PERSONALITY TRAITS OF PROJECT MANAGERS: DIFFERENCES IN KNOWLEDGE, EXPERIENCE, AND BUSINESS SECTOR

Ralf Luis de Moura[1]
Teresa Cristina Janes Carneiro[2]
Taciana de Lemos Dias[3]
Bruno Silva Oliveira[4]

ABSTRACT

This study aims to verify if there is any difference in the personality traits of Project Managers with different professional backgrounds – training, experience, and business sector (public or private). Using as theoretical basis the Big Five personality traits, this research was conducted with 244 Project Managers who work in Brazil. The results of tests of mean differences between groups showed that Project Managers with more experience have the trait agreeableness more pronounced than managers with less experience, while Project Managers with more schooling have a higher Conscientiousness, Openness to Experience, and Emotional Stability than Managers with less schooling. Project Managers who work in the public and private sectors showed different personality traits between themselves, and only for agreeableness no significant difference was found. These findings may contribute to the targeting of selection and training policies and the development of interpersonal and technical skills for this professional.

Keywords: Personality Traits, Project, Management, Project Manager

1 Doctorate in Business Administration from the Federal University of Espírito Santo, Professor of Undergraduate and Postgraduate Studies at Espírito Santense University Center. Vitória – Espírito Santo. Brazil. Email: ralfmoura@gmail.com
ORCID: https://orcid.org/0000-0002-0170-4056
2 Doctorate in Business Administration from the COPPED Institute of UFRJ, Professor of the Postgraduate Program in Administration and Postgraduate Program in Public Management at the Federal University of Espírito Santo. Vitória – Espírito Santo. Brazil.
Email: carneiro.teresa@gmail.com. ORCID: https://orcid.org/0000-0001-9987-1460
3 Doctorate in Applied Computing by the National Institute for Space Research - INPE, Professor and Researcher at Master of Public Management and Administration program at the Federal University of Espírito Santo. Vitória – Espírito Santo. Brazil.
Email: taciana.dias@ufes.br. ORCID: https://orcid.org/0000-0002-7172-1230
4 Master in Public Management from Federal University of Espírito Santo. Vitória – Espírito Santo. Brazil.
Email: brunossf@yahoo.com.br. ORCID: https://orcid.org/0000-0001-6220-3688

RESUMO

O objetivo desta pesquisa é verificar se há diferença nos traços de personalidades dos Gerentes de Projetos com diferentes perfis profissionais - formação, tempo de experiência e setor de atuação (público ou privado). Utilizando como base teórica o Modelo dos Cinco Traços de Personalidade (Big Five Traits), a presente pesquisa foi realizada com 244 Gerentes de Projetos que atuam no Brasil. Os resultados de testes de diferenças de médias entre grupos mostraram que Gerentes de Projetos com maior tempo de experiência profissional possuem o traço Amabilidade mais acentuado do que os Gerentes com menor experiência, enquanto que Gerentes de Projetos com maior escolaridade apresentam maior Organização, Abertura à Experiência e Estabilidade Emocional do que os Gerentes com menor escolaridade. Gerentes de Projetos que atuam nos setores público e privado apresentaram traços de personalidade diferentes entre si sendo que apenas para o traço Amabilidade não foi identificada diferença significativa. Esses achados podem contribuir para o direcionamento de políticas de seleção, capacitação e desenvolvimento de habilidades interpessoais e técnicas deste profissional.

Palavras chave: Traços de Personalidade, Projetos, Gestão, Gerente de Projetos

1 INTRODUCTION

The pace of change in the business environment, especially with the adoption of technological innovations, generates the need for changes in organizations. Projects are designed and implemented to operationalize these changes and achieve strategic goals. Organizations recognize that excellence in project management is essential for strategic goals to be achieved (DAVIS, 2011; CREASY; ANANTATMULA, 2013; 2015).

Global investments in projects are growing exponentially. According to the PMI's Industry Growth Forecast, between 2010 and 2020, 15.7 million new Project Manager positions will be created globally. Only in the United States, the expected growth is 12% (PMI, 2013). In 2015, in Brazil, the expected growth of project management professionals was 2.2%, even in a recession scenario (PMI, 2015). The public sector in Brazil has also been advancing in implementing project management (PRADO; ARCHIBALD, 2014), incorporating project managers in its organizational structure (BRASIL, 2015). These indicators show the growing importance of this professional in organizations.

Studies have associated personal characteristics of project managers with the success of projects and the success in implementing strategies in organizations (CREASY; ANANTATMULA, 2013; MAZUR, 2014; REICH; GERMINO; SAUER, 2013). However, most studies analyze the technical aspects of Project Managers: technical skills and knowledge of management methodologies (COOKE-DAVIES; ARZYMANOW, 2002; CHARETTE, 2005; KAUR; SENGUPTA, 2011; TAIMOR, 2005; HYVARI, 2006), besides focusing on the private sector.

Behavioral aspects (KERZNER, 2010) and interpersonal skills (LECHLER, 1998; POSNER, 1987) of Project Managers also contribute to the success of the projects. However, few empirical researches examine the contribution of "Soft Skills" that include personality traits, interpersonal relationships, personal experiences, and attitudes of these professionals to achieve success in the projects (HYVARI, 2006; JUDGE, ZAPATA, 2015).

Some researchers have linked personality traits to professional profiles (HURTZ; DONAVAN, 2000; HOGAN; HOLLAND, 2003; MOTOWIDLO; MARTIN; CROOK, 2013; JUDGE; ZAPATA, 2015; SCHAUFELI, MASLACH, MAREK, 2017). However, studies on personality traits of project managers are still scarce (EL-SABAA, 2001; THOMAS; MENGEL, 2008; KERZNER, 2010; THAL; BEDINGFIELD, 2010; BAKHSHESHI; NEJAD, 2011), especially comparing professionals working in the public and private sectors of the economy. This is the main theoretical gap explored in this article.

For Allport (1961), personality consists in the dynamic organization of psychophysical systems that determine the behaviors and thoughts of individuals. For Eysenck (1966), personality is

a relatively durable and steady organization of character, temperament, intelligence, and physical dimension of an individual. For Pervin (1978), personality gives coherence to people's lives. Cattel (1975) argues that personality allows one to predict what a person will do in a given situation.

