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
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; BAKHSHEH; 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:

\[ H_1: \text{There are differences in personality traits of project managers with different education levels.} \]
There are differences in the Extroversion personality trait of project managers with different education levels.

There are differences in the Agreeableness personality trait of project managers with different education levels.

There are differences in the Conscientiousness personality trait of project managers with different education levels.

There are differences in the Emotional Instability personality trait of project managers with different education levels.

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.

There is a difference in the Extroversion personality trait of project managers with different times of professional experience.

There is a difference in the Agreeableness personality trait of project managers with different times of professional experience.

There is a difference in the Conscientiousness personality trait of project managers with different times of professional experience.

There is a difference in the Emotional Instability personality trait of project managers with different times of professional experience.

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:

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.

H4: There is a difference in the personality traits of project managers who work in the public sector and in the private sector.

H4a: 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.

H4b: There is a difference in the Agreeableness personality trait of project managers who work in the public sector and in the private sector.

H4c: There is a difference in the Conscientiousness personality trait of project managers who work in the public sector and in the private sector.

H4d: There is a difference in the Emotional Instability personality trait of project managers who work in the public sector and in the private sector.

H4e: 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 (BAKHSHESHLI, 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).

| 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                                                  |

*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 ye-ars (n=26) | $F$  | $Sig.$ |
|----------------------------|------------|-----------------------|----------------------------------|----------------------|------|--------|
| Openness to Expe-rience    | $H_{3a}$   | 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 H1 of this research.

The hypothesis testing results for H2 and H3 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 H4, 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.

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-
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.

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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 | References |
|-------------|------------|
| The following items match my most frequent actions and behaviors ... | John & Srivastava (1999) |
| Q1a I am open to changes | |
| 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) | | | | |