

# Relationship between Dark Triad personality traits and professional skepticism among independent auditors

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## Abstract

**Objective:** To analyze the influence of the Dark Triad personality traits on professional skepticism among independent auditors in Brazil.

**Method:** The sample was composed of 170 independent auditors actively registered in the CNAI (National Register of Independent Auditors). Data were analyzed using descriptive statistics, via regression analysis estimated by Ordinary Least Squares to verify the hypotheses, and regressions estimated by Minimum Absolute Deviation to analyze sensitivity. As proposed by Hurtt (2010), professional skepticism, was the regressand, while the Dark Triad (narcissism, Machiavellianism, and psychopathy) was treated as a set of stimulus variables.

**Results:** The results indicate that narcissism positively influences professional skepticism as it raises the auditors' self-esteem and questioning ability. Machiavellianism and psychopathy, in turn, did not positively influence professional skepticism, while an inverse relationship with autonomy and self-esteem is possible.

**Contributions:** At a theoretical level, this study addresses for the first time the influence of socially undesirable personality traits on auditors' professional skepticism, filling a gap concerning the interdisciplinary connection between accounting and psychology, specifically focusing on the auditing field. In practical terms, this study promotes a better understanding of the relevance of socially undesirable personality traits on the auditors' professional skepticism, which is useful for audit firms when selecting and training their professionals.

**Keywords:** Dark personality traits; DarkTriad; Professional Skepticism; Audit; Independent Auditors.

## 1. Introduction

According to NBC TA 200 (R1), professional skepticism is one of the basic requirements for an independent auditor to perform his/her job. It is defined as “an attitude that includes a questioning mind and being alert to conditions that may indicate possible misstatement due to error or fraud and a critical assessment of audit evidence.” (CFC, 2016, p. 6).

According to Nelson (2009), this definition fits a neutral view in which an auditor would be gathering and assessing evidence without assuming any *ex-ante* bias. However, Bell, Peecher, and Solomon (2005) highlight that devices dealing with fraud – such as NBC TA 240 (R1) – tend to change this perspective, assuming a suspicious presumption, that is, auditors should always consider a certain level of dishonesty from managers, unless there is evidence to the contrary. Therefore, even though, in general, audit standards adopt skepticism as a common interest, its conceptual definition is not precise (Nelson, 2009).

Although different professional skepticism concepts coexist within the audit scope, the central idea is that auditors should not accept information first presented to them. Instead, they need to critically assess evidence to establish an opinion regarding facts (Mubako & O’Donnell, 2018).

The academic literature also contains different definitions of professional skepticism (Nelson, 2009); however, the premise that skepticism must be exercised in levels that favor independent auditors to make their professional assessment and meet the purposes of an adequate audit seems to be consensual (Quadackers; Groot & Wright, 2014; Mubako & O’Donnell, 2018; Mendes; Niyama & Silva, 2018). For instance, Hurtt (2010) highlights that there is no other professional sphere in which skepticism is as relevant as in auditing.

Even though studies and regulatory bodies emphasize the relevance of skepticism to the core of auditing, it is crucial to note that skepticism by itself is a feature difficult to measure (Hurtt; Brown-Libur; Earley & Krishnamoorthy, 2013; Nolder & Kadous, 2018). In this context, authors such as Nelson (2009), Hurtt *et al.* (2013), and Nolder and Kadous (2018) tried to identify the antecedents of professional skepticism among auditors and an element that appears in all studies is the characteristics of auditors (e.g., motivation, affection, and expertise, among others).

In this sense, some studies, such as Nelson (2009), Quadackers *et al.* (2014), and Cohen, Dalton, and Harp (2017), show that professional skepticism is related to the auditors’ personality traits. In general, these studies analyze this relationship based on socially desirable personality traits, such as ethical conduct and self-confidence, among others. A recent example of this tendency is the study conducted by Cunha, Silva, Peyerl, and Haveroth (2019), which analyses the effects of experience, consciousness, extroversion, amiability, and neuroticism on auditor’s professional skepticism, reporting distinct signs in the relationships established based on the previously specified personality traits.

There are no empirical reports or evidence of the influence of socially undesirable personality traits on professional skepticism though. This research gap is relevant in the auditing context because psychology suggests that auditors report different social interactions depending on their personalities, which implies a consequent influence on the quality of auditing services (Hobson; Stern & Zimbleman, 2020). These authors exemplify this relationship when they explain that an auditor’s social interaction tends to compromise his/her professional skepticism, though some personality traits may decrease this risk.

Therefore, this study’s objective is to analyze the influence of “dark” personality traits on the professional skepticism of independent auditors in Brazil.

The “dark” perspective of individuals’ personality has been investigated in the accounting field based on the so-called Dark Triad, see Majors (2016), D’Souza and Lima (2018), D’Souza, Lima, Jones and Carré (2019), Hobson *et al.* (2020). The Dark Triad consists of a set composed of three distinct, partially correlated undesirable characteristics: narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002; Jones & Paulhus, 2014).

Note that the three personality traits that compose the Dark Triad are investigated from a non-pathological perspective, as there is no intent to diagnose individuals (D’Souza & Lima, 2018). It is also important to emphasize that, in general, Dark Triad personality traits are harmful to organizations and society, though these personality traits may present some beneficial aspects (Volmer; Koch & Göritz, 2016). D’Souza and Lima (2018), for instance, state that analysis of the “bright side” of the Dark Triad constitutes a literature gap. Thus, this study addresses this gap to identify a greater level of professional skepticism among independent auditors presenting narcissism, Machiavellianism, and psychopathy traits.