According to Allport (1961), the understanding of human personality can occur by personality traits, which combined can generate different personalities. For McCrae and John (1992), personality traits are the basic dimensions of personality – the most significant and stable ways in which individuals differ in their emotional, interpersonal, experiential, attitudinal, and motivational styles. From this premise, they proposed the Big Five personality traits model, which organizes personality traits into five dimensions: Extroversion, Agreeableness, Conscientiousness, Emotional Instability, and Openness to Experience. Theorists who defend the model (MCCRAE; JOHN, 1992; PARKS-LEDUC, FELDMAN, BARDI, 2015) claim that the five traits, singly or combined, can be found in virtually all types of personalities.

Project Managers have different levels of schooling, experience, and work in different sectors of the economy. These differences in profiles are the result of choices that have been made throughout their careers and may have something to do with the personality of these professionals. Therefore, this study aims to verify if there is any difference in the personalities traits of project managers with different professional profiles: training, experience, and sector of activity (public or private).

2 THEORETICAL FRAMEWORK
2.1 The Project Manager

Project Managers are primarily responsible for the results of a project, and their performance is commonly associated with project success (PMI, 2013; ANANTATMULA, 2015). The duties of a Project Manager include coordinating and integrating activities in several functional lines and managing communications between the parties interested in the results of the project (PMI, 2013). So they can meet the project objectives and the expectations of the concerned parties, Project Managers must have technical, team management, negotiation skills and understanding of the organization's policy (PMI, 2013).

Kerzner (2010) states that project managers need to have behavioral skills compatible with the management function. However, studies on the profile of these professionals have focused on "hard skills" – technical aspects, which are easily measurable (EL-SABAA, 2001; THOMAS; MENGEL, 2008; KERZNER, 2010; THAL; BEDINGFIELD, 2010). Empirical studies involving "soft skills" – such as resilience, empathy, collaboration, and communication, based on emotional intelligence – are still scarce (KERZNER, 2010; BAKHSHESHI; NEJAD, 2011).

Once there is an understanding of the contribution of behavioral aspects of project managers for project success (BERINGER, JONAS, KOCK, 2013), the importance to understand the profile of these professionals grows, especially regarding aspects of their personality. Allport (1961) defines personality as a dynamic organization within the psychophysical systems of individuals that determine their human behavior and thinking. According to Schaufeli, Maslach, and Marek (2017), personality determines human behavior and, more specifically, professional behavior.

2.2 Personality traits

Personality is an extensive research area that has been conceptualized by several theoretical perspectives that contribute to the understanding of individual differences regarding individual behavior and experiences (JOHN, SRIVASTAVA, 1999; SCHULTZ, SCHULTZ, 2016).

In an ideal situation, scholars would have time and resources to explore, by multiple instruments, the personality of an individual or groups of individuals. However, circumstances are often not ideal, directing researchers to choose simplified models and succinct measuring instruments (GOSLING, RENTFROW, SWANN JR, 2003). After decades of research, a consensus was established that, by a model of five predicting personality factors (or traits), it would be possible to achieve adequate confidence and robustness levels in personality analyses (HURTZ, DONAVAN, 2000).

The five factors do not imply that differences in personality can be reduced to only five traits, but that these five dimensions represent personality in a broad level of abstraction and that each dimension is a summary of a set of specific personality traits (JOHN; SRIVASTAVA, 1999). These five factors became known as the Big Five personality traits and are classified as: Extroversion, Agreeableness, Conscientiousness, Emotional Instability, and Openness to Experience (MCCRAE; JOHN, 1992). Chart 1 summarizes the personality traits and the features related to them.

Chart 1 – Features associated to the Big Five personality traits

Extroversion	Agreeableness	Conscientiousness	Emotional Instability	Openness to Experience
Sociability	Reliability	Efficiency	Anxiety	Curiosity
Positivity	Correctness	Organization	Irritability	Imagination
Activity	Honesty	Sense of duty	Depressiveness	Sense of aesthetics
Enthusiasm	Altruism	Effort	Shyness	Proactivity
Cordiality	Modesty	Self-discipline	Vulnerability	Excitement
	Sympathy	Prudence	Impulsiveness	Unusual values

Source: Srivastava (1999, p. 100)

Extroversion captures the comfort level with relationships. Extroverts tend to be gregarious, assertive, and sociable. Introverts tend to be reserved, shy, and quiet. *Agreeableness* refers to an individual's propensity to love others. Highly amiable people are cooperative and confident. People with low Agreeableness are cold, unpleasant, and antagonistic. *Conscientiousness* is a measure of reliability. A highly conscious person is responsible, organized, reliable, and persistent. Those with a low score on this dimension are easily distracted, disorganized, and unreliable. *Emotional Instability* (neuroticism) is a measure of a person's ability not to withstand stress. Those with high emotional instability tend to be nervous, anxious, depressed, and insecure. People with emotional stability (low instability) tend to have calmness, self-reliance, and certainty. *Opening to Experience* considers a range of interests and fascination with novelty. Open people are creative, curious, and artistically sensitive. The people who are on the other end (little open to experiences) are conventional and find comfort in the familiar and routine.

2.3 Personality traits and level of knowledge

Professionals can assume project management positions having different levels of education and different levels of knowledge on the subject. The higher the education, the longer the time dedicated to obtaining knowledge. There is no definitive answer to the required level of knowledge to manage projects, although one knows that a project manager must have relevant knowledge on the technology involved in the project to be successful (EL-SABAA, 1999). On the other hand, personality traits can affect the choice of people by their experiences and educational trajectories (ROBERTS et al., 2006). Therefore, it is expected that project managers with different levels of education will have different personality traits, leading to the hypothesis:

H_1: *There are differences in personality traits of project managers with different education levels.*

H$_{1a}$: There are differences in the Extroversion personality trait of project managers with different education levels.

H$_{1b}$: There are differences in the Agreeableness personality trait of project managers with different education levels.

H$_{1c}$: There are differences in the Conscientiousness personality trait of project managers with different education levels.

H$_{1d}$: There are differences in the Emotional Instability personality trait of project managers with different education levels.

