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Personality traits and life experiences influencing highly creative people: Six life stories

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요약

Throughout qualitative methods this work examines life stories of six highly creative men (puppeteer, social scientist, painter and electrical engineering) and women (dancer & biologist) from both scientific and artistic fields. Salient life events and their own accounts of external and internal influences that they considered crucial in developing their high creative potential were analyzed in order to discern the degree in which experiences, education, personality and genetics combined to explain their highly creative performances. Differences between artistic and scientific creativity were found. Artistic creativity onsets earlier in life in a rather spontaneous fashion, whereas scientific creativity emerges later in life, and it is related to educational experiences. Likewise, scientific personality tended to be more stable over time whereas artistic creative productivity is episodic and rather inspirational. Familiar influences over their actual professional life were explained better by contextual rather than genetic influences, since none of their parents had the same profession. Activities in the family fostered the like and orientation for their work. Challenges and limitations in studying creative personalities are discussed in light of the procedures and results. It is argued that by studying life stories of highly creative people, may yield relevant information on how to foster creativity and understand highly creative individuals.

Key words: creative personalities, artistic creativity, scientific creativity

I . Introduction

Understanding the origins and development of creativity in diverse human manifestations has been a challenge in serious scientific research. Variability and lack of stability in creative manifestations and the diversity of creative performance in diverse professional domains have represented a challenge for investigators and scholars alike.

The purpose of this study is to identify personality and life events influences six highly creative individuals in both scientific and artistic domains. Robinson (2012), argues that parents, teachers and counselors should help creative individuals to discover their potential and foster opportunities for the development of creative abilities.

The method of life stories was used to investigate which external and internal factors were perceived as influencing their creative potential. Gardner (2012) was a pioneer in the use of life stories to understand human potential, he studied famous artists and scientists to develop his theory of Multiple Intelligences, arguing that people have different talents and that early detection could help develop the full potential of the individual. In this perspective, Robinson (2012), believes that helping people discover and connect with their creative abilities is the safest way to release the best they have.

However, in developing creativity, it is common to find obstacles due to cultural and educational prescriptions that prioritize certain skills within the school agenda, neglecting other equally valuable abilities not included in the curriculum.

This work was developed under the tenet that experiences, events and productions of people who have excelled in various scientific and artistic fields may give insight into the ways the school may change to meet needs and challenges of highly creative students in order to foster the development of their full potential.

1. General Objective:

To explore the influence of formal education in developing creativity and its differential expression in artistic and scientific fields through the life stories of six people living in Mexico.

2. The creative personality

Creative individuals are recognized for their ability to adapt to almost any situation and do what is in their hands to achieve their goals, they are people with an attitude of openness to experience, allowing them to explore different ways to solve a problem. They possess a dose of curiosity and interest that allows them to delve into a particular field, dominate and thus provide new things (Csikszentmihalyi, 1997).

Mitjans (1990) states that creative people display a strong intrinsic motivational impulse that is characterized by a great intellectual curiosity and love for creation itself, emphasizing the creative process and the products, she posits that creativity conveys both cognitive and affective elements that interact in the creative act as an indissoluble unity.

There are some indicators relating to personality functioning that seem to characterize highly creative people and one of these is the strong motivational drive towards one or several areas of action. In this regard, Csikszentmihalyi (1997) says: If I had to express a word that is what makes the difference as to the personality of creative people with the rest, this would be complexity (p. 57).

Creativity can be fostered and promoted or hindered and even eradicated within the education process.

Having a complex personality means being able to express the full range of features that are potentially present in the human repertoire but usually blocked or repressed because we think that a pole is good or right and the other is bad. But while align these parts of ourselves, we can never feel full or satisfied, on the other hand we can remain in a battle against ourselves trying to pretend an image that distorts our true essence (Csikszentmihalyi, 1997).

Creative people to show trends of thought and action that most people have repressed. They have conflicting ends, instead of being an individuality, each of them is a crowd. They carry within the entire repertoire of human possibilities. The complexity of which has been spoken does not mean being at the midpoint between two poles, but involves the ability to move from one extreme to another as the occasion requires. Creative people know both ends and experiment with equal intensity without internal conflicts (Csikszentmihalyi, 1997).

This study follows the tradition of Gardner (2011) early studies that analyzed the work and personalities of seven highly creative characters of XX century that were distinguished by their talents and novelty products in various fields: Sigmund Freud, Albert Einstein, Pablo Picasso, Igor Stravinsky, T.S Eliot, Martha Graham & Mahatma Gandhi.