**Why is it important to analyze the influence of new elements on the professional skepticism among independent auditors?** The answer to this question may be based on Olsen and Gold (2018), which state that professional skepticism is a proper parameter of auditing services’ quality. According to NBC TA 200 (R1), this derives from the greater critical power of professionals with such characteristics.

Therefore, in practical terms, this study is expected to contribute to the audit field by reporting how certain personality traits (in this case, dark traits) can be essential traits to achieve an appropriate level of skepticism. That is, audit firms could apply personality tests to professional candidates considering the elements found in this study, which would generate knowledge about the professional profile a company desires.

The literature indicates an unexplored relationship, considering that only socially desirable traits have been investigated with auditors’ professional skepticism (Nelson, 2009; Quadackers *et al.*, 2014; Cohen *et al.*, 2017). Nevertheless, the results can contribute to the academic milieu by promoting an interdisciplinary connection between accounting and psychology. According to D’Souza and Lima (2018), this connection is seldom promoted but seems to be relevant to the auditing field, as noted by Hobson *et al.* (2020).

## 2. Theoretical Framework

This section addresses the relevance of professional skepticism among auditors, reports the Dark Triad’s concepts, and presents previous studies addressing the Dark Triad within the accounting and auditing fields. This study’s hypotheses are also developed and presented throughout the text.

### 2.1 Auditors’ Professional Skepticism

According to Hurtt (2010), professional skepticism is more relevant in the auditing field than in any other profession. Nolder and Kadous (2018) corroborate this argument by explaining that professional skepticism is present in all auditing standards, while lack of skepticism would be the root of audit deficiencies in the eyes of inspectors. These authors and Hurtt *et al.* (2013) emphasize that, despite this importance, professional skepticism is still inconsistently defined.

According to NBC TA 200 (R1), professional skepticism would be a questioning mindset an auditor maintains throughout his/her work, making someone more critical when assessing audit evidence and, consequently, more apt to identify potential misstatements arising from errors or fraud. In this sense, professional skepticism is an indicator of auditing services' quality (Olsen & Gold, 2018). This is so because a quality audit demands auditors to be competent and at the same time recognize and report the audited entity's accounting misstatements (DeAngelo, 1981). Hence, in the absence of skepticism, an auditor's ability to recognize potential accounting irregularities is directly affected.

Thus, Olsen and Gold (2018) highlight that professional skepticism has received much attention in academic research. Mubako and O'Donnell (2018), for instance, verify whether auditors who know the different risks of fraud for each type of account tend to become less skeptical towards the evidence. The experiment's results indicated that the auditors who were aware that the risk of fraud was high in terms of revenue but low in terms of cost classified cost accounts as lower in the risk of account misstatements than the auditors with the information that both the accounts presented the same risk.

Hussin, Saleh, and Al-Smady (2019) analyze whether demographic factors influence the level of skepticism of auditors in Jordan. The results indicate that the auditors who had previously experienced frauds were positively related to skeptical attitudes, while the auditors' gender, specific knowledge, and experience did not present statistical significance in this relationship.

The experiment conducted by Stevens, Moroney, and Webster (2019) shows that when the team's identity is an important factor, auditors tend to show a greater level of skepticism when teammates present a favorable style compared to when teammates present an unfavorable style.

Therefore, professional skepticism remains a big issue, and there is a wide range of studies that can address this construct, which is essential for auditors, both within the academic milieu and regulatory bodies (Hurt et al., 2013).

## 2.2 The DarkTriad

Among the aversive personality traits presented by the psychology literature, Paulhus and Williams (2002) highlight three traits that achieved empirical prominence: Machiavellianism, narcissism, and psychopathy.

Studies before Paulhus and Williams (2002) had suggested that there was a relationship between Machiavellianism and psychopathy (Mchiskey; Worsel & Szyarto, 1998), between narcissism and psychopathy (Gustafson & Ritzer, 1995), and between Machiavellianism and narcissism (McHoskey, 1995). Based on these associations and the relevance of these constructs to academia, Paulhus and Williams (2002) investigated the relationship of the interdependence between these three elements based on a sample of 245 Psychology students, concluding at the end of the study that these elements are partially correlated but independent from each other. Hence, the so-called Dark Triad emerges.

Machiavellianism can be defined as a behavior in which individuals manipulate others as instruments to achieve personal purposes (Christie & Geis, 1970; Wilson; Near & Miller, 1996). Nelson and Gilbertson (1991) point out that the Machiavellianism term appears in a reference of Niccolò Machiavelli, especially in his work "The Prince," and that the author would pay a high price for this recognition. This is because subsequent generations of writers and students coined Machiavellianism as a synonym for immoral actions, unethical behavior, and hidden agenda (Ralph, 1973).

McIlwain (2003) considers that “cold-bloodedness” is one of the hallmarks of individuals with a Machiavellian nature, as it enables them to keep calm even in situations of intense emotional charge. This coldness contributes to manipulating others and a tendency to show no empathy or affective connection with people (Paal & Bereczkei, 2007). Based on this premise, it is reasonable to believe that auditors who have Machiavellian traits present a higher level of skepticism than their counterparts, given their lack of affective connection with others (such as managers). Therefore, the following hypothesis was established:

- **H1: Machiavellianism positively influences professional skepticism among independent auditors**

Regarding narcissism – in a historical sense –, the term goes back to Greek mythology, in which the young Narcissus, endowed with remarkable beauty, refuses the love of the equally beautiful and devoted Echo, for believing that Echo would not be at the same level of his perfection. Hence, Narcissus starts a search for the perfect partner but, in the face of his inflated ego, can only fall in love with his reflection, a fact that eventually led to his death (Campbell & Foster, 2002).