H$_{1e}$: There are differences in the Openness to Experience personality trait of project managers with different education levels.

2.4 Personality traits and experience

McCrae and Costa Jr. (1994, 1997) state that personality traits change with the development of the individual but reach stable levels around 30 years old. Men and women aged between 20 and 30 years become less emotional and less adventurous, but more cooperative and disciplined. Stability occurs in the five domains of personality and this applies virtually to all people regardless of race or gender.

Some studies argue that personality traits do not stabilize and keep changing from the middle age (HELSON, JONES, KWAN, 2002; HELSON, KWAN, 2000; SRIVASTAVA, JOHN, GOSLING, POTTER, 2003; ROBERTS et al, 2006). Roberts, Walton, and Viechtbauer (2006) argue that personality traits continue to develop after 30 years, especially *Agreeableness*, *Conscientiousness*, and *Openness to Experience*. Therefore, this is a matter still under discussion in the scientific world.

Considering that personality can continue to develop over the years, and that professional experience also develops over the years, it is expected that the personality traits of project managers with different times of experience will be different.

H$_{2}$: There is a difference in the personality traits of project managers with different times of professional experience.

H$_{2a}$: There is a difference in the Extroversion personality trait of project managers with different times of professional experience.

H$_{2b}$: There is a difference in the Agreeableness personality trait of project managers with different times of professional experience.

H$_{2c}$: There is a difference in the Conscientiousness personality trait of project managers with different times of professional experience.

H$_{2d}$: There is a difference in the Emotional Instability personality trait of project managers with different times of professional experience.

H$_{2e}$: There is a difference in the Openness to Experience personality trait of project managers with different times of professional experience.

Additionally, we aim to verify if project management experience also differs regarding the personality traits of project managers. Thus, hypothesis 3 was proposed, which can also be detailed for each of the five traits:

H$_{3}$: There is a difference in the personality traits of project managers with different times of experience in project management.

2.5 Personality traits and sector of activity

Project managers can choose to follow a career in different sectors of the economy. Argyriades (2003) states that professionals, when choosing to follow a career in a certain sector, public or private, make this decision by rational reasons and self-interest, in search for personal

rewards. However, much is still being discussed about the possibility of individual choosing their careers in the public sector by reasons related to altruism and public interest and not necessarily by economic factors (FREDERICKSON, HART, 1985; PERRY, WISE, 1990). This type of choice can vary significantly between countries. In Brazil, for example, the public sector is valued as a low-risk career option for involving considerable economic rewards in addition to job security.

Lyons et al. (2006) compared the values and commitments of public and private sector professionals and did not find differences in what they called "general values" (achievement, conformity, incentive, benevolence, among others), but they found differences in "specific values" such as contribution to society, opportunity for growth, organizational commitment, prestige, and intellectual stimulation among professionals of these two sectors.

Bilsky and Schwartz (1994) identified significant associations between personality traits and personal values. Research shows that personality traits are significantly related to professional performance when the personality is properly aligned to the values of the work (HOGAN, HOLLAND, 2003; ROBERTS et al., 2006). This indicates that people who seek jobs and fit their criteria experience better levels of work performance, success, and satisfaction during their life (JUDGE; ZAPATA, 2015).

By these findings, it is expected to find significant differences in the personality traits of project managers working in the public and private sectors, based on the values that underlie their choices.

H_4: There is a difference in the personality traits of project managers who work in the public sector and in the private sector.

H_{4a}: There is a difference in the Openness to Experience personality trait of project managers who work in the public sector and in the private sector.

H_{4b}: There is a difference in the Agreeableness personality trait of project managers who work in the public sector and in the private sector.

H_{4c}: There is a difference in the Conscientiousness personality trait of project managers who work in the public sector and in the private sector.

H_{4d}: There is a difference in the Emotional Instability personality trait of project managers who work in the public sector and in the private sector.

H_{4e}: There is a difference in the Extroversion personality trait of project managers who work in the public sector and in the private sector.

3 METHODOLOGICAL PROCEDURES

In this study, we chose to perform analyses of mean differences using the statistical technique of analysis of variance (ANOVA) (LEVINE et al., 2012). The use of this technique is indicated in situations in which one needs to evaluate population means, fundamentally, and verify if there is a significant difference between the means of different groups and the factors that affect some variable (MILONE, 2009). As the literature suggests, we tested the difference in variance between groups using the F-test of the ANOVA procedure of SPSS®.

3.1 Operationalization of variables

Personality measures require relatively long questionnaires. Long questionnaires generate resistance of respondents because of the time required to fill them. To solve this, the construction of personality tests moved toward shorter measures (RAMMSTEDT; OLIVER, 2007). In

this study, we chose a level of abstraction based on the five personality traits, measured in a simplified way, using a single item scale.

Openness to Experience was operationalized with the statement "I'm open to novelty," supported by studies that emphasize the need for openness to new ways of communication, adaptability, experimentation with new solutions to problems in projects (PMI, 2013; DAVIS, 2011) and the environment of uncertainty that challenge the manager every new project (EL-SABAA, 2000).

Conscientiousness was operationalized with the statement "I am organized." The way project managers organize their projects is a portrait of their managerial competence (TURNER, MÜLLER, 2005). Project managers with strong organizational traits tend to be more thorough and disciplined (BAKHSHESHIL, NEJAD, 2011).

We decided to operationalize the trait Emotional Instability by its inverse, Emotional Stability, with the statement "I am emotionally stable." Emotional competencies are one of the most important cognitive skills attributed to project managers (DAVIS, 2011). Their emotional stability is linked to their leadership skills (TURNER, MÜLLER, 2010; TURNER, MÜLLER, 2005) and their ability to work in turbulent environments, typical in projects (PETTERSEN, 1991).

The Extroversion trait was operationalized with the statement "I am extroverted," and Agreeableness, with the statement "I am amiable," as addressed by the traditional theories about personality.

Chart 2 presents the single item scale used to measure the five personality traits of project managers in this research. A five-point Likert-type scale was used, with point 1 equivalent to "totally disagree" and point 5 to "totally agree," which shows good performance in similar researches (HAIR et al., 2009).

