

Relationship between Creativity, Personality and Entrepreneurship: An Exploratory Study

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Abstract

In the entrepreneurship field, the study of entrepreneurial opportunities has been a topic of interest, however, the origin and nature of these opportunities, from the perspective of the person who identifies them, has not been sufficiently studied. The aim of this study was to explore the relationship between the preference of the person in the creative process when he identifies an entrepreneurial opportunity and how he organizes and processes the information to take advantage of that opportunity. Another objective is to analyze the personality traits associated with the creative process and thinking style. To explore these relationships, the responses of 183 people who participated in a contest of business ideas were analyzed. Statistical analysis showed that the strongest relationship between the creative process and thinking style was between Sufficiency of Originality and Ideator variables. The same variables also showed the greatest association with the personality traits of those who participated in the study. Other relationships between the creative process, thinking style and personality traits and their implications are also shown.

Keywords: creative problem solving, creativity, entrepreneurs, foresight, opportunities, personality

1. Introduction

Rapid technological change, globalization and disruption, have originated changing circumstances, chaos, confusion, inconsistencies, delays or benefits, knowledge or information gaps, that in the interest of some people, have originated in entrepreneurial opportunities (Eckhardt & Shane, 2003). The proposal to create and introduce new products and services in the market is a response to a problem or need that a person has identified. In this process, creativity and innovation are very important (Pretorius, Millard, & Kruger, 2005). That is why, solving problems creatively is essential in the entrepreneurship field, where the interest is in knowing how, by whom, and with what effects opportunities to create future goods and services are discovered and evaluated (Shane & Venkataraman, 2000).

Generally, Creative Problem Solving (CPS) refers to any activity during which a person, team or organization tries to generate a novel solution to a problem that has not been fully identified (Puccio, 1999). In this process, creativity plays an important role in conceiving new ideas and offering solutions that can be implemented and be result-oriented. Accordingly, Baer (2012) mentions that creativity is determinant for innovation. Leibold, Voelpel, and Tekie (2004) argue that creativity, knowledge and new ideas help establish business models that are more competitive.

In fact, creativity is considered a complex construct. Unsworth (2001) notes that creativity is not homogeneous, making it difficult to understand, since it is a function of several factors -person, process and environment, which can be related to tangible aspects such as a product or the generation of innovative ideas. For Runco (2007), creativity is a personality trait and a cognitive ability. However, creativity is determined by the personality and other factors (Muñoz-Doyague, Gonzalez-Alvarez, & Nieto, 2008).

In the entrepreneurship field, the study of the individual-opportunity binomial has been important throughout the years (Busenitz, Plummer, Klotz, Shahzad, & Rhoads, 2014). However, despite being several the studies that have addressed the study of this pair, the contribution of the creative person in this work has not been openly considered. It seems that the creative person, as an object of study, is of more importance in the field of creativity than that of entrepreneurship. Creativity is a quality that is attributed to many people, but especially entrepreneurs (Morris & Kuratko, 2002). Creative people have different personality traits from other people, so they have a greater ability to generate new ideas (Cervone & Pervin, 2008), aspects that are fundamental when the discovery of entrepreneurial opportunities is studied.

Therefore, this research is based on the claim that creativity is multifaceted and must be integrally explored. So, in order to understand their contribution to the discovery of entrepreneurial opportunities, the influence of distinctive aspects of people, elements of the creative process, product features and characteristics of the environment are analyzed. To this end, this paper is based on research traditions or paradigms in the field of creativity to study a central theme and of present topicality in the entrepreneurship field.

Particularly, the CPS model and creative thinking style, combined with personality traits, are visualized as tools that can help better understand what happens in the initial stage of the entrepreneurial process, which corresponds to the discovery of opportunities and up until today, the literature has not given sufficient explanation to how entrepreneurial opportunities arise. The purpose of this paper is twofold. First, to explore the relationship between the CPS model and the creative thinking style. Second, to examine the personality traits associated to the CPS model and to creative thinking style, both in a specific context.