Pulver (1970) points out that there are only two consensual facts in the vast literature addressing narcissism: 1) narcissism is one of the most important concepts at the heart of psychoanalysis; and 2) it is one of the most confusing. The author notes that this confusion goes back to its inception when even Sigmund Freud (who coined the term) reported dissatisfaction with his original definition of narcissism, namely: “the attitude of a person who treats his/her body in the same way in which the body of a sexual object is ordinarily treated [...]” (Freud, 1914, p.73, *apud* Crockatt, 2006).

Since Freud’s seminal work (1914), the concept of narcissism has been expanded and later divided between pathological and non-pathological (Wallace & Baumeister, 2002).

This section is essential because even though some characteristics are considered key manifestations of a narcissist personality, such as arrogance and a feeling of entitlement (Rhodewalt & Peterson, 2009; Pincus & Lukowitsky, 2010), the literature has not reached a consensus regarding other characteristics (Maxwell; Donnellan; Hopwood & Ackerman, 2011), such as insecurity and emotional fragility, which according to Miller and Campbell (2008), would be associated with pathological narcissism, while Rosenthal and Hooley (2010) disagree of this logic, arguing that the ways narcissism is measured are mistaken and lead to such a belief.

Considering that, similar to the Dark Triad, narcissism is analyzed from a non-pathological perspective, as noted by D’Souza and Lima (2018), the second hypothesis was established based on the narcissist’s general characteristic, arrogance (Rhodewalt & Peterson, 2009; Pincus & Lukowitsky, 2010). We assume that, because narcissist auditors would believe that they are more capable in technical terms than any other individual, they would be more skeptical toward financial reports performed by others. Hence:

- **H2: Narcissism positively influences professional skepticism among independent auditors.**

Psychopathy, in turn, refers to a personality disorder marked by lack of empathy, egocentrism, impulsive actions, and a lack of remorse for the consequences of these acts (Cleckley, 1976; Paulhus & Williams, 2002; Jones & Paulhus, 2014).

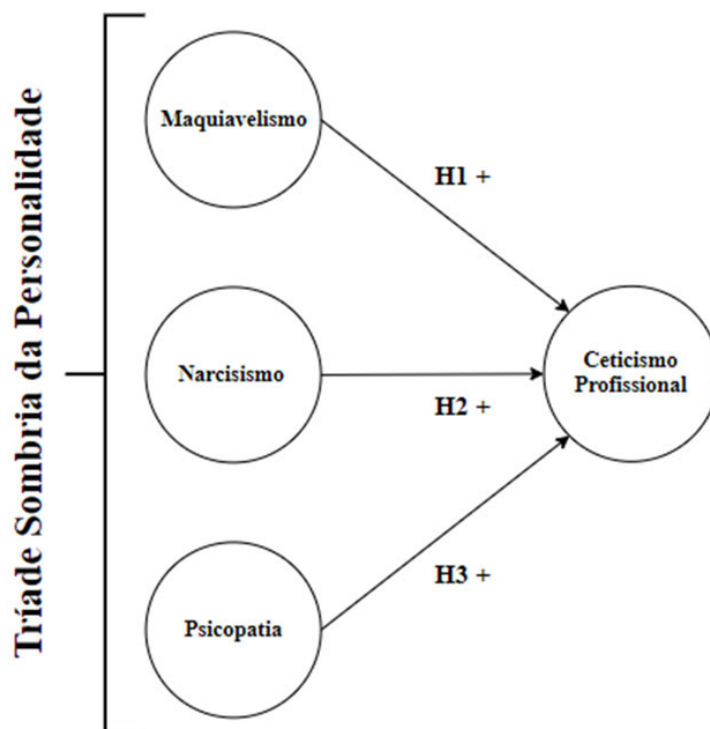
Psychopaths can also behave antisocially in a severe and premeditated way, with direct consequences for the society (Hare & Neumann, 2008; Viding & McCrory, 2018); however, according to Viding and McCrory (2018), this is not the general characteristic of these individuals. Jones and Paulhus (2014) corroborate this argument by explaining that even seminal works have established only two key elements as being typical of a psychopath: a sentimental deficit and a deficit in self-control.

In a work context, as stated by Wexler (2008), psychopaths tend to be successful due to skills, such as coldness when making complex decisions, ability to perform hard work, confidence, and objectivity. According to the author, these attributes denote trust and loyalty to the work colleagues, giving psychopaths wide networking to obtain personal objectives.

Thus, an independent auditor presenting a high level of (non-clinical) psychopathy should be more skeptical in his/her work given a lack of affection to others and an interest in performing a high-quality job to advance in the company's hierarchy, be recognized by his/her technical competence, and to promote his/her ego. Therefore, the third hypothesis emerges:

- **H3: Psychopathy positively influences professional skepticism among independent auditors**

Given the hypotheses previously presented, this study's design takes the form presented in Figure 1.



Translation: Dark Triad of Personality / Machiavellianism / Narcissism / Psychopathy / Professional Skepticism.

**Figure 1.** Study design

Source: developed by the authors (2020).

