NEUROSCIENCE: A NEW MODEL FOR ANTICORRUPTION POLICIES?

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RESUMO[2]

Desde o colapso das narrativas sobre corrupção nas ciências sociais modernas e o descrédito experimentado pelas políticas anticorrupção baseadas na Teoria da Agência, novas perspectivas sobre a corrupção surgiram. A maioria delas sustenta uma visão culturalista ou antropológica, baseada em práticas sociais, rotinas e ação coletiva. Uma parte menor dos estudos, entretanto, confia sua explicação no renascimento de abordagens clássicas do crime na biologia. Esses estudos, impulsionados pelos progressos nas neurociências, permitiram diagnosticar – por meio de técnicas de escaneamento cerebral – disfunções e lesões no cérebro que poderiam estar relacionadas ao comportamento corrupto. Este artigo pretende oferecer uma visão geral sobre a abordagem neurocientífica da corrupção e suas implicações no campo da administração, especialmente na formulação de políticas anticorrupção. Poderia ela, de fato, contribuir para reformular velhas políticas? Ou, ao contrário, essa abordagem é meramente uma repetição de fórmulas antigas? Até que ponto as políticas públicas baseadas na neurociência podem estimular intervenções mais eficazes e programas de boa governança? O artigo é dividido em três partes: na primeira seção, apresentamos o contexto em que se desenvolve a abordagem neurocientífica, comparando-a rapidamente com outras abordagens também preocupadas com a governança no setor público. Na seção seguinte, descrevemos as principais características dos estudos de neurociência que os tornam atraentes para os profissionais da administração e para os formuladores de políticas. Na última seção, fazemos um balanço de sua capacidade de identificar possíveis comportamentos corruptos e também de suas limitações, considerando pesquisa em campo realizada em 2015.

Palavras-chave: Direito Administrativo; Direito Financeiro; Direito Constitucional; Controle externo; Corrupção; Neurolaw; Neurociência; Políticas públicas.

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ABSTRACT

Since the collapse of the narratives on corruption in the modern social sciences, and from the discrediting experienced by anti-corruption policies based on the Agency Theory, new perspectives on corruption have emerged. Most of them support a culturalist or anthropological view, based in social practices, routines and in collective action. However, a smaller part of the studies bases its explanation on the revival of classic approaches to crime in biology. These studies, driven by the advances in the neurosciences, allowed diagnoses – through brain scanning techniques – of disorders and brain injuries that could be related to corrupt behavior. This article provides an overview of a neuroscientific approach to corruption and its implications in the field of public administration, especially in the creation of anticorruption policies. Could it, in fact, help reformulate old policies? Or, on the contrary, is this approach merely a repetition of old formulas? To what extent can public policies based on neuroscience stimulate more effective interventions and good governance programs? The article is divided into three parts: in the first section, we present the context in which the neuroscientific approach is developed, quickly comparing it to other approaches also related to governance in the public sector. In the following section, we describe the main characteristics of neuroscience studies that make them attractive to management professionals and policy makers. In the last section, we analyze their ability to identify possible corrupt behaviors and also their limitations, considering a field research carried out in 2015.

Keywords: Administrative Law; Financial Law; Constitutional Law; External control; Corruption; Neurolaw; Neuroscience; Public policies.

1 PSYCHOPATHY AND BRAIN IMAGING IN THE PREVENTION OF CORRUPTION IN THE PUBLIC ADMINISTRATION

The turning of scientific research towards the ways of controlling corruption has more recently been followed by two fundamental aspects: on the one hand, the successive implication of public and private agents in corruption scandals suddenly exposed in the means of communication; and, to the other hand, the fluctuation of perception levels in what regards corruption, whose results, periodically disclosed by international agencies, point at the idea that current corruption is higher than the one existing in the past.

Those factors help explaining the growing interest of researchers, public administrators and external as well as internal control professionals in unraveling not only repressive measures to fight corruption, but also alternatives that can offer responses to that reality and to prevent, *a priori*, antisocial behavior and corruption acts to flourish and to perpetuate in the public administration.