To achieve these objectives, the paper is organized as follows: After the introduction, a literature review is done and the working hypothesis are established. Then, the methodology followed in this research is explained to then move on to the description of results. In a final section, we discuss the results and the conclusion of the work

2. Literature Review and Hypothesis

In 1953, Osborn developed the CPS model. This model provided a structured set of principles, tools and stages of the creative thinking framework. The initial objective of Osborn (1953) was to help individuals and teams to solve complex problems. The original model included seven steps: (1) Orientation-pointing up the problem; (2) Preparation-gathering pertinent data; (3) Relevant Analysis-breaking down the relevant material; (4) Hypothesis-piling up alternatives by way of ideas, (5) Incubation-letting up to invite illumination; (6) Synthesis-putting the pieces together; and (7) Verification- judging the resultant ideas.

Since its introduction, the CPS model has been an object of study and ongoing review, which is why it has been identified as one of the most used to stimulate and develop creative thinking skills (Scott, Leritz, & Mumford, 2004). The work of Isaksen and Treffinger (2004), Puccio, Murdock and Mance (2005) and Puccio, Firestein, Coyle and Massuci (2006) show a chronological review of the CPS model and the different models and proposals that have been derived from it. The conclusion of Puccio et al. (2005) in this regard was different models from the same genetic stock.

Currently, there are different versions of the CPS model that include various stages of the creative process (Puccio, Murdock, & Mance, 2007; Isaksen, Dorval, & Treffinger, 1994; Basadur, Runco, & Vega, 2000). In this sense, Puccio (1999) explored whether people had cognitive preferences for different stages of the CPS model and his findings can be summarized in three principles: (1) The creative process is a way of thinking and problem solving is a capability that every person has; (2) The creative process involves a series of mental operations that can be identified; (3) People have different preferences for different mental operations (i.e., cognitive styles), so it is expected that they have preferences for different stages of the CPS model.

These principles guided the development of a self-assessment tool that would help identify the preferences of a person for the stages of the CPS model. This tool is known as FourSight. Its origin can be located in the Buffalo Creative Process Inventory (BCPI) and it identifies four stages in the creative process (Puccio, 2002; Puccio & Grivas, 2009). These stages are known as problem clarification, idea generation, solution development, and implementation. DeCusatis (2008) summarizes very well every stage of FourSight. These are discussed below: (1) Clarify the situation- clarifying a situation means to bring a problem, challenge or opportunity to its most granular level; (2) Generate ideas- generating ideas, or fluid ideating, requires divergent thinking. Divergent thinking is about looking at the big picture, and playing with potentially abstract concepts that stretch our imagination; (3) Develop a solution- Select a promising idea (or series of ideas), and make it a workable solution is about giving the idea(s) the support required to develop them; (4) Implement a plan- implementation is about giving structure to the idea until it becomes a reality.

On the other hand, in 1976 Kirton developed a cognitive based theory of creativity, in which, instead of focusing on the type of cognition associated with steps of the CPS model, it focused on the expression of creativity through cognitive styles qualitatively different. A cognitive style refers to the different ways in which a person prefers to organize and process information (Messick, 1984). In other words, it is an individual's preferred style to solve problems and it is highly resistant to change (Kirton, 1994).

Kirton's theory (1976, 2003) is interested in the cognitive style that people predominantly use. The theoretical continuum of Kirton goes from an adaptive preference, in which it is preferred to work within the current scheme to improve it, to an innovative orientation, which seeks to go beyond the current paradigm or system. Kirton's theory, unlike other theories of creativity, analyzes the different forms of creative expression, so both styles (adaptive or innovative) are equally important and necessary for the proper functioning of any organization (Isaksen, Lauer, & Wilson, 2003).

Kirton (1976) developed a scale to measure creative thinking style, the Kirton Adaption-Innovation Inventory (KAI), which includes three subscales. The first one is known as Sufficiency of Originality (SO), which assesses the degree to which a person prefers to generate original ideas when faced with a problem (an innovative trend) or, focus on a small number of more viable ideas (a tendency of adaptation). The second subscale is Efficiency (EFF), which marks a preference for detail, accuracy, thoroughness and reliability. Finally, the third subscale called Rule/Group Conformity (RGC), which considers the preference for working with standards, guidelines or systems in organizational structures within which problem solving occurs.