## 2.3 Previous Studies

The academic literature presents a set of (Brazilian and international) studies relating the Dark Triad with accounting. Various spheres within accounting are addressed in these studies (academic milieu; auditing; management accounting, etc.), showing its versatility and compatibility with the accounting field. Hence, this subsection presents some of the most recent studies in the field in chronological order.

Majors (2016) carried out a laboratory experiment with undergraduate students and reports evidence that being required to disclose intervals for estimates tend to lead managers to present less aggressive reports. The author highlights that this effect is maximized when managers present a high level of at least one Dark Triad trait. In principle, this would be explained by the disciplinary effect of mandatory bands when, by nature, these individuals feel the need to control others.

In a socio-bibliometric survey, D'Souza and Jones (2017) attempted to characterize the Dark Triad's scientific research in the business and accounting contexts between 2012 and 2014. The study sample (90 studies) enabled the authors to develop a taxonomy capable of reporting the following: a) Machiavellianism is an element with the greatest emphasis in the studies addressing manipulations; b) narcissism is the element most frequently explored and routinely associated with leadership and business decision-making, and; c) psychopathy usually arouses academic interest to assess hostile and inappropriate behavior of leaders in organizations. The authors note that, specifically in the accounting field, most studies associate the Dark Triad with a tendency for the occurrence of frauds in financial reporting.

D'Souza and Lima (2018) analyze the Dark Triad's influence on the professional interests of undergraduate students in Accounting Sciences. The survey, which involved 1,404 participants of all Brazilian regions, shows that the undergraduate students most frequently preferred Auditing and Accounting in private companies. The results show that the Dark Triad elements directly influence all the variables of career interest, suggesting, according to the authors, a search for social prestige and exhibitionism of hierarchical positions.

In a related study, D'Souza and Lima (2019) verify the relationship between the Dark Triad traits and the cultural values of the Accountancy students. The findings show a trend towards individualist values among those with high levels of the Dark Triad traits.

D'Souza *et al.* (2019) analyzed the relationship between maximization of personal and business gain and the Dark Triad. The survey conducted with 263 managers indicates that when the three elements of the Dark Triad are combined (narcissism, Machiavellianism, and psychopathy), they present a positive and significant influence on opportunistic maximization of gains.

Similar to this study's objective, Hobson *et al.* (2020) assume that independent auditors with high levels of Dark Triad traits are less prone to believe in managers, reinforcing professional skepticism. The results of the above experimental study corroborate the authors' expectations. Even though this study differs from the above in form, methodology, and target-population, its general purpose is the same. Nonetheless, Hobson *et al.* (2020) focus on "unjustified trust" in managers, while this study directly focuses on independent auditors' professional skepticism.

### 3. Methods

This is a quantitative study, the purpose of which is to explain how a phenomenon (professional skepticism) is related to the Dark Triad traits among independent auditors using numerical data and statistical techniques (Mujis, 2011).

The study population includes independent auditors actively registered in the CNAI (National Register of Independent Auditors). There were, on February 4<sup>th</sup>, 2020, a total 4,142 of auditors in this population. The LinkedIn® platform was used to contact the target-population, and 1,246 independent auditors were identified. They were asked to answer an electronic questionnaire voluntarily and return it afterward. A total of 170 valid questionnaires were received by the end of this process (April 28<sup>th</sup>, 2020), with a response rate of 13.6% of the identifiable group.

Jones and Paulhus (2014) created the Short Dark Triad (SD3) to simply and effectively measure Dark Triad traits among individuals. Later, D'Souza and Lima (2018) translated the instrument's 27 statements (9 for each of the 3 traits) and kept the original 7-point Likert scale. Because this is a validated instrument that specifically meets this study's objective, the version translated by D'Souza and Lima (2018) was assumed to be efficient to measure Machiavellianism, narcissism, and psychopathy.

As for professional skepticism, the scale proposed by Hurtt (2010) was used. It measures the skepticism of independent auditors through 30 items rated on intervals ranging from 1 to 6. This scale's items are aggregated into six different subgroups, namely: Questioning Mind (MQ); Suspension of Judgment (SJULG); Search for Knowledge (BC); Interpersonal Understanding (CINT); Self-Esteem (AEST); and Autonomy (AUT). Haveroth and Cunha (2018) translated the scale proposed by Hurtt (2010) and to mitigate potential biases, a 7-point scale was also adopted for this construct.

Note that the reverse questions established by the authors of the original instruments were kept both for the SD3, and professional skepticism, while Cronbach's alpha was used to measure the internal consistency of both (Maroco & Garcia-Marques, 2006).

Other questions were asked to gather the control variables for the model, such as experience in the auditor's position (Nelson, 2009; Hurtt *et al.*, 2013), which is measured in years; the auditor's gender (Bobek; Hageman & Radtke, 2015) measured in this study through a dichotomous variable (Male=1; Female=0); and whether they worked in one of the Big Four firms, according to DeAngelo (1981), also a dichotomous variable (*Big 4* = 1; Otherwise = 0). For descriptive purposes only, the respondents also reported in which state they were registered in the CNAI.

Latent variables were generated according to confirmatory factor analyses to measure the three elements of the Dark Triad – Machiavellianism, narcissism, and psychopathy, abbreviated here as MAQ, NAR, and PSI (through the SD3), and also the variables MQ, SJULG, BC, CINT, AEST, and AUT obtained with the professional skepticism proposed by Hurtt (2010). The objective is to corroborate a previously conceived theoretical conception (Fávero; Belfiore; Silva & Chan, 2009).

