 1993).

More attention is needed to be drawn to creative and gifted adults. The vast majority of research and studies in the literature is directed towards gifted children. Good amount of awareness and consideration is given children's giftedness and creativity leaving them to frustration and disappointment when facing the system as adults.

In addition, the results confirm that educators do not need to sacrifice creativity for academic achievement because it is possible to achieve both once they know which teaching and learning approach must be used. Creativity is naturally implemented as part of students' human attributes. This makes educators' jobs easier because they do not need to produce students' creative abilities, they only need to maintain them. Gifted students can misinterpret their complex and deep ways of thinking as craziness or at least out of the ordinary. They can mistake their emotional intensity for emotional immaturity or see it as a character flaw. Unless they are given adequate information that explains what is "normal for gifted," they might experience frustration, alienation, anger, self blame, or emptiness.

In addition, the current educational system needs to develop itself just like everything else around it because the prime goal of education is to have a generation of students who are independent, creative, and responsible: students who have the critical thinking skills to be productive members and add to the development and progress of civilization and humanity. The current system depends mostly on rehearsal and memorization, which does not promote creative thinking.

A number of measures in the current educational system seem to destroy students' imaginations and creative abilities (Anderson, 2000; Iran-Nejad & Gregg, 2001). More data on the influence of psychology on creativity may ultimately steer the field of education in a different direction. Psychological support is very critical for the gifted (young and adults), because unless they learn to value themselves and their abilities, identity conflicts and depression may result. Gifted students need help in knowing when to rest and when to set new goals. Approaches such as the information processing theory do not offer much attention to creativity. Instead, they employ isolated executive routines, rules, strategies, and plans to guide behavior and thinking. Therefore, we can say that highly gifted and creative people have a number of psychological and personality traits that are not connected to intelligence, and many of these traits are related to emotions.

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