Previous studies have already linked the CPS model with the theory of Kirton. Puccio (1999) was the first to perform work in this line of research by stating that people have preferences for different cognitive processes, thus having preferences for certain stages of the CPS model. Rickards and Puccio (1992) found that adapters and innovators make their best contribution to the solution of problems in different stages of the CPS. Moreover, McFadzean (1998) finds that adapters and innovators prefer to use different tools to help in the solution of problems. In this line of thought, Puccio (1999) found a relationship between the EFF subscale in the theory of Kirton and clarifier stage in FourSight, results that were subsequently corroborated (Puccio, 2002). The above analysis makes it possible to deduce that there is a relationship between the CPS model and creative thinking style. Therefore, more formally, the following hypothesis is established:

Hypothesis 1: People, when identifying an entrepreneurial opportunity, have cognitive preferences in the creative process that are related to their thinking style.

One important aspect that is not openly considered when working with creative thinking style and the CPS model are the distinctive traits of those who carry out these processes. In the latest CPS model made by Puccio et al. (2007), it is mentioned that some mental abilities and affective qualities may favor the execution of some stages of the CPS model. In this sense, Puccio and Grivas (2009) comment that personality traits can help uncover the emotional qualities associated with creativity, both in its style and its process. Martinsen and Kaufmann (1999) stated "cognitive style can be placed at the intersection between personality and cognition" (p. 274).

Personality is a singular trait exhibited by an individual who is defined because of his dynamic interaction with the environment (Cervone & Pervin, 2008). Personality traits can be categorized and ranked based on its intercorrelations (DeYoung, Quilty, & Peterson, 2007). The arrangement of these categories has been a central theme among those who have studied personality throughout the years. Significant progress has been made, which has led to a reasonable degree of consensus as to the composition of a suitable categorization scheme. The Five Factor Model (FFM) or Big Five is one of the most widely used classification systems of personality traits. The origin of this model can be found in the work of Fiske (1949) and during the following decades, several studies have confirmed its stability in a structure of five factors (Costa & McCrea, 1992; Digman, 1990; Goldberg, 1992; John & Srivastava, 1999; Funder, 2001; Judge, Bono, Ilies, & Gerhardt, 2002; Rantanen, Metsapelto, Feldt, Pulkkinen, & Kokko, 2007; Furham, 2008). Nowadays, there are different measures of the five factors. However, they all share the same fundamental factors.

McCrea and Costa (1987) provide a good summary of each of these factors, which is mentioned below: 1) Neuroticism-it reflects the tendency to be anxious, defensive, insecure, and emotional. Neurotics possess facets such as angry hostility, depression, self-consciousness, impulsiveness and vulnerability; (2) Extraversion-individuals with an extraversion personality are social, assertive, active, bold, energetic and adventurous. Extroverts are dominant in their behavior and expressive when interacting with others; (3) Openness to experience-individuals whose personality is marked by an openness to experience possess traits like imagination, unconventionality, autonomy, creativity and divergent thinking. Openness to experience

encompasses aspects like fantasy, feelings, actions, ideas and values; (4) Agreeableness-Agreeable individuals are altruistic, warm, generous, trusting and cooperative. Agreeableness includes dimensions like trust, straightforwardness, altruism, compliance, modesty and tender-mindedness; (5) Conscientiousness-Conscientiousness encompasses dependability, responsibility, dutifulness, deliberation, achievement orientation and a concern for following established rules. They are cautious, thoughtful and have a tendency to strictly adhere to standards of conduct.