Because these constructs are organized on an ordinal scale, the confirmatory factor analysis is based on polychoric correlation matrices, following the methodological suggestion of Holgado-Tello, Chacón-Moscoso, Barbero-García and Vila-Abad (2010). Bistaffa (2010) emphasizes that a polychoric correlation matrix is formed by the bivariate association of two ordinal variables with at least three categories. In this sense, according to the author, starting with the hypothetical categorical variables A and B and their respective latent variables X and Y, and with a relationship between these variables, considering that:  $A = a_p$ , if  $\lambda_{i-1} \leq X < \lambda_i$ ;  $i = 1, 2, \dots, m$  and  $B = b_p$ , if  $\tau_{j-1} \leq Y < \tau_j$ ;  $j = 1, 2, \dots, n$ , with thresholds  $\tau_i$  and  $\lambda_j$ , being  $\lambda_0 = \tau_0 = -\infty$  and  $\lambda_m = \tau_n = +\infty$ , polychoric correlation coefficient  $\rho$  emerges, designated as the product-moment relationship between the latent variables X and Y.



The principal component analysis was used to extract the latent variables because the initial objective was to decrease the number of the original variables (Fávero *et al.*, 2009). *A priori* criterion was adopted during the extraction of factors considering only one unit per group.

After extracting the latent variables using factor analysis, six equations were generated to be regressed via Ordinary Least Squares (OLS), highlighted below:

$$MQ = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (1)$$

$$\text{SJULG} = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (2)$$

$$\text{BC} = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (3)$$

$$\text{CINT} = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (4)$$

$$\text{AEST} = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (5)$$

$$\text{AUT} = \alpha + \beta_1 \text{ GEN} + \beta_2 \text{ BIG4} + \beta_3 \text{ EXP} + \beta_4 \text{ MAQ} + \beta_5 \text{ NAR} + \beta_6 \text{ PSI} + \varepsilon \quad (6)$$

The Jarque-Bera and Breusch-Pagan tests were performed to verify normality and homoscedasticity of the residues, according to Fávero *et al.* (2009). In the absence of a Gaussian tendency for the residues' behavior, the assumption was relaxed based on the Central Limit Theorem (Gujarati & Porter, 2011), whereas where there was heteroscedasticity, it was treated with White's robust correction (Fávero *et al.*, 2009). Nevertheless, the 10-unit mark in the Variation Inflation Factor (VIF) was considered an acceptable limit of multicollinearity between regressors, according to Gujarati and Porter (2011).

Finally, to bring robustness to the study's results, regressions were estimated using Minimum Absolute Deviation (MAD) for the models previously presented. According to Ohlson and Kim (2015), by replacing the mean for the median as the parameter, this form of estimation suggests greater confidence in the results given the influence of potential outliers. It is also important to note that this technique adopted here as a sensitivity measure is semi-parametric, thus, exempt from the need to assume parameters such as normality and homoscedasticity of residues (Duarte, Girão & Paulo, 2017).

For explanatory purposes, MDA models will be given by:

$$Q\tau(\text{VD}|x) = \alpha(\tau) + \beta_1(\tau)\text{GEN} + \beta_2(\tau)\text{BIG4} + \beta_3(\tau)\text{EXP} + \beta_4(\tau)\text{MAQ} + \beta_5(\tau)\text{NAR} + \beta_6(\tau)\text{PSI} + \varepsilon \quad (7)$$

- Where: Q is the conditional quantile function; VD are the dependent variables of Equations 1 to 6;  $\tau$  is the regression's quantile-parameter represented by median (0.5); x is the matrix of regressors;  $\alpha$  is the intercept;  $\beta_{1,2,3,\dots,n}$  are the slope coefficients;  $\varepsilon$  is the stochastic error.

## 4. Analysis and Discussion of Results

### 4.1 Validation of the Instrument and Sample Characterization

First, it is important to report that the study's instruments, that is, SD3 and skepticism by Hurtt (2010), presented appropriate internal reliability, with Cronbach's alphas equal to 0.8182 and 0.8457, respectively. Assuming the precepts of Murphy and Davidshofer (2005), these are classified as "moderate to high" reliability. Nunnally and Bernstein (1994) also note that in the social sciences field (as is the case of this study), values between 0.7 and 0.8 are acceptable to validate an instrument's internal consistency. The same procedure was adopted considering the constructs individually and only two obtained values below 0.7 (NAR=0.6454 and MQ=0.6888). That is, even if considered in isolation, the results indicate appropriate consistency considering a tolerance measure.

As for the respondents' characterization, 51 ( $\cong 29.82\%$ ) reported being women, while 119 ( $\cong 69.59\%$ ) reporting being men. This predominance of males over females within audit firms' scope was also identified in the studies by Mendes *et al.* (2018) and Haveroth and Cunha (2018), though different percentages confirmed the majority of males, 86.67% and 74.90% respectively. Hence, in line with other studies, this study's results suggest that male individuals are a majority in the field of independent auditing.

The respondents were also classified in terms of the size of the firms for which they worked (Big 4 x Non-Big 4). In this sense, 101 participants were in the Non-Big 4 group, approximately 59% of the sample. Consequently, 69 respondents (approximately 41% of the sample) reported being an employee of one of the world's four largest independent auditing companies. The study by Haveroth and Cunha (2018), which used the LinkedIn® platform to access independent auditors registered in the CNAI, found a percentage of approximately 49% in the Big 4 group from a total of 255 participants. Thus, in principle, the results are similar, apparently not showing bias due to sample variability.