II . Methods

This work was based on a biographical approach, using as a tool of data collection the method of life stories. This approach provided a conceptual, ethical and epistemological framework to the study (Cornejo, Mendoza and Rojas, 2008).

In depth interviews were conducted with each of the participants to construct their autobiographies. Investigators recorded and made transcripts of each interview, made notes on their observations during their visit to the person's working place and registered information from personal documents and products provide by the interviewed.

Biographical methods are defined by Denzin (1989) as the studied use of living documents set that describes significant moments in the lives of people. These documents include autobiographies, biographies, letters, obituaries, life histories, oral histories, personal experiences. The main subject of biographical methods is to collect the experiences of people. Within this approach life stories are included

The life story has been used in different disciplines with different goals therefore be said to have an instrumental character. The life story corresponds to the written or spoken enunciation by a narrator of his life or part of it (Cornejo, Mendoza and Rojas, 2008).

The autobiography is a story of an individual with itself, it differs from the history of life in which the latest requires the intervention of an interviewer in the process of data collection that actively solicits the account of the experiences and ways of seeing the person and builds the life story as a final product (Behar, 1991). Autobiography instead, it is the story of the personal story told by the individual without the intervention of the researcher, written in first person. In this study participants were also asked to write

this story to supplement the stories and interviews so we could have more information to have a wider and clearer vision.

Information data was analyzed by the main investigators and three external judges (all of them scholars in the field of gifted education) who reviewed the transcripts and the products of the participants. After analyzing, reflection and discussion about the main ideas expressed by participants, they agreed to establish six major avenues of discussion that helped organized results: their concept of creativity, emotional drive, family influences, educational experience, challenges and attitude towards rules and regulations.

1. Participants

All participants lived in the Mayan (southeast) part of Mexico. The selection of participants was based on three provisions. The first, that they had some degree of social recognition as expressed by at least 2 other colleagues in the same field. The second is that they considered themselves as creative individuals; and the third was that they were willing to voluntarily participate in the study by sharing both their time and some products with the investigators.

1) Artistic field

This category includes participants who have developed and demonstrated their creativity in the artistic world. Pseudonyms are used to keep the anonymity and confidentiality of the information, due exception of the puppeteer, who authorized (and demanded) to disclose his identity.

(1) Dancer

Vanesa, dancer and choreographer, is a 40 years old lady, who began studying classical dance at four years of age by prescription because of a problem in the knees, but was gradually discovering her passion for dance, at 13 years old danced in abroad in dance companies from the USA and Cuba. She has received several awards at the state, national and international level and currently has her own academy which trains

dancers of high performance.

She relates: Dance is the way the human being transcends above all time, all cultures and all nations, is the hidden language of the soul, is a poem in which each movement is a word, where each day humans challenge themselves to be better than yesterday, and where every being differs from others by its technique, dedication and above all its passion.

(2) Puppeteer

Gilberto is a young man of 35 years. He is the youngest of three brothers, although there is no artist in his family, he demonstrated passion for acting in an early age. Gilberto belongs to the International Union of Puppeteers (UNIMA), he also he represented Mexico at an international conference of puppeteers in Cuba. Fond of the arts since he was a child, he has participated in works school, declamation contests and public speaking.

At age 8 he enters a theater workshop, at the same time worked on a radio program where he doubled voices of storybook characters. Later, he entered the State Center for Fine Arts. Then recorded a CD which was distributed throughout the Mexican Republic and Central America. At the age of 14, he entered a puppeteers group that hitherto accounts for more than 50 productions with more than 100 performances each. He also has participated in the theater workshop and a puppet group ascribed to Sesame Street Mexico.

He is a licensed psychologist with a degree in family and couple therapy, currently shares the private consultation with the teaching of subjects such as psychology, research methodology and human relations. Besides running his own show for children's events, collaborates in an editorial group as storyteller.

Investigators were impressed by his love for art, puppetry and his training in psychology was reflected in his creations.

(3) Painter

Joseph is a 50-year-old man, he is a friendly person, simple and quiet. His eyes are wide probably because they are capturing lights, shades, nuances, features and

movements. He claims that his sight is meant to visualize a canvas to be treated with “brushes and spatulas”.

He is an artist whose voice falls largely within the impressionist-expressionist tradition. He claims that his art responds to his Mayan ancestral roots and the world beyond.

His family consists of his parents, older sister and 2 younger sisters. He studied at the Fine Arts Institute and since age 13 he discovered his passion for drawing; which led him to decide to be a painter, so it has taken 30 years of his life dedicated to this art, his family has always supported him in his decisions.