FFM's popularity has caused it to be used in different research projects, contexts and cultures throughout time. The interest of this study is its relationship with creativity. Several studies have already approached and described results of this relationship. For instance, King and Anderson (2002) mention that the creative personality is associated with tolerance for ambiguity, originality, intelligence above average and determination for success. Moreover, Feist (1998, p. 299) mentions, "creative people are more autonomous, introverted, open to new experiences, norm doubting, self-confident, self-accepting, driven, ambitious, dominant, hostile and impulsive". Divergent thinking is usually associated with creativity because it stimulates the generation of new ideas and radical problem solving (Im, Montoya, & Workman, Jr., 2013). It has also been found that creative thinking style and spontaneity are associated with certain personality attributes (Kelly, 2006).

It appears that extraversion and openness to experience are positively related to creativity. However, different results cannot affirm this. This diversity of outcomes can be attributed to dimensions of context, sample selection and other related factors. As reported by Prabhu, Sutton and Sauser (2008), a creative personality changes over time and from one professional field to the other. Therefore, this research establishes the following assumptions:

Hypothesis 2: The personality traits of who identifies an entrepreneurial opportunity are associated with cognitive stages of the creative process.

Hypothesis 3: The personality traits of who identifies an entrepreneurial opportunity are associated with elements of his creative thinking style.

3. Research Methodology

3.1 Participants

The study involved the participation of 183 people, of whom 65 were women and 118 were men. The average age of participants was 24 years and they all had professional studies. The main academic background of participants was business administration, marketing, international business, information technology management, economics, hotels and restaurants management, accounting, architecture, industrial engineering, electronic engineering and logistics engineering.

The identification of this group of people was through the registration process to an entrepreneurial opportunity contest in 2013 and 2014. A requirement for participation in this contest was the delivery of a written report with the proposal of an entrepreneurial opportunity.

The report was supposed to be no more than 10 pages long and it had to describe the opportunity around five areas: strategic definition, market and competition, operations, organization and financing. Thus, the product of the creativity was controlled. In other words, the document described the development of an entrepreneurial opportunity. It is worth mentioning that for the purposes of this research, the content of the proposals that were registered for the contest were unknown.

Regarding the creative environment, it is also necessary to mention that all contest participants attended informative talks, in which they were provided with an explanation of the contents of the proposal as well as individual sessions and group work with the purpose of clarifying doubts and discussing the proposals.

3.2 Data Collection

Data collection was conducted through a questionnaire that was prepared specifically for this project. The questionnaire included the three dimensions of interest to this research: CPS model, creative thinking style and personality traits. Questionnaires were sent electronically through the contest organizers, so that the use of the electronic version could contribute to obtain a greater response. Initially the questionnaire was sent to 208 participants. However, 183 responses were received and it was with these participants that the data analysis was developed. As suggested by Armstrong and Overton (1977), an analysis was performed to identify whether there was a difference between those who answered the questionnaire at the beginning or at the end of the data collection period. The results confirmed that there was no bias, therefore making the combination of data obtained from questionnaires possible.

3.3 Measurements

The measurement of the model CPS was conducted with FourSight, which consists of 36 statements that are divided into four subscales and describe the activities associated with different stages of the creative process: clarifier, ideator, developer and implementer. For each statement, the person responds to how descriptive it is the activity performed to solve problems creatively, seeking to identify the major preference. Responses are assessed with a Five point Likert scale ranging from “not like me at all” to “very much like me.” The average for each subscale represents the evaluation of each person.

To measure creative thinking style, KAI scale, which stems from the theory of Kirton (1976, 2003) was used. The KAI scale consists of 32 statements, of which 13 of them measure the SO, 7 measure the EFF and 12 measure the RGC. For each statement, the person responds on a Five-point Likert scale according to how much you agree with each statement. As in the FourSight, the average in each subscale represents the evaluation of each person.

Personality was measured with the 50-item scale International Personality Item Pool that measures the five broad domains of the FFM (IPIP, 1999). The item pool was developed as part of an international collaborative effort to develop broad-bandwidth, noncommercial measurement instruments which can be freely compared to other instruments, and refined over time (Goldberg, 1999). Participants are presented with statements and are asked to indicate how accurately each one describes them on a five-point Likert scale.