The sample's composition considering the geographical factor (State where the independent auditor is registered to the CNAI), is presented in Table 1.

Table 1

**Sample composition (geographical)**

Region	FA	FR (approx.)	Federal Unit	FA	FR (approx.)
Mid-West	9	5.294%	Federal District (DF)	4	2.353%
			Goiás (GO)	2	1.176%
			Mato Grosso (MT)	2	1.176%
			Mato Grosso do Sul (MS)	1	0.059%
Northeast	8	4.705%	Bahia (BA)	4	2.353%
			Ceará (CE)	1	0.059%
			Pernambuco (PE)	3	1.177%
Southeast	78	45.882%	Espírito Santo (ES)	2	1.176%
			Minas Gerais (MG)	6	3.529%
			Rio de Janeiro (RJ)	4	2.353%
			São Paulo (SP)	66	38.823%
South	75	44.117%	Paraná (PR)	27	15.882%
			Rio Grande do Sul (RS)	28	16.470%
			Santa Catarina (SC)	20	11.765%
<b>TOTAL</b>	<b>170</b>	<b>100%</b>	-	<b>170</b>	<b>100%</b>

Obs.: FA = Absolute Frequency; FR = Relative Frequency.

Source: research data (2020).

Table 1 shows a predominance of the Southeast and South, while the state of São Paulo is the most frequently represented in this study. These numbers follow the proportion of the study's population (auditors with an active CNAI), in which the Southeast and South are the ones with the highest number of auditors and São Paulo is the leading state. Thus, in principle, it suggests a lack of bias due to sample variability.

Haveroth and Cunha (2018) also report both the leadership of São Paulo in terms of sample size among states and the leadership of the Southeast (followed by the South).

## 4.2 Factor Analysis and Descriptive Statistics

Based on the polychoric matrices, factor analysis was performed to extract the latent variables MAQ, NAR, and PSI (SD3) and MQ, SJULG, BC, CINT, AEST, and AUT (professional skepticism). Table 2 presents a summary of this process.

Table 2

**Factor analysis**

Variable	Bartlett's test	KMO	Communality
AEST	0.000	0.8566	0.7800
AUT	0.000	0.8102	0.7622
BC	0.000	0.8646	0.8614
CINT	0.000	0.8128	0.7291
MAQ	0.000	0.7279	0.4789
MQ	0.000	0.7964	0.6289
NAR	0.000	0.6619	0.4469
PSI	0.000	0.8217	0.6028
SJULG	0.000	0.8238	0.7080

Note: KMO=Kaiser-Meyer-Olkin.

Source: research data (2020).

According to Fávero *et al.* (2009), adequate factor analysis is required to reject the null hypothesis of Bartlett's sphericity test; that is, the correlation matrix has not to be an identity matrix. As shown in Table 2, the p-values of all the variables for this test indicate that the premise is accepted at a 99% confidence level.

Kaiser-Meyer-Olkin (KMO) criterion, which verifies the general consistency of data, also presented reliable values for the factor analysis' continuity. According to Fávero *et al.* (2009), KMO values above 0.6 are considered appropriate, a factor that is confirmed by the study's data. Considering the sample size (n=170), the commonality of factors can also be considered statistically significant for this study, according to Hair, Anderson, Tatham, and Black (2005).

As a measure of complementary analysis, the criteria to extract factors was replaced, *a priori*, by the latent root criterion (Kaiser's criterion) and all the initial results were maintained considering that only one factor presented an eigenvalue greater than one unit for all the variables (Fávero *et al.*, 2009).

Table 3 presents a descriptive summary of the quantitative variables.

Table 3

**Descriptive statistics**

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
AEST	6.13	6.27	1.13	1.25	7.40
AUT	6.31	6.42	1.13	2.26	7.79
BC	6.94	7.31	0.70	1.65	7.40
CINT	6.00	6.21	1.36	1.59	7.78
EXP	8.98	7.00	7.86	0.00	37.00
MAQ	4.61	4.53	1.48	1.38	8.62
MQ	6.95	6.96	0.83	3.93	8.12
NAR	5.73	5.62	1.41	2.53	10.21
PSI	2.53	2.18	1.11	1.29	8.53
SJULG	6.50	6.59	0.99	3.36	7.84

Source: Research data (2020).

A low level of dispersion was observed among the variables with metric properties, except for the only discrete variable (EXP). This fact, corroborated by proximity between means and medians, indicates little influence of outliers in the sample set.

### 4.3 Regression Analysis (OLS)

Table 4 shows the results of the tests used to verify the basic assumptions to be assumed in the analysis of the OLS regressions.

Table 4  
Regression Assumptions

Panel A - Normality and Homoscedasticity of Residues						
Equation	Jarque-Bera		Breusch-Pagan		Breusch-Pagan	
	Chi <sup>2</sup>	p-value	Chi <sup>2</sup>	p-value	p-value	p-value
1	7.59	0.022	3.58	0.058	0,058	0,058
2	12.52	0.002	1.62	0.203	0,203	0,203
3	594.50	0.000	141.01	0.000	0,000	0,000
4	14.13	0.000	0.41	0.520	0,520	0,520
5	81.32	0.000	10.16	0.001	0,001	0,001
6	14.04	0.000	15.43	0.000	0,000	0,000

Panel B - Multicollinearity between Regressors						
	GEN	BIG4	EXP	MAQ	NAR	PSI
VIF	1.10	1.11	1.11	1.63	1.26	1.63

Note: VIF = Variance Inflation Factor.