Chart 2 – Operationalization of the Big Five personality traits of project managers

Personal features	
The following items match my most frequent actions and behaviors …	
Q3a	I am organized
Q3b	I am open to novelty
Q3c	I am emotionally stable
Q3d	I am extroverted
Q3e	I am amiable

Source: Prepared by the authors (2017)

Schooling was subdivided into three categories: "higher education (complete or incomplete)," "specialization," and "master's degree or PhD." Time of Professional Experience and Time of Experience as Project Manager were operationalized with three options: "up to 5 years," "between 5.1 and 15 years," and "over 15 years." Sector of Activity was operationalized with two categories: "public sector" and "private sector."

The questionnaire with closed-ended questions used as data collection instrument (see Appendix) was divided into two parts. The first part contains questions to characterize the respondent profile regarding training, time of professional experience, time of experience as project manager, and sector of activity. The second part contains questions related to the respondent's personality traits.

The survey was conducted with project managers working in Brazil. The link to the electronic questionnaire was sent to the regional associations of project management (PMI – Project Management Institute) in the states of the Southeast region and the Federal District, since these regions concentrate much of the country's economic activity. 244 responses were collected from project managers aged between 25 and 60 years; 96% of them had full degree in the areas of

information technology (61%), engineering (23%), administration (11%), and others (5%). Of the total professionals who responded to the survey, 60% manage projects for over 5 years, 66% work in the private sector, and 34% in the public sector.

4 RESULTS

Table 1 summarizes the descriptive statistics of the personality traits of project managers and Table 2 shows the tests performed between samples to verify the mean differences.

Table 1 – Descriptive statistics of the personality traits of project managers

Personality traits	N	Mean	Standard Deviation
Openness to Experience	244	4.448	0.604
Agreeableness	244	4.010	0.981
Emotional Stability	244	4.290	0.871
Extroversion	244	4.217	0.734
Conscientiousness	244	4.217	0.732

Source: Prepared by the authors (2017)

Table 1 shows that *Openness to Experience* is the personality trait with the highest mean value and lowest standard deviation and *Agreeableness* is the trait with the lowest mean value and highest standard deviation. These results indicate that the project managers who took part in the survey are more open to experience (innovative profile) than that amiable, and that Agreeableness the trait that most varied among respondents.

4.1 Hypothesis testing

We present below the results of hypothesis testing. The first tests carried out were related to schooling hypotheses H_1: *There is a difference in the personality traits of project managers with different levels of schooling*. Table 2 presents the results.

Table 2 – Hypothesis testing for H_1 – Mean difference between personality traits and schooling

Schooling	Hypothesis	Complete or incomplete higher education (n=45)	Specialization (n=156)	Master's degree or PhD (n=43)	F-test	Sig.
Openness to Experience	H_{1a}	4.11	4.55	4.23	6.651	*0.002**
Agreeableness	H_{1b}	3.78	4.04	4.12	1.619	0.200
Conscientiousness	H_{1c}	3.76	4.41	4.21	11.271	*0.000**
Emotional Stability	H_{1d}	4.11	4.39	4.12	2.898	0.057
Extroversion	H_{1e}	3.80	3.95	3.65	1.293	0.276

Note: *Significance at 5%.

Source: Prepared by the authors (2017)

Hypothesis H_1 was partially supported. There is evidence that *Openness to Experience* (H_{1a}; p-value=0.002) and *Conscientiousness* (H_{1c}; p-value=0.000) have significantly different means in the comparison between project managers with different levels of schooling. Project

managers with complete or incomplete higher education show lower levels of *Conscientiousness* and *Openness to Experience* compared to managers with higher level of schooling. Hypotheses H_{1a}, H_{1b}, and H_{1d} were refuted.

We present below the hypothesis testing regarding professional experience: *H2: There is a difference in the personality traits of project managers with different times of professional experience* and *H3: There is a difference in the personality traits of project managers with different times of project management experience.*

Hypotheses H_2 and H_3 were partially supported. Table 3 shows that only the *Agreeableness* personality trait presented significant mean difference (*p*-value=0.034) for the time of professional experience.

Table 3 – ANOVA results of hypothesis testing for H_2 – Time of professional experience

Personality trait	Hypothesis	Up to 5 years (n=105)	Between 5.1 and 15 years (n=113)	Over 15 years (n=26)	F	Sig.
Openness to Experience	H_{2a}	4.40	4.45	4.36	0.209	0.812
Agreeableness	H_{2b}	3.99	3.87	4.33	3.444	*0.034**
Conscientiousness	H_{2c}	4.28	4.18	4.35	0.649	0.523
Emotional Stability	H_{2d}	4.23	4.37	4.28	0.647	0.525
Extroversion	H_{2e}	3.83	3.87	3.96	0.190	0.827

Note: *Significance at 5%.

Source: Prepared by the authors (2017)

The same can be observed in Table 4 for the time of project management experience – only the Agreeableness trait presented significant mean difference (*p*-value=0.008). Tables 3 and 4 show that project managers with longer time of experience have higher levels of Agreeableness (mean=4.33 and 4.54, respectively).

Table 4 – ANOVA Results of hypothesis testing for H_3 – Time of project management experience

Personality trait	Hypothesis	Up to 5 years (n=105)	Between 5.1 and 15 years (n=113)	Over 15 years (n=26)	F	Sig.
Openness to Experience	H_{3a}	4.34	4.46	4.46	0.662	0.517
Agreeableness	H_{3b}	3.88	4.01	4.54	4.899	*0.008**
Conscientiousness	H_{3c}	4.11	4.38	4.27	2.702	0.069
Emotional Stability	H_{3d}	4.21	4.36	4.31	0.847	0.430
Extroversion	H_{3e}	3.89	3.79	4.15	1.149	0.319

Note: *Significance at 5%.

Source: Prepared by the authors (2017)

We present below the hypothesis testing results for *H4: There is a difference in the personality traits of project managers who work in the public sector and in the private sector.* The results show that the hypothesis was partially supported (Table 5). Of the five personality traits of project managers who work in the two sectors, only Agreeableness showed no statistically significant mean difference (*p*-value > 0.05).

Table 5 shows that project managers who work in the private sector present higher levels of *Openness to Experience, Conscientiousness, Emotional Stability,* and *Extroversion* than managers who work in the public sector.