3.4 Data Analysis

For data analysis, first normality distributions were revised by observing the values in the Skewness and Kurtosis tests. Skewness values higher than 2 and higher than 7 on Kurtosis test were not obtained. The values of arithmetic mean and standard deviation of the distributions of each construct were analyzed.

Initially the Cronbach's alpha were evaluated to determine the internal validity of the variables and consequently of the constructs, finding acceptable values of above 0.7 (Hair, Black, Babin, & Anderson, 2007). Despite the tradition in different measurement scales that were used in this work and which confirm the study's reliability, a confirmatory factor analysis was conducted. The tests used were χ^2/df , Goodness-of-Fit Index (GFI) (Jöreskog & Sörbom, 1996) and the Comparative Fit Index (CFI) (Bentler, 1992). The threshold for χ^2/df should be less than three or less than two in a more restrictive sense (Premkumar & King, 1994). The GFI and CFI values should be above 0.90 (Jöreskog & Sörbom, 1996). It was decided to observe another index, specifically the AVE (Average Variance Extracted), which assesses the convergent validity of the variables and must have values of over 0.5, in order to explain more than half of the variance of its items (Hair et al., 2007).

A correlation analysis was conducted to determine the degree of relationship between variables of the CPS model and the creative thinking style. Moreover, there was a multiple linear regression analysis to determine the degree of association between the variables of this study. In this sense, each of the components of the FourSight and the KAI were treated as independent variables. The independent variables in the regression model were each element of the FFM. Considering the possibility that there existed multicollinearity, the tolerance and the Variance Inflation Factor (VIF) tests were developed. A value of less than 0.20 tolerance and VIF value that exceeded 5 indicated a problem of multicollinearity (O'Brien, 2007). The results indicate that the regression in this study had no problems of multicollinearity.

4. Results

Table 1 presents the results of the descriptive statistics, Cronbach's alpha values, confirmatory factor analysis and convergent validity. Through the evaluation of the values presented in Table 1 shows that the internal validity of all constructs was satisfactory (Cronbach's alpha) because values of above 0.7 were observed. Regarding the confirmatory factor analysis, Table 1 shows that the FourSight, KAI and FFM obtained good adjustment in each of the three evaluation models thus values within the recommended limits were obtained. All the factors of all the items of the constructs were loaded into acceptable and significant ranges of $p = 0.01$, whose range was between 0.63 and 0.84 indicating a convergent validity (Anderson & Gerbin, 1988). Finally, all AVE values are satisfactory since they are higher than 0.5.

Table 1. Descriptive statistics and confirmatory factor analysis

	Variable	M	SD	α	χ^2/df	GFI	CFI	AVE
FourSight	Clarifier	3.86	0.83	0.80	2.81	0.94	0.95	0.56
	Ideator	4.02	0.57	0.82				0.63
	Developer	3.44	0.98	0.79				0.61
	Implementer	3.11	1.28	0.73				0.59
KAI	SO	4.22	0.51	0.85	1.98	0.91	0.93	0.63
	EFF	3.91	0.77	0.80				0.55
	RGC	4.07	0.62	0.78				0.54
FFM	Neuroticism	3.01	1.11	0.82	1.87	0.96	0.94	0.62
	Extraversion	3.88	1.35	0.83				0.60
	Openess to experience	4.15	0.78	0.84				0.58
	Agreeableness	3.73	1.05	0.81				0.54
	Conscientiousness	4.01	0.54	0.89				0.55

In an initial analysis based on the means and standard deviation, it can be observed that the respondents to the Ideator variable of the FourSight obtained a higher average value. Regarding the general preference between Adaptive and Innovative, which helps identify the KAI scale, the sample showed an average value of 112.5, indicating a slight orientation to innovation. Finally, of the five variables of FFM, Openness to Experience obtained a higher average.