Source: Research data (2020).

Assuming a 95% confidence interval, data in Table 4, Panel A, indicate a lack of Gaussian behavior for the residues in all the proposed equations. However, given the sample size of this study (n=170) and concerning the Central Limit Theorem, this assumption could be relaxed (Gujarati & Porter, 2011). Panel A indicates heteroscedasticity in equations 3, 5, and 6, given the level of significance adopted. White's correction was adopted in these equations to solve these obstacles, making its standard errors robust.

Finally, Panel B presents values much below the limit established by Gujarati e Porter (2011) for the VIFs, indicating, in principle, a lack of problems derived from collinearity between the stimulus variables.

Hence, it is important to analyze the regressions listed in the methodology section. Table 5 presents a summary.

Table 5  
OLS Regressions

Panel A							
Equation / Regressand	$\alpha$	GEN	BIG4	EXP	MAQ	NAR	PSI
(1) MQ	6.408*** (21.58)	0.015 (0.10)	-0.049 (-0.37)	0.022** (2.57)	-0.040 (-0.74)	0.113** (2.26)	-0.401 (-0.56)
(2) SJULG	6.857*** (19.31)	-0.161 (-0.94)	-0.207 (-1.29)	0.007 (0.70)	0.027 (0.41)	0.018 (0.29)	-0.184** (-2.12)
(3) BC	7.276*** (31.94)	0.059 (0.52)	-0.142 (-1.34)	0.007 (0.91)	0.009 (0.22)	0.029 (0.89)	-0.233 (-1.58)
(4) CINT	5.645*** (11.59)	-0.345 (-1.46)	0.281 (1.28)	-0.008 (-0.59)	0.030 (0.33)	0.140* (1.70)	-0.148 (-1.26)
(5) AEST	5.012*** (13.18)	0.245 (1.27)	-0.443** (-2.52)	0.031*** (2.94)	0.050 (0.51)	0.259*** (4.05)	-0.340*** (-3.32)
(6) AUT	6.456*** (14.26)	0.579*** (2.96)	-0.027 (-0.15)	0.001 (0.09)	-0.140* (-1.82)	0.091 (1.50)	-0.170 (-1.29)

Panel B			
Equação / Regressando	F	Prob> F	R <sup>2</sup>
(1) MQ	2.24	0.0417	0.0763
(2) SJULG	1.46	0.1942	0.0511
(3) BC	1.38	0.2257	0.1250
(4) CINT	1.69	0.1271	0.0585
(5) AEST	7.16	0.0000	0.2349
(6) AUT	3.39	0.0036	0.1068

Note: \* = 90% confidence level; \*\* = 95% confidence level; \*\*\* = 99% confidence level.

Source: Research data (2020).

The results presented in Table 5 enable us to disregard beforehand any linear relationships between the regressors of equations 2, 3, and 4 their respective regressands. Panel B shows that these equations present p-values (F)>0.05, that is, the models *per se* are not statistically significant at a 95% confidence level.

Equations 1, 5, and 6 – statistically significant and with explanatory power (R<sup>2</sup>) of approximately 7%, 23%, and 10%, respectively –, present distinct results. The control variable GEN, for instance, is only statistically significant for the Autonomy characteristic. Men seem to have stronger traits of this characteristic than women. This result contradicts Haveroth and Cunha (2018) results as they found very similar means between these two groups (using descriptive statistics). A possible explanation for this discrepancy is the difference in the methods used in each study, while a potential impact arising from sample variability is not ruled out.

BIG4, another control variable, was statistically significant only for AEST. The negative sign suggests that independent auditors working in one of the Big Four firms have higher self-esteem than their counterparts, contrary to the apparent indifference of this aspect found by Haveroth and Cunha (2018). Hurtt (2010) explained that self-esteem corresponds to the level in which auditors trust themselves. Hence, this result is in line with DeAngelo (1981) proposes, that even if partially, regarding the high quality of the services provided by large audit firms. Note, however, that even though confidence is relevant for professional skepticism among auditors, overconfidence is a common problem among these professionals (Lucena, Fernandes & Silva, 2011), possibly damaging the quality of the service they provide (Steppan, Santiago, Silva, Cavalcante & Silva, 2015).

The last control variable (EXP) appears statistically significant for MQ and AEST. In both cases, the sign was positive, suggesting that more experienced auditors question more and have higher self-esteem and confidence in their capabilities. This result is in line with Nelson (2009) and Hurtt *et al.* (2013), considering that experience brings a greater ability to identify patterns, errors, etc. Nonetheless, as previously explained, Nelson (2009) points out that more experienced auditors may also have their professional skepticism decreased if they assume imprudent attitudes arising from bad habits at work.

When analyzing this study's interest variables, we note that the MAQ variable is statistically significant (at a 10% level of significance) for the construct that refers to independent auditors' autonomy. The negative sign that precedes this coefficient indicates an inverse relationship between the variables, suggesting lower autonomy among independent auditors who present characteristics of Machiavellianism.

This contradicts this study's expectations, considering that Machiavellian individuals do not establish affective ties with others (Paal & Bereczkei, 2007); hence, they should be completely autonomous and disregard others' opinions assuming the level of evidence demanded by the hypothesis (Hurtt, 2010). Perhaps this controversial result may be linked to the fact that Machiavellian people manipulate others to achieve their personal goals (Christie & Geis, 1970; Wilson *et al.*, 1996) and, therefore, less autonomy could be interpreted as a delegation of tasks, which the auditor does not wish to perform. More studies are needed to understand this finding better.