Table 5 – Hypothesis testing results for H_4 – Public sector and private sector

Personality trait	Hypothesis	Private Sector (n=161)	Public Sector (n=72)	F	Sig.
Openness to Experience	H_{4a}	4.53	4.17	5.177	*0.006**
Agreeableness	H_{4b}	4.04	3.97	0.601	0.549
Conscientiousness	H_{4c}	4.36	3.99	5.301	*0.006**
Emotional Stability	H_{4d}	4.41	4.04	4.675	*0.010**
Extroversion	H_{4e}	3.99	3.71	4.507	*0.012**

Source: Prepared by the authors (2017)

Table 3 presents a summary of the results found for hypothesis testing.

Table 3 – Summary of the results of hypothesis testing of mean differences

Hypothesis	Result	Personality trait with mean difference
H_1 – Schooling	Partially supported	Openness to Experience, Conscientiousness
H_2 – Professional experience	Partially supported	Agreeableness
H_3 – Project management experience	Partially supported	Agreeableness
H_4 – Sector of activity	Partially supported	Openness to Experience Conscientiousness Emotional Stability, Extroversion

Source: Prepared by the authors (2016)

5 ANALYSIS AND DISCUSSION OF THE RESULTS

In this part, we will discuss the results found by comparing personality traits of project managers. Figure 1 graphically shows the results presented in Table 1 of the personality trait means of project managers. *Openness to Experience* is the most striking trait (mean=4.448) followed by *Emotional Stability* (mean=4.290), *Extroversion* and *Conscientiousness* (same mean=4.217), and Agreeableness (lowest mean=4.01).

Figure 1 – Personality profile of project managers
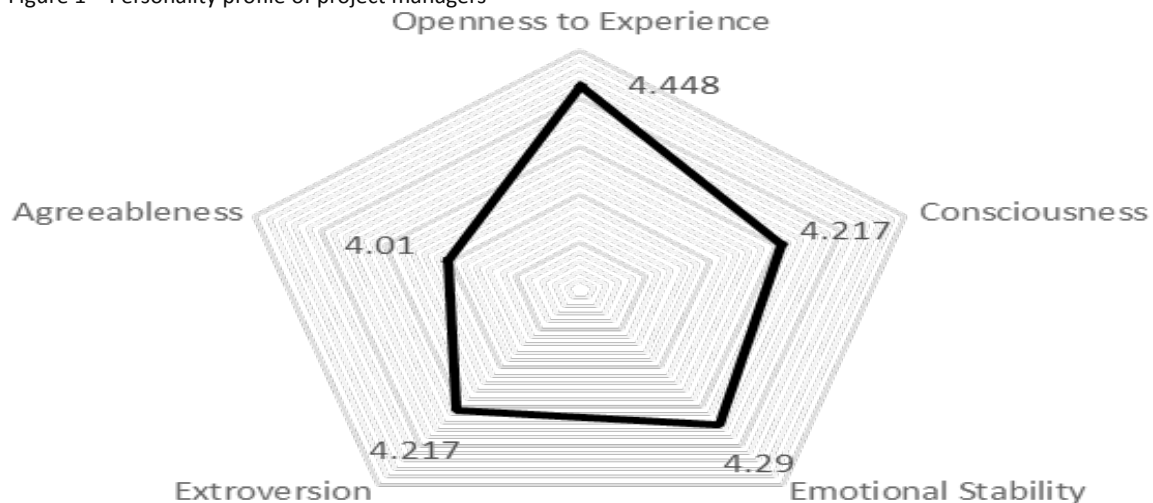
Source: Prepared by the authors (2016)

These numbers make up the characteristic profile of the project managers who took part in the research. They present high levels of *Openness to Experience*, which is related to interest in novelty, creativity, and curiosity (JOHN, SRIVASTAVA, 1999). Projects are usually associated with innovation and change, thus, this personality trait is expected from these professionals to deal with uncertain, challenging (EL-SABAA, 2000), unique (PMI, 2013), and often complex environments (KERZNER, SALADIS, 2011). These circumstances generate a need for adaptation and experimentation on the part of these professionals (DAVIS, 2011).

Emotional Stability is related to the capacity of professionals to support internal and external pressures in day to day project management. One can mention macro environment pressures, such as economic, sociocultural, political and legal, environmental, and technological pressures, as well as micro environment pressures, such as customer, supplier, concurrent, and new competitor pressures (CARVALHO, 2015). In addition, projects involve changes that generate instability. Thus, these professionals need to be able to withstand instability without being emotionally shaken.

Also, project managers must take on the role of leader of the project teams (KERZNER, 2010), which it requires emotional balance to support the teams in times of crisis. Project managers must deal with these situations remaining emotionally stable and acting rationally to achieve expectations in the best possible way (DAVIS, 2011).

Extroversion is related to socialization, motivation, enthusiasm, effective communication, and leadership. Project managers spend most of their time communicating with those involved in the project (PMI, 2013). Negotiation of resources, dissemination of results, meetings on the progress of steps are some examples when the ability to communicate is required (KERZNER, 2010).

Conscientiousness is associated with the ability of planning of project managers, critical to the success of the project (PMI, 2013; TURNER, MÜLLER, 2005). The ability of organization is part not only of the planning stage, but mainly of the stages of implementation and completion of the project, and therefore is an important trait for a project manager (PMI, 2013).

Agreeableness, which presented the lowest but still high mean (4.01 – above the midpoint of the scale), is an important trait in the profile of project managers. This trait can be associated with trust, honesty, correctness, and sympathy (JOHN, SRIVASTAVA, 1999), important features for a team leader (KERZNER, 2010).

The result of the hypothesis testing for H_1, which associated personality traits and schooling, is in line with the research findings that associate level of knowledge with *Openness to Experience* and *Conscientiousness* (FURNHAM; CHAMORRO-PREMUZIC, 2006; MOTOWIDLO; MARTIN; CROOK, 2013).

Openness to Experience indicates the need to find innovative solutions, express original ideas, and use imagination to perform tasks (MOWEN, 2000). Butt and Phillips (2008) argue that people with high level of *Openness to Experience* show intellectual curiosity and have greater need for information. Berenbaum (2002) found that intellectual activities are positively associated with *Openness to Experience*. It is expected that individuals with higher levels of *Openness to Experience* will have greater propensity to reach higher levels of schooling, as supported by hypothesis H_1 for the project managers who took part in the research.