Thus, how to hinder public servers, or future public agents, to engage in corruption?

The more immediate answer to that question suggests that the first task consists in identifying the predisposition of those individuals to engage in corruption practices by diagnosing characteristics that prevent their access to public service, always insuring

presumption of innocence and due legal process. It is clearly a rhetorical exit that, in order to be satisfactory, requires that we look for the existing or available ways to verify the tendency of some individuals to engage in antisocial practices among which are corruption crimes. Would they have a biopsychological marker that evidenced such predisposition?

An Italian doctor, Cesare Lombroso, was a pioneer in working with that hypothesis in the end of the 19th century. From a comprehensive study with criminals' skulls and bodies, Lombroso concluded that the existence of crime was directly associated to the presence of physical, psychological and biological traits in the individuals. When distinguishing morally insane people from born offenders, for example, Lombroso[3] endorses the reasoning that assigns the following characteristics to those criminals:

> [...] brain affections, congenital or acquired, alcoholism inheritance, epilepsy, madness, brain trauma, meningitis or senile atrophy, senile dementia, functional changes of the nervous system or the development of the body, strabismus, equine foot, poor genital conformation. They are predisposed to brain diseases, to congestion, intolerance in alcoholics, variable mood, exaggerated passions.

Although he revolutionized the study of crime and criminal anthropology at that time, Lombroso's ideas were forgotten a while after. Only recently, with the progress of neuroscience techniques and studies, was the credibility of his thesis taken up.

Adrian Raine,[4] a medical doctor and neuroscientist at the University of Pennsylvania, recalls the contribution of the Italian doctor exactly by pointing at the biological roots of crime. When developing his studies on psychopathy, the anatomy of violent crimes and of white-collar crimes, Raine rescues Lombroso's ideas and highlights the central role that psychological and biological characteristics, especially brain activities, assume in defining the most different types of crime. Nonetheless, the only remark added by the neuroscientist concerns the Lambrosian argument according to which the characteristics that are present in criminals are evolutionary, that is, they are transmitted from father to son and they are responsible for ranking and differentiating better evolved species from species that experienced less evolution and for which science failed to find evidence.

In the attempt to answer the question, we covered the alternatives that could predict or anticipate the possibilities of a certain public server, or candidate, to engage in acts of corruption, notably when they reach directive, leadership and expenditure planning positions.

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[3] LOMBROSO, C. **O homem delinquente**. São Paulo: Ícone, 2016. p. 208.
[4] RAINE, Adrian. **Predicting Anti-Social Behavior.** Available at: https://www.youtube.com/watch?v=6PpKdwWHDMA, from minute 4:38 to minute 8:35. Accessed on: Nov. 25, 2016.

The test of integrity, the psychopathy diagnoses and the brain scan techniques were surveyed so as to present the main characteristics and the experiences already carried out by using those tools in order to validate the hypothesis that corruption practices reach public departments and contribute to the inefficiency of the public budget once corrupt agents hinder the optimal implementation of public policies.

One of the most important strategies to help preventively control corruption is the Integrity Test, which came up in the 40's. In its core and according to Baumgartl,[5] one can find the "personality traits that present greater validity evidence predicting the performance of the employee in several positions". Although permeated by relative subjectivity, according to the studies carried out by this researcher, there is an epistemological core of integrity that is related to

> [...] the intensity of the manifestation of behaviors that are decent and honest [...]. The theoretical rationale involved in the assessment of that factor says that the largest the magnitude of the integrity, the smallest the manifestation of counterproductive behaviors in the work environment.[6] (translated by us)

Thus, the central idea in the argument is that there is a reverse correspondence between someone's honesty and the chances that the person may act to the detriment of the interests of the entity, so that, the more reliable and honest a person is, the lower the probability that this person behaves so as to harm the company itself and the collectivity.