His first painting is dated 1984 and he has been able to do, what few painters can: live from the sale of his paintings. He paints much and his collection has appeared in 37 local, national and international exhibitions. Being 50 years old, his work has been exhibited around the world in places like Amsterdam, New York, New Delhi, China, Belgium and Paris. Some of his paintings show landscapes, inspired and located in the state of Yucatan.

2) Scientific field

In this section, three participants who have made significant innovations in science are included with an overview of their creative process, factors, context, experiences and circumstance.

(1) Electrical engineer

Joaquin is a 30-year-old young man, he majored in electrical engineering and currently works for an American company, giving maintenance to x-ray security equipment at airports around the world.

Joaquin from an early age discovered that he makes things different than others. For instance, he noticed that he had the ability to find unconventional ways to achieve their goals, he also liked to challenge teachers by choosing different alternatives to perform the exercises assigned to the group and usually reaching the same result.

He likes math and has become a prominent mathematician. The concept of challenge has a key meaning for him: anything that he develops must be based on challenge.

He refers that his parents influenced his creativity. He claims that he inherited his intellectual capacity from his mother, and his psychomotor abilities from his father. The ability to use his hands to create has lead him to acquire very good jobs: a perfect combination. Currently he has the ability to fix, repair, understand, study and learn, constantly developing new techniques for innovation.

His passion is understanding mechanical puzzles, anything moving that involves the design, construction and manufacturing of a device. He asserts that he discovered this since childhood from observing cars, engines, motorcycles and trains. His father worked in railroads, and he often visited him in order to get a chance to ride in the train and play.

His greatest achievement has been the design and manufacturing of one of the first prototypes in Mexico of an energy saving LED bulb.

(2) Biologist

Mary, a biologist of 57 years, born in México City, is the second of five children. For more than 22 years she has focused on botanical research and environmental education, her love for nature has been evident in every project she has carried out. Her main achievement has been the design and creation of a well-known botanical garden in the south-east of Mexico.

She claims that her love for nature was instilled as a child, when living in the suburbs of Mexico City, and she had frequent opportunities to visit the nearby national park.

She relates that as an adolescent the atmosphere of the school was sad and dark. She attended a quite strict French school. She attributes her rebelliousness to the desire to fight for change, and adds “I decided to study biology in order to live outside Mexico City”.

(3) Social scientist

Manuel is a man of 52 years old, born in Barcelona, Spain, but he has lived in Mexico for 25 years. He is a doctor in anthropological sciences and focuses in modern history and cultural anthropology. He has worked as a researcher in social sciences, an

area which has been finished numerous studies are reflected in a vast scientific production and currently he is recognized by the national roster of scientific researchers in Mexico.

He is the youngest of 2 brothers. His parents' childhood was marked by the Spanish civil war. He argues that his dedication and commitment have been essential to achieve his goals, one of them was to move from Europe to Mexico.

He relates. "I have a memory of Barcelona which is very gray. Everything was gray: the buildings the school robe etc.". He argues: during periods of dictatorship, in many places, there are great creators, for instance the best writers aroused in behind the Berlin wall.

III. Results

〈Table 1〉 Their concept of creativity

Participant	Discourse
Dancer	For me creativity is to combine elements to create new things and fit harmoniously, bring new ideas. Creativity is something that can develop but I think there are people for whom it is easier from the beginning, you are given more easily, for example, I discovered along the way.
Puppeteer	We tend to think that creativity is an object created and tangible, but I think it is a thinking skill that ends reflected in the practice of those who live or run. We are born to be creative and environments in which we evolved encourage or restrict it. A creative person is free and risky.
Painter	It is an opportunity to see, feel and enjoy things, said a thinker: we all eat and drink but few know to discern the flavors it is to see beneath the appearances of things and have the power to transform, structuring of bring it to reality.
Electrical engineer	I think we all have the innate creativity in different departments, such as the theory of multiple intelligences, all human beings are smart just not in the same area then based on that intelligence I think there your creativity is.
Biologist	Children are creative, but society is responsible for curtailing the creativity. I think: a creative person is a person who dares to make different approaches. We all have at least a minimum degree of creative and up to us to develop it.
Social scientist	It is the ability to do things that not everyone has the ability to do. Someone whocandodifferentthingsindifferentfields.

In general, most of them agree that everybody can be creative in different fields, but creativity needs nurture and motivation to develop. Interestingly, they argued that creativity is multidimensional and that can be depicted as an attitude of freedom and a disposition to risk.