Conscientious individuals are more organized and efficient in the execution of tasks. They have clear goals and strive to reach them with discipline. Conscientiousness and self-discipline are traits that determine cognitive effort. *Conscientiousness* is associated with the motivation to engage in activities that require cognitive effort (BAUMEISTER, 2002). One can assume

that individuals with higher levels of *Conscientiousness* have greater propensity to reach higher levels of schooling, as supported by hypothesis H_1 of this research.

The hypothesis testing results for H_2 and H_3 showed that project managers with longer time of professional experience and longer time of project management experience have the *Agreeableness* trait more pronounced. Thus, one can conclude that project managers who stay longer in the career are those with higher level of *Agreeableness*.

Figure 2 shows the means of the personality traits of project managers working in the public and private sectors. Hypothesis H_4, which associates personality traits with sector of activity, was partially supported. The results showed that the professionals working in these two sectors have significantly different levels of *Openness to Experience, Emotional Stability, Extroversion*, and *Conscientiousness*. Only the Agreeableness trait showed no significant difference between the two groups.

Using the associations proposed by Srivastava (1999),one can conclude from these results that the professionals who choose to act as project managers in the public sector present less propensity to innovate or to adopt innovations, to curiosity, imagination, excitement, and proactivity; greater propensity to be irritable, negative, shy, impulsive, less prone to Conscientiousness, efficiency, sense of duty, effort, self-discipline, and prudence; and less propensity to sociability, enthusiasm, and cordiality than those who choose to act in the private sector.

Specifically in the case of Brazil, place of the research, public servants have job stability, which may explain the attraction of professionals with less propensity to take risks, be less innovative, more introverted and less communicative, even when choosing to work in managerial functions that require these traits from professionals.

Figure 2 – Comparison of personality traits of project managers of public and private sectors
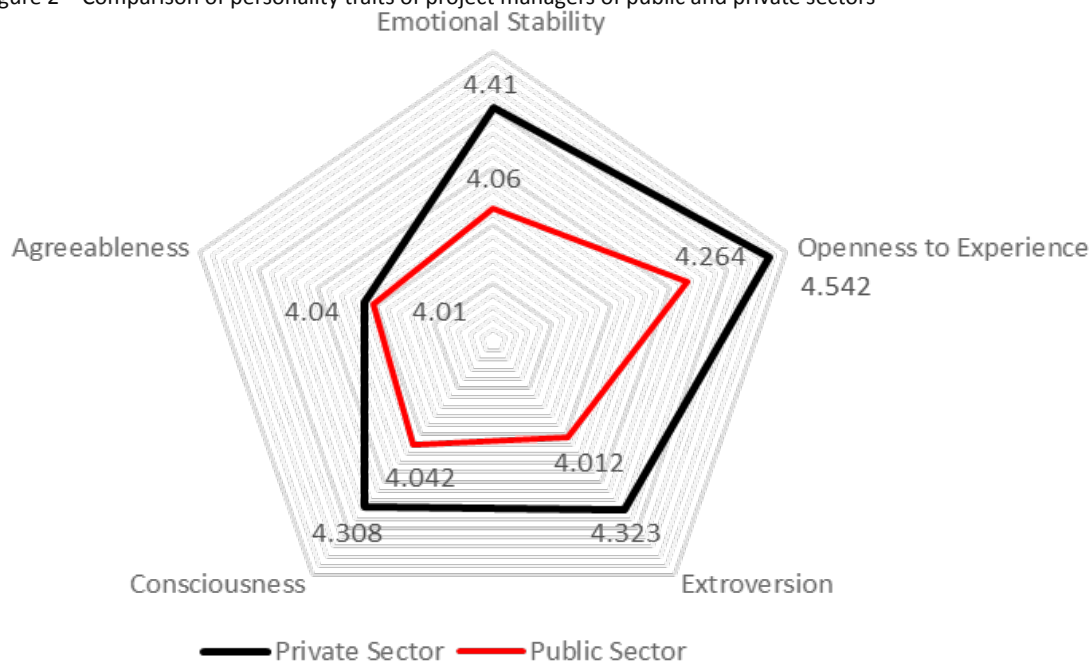
Source: Prepared by the authors (2017)

The results allow us to infer that the personality traits of project managers who work in the public sector are not found in the same proportions in professionals who work in the private sector. This can be explained by the difference between the two sectors. While public sector workers are subject to changes in the legal framework, economic policy, and politics (HARDCAS-

TLE, 2002), private sector workers suffer market and competition pressures that affect their employability, making them more steadfast, dedicated, and emotionally involved in the results of their work (PETTERSEN, 1991; CARVALHO, 2015).

In addition, the pace of change in two sectors is differentiated, attracting to the public sector professionals with project manager profile, but with softened personality traits. Figure 2 reveals that the four personality traits that showed significant differences presented the same proportion between the means of the two sectors, indicating a similarity of profile of project managers, with difference only in the intensity of traits.

6 FINAL CONSIDERATIONS

Empirical studies that analyze the personality of project managers are scarce. Aiming to reduce this gap, this study explored the personality traits of this professional and has found evidence pointing to a distinctive profile, although with significant differences between professionals who choose to act in the public and private sectors.

Comparing the personality traits by different perspectives, we observed that project managers with higher schooling have a more pronounced *Conscientiousness*, *Emotional Stability*, and *Openness to Experience*, showing higher levels of creativity, planning, efficiency, and dedication, which are personality traits desired in project managers.

Another contribution of this study was showing that more experienced project managers tend to have a higher level of Agreeableness, which indicates greater confidence, sympathy, and honesty during the time working in this position. We have also shown empirical evidence of the differences between project managers working in the public and private sectors, with professionals in the private sector presenting more pronounced traits. However, the proportion of traits between the professionals of both sectors has remained virtually constant, indicating a pattern.

All these findings can be used as a reference for human resource professionals to target project manager selection/appointment policies and training and development of interpersonal and technical skills.