The relevance of the binomial honesty-trust in that kind of test does not lack sense and it greatly explains why integrity tests rivaled polygraphs or "lie detectors" in the past.

The polygraph is nothing but an "electronic device that identifies physiological signs (respiratory rhythm, cardiovascular activity and skin sweat) and registers them"[7] on the assumption that those registers may capture violations of the truth, that is, honesty and trust, at the exact moment when the examinee lies and noticeably changes his/her physiological signals.

When we face an almost unexplored field of scientific knowledge, at least in the interaction with Administrative Law, it is possible to take the following stances: dogmatism, skepticism, relativism and perspectivism. We then assume that the scientific theory approached herein substantiates a formal and conceptual mechanism of experimental observations.

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[5] BAUMGARTL, V. O. et al. Integridade e externalização: estudo exploratório em uma amostra de estudantes de psicologia. **Psico-Usf**, v. 14, n. 3, Sep./Dec. 2009. p. 300.
[6] Ibidem.
[7] Ibidem.

According to Henry Greely, "neuroscience is in the midst of a revolution having important consequences for Law, may they be wider, in the way it is going to change society, or more direct, by means of its immediate applications to the legal system".[8] Such revolution considers the expansion of knowledge of biological phenomena on human behavior, the society and Law.

The progresses of the neuroscientific revolution affect Law in at least four fields: "(1) new insights on issues involving responsibility, (2) the refinement of the ability to 'read minds', (3) better predictions on future behaviors and (4) possibilities to improve the human brain".[9]

However, the most important transformations are in the area of neuroimaging. The Magnetic Resonance Imaging (MRI) exams, among others, are nowadays a safe method to map brain structures that is widely available. Likewise, the so called Functional Magnetic Resonance Imaging (fMRI) is particularly useful.

Pursuant to Henry Greely, the use of fMRI and other techniques to study the neuroscience of decision making, including the ethical decision making, is spreading with possible implications on legal responsibility issues.[10]

Those issues put the existence or the inexistence of free will under analysis. Conclusions that question the existence or the scope of free will may "have consequences for legal responsibility – not just in Criminal Law, but also in areas where Law concentrates in individual choice".[11]

The broadly studied neuroscientific reading of the mind is the detection of lies. In Henry Greely words:

> [...] at least two private companies announced plans to start offering lie detection services based on fMRI in 2006. It is widely known that the Army and the Intelligence are spending substantial resources to research several methods to detect lies by means of neuroimaging.[12] (Translated by us)

Such investment may have substantial effects on the prevention of corrupt behavior. What may nowadays sound like a chimera, in terms of the effectiveness of public expenditure through the prevention of corrupt behavior may become a reality with time once "it is impossible to know what the uses of neuroscience will be, but the accelerated increase of our

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[8] GREELY, H. T. Neuroscience and Law. In: CLARK, D. S. (Ed.). **Encyclopedia of Law & Society:** American and Global Perspectives. Thousand Oaks: SAGE Publications, 2007. p. 1062. v. 2.
[9] Ibidem.
[10] Ibidem.
[11] Ibidem.
[12] Ibidem.

knowledge on the human brain leads to the fact that neuroscience shall have great effects on the society along the 21st century".[13]

A recent and concrete experience involving the Integrity Test can be seen in East Asia. The Malaysian experience appears as one of the most successful in the continent. It is responsible for providing the public sector's "Integrity System"[14] with robustness once it is frequently busy dealing with techniques to improve ethics and integrity[15] inside its departments.