Table 2 shows the relationship between the variables of FourSight and KAI. In the analysis, five correlation coefficients could be identified and which resulted statistically significant. The most striking correlation was between SO and Ideator ($r = 0.33$, $p < 0.01$). Also, SO showed a significant correlation with the Clarifier stage ($r = 0.22$, $p < 0.05$). The other variable that is also significantly correlated with two stages of FourSight was RGC. One was with the Developer stage ($r = 0.23$, $p < 0.05$) and the other was with the Implementer stage ($r = 0.21$; $p < 0.01$). Finally, a significant relationship between EFF and Ideator was also found ($r = -0.24$, $p < 0.05$).

Table 2. Correlation coefficients between FourSight and KAI

KAI	FourSight			
	Clarifier	Ideator	Developer	Implementer
SO	0.22**	0.33***	-0.08**	-0.09**
EFF	0.12**	-0.24**	-0.11**	-0.06**
RGC	-0.09*	-0.14*	0.23**	0.21***

Note. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

With the results in Tables 1 and 2, Hypothesis 1 of this research can be confirmed. It was identified that respondents to the proposals in each of the two scales, have a cognitive preference. In this case, there is a slight preference for Clarifier and Ideator of the CPS model, which in turn are correlated with a style of creative thinking that favors the SO and EFF stages. The analysis also shows the relationship between RGC with the Developer and Implementer stages of the CPS model.

Table 3 presents an analysis of the relationship between FourSight and FFM by calculating the correlation coefficients. Six of the 20 correlation coefficients were significant. Correlations were found in three dimensions of the FFM. The strongest correlation was found between Ideator and Openness to experience ($r = 0.41$, $p < 0.05$).

Table 3. Correlation coefficients between FourSight and FFM

FourSight	FFM				
	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
Clarifier	-0.25**	0.12*	0.24***	0.14**	0.22***
Ideator	-0.15**	0.18***	0.41**	-0.07**	-0.29**
Developer	0.04*	0.16**	0.28***	0.04**	0.10**
Implementer	0.11**	-0.08*	-0.09*	0.16*	0.16*

Note. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 4 shows the regression coefficients (beta) for each variable of the FourSight in relation to the five personality dimensions of the FFM, as well as total variance explained (R^2). It can be observed that six betas are statistically significant. Most of the significant relationships were associated with the Ideator stage of the FourSight. Here's something interesting to observe, as the Ideator stage is related to three dimensions of the FFM, with Extraversion ($\beta = 0.22$, $p < 0.01$), Openness to experience ($\beta = 0.31$, $p < 0.01$) and Conscientiousness ($\beta = -0.21$, $p < 0.05$). The Clarifier stage was also significantly associated with two dimensions of the FFM, although in opposite directions, Neuroticism on one hand ($\beta = -0.19$, $p < 0.05$) and on the other Conscientiousness ($\beta = 0.21$, $p < 0.05$). The Implementer stage of the FourSight reports no relationship to the FFM. Therefore, hypothesis 2 of this paper can be confirmed, because personality traits that are associated with the CPS model stages have been identified. Particularly, the greatest variance explained is found in the Openness to experience dimension of the FFM, which has a good partnership with the Ideator and Developer stages.

Table 4. Regression coefficients between FourSight and FFM

FourSight	FFM				
	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
Clarifier	-0.19**	0.15**	0.10***	0.13*	0.21**
Ideator	-0.12**	0.22***	0.31***	-0.05*	-0.24**
Developer	-0.08*	0.28**	0.24***	-0.09*	0.13**
Implementer	0.09*	-0.10**	0.13**	0.11*	0.04*
R^2	0.13	0.15	0.21	0.09	0.19
Adjusted R^2	0.11	0.12	0.19	0.06	0.18

Note. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 5 shows the correlation coefficients between KAI and FFM. Four correlation coefficients were statistically significant. Correlations were found in three dimensions of the FFM. The SO variable was best related to FFM, being the Conscientiousness dimension ($r = -0.34$, $p < 0.05$) the most related. It was also related to the dimensions Openness to experience ($r = 0.32$, $p < 0.01$) and Extraversion ($r = 0.19$, $p < 0.01$). A significant relationship between RGC and Conscientiousness was also found ($r = 0.27$, $p < 0.05$).