This follows Marin (2011) and Waisburd (2000), who characterized creativity as a natural talent, an innate potential. They also posit that all human beings are potentially creators

〈Table 2〉 Emotional drive

Participant	Discourse
Dancer	I have moments of depression and it is when the ideas arise, I get no sleep stages and that is when creativity emerges. When we are in a dance class, it is an escape, you can feel overwhelmed, but when you start the class, your brain is thinking about something else.
Puppeteer	I feel completely happy, I enjoy what I do and that makes me feel fulfilled.
Painter	I experience a feeling of fullness, I enjoy life, enjoy what I do.
Electrical engineer	I feel I've evolved, I am happy, something that makes me feel comfortable is that at my young age, I feel close to where I want to be.
Biologist	I am very satisfied with what I have achieved, I feel very happy, very lucky and grateful.
Social Scientist	Now I feel very happy, but it is not always so AtthispointIcheckmylifetimeandmywork.

All participants recognize a feeling of pleasure and enjoyment during the creative process, a sense of comfort and satisfaction during times when they are creating. Thus, motivation is key to all of them. Curiously, the dancer mentioned that the moments of depression, usually their most creative moments, sadness seems to drive her to create. This is consistent with Csikszentmihalyi (1997) reports that openness and sensitivity of creative individuals exposes them to suffering and pain, as in the case of the dancer, but also leads to a lot of enjoyment

〈Table 3〉 Family influences

Participant	Discourse
Dancer	My dad's family was very artist My mom influenced, supported and helped me be consistent. I was surrounded by the media, my cousins were gymnasts and dancers
Puppeteer	In my family there is no artists but the fact that my mom would let me do whatever I wanted, that was the first factor in the development of my creativity.
Painter	Art took me away from my family, I like living alone, I feel I produce more.
Electrical engineer	My grandfather was a carpenter, seeing that grabs a piece of wood and into something different, I was curious. My family said it was a destroyer, I was labeled, but now, the destroyer is something good.
Biologist	Being with my kids and know other things gave me ideas that education is not only information and learning what they say in books, if not, is to experience other things.
Social Scientist	I come from a family losing the Spanish civil war, then the losers were such, that means we did not have much chance as others. Then the realization of my studies is an effort of my family, I was surrounded by books.

They all claim that the family had an enormous influence on their attitudes and decisions. In general, they came from families that allowed them to express themselves freely set the tone for discover and explore their capabilities.

〈Table 4〉 Educational experience

Participant	Discourse
Dancer	I never liked school, School is not something that makes me happy. My mom told me I had to study before dance class, so I had to study for a degree and thus I reached a master degree.
Puppeteer	The teachers told us (the most creative students) you cannot, you'll get out of the classroom. We were the most terrible of the school halls.
Painter	The school did not influence my further training. Some of my teachers in elementary school enjoyed what I did, but did not have the capacity to address, because they were not masters in this specialty.
Electrical engineer	It was hard for me to survive in the academic environment, I am rebellious and undisciplined.
Biologist	I remember my school rather gray, sad, old, and dark, it was an old building. It was a very traditional and very behaviorist teaching, teachers punished you, and you were educated based on fear.
Social Scientist	It was until high school when I enrolled in an institution with great teachers of literature, philosophy, history, geography and Latin, it was a useful stage in my training, in that period of three years I decided to study history, that attracted me.

Many encountered difficulties, dissatisfactions and in the best scenario they did not find the schools challenging and friendly to their creative potential. However, formal education was better valued. In the artistic domain formal education was even less important, they had to look for these learning outside the school environment.

An interesting fact is that the two participants who reported having the most rigid education (biologist and social scientist) were the two who used their creative abilities the latest in life. In this regard, Robinson (2011) states that "the challenge today is to transform education systems better to fit the needs of the XXI century. On the basis of this transformation must be a radically different view of human intelligence and creativity "(p. 36). The same author notes that everyone is born with a wealth of skills, but few discover and develop them appropriately. "The paradox is that one of the main reasons for this waste of talent is the process itself that is supposed to be to develop: education" (p. 27).

The puppeteer argued: "I believe in the theory of multiple intelligences of Howard Gardner and I think that schools do not explore, discover, encourage or value all the intelligences or at least to promote the child's contact with his own knowledge of that intelligence to at that time the child grips the taste and finds its way in music, art or mathematics.

The engineer suggested: If I think of schools now, I've always thought that the educational model has to be, rather than separatist, inclusive; currently classified in studious people, in lazy people, people that know or people who do not know and perhaps should be classified by type of skills and teaching according to each person, they can integrate various people such as; people who are visual with hearing people, but the teaching method should be focused on all types of skills.