Further studies can be carried out to associate personality traits of project managers with project performance using experience, sector of activity, and schooling as moderating factors of the relationship. Empirical work can be developed exploring in depth the differences of the professionals working in the public and private sectors, to understand why the differences highlighted in this study exist.

The results of this research contribute to studies on the influence of personality on professional performance, especially in the performance of project managers, leading to discussions about profile differences between professionals who choose to act in the public and private sectors of the economy. As a practical contribution, this study can be used as a reference for human resource professionals in the process of selection, recruitment, training, and development of interpersonal and technical skills of these professionals.

REFERENCES

ALLPORT, Gordon. *Pattern and growth in personality*. Harcourt College Publishers. Ed. New Edition, England, 1963.

ANANTATMULA, Vittal. Strategies for enhancing project performance. *Journal of Management in*

Engineering, v.31, n.6, p.1-8, 2015.

BAKHSHESHI, A.H.F.; NEJAD, S.R.. Impact of project managers' personalities on project success in four types of project. *2nd International Conference on Construction and Project Management (IPEDR)*,v.15, 2011.

BAUMEISTER, R. F. Yielding to temptation: self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research*, V. 28, N.4, p.670-676, 2002.

BERENBAUM, H. Varieties of joy-related pleasurable activities and feelings. *Cognition & Emotion*, v. 16, n. 4, p. 473–494, 2002.

BERINGER, Claus; JONAS, Daniel; KOCK, Alexander. Behavior of internal stakeholders in project portfolio management and its impact on success. *International Journal of Project Management*, v. 31, n. 6, p. 830-846, 2013.

BILSKY, Wolfgang; SCHWARTZ, Shalom H. Values and personality. *European Journal of Personality*, v.8, p.163-181, 1994.

BRASIL. Decreto nº 8.578, de 26 de novembro de 2014. Aprova a estrutura regimental e o quadro demonstrativo dos cargos em comissão e das funções de confiança do Ministério do Planejamento, Orçamento e Gestão.... *Diário Oficial [da] República Federativa do Brasil*, Brasília, 27 nov. 2015. Available from: <http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2015/Decreto/D8578. htm>. Access on Apr. 29, 2016.

BRENT, W. Roberts; WALTON, Kate E.; VIECHTBAUER, Wolfgang. Patterns of mean-level change in personality traits across the life course: a meta-analysis of longitudinal studies. *Psychological Bulletin*, v.1. 132, n.1, p.1–25, 2006.

BUTT, S.; PHILLIPS, J. G. Personality and self-reported mobile phone use. *Computers in Human Behavior*, 24, 346–360, 2008.

CARVALHO, Fabio C. A.. *Gestão de Projetos.* 1 Ed. Pearson Education do Brasil, São Paulo, 2015.

CATTELL, R. B. *Análise científica da personalidade*. São Paulo: IBRASA, 1975.

CONLEY, James J. Longitudinal stability of personality traits: a multitrait–multimethod– multioccasion analysis. *Journal of Personality and Social Psychology*, v.49, n.5, p.1266-1282, 1985.

COSTA, P. T., Jr., HERBST, J. H., MCCRAE, R. R., & SIEGLER, I. C. Personality at midlife: stability, intrinsic maturation, and response to life events. *SAGE – Social Science Collections*, v.7, 365–378, 2000.

DAVIS, Steven A. Investigating the impact of project managers' emotional intelligence on their interpersonal competence. *Project Management Journal*, v.42, n.4, p.37-57, 2011.

EL-SABAA, S. The skills and career path of an effective project manager. International *Journal of Project Management*, vol.19, 1999.

EYSENCK, H. J. Personality and experimental psychology. *Bulletin of the British Psychological Society*, v.19, n.62, 1–28, 1966.

FIELD, A. *Discovering statistics using SPSS for Windows*, 1st ed. SAGE Publications Ltd., London,

p.243-294, 2000.

FREDERICKSON, H . George; HART, David K .. The public service and the patriotism of benevolence. *Public Administration Review*, v.45, n.5 p.547-553, 1985.

FURNHAM, Adrian; CHAMORRO-PREMUZIC, Thomas. *Personality, intelligence and general knowledge*. Elsevier, 2006.

GOLDBERG, Lewis R.. The power of personality: the comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspect Psychology Science, v.2; n.4; p.313–345, 2007*.

GURVEN, Michael et al. How universal is the Big Five? Testing the five-factor model of personality variation among forager–farmers in the Bolivian Amazon. *Journal of personality and social psychology*, v. 104, n. 2, p. 354, 2013.

HARDCASTLE, Edwards, P.J., Akintoye, & Li, B. Critical success factors for PPP / PFI projects in the Uk construction industry: a factor analysis approach. *Construction Management and Economics,* v.23, n.5, p.1–9, 2002.

HELSON, R.; JONES, C.; KWAN, V. S. Y. Personality change over 40 years of adulthood: Hierarchical linear modeling analyses of two longitudinal samples. *Journal of Personality and Social Psychology,* v.83, p.752–766, 2002.

HELSON, R.; KWAN, V. S. Y.. Personality development in adulthood: the broad picture and processes in one longitudinal sample. *Advances in personality psychology*, v.l. n.1, p. 77– 106, 2000.

HOGAN J, HOLLAND B. Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *Journal of Applied Psychology*, v.88; p.100–112, 2003.

HURT, M., and THOMAS, J. Building value through sustainable project management offices. *Project Management Journal*, v.40 n.1, p. 55–72, 2009.

HURTZ, M. Gregory; DONAVAN, John. Personality and job performance, the Big Five revisited. *The Journal of Applied Psychology*, v.85, n.6, p.869-879, 2000.

JOHN, O.; SRISVASTAVA, S.. The Big Five trait taxonomy: history, measurement, and theoretical perspectives. *Handbook of personality:* theory and research, vol. 2, n.510, p.102-138, 1999.

JUDGE, Timothy A.; ZAPATA, Cindy P. The person–situation debate revisited: effect of situation strength and trait activation on the validity of the Big Five personality traits in predicting job performance. *Academy of Management Journal*, v. 58, n. 4, p. 1149-1179, 2015.

KERZNER, Harold. *Gestão de projetos:* As melhores práticas. Artmed Editora S.A. São Paulo, 2010.