Table 5. Correlation coefficients between KAI and FFM

KAI	FFM				
	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
SO	-0.10**	0.19***	0.32***	0.16***	-0.34**
EFF	-0.06*	-0.12*	-0.17**	-0.11**	0.11*
RGC	0.15**	0.08*	0.13**	-0.07*	0.27**

Note. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 6 shows the regression coefficients for the three KAI variables in relation to the five personality dimensions of the FFM and the total variance explained. The variable SO had three significant relationships with FFM dimensions. The first was with Openness to experience ($\beta = 0.38$, $p < 0.01$), then Conscientiousness ($\beta = -0.26$, $p < 0.05$) and finally with Extraversion ($\beta = 0.23$, $p < 0.05$). Moreover, the Conscientiousness dimension also showed another significant relationship with the RGC ($\beta = 0.28$, $p < 0.05$) variable. With these results, we can prove hypothesis 3, since the personality traits of the respondents are associated with elements of their creative thinking style, particularly with the SO and RGC.

Table 6. Regression coefficients between KAI and FFM

KAI	FFM				
	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
SO	-0.14**	0.23**	0.38***	0.12*	-0.26**
EFF	-0.09*	-0.04*	-0.14**	-0.06**	0.08*
RGC	0.11*	-0.07*	-0.16**	-0.09**	0.28**
R ²	0.09	0.14	0.20	0.08	0.18
Adjusted R ²	0.08	0.12	0.18	0.06	0.16

Note. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

4. Discussion

The results of this work can be discussed in three aspects. The first has to do with the relationship between problem solving and thinking style that helps solve these problems creatively. This paper has provided empirical evidence linking common elements that are assessed by different scales. Specifically, the most significant relationship is found between SO-Ideator. In other words, people who identified an entrepreneurial opportunity have a slight preference for an innovative creative thinking style. In addition, this style of thinking shows a greater ability to work with the Ideator stage of the CPS model. This relationship is shown as indicated by the theory. For instance, someone who interacts better with the Ideator stage generates many ideas, notes a problem from a new angle and prefers divergent thinking (DeCusatis, 2008). An interesting aspect observed in the results is that the Ideator stage also has a significant relationship with the EFF variable, but in a negative sense. This may indicate that the more detailed and precise a person wants to be, the more the creativity variable is impaired. From this perspective, convergent thinking is negatively related to what is expected in the Ideator stage. Interestingly, the theory would point out that EFF should be more related to the Clarifier stage (Puccio, 2002), but the results indicate otherwise. One way to interpret this result is that by following an approach, which favors more viable ideas (an adaptive approach) creativeness and innovativeness may be inhibited in Kirton's terms (2003).

Another interesting aspect to mention is that the RGC variable is related to the Developer and Implementer stages. It can be concluded that people who resolved the questionnaires, with this result, take into account the need to adapt to present circumstances if necessary, in order to implement their entrepreneurial ideas. This cannot be categorically stated since the viability of the entrepreneurial opportunities identified by individuals is unknown for access to documents that were submitted by them was not provided. The results do allow to comment that a preference to follow rules or guidelines by those who identify Entrepreneurial opportunities can help them identify aspects that can facilitate or inhibit the implementation of proposals (DeCusatis, 2008). In essence, it can be stated that people who participated in this study, when identifying an entrepreneurial opportunity (initial step in solving a problem), prefer a creative thinking style which is more innovative, but when analyzing the implementation of this same opportunity (final step to problem solving) a creative thinking style which is more adaptive is more important.

The second aspect to discuss is the relationship between the CPS and FFM model. First, it is interesting that the Clarifier stage is most related to dimensions of the FFM. Moreover, the dimension Openness to experience was the most related to the stages of the CPS model. The theory would state that the Ideator stage would be the most related to the dimensions of the FFM, but the results obtained in this study would indicate otherwise. This could be interpreted by the nature of the sample that was analyzed. They were people who do better in the process of what is important and what is not, as well as in the interpretation of the history of the situation that leads them to

identify the entrepreneurial opportunity. An expected result is that the dimension Openness to experience was the most related to the stages of the CPS model, especially with the Ideator stage, similar to the results obtained by Puccio (2009).