The biologist says, "I would like the schools to be more participatory, to ask the children more what they want to learn, what interests them, which gives them curiosity to know, that they also participate in the construction of their own learning and also to be more vivid. Another thing that she also would add is to give more affection to children. Put an attractive, nice garden, have an area of vegetables".

The painter suggests: "That there should be more artistic activities and leave them freer. To begin ... to change the time of entry, for a child at seven in the morning, his brain has not awakened, he is sleepy and spends all that time trying to wake.

The social researcher advocates to provide greater initiative to the students since they are expecting to receive, reproduce, and not to propose. This is reflected in the attitude with which students come because they have prior learning from previous schools that prevents them of being creative.

〈Table 5〉 Challenges

Participant	Discourse
Dancer	They told me that I cannot do it; thus, I like to show them that I can. I work hard.
Puppeteer	They are the motivation of life, who do not set challenges do not live.
Painter	To me instead of challenges are commitments that I have to make, I like challenges, I say they will naturally emerging to cash them overcome, I know there are things I will not be able to do because our society, Even children society have them very limited.
Electrical engineer	They produce pleasure on me, I think if there is a keyword for me it is that, the word challenge in me plays a fundamental role
Biologist	The challenge is to go out the statement to improve.
Social scientist	It's something that must have every human being is related to the ambition but not necessarily have to be economic, ambition to achieve goals that can be based on knowledge, labor, or profession. The challenges are overcome things.

It can be seen that the all six participants have high achievement motivation which is reflected in their taste for challenges and taking over complex tasks that demand their skills and talents, they function as a motor or a source of inspiration that encourages them to create and produce.

This goes hand in hand with the observation of Mitjans (1990) when she states that creative people have a strong intrinsic motivational impulse that is characterized by a great intellectual curiosity, love about creation, delivery and passion.

A common trait can be depicted as some degree of rebellion and indiscipline, necessary to break patterns, rules and structures that allow them to scale their work and innovate in their area of Expertise. However, they also need the discipline to give meaning and direction to their projects and processes. This relates to the paradox mentioned by Csikszentmihalyi when depicts a creative person as rebellious and independent but at the same time, traditional and rule abiding.

〈Table 6〉 Attitude toward regulations

Participant	Discourse
Dancer	Inside the hall I meet rules ever, I have never got reluctant, never had problems with any teacher. But in life I never do what I should do, I do what I please, even it is wrong. If I do not do things like, that would not be happy.
Puppeteer	As they say the rules are made to be broken, I can hardly go into the rules, but I think: The rules make us function in society, then I also like to function in society..
Painter	Sometimes I do not know, do not interest me.
Electrical engineer	I do not follow them, make my own rules in almost everything from the simplest to the most complicated
Biologist	I believe that standards are important to live in society but also depends a lot on how we understand the concept and are met.
Social Scientist	I have met them and I have been enforced because they has also touched me, but the rules are to be broken so in case of social norms, it depends on what they are.

IV. Discussion

Many lessons can be learned from the life stories and accounts of these six highly creative individuals. The first reflection has to do with the concept of creativity itself.

There is not a consensus in what is creativity for them. For some it is an attitude towards life, for others it is an emotional state, even a life style described as risky and adventuresome. Indeed, creativity is multidimensional and differentiated by the field or context in which it developed.

Second, the emotional drive is the fuel for the motor of creativity regardless of the field. Whereas participants in the artistic field speak in their stories of moments of isolation, loneliness, introspection and even depression; but they also recognize the value of social life and the interactions with others.

Third, families all had an enormous influence on the development of creativity, the familiar context of freedom allowed them to express themselves freely, set the tone to discover and explore their capabilities.

Fourth, educational experiences were in general not completely satisfactory and in all

six cases there was a sense of unfinished business. The school was not enough for them to achieve and deploy their creative abilities. The role of teachers in the school was important for them, apparently, the fact that someone recognized and valued their talent reinforced their creative vocation.

Fifth, there is a sense of success in all of them, participants faced and overcame challenges in their life and they have the feeling of being victorious and triumphant.

Interestingly, a common factor in these life stories is the rebelliousness and lack of conformity with the status qua, the constant questioning of rules and regulations. However, they all recognize the value of hard work, social adaptation, and the respect of the law to fully succeed in life.

Results suggest that life stories and biographical methods are promising approaches towards understanding the origins, evolution and nature of the creative process.

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전공 및 관심분야 : Personality traits, Creativity

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