Regarding narcissism (NAR), there is a statistically significant linear relationship between this variable and questioning minds and self-esteem. Both the results are in line with the notion that narcissistic individuals are arrogant (Rhodewalt & Peterson, 2009; Pincus & Lukowitsky, 2010). This result was expected in this study, and the results confirm it. Thus, auditors with this characteristic should question more because they doubt others' ability when validating a given issue while simultaneously presenting a high level of confidence in their capabilities.

The relationship between NAR and autonomy (AUT) was not statistically significant. This result contradicts the expectations, but it is possibly explained by the auditors' eventual lack of power to make autonomous decisions in their firms. This explanation seems realistic because the average experience of the sample's independent auditors is approximately nine years. Hence, a considerable portion of the sample may be composed of auditors who do not yet occupy a management position, and consequently, cannot act on their own in many situations (Muzel, 2018).

Concerning the psychopathy trait (PSI), note that this variable presented a statistically significant relationship only with the AEST variable. The negative sign in this relationship indicates that auditors with high levels of psychopathy would have lower self-esteem. This result opposes Wexler (2008), in which psychopath individuals would have confidence as a typical trait in their work activities. Perhaps, this is a specific point in the auditors' function, so that future studies are needed to make comparisons and verify this issue.

The fact that PSI was not significantly associated with AUT is noteworthy. This is because egocentrism is a characteristic trait of psychopaths (Paulhus & Williams, 2002; Jones & Paulhus, 2014), and a positive sign for the autonomy variable was expected. This finding can be explained by potential power relations existing in audit firms, beyond the respondents' individual perspectives. This is possible given the arguments previously presented regarding the NAR variable. According to Muzel (2018), the study participants' average experience in years in non-managerial positions would impede them from acting on their own in many situations.

In summary, this set of results indicates total rejection of H1 and H3, while H2 was only partially rejected.

#### 4.4 Sensitivity Analysis (MDA)

As described in the methodology sector, the results of the regressions estimated with minimum absolute deviation to analyze the sensitivity of the general results are presented below. Table 6 shows data that refer to equations 1, 5, and 6 only to enable comparisons with the valid models estimated via OLS.

Table 6

##### MDA Regressions

Equation/ regressand	$\alpha$	GEN	BIG4	EXP	MAQ	NAR	PSI
(1) MQ	6.568*** (18.03)	0.003 (0.02)	-0.125 (-0.75)	0.026** (2.58)	-0.107 (-1.58)	0.111* (1.85)	0.057 (0.64)
(5) AEST	5.106*** (13.43)	0.386** (2.11)	-0.502*** (-2.95)	0.034*** (3.26)	-0.033 (0.47)	0.309*** (4.76)	-0.320*** (-3.50)
(6) AUT	6.053*** (9.12)	0.439 (1.36)	-0.134 (-0.44)	0.001 (0.07)	-0.136 (-1.12)	0.184 (1.63)	-0.135 (-0.83)

Note: \* = 90% confidence level; \*\* = 95% confidence level; \*\*\* = 99% confidence level.

Source: research data (2020).

There is only one change concerning the initial results among the control variables. It refers to the GEN variable, which becomes statistically significant with the AEST (95% confidence interval), but, in turn, loses its statistical significance with the AUT variable.

In turn, variables BIG4 and EXP keep all their statistically significant relationships. The coefficients estimated through MDA are very close to OLS's coefficients, and their signs did not change.

For the variables of interest, note that MAQ, previously significant at a 90% confidence interval to explain AUT, no longer presents a linear statistically significant relationship. This result may challenge the negative sign previously found, which contradicted the existing literature on Machiavellianism.



In turn, NAR and PSI maintain the same statistically significant relationships perceived in the OLS estimates in addition to the same signs and coefficients with very similar magnitudes.

Thus, this set of results shows greater consistency with the results perceived in the OLS estimates when indicating that there was little influence of outliers, given that the results based on the median were preserved almost in their entirety.

## 5. Final Considerations

Professional skepticism is a desirable characteristic for the proper exercise of the audit profession according to provisions of regulatory and academic bodies. However, it is also known that such an attribute is difficult to measure.

Given the relevance and complexity of auditors' professional skepticism, some studies seek to explain these variable's determinant factors, in which the auditors' personality traits are one aspect frequently addressed. Up to the moment, however, no empirical studies addressing socially undesirable personality traits have been found. According to Hobson *et al.* (2020), this gap is relevant because psychology suggests that the auditors' personality traits tend to influence the quality of the services they provide.

In this context, this study's objective was to analyze the influence of the Dark Triad on professional skepticism among independent auditors in Brazil.

In general, the results suggest that: a) Machiavellianism does not positively influence professional skepticism, as it can harm this quality in terms of auditors' autonomy; b) Narcissism among independent auditors can benefit professional skepticism as it raises self-esteem and a questioning mindset, and: c) psychopathy does not favor professional skepticism among auditors. The results show that this personality trait may decrease professional skepticism by decreasing self-esteem among these workers.

This study is limited because it does not consider the auditors' socially desirable personality traits together with their undesirable traits and does not explore each individual's specificities in the face of these unanswered questions.

Hence, future studies are suggested to analyze the relationship between the auditors' Dark Triad personality traits and professional skepticism using an interpretative approach, which would enable the participants to report how their personal and professional experiences influence their skeptical attitudes.

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