In regard to the association of the stages of the CPS model with personality traits, the Openness to the experience and Conscientiousness dimensions resulted to be the most representative dimensions. The first one has an explanation of variance of 19%, while Conscientiousness 18%. Interesting to say is that in both variances, the Ideator stage was the most representative. Another aspect to highlight is that once again the Clarifier and the Ideator stages were the largest contributors to explain the variance in personality traits, except Agreeableness. The two dimensions in the personality of the sample analyzed offer two different explanations. Openness to experience is confirmed as a personality trait that facilitates the imagination, autonomy and divergent thinking, aspects that are critical to identifying entrepreneurial opportunities. Additionally, there was a combination of intelligence, creativity and motivation, what DeYoung, Peterson and Higgins (2005) called “cognitive motivated flexibility”. Furthermore, Openness to experience is related to a tolerance for ambiguity and a preference for complexity (McCrae & Costa, 1997), an aspect that is characteristic when identifying an entrepreneurial opportunity (Ardichvili, Cardozo, & Ray, 2003). This result sets the basis for considering that participants think in an esoteric way while fantasizing about the social value of their entrepreneurial opportunities. Thus, from these results, the importance of the CPS model in conscientiousness dimension is also observed. Chamorro-Premuzic (2006) had already discussed the importance of the orientation of achievement and perseverance in Conscientiousness, aspects that are linked to the identification of opportunities. It is not possible to determine the social nature of the entrepreneurial opportunities identified but judging by the results obtained, it may be thought that order, sense of duty and discipline distinguish people who identify entrepreneurial opportunities (Costa & McCrae, 1992). An interesting combination of the results obtained in this research, is that people who identified entrepreneurial opportunities were open to the experience and discipline. These personality traits are stronger in the initial stages of the CPS model, similar to the results obtained by Puccio and Grivas (2009).

The last part to comment on the results is the relationship between creative thinking style and personality traits. Again, SO is characteristic in the creative thinking style. Openness to experience and Conscientiousness once again stand out as personality traits. Silvia et al. (2008) had already identified a relationship between a creative thinking style and personality traits that are open to new experiences. In this sense, Batey, Chamorro-Premuzic and Furnham (2010) mention that the probability of receiving creative experiences strengthens the enthusiasm and confidence of individuals to seek new experiences, aspect that has also been discussed by Prabhu et al. (2008). Moreover, Silvia, Kaufman, Reiter-Palmon and Wigert (2011) argue that being an open person, promotes learning and adaptability, which can generate more and better quality of ideas, in this case entrepreneurial opportunities.

5. Conclusion

The results of this study show that people who have a preference for an adaptive style of thought, unlike those who prefer a style of innovative thinking, correlate differently with the stages of the CPS model. Similarly, the results also indicate that some personality traits are associated with cognitive preferences, both in the creative process of problem solving and in the creative thinking style. These associations appear as established by the theory. Particularly two stages stand out, the Clarifier and the Ideator in the CPS model and the subscale SO in the style of creative thinking. On the other hand, there are two dimensions of the FFM that also showed prominence, Openness to experience and Conscientiousness.

The relationships between these variables and dimensions provide personality profiles and cognitive skills that favor the discovery of entrepreneurial opportunities. Future research may focus on describing the degree of innovation in entrepreneurial opportunities identified. Upon including implementation of the proposal, or the innovation, it may be interesting to know how the other two stages of the CPS model behave.

The results also provide some theoretical implications that may help the entrepreneurship field, to know what steps, processes and personality traits promote creativity of entrepreneurs, which can result in bigger and better identification of entrepreneurial opportunities. Future work may investigate some of the relationships that have been identified in this study.

Finally, the profile of the sample in this study contributed to the results obtained, as they were people who participated in a contest of entrepreneurial opportunities. It would be interesting to explore the behavior of a more open sample, such as entrepreneurs who are already marketing. Moreover, the consideration of gender can also be interesting, since women may express combinations of different styles of thinking and behavior.

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