LEVINE, David; STEPHAN, David F.; KREHBLEL, Timothy; BERENSON, Mark L.. *Estatística Teoria e Aplicações* - Usando Microsoft Excel. LTC, 6ª Ed. 2012.

LYONS, Sean T.; DUXBURY, Linda E.; HIGGINS, Christopher A.. A comparison of the values and commitment of private sector, public sector, and parapublic sector employees. *Public Administrative Review*, v.66, n.4, p.605-618, 2006.

McCRAE, R.; JOHN, O.. An Introduction to the five-factor model and its applications. *Journal of*

Personality, v.60, n.2, p.175-215, 1992.

MCCRAE, Robert R.; COSTA JR, Paul T. Personality trait structure as a human universal. *American Psychologist*, v. 52, n. 5, p. 509, 1997.

MILONE, Giuseppe. *Estatística geral e aplicada*. São Paulo: Centage Learning, 2009.

MOTOWIDLO, Stephan J.; MARTIN, Michelle P.; CROOK, Amy E.. Relations between personality, knowledge, and behavior in professional service encounters. *Journal of Applied Social Psychology,* v.43, n.9, p.1851–1861, 2013.

MOURA, Ralf. O insucesso de projetos de desenvolvimento de software e fatores influenciadores. *Revista Faesa*, v.6, n.7, p.69-73, 2015.

MOWEN, J. C. *The 3M model of motivation and personality*: theory and empirical applications to consumer behavior. Boston: Kluer Academic Publishers, 2000.

PARKS-LEDUC, Laura; FELDMAN, Gilad; BARDI, Anat. Personality traits and personal values: a meta-analysis. *Personality and Social Psychology Review*, v. 19, n. 1, p. 3-29, 2015.

PERRY, James L . ; WISE, Lois R.. The motivational bases of public service. *Public Administration Review*, v.50, n.3, p.367–73, 1990.

PERVIN, Laurence A. *Personalidade*: teoria, avaliação e pesquisa. São Paulo: Editora EPU, 1978*.*

PETTERSEN N.. What do we know about the effective project manager? *International Journal of Project Management*, v.9, n.2, p. 99-104, 1991.

PMI. A guide to the project management body of knowledge. *Project Management Journal*, v.44, n.3, 2013.

PMI. *2015 Global Job Report*. Available from: <https://www.pmi.org/learning/PM-Network/2015/global-job-report-salary-data.aspx>. Access on: May 2, 2016.

PMI. *E-Link Brasileiro do PMI. Newsletter do PMI para o Brasil*. Available from: <www.pmi.org. br>. Access on: Apr. 20, 2016.

PMI. *PMI's Industry Growth Forecast, 2013*. Available from: <https://www.pmi.org/~/ media/PDF/Business-Solutions/PMIProjectManagementSkillsGapReport.ashx>. Access on: Apr. 20, 2016.

PRADO, D. S.; ARCHIBALD, R. D. *Maturidade Brasil 2014:* pesquisa sobre maturidade em gerenciamento de projetos. Available from: <http://www.maturityresearch.com/novosite/index_br.html>. Access on: Apr. 29, 2016.

RAMMSTEDT, B.; OLIVER, J. P. Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, v. 41, p. 203–212, 2007.

RUGENYI, F. Assessment of the influence of project management competence on the triple constraint in projects in Nairobi. *International Journal of Academic Research in Business and Social Sciences*, v. 6, n.4, p.295-309, 2016.

SCHAUFELI, Wilmar B.; MASLACH, Christina; MAREK, Tadeusz (Ed.). *Professional burnout*: Recent developments in theory and research. Taylor & Francis, 2017.

SCHULTZ, Duane P.; SCHULTZ, Sydney Ellen. *Theories of personality*. Cengage Learning, 2016.

SRIVASTAVA, S.; JOHN, O. P.; GOSLING, S. D., & Potter, J.. Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology*, v.84, p.1041–1053, 2003.

THOMAS, Janice; MENGEL, Thomas. Preparing project managers to deal with complexity – advanced project management education. *International Journal of Project Management,* v.26, p.304-315, 2008.

TURNER, J. R.; MÜLLER, R.. Leadership competency profiles of successful project managers. *International Journal of Project Management*, v.28, n.5, p.437-448, 2010.

TURNER, J. R.; MÜLLER, R.. The project manager's leadership style as a success factor on projects: a literature review. *Project Management Journal*, v. 36, p.49-61, 2005.

APPENDIX

Questionnaire used in the survey:

I-IDENTIFICATION OF RESPONDENT

1. Age:
( ) Up to 25 years   ( ) 26 to 30 years   ( ) 31 to 35 years   ( ) 36 to 40 years   ( ) 41 to 50 years
( ) 51 to 55 years   ( ) 56 to 60 years   ( ) Over 60 years

2. Sex: ( ) Female   ( ) Male
3. Schooling:
( ) Complete or incomplete higher education
( ) Specialization
( ) Master's degree or PhD

4. Main area of training:
( ) Computing
( ) Engineering
( ) Other Specify: _____

5. Time working in the company
( ) Up to 5 years
( ) Between 5.1 and 15 years
( ) More than 15 years

6. Time working as a project manager

( ) Up to 5 years

( ) Between 5.1 and 15 years

( ) More than 15 years

7. Sector of activity

( ) Public

( ) Private

( ) Other Specify: _____

Personality *The following items match my most frequent actions and behaviors ...*		References
Q1a	I am open to changes	John & Srivastava (1999)
Q1b	I am meticulous and careful	
Q1c	I am emotionally unstable	
Q1d	I am an extrovert	
Q1e	I am amiable	

Contribution	*[Author 1]*	*[Author 2]*	*[Author 3]*	*[Author 4]*
1. Definition of research problem	√	√		
2. Development of hypotheses or research questions (empirical studies)	√			
3. Development of theoretical propositions (theoretical work)	√	√	√	√
4. Theoretical foundation / Literature review	√	√		
5. Definition of methodological procedures	√			
6. Data collection	√			√
7. Statistical analysis	√	√		
8. Analysis and interpretation of data	√	√		
9. Critical revision of the manuscript		√	√	
10. Manuscript writing	√			
11. Other (please specify)				