Developed by the National Center of Research and Development in Information Technology and Communication (MIMOS), an agency that is subordinated to the Ministry of Science, Technology and Innovation (MOST), and based on psychometry,[16] the Malaysian Integrity Test (MIT) was designed "[...] to identify the tendency of an individual to be honest and coherent in what regards actions, values and principles and to evaluate the person's propensity for getting involved in counterproductive behaviors".[17]

2 ANTISOCIAL BEHAVIOR AND BRAIN IMAGING TECHNIQUES: NEUROLAW

All diagnosis forms based on reports and expert observation evolved to the use of more modern identification techniques that are also being introduced into the Brazilian public sector. Not only integrity tests and digital media[18] have been used in the prevention of crime in corporate and police environments, but also techniques coming from neuroscience, especially from neuropsychiatry and neuropsychology such as brain imaging[19] feed and give breath to a new branch of legal science: neurolaw.[20]

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[13] GREELY, H. T. Neuroscience and Law. In: CLARK, D. S. (Ed.). **Encyclopedia of Law & Society:** American and Global Perspectives. Thousand Oaks: SAGE Publications, 2007. p. 1064, v. 2

[14] ROSLI, M. H. et al. Integrity Systems in Malaysian Public Sector: an Empirical Finding. **Procedia Economics and Finance**, v. 28, 2015. p. 260-265.

[15] SIDDIQUEE, N. A. Combating Corruption and Managing Integrity in Malaysia: a Critical Overview of Recent Strategies and Initiatives. **Public Organization Review**, v. 10, n. 2, June 2010. p. 153-171.

[16] Psychometry, a word originating from the junction of *psyché* and *metron* in Greek regards the measurement or the identification of and individual's psychological traits (in the min dor the personality) manifested in his/her behavior

[17] MIMOS – NATIONAL R&D CENTRE IN ICT. **Malaysian Integrity Test (Mi-PBT MIT).** Kuala Lumpur: [s.n.], 2013.

[18] SOUZA, S. H. C. L. D.; COSTA, E. G. D. Vigiar para punir: as mídias digitais como ferramenta para prevenir e conter ações criminosas. In: SIMPÓSIO INTERNACIONAL LAVITS: VIGILÂNCIA, TECNOPOLÍTICAS, TERRITÓRIOS, 3, 2015. **Anais...** Rio de Janeiro: [s.n.].

[19] UMBACH, R.; BERRYESSA, C. M.; RAINE, A. Brain Imaging Research on Psychopathy: Implications for Punishment, Prediction, and Treatment in Youth and Adults. **Journal of Criminal Justice**, v. 43, 2015.

[20] PIMENTEL, C. P. O "cérebro criminoso": observações críticas sobre o uso das neurociências cognitivas no sistema judiciário. In: SIMPÓSIO INTERNACIONAL LAVITS: VIGILÂNCIA, TECNOPOLÍTICAS, TERRITÓRIOS, 3, 2015. **Anais...** Rio de Janeiro: [s.n.].

Having come up in the United States of America in the second half of the years 2000 and disseminated nowadays in study centers in Berlin, Milan and London, neurolaw uses the broad instruments of neurocognitive science and neuroimaging techniques to build strong evidence in the legal world so as to help judges, lawyers and legal professionals understand the meander of crime. The comprehension of brain functioning and of mental processes that are in the origin of human behavior assumes a central role in the legal science while the law is a way to regulate the behavior of individuals.[21]

Nonetheless, the contributions of this new field of legal science overcome the simple connection between the brain, the mind and the behavior of individuals. When extending its analysis over the role of genes and the environment in the development of different personalities in individuals, neurolaw offers lessons concerning the definition of criminal responsibility and the dosimetry of penalties.[22]

One of the greatest challenges imposed by corruption to the public administration's control systems – of which, for example, public managers as well as internal and external control professionals in the public administration are part – regards predicting acts and behaviors that are at the origin of irregularities that tarnish the management of public affairs.

The discussions on the subject are quite new and they are fed by the rise of new tools that identify the predisposition of individuals to commit crimes such as corruption.

From some experiences in the public administration to prevent servers to engage in corruption acts, a new field of studies on policies to stop corruption opens up. It is based on the use of tests or exams that identify the existence of psychological traits or personality elements that can predispose individuals who aim at the public service – as well as the ones who already hold a public position – to antisocial, counterproductive behavior and to corruption practices.

These are techniques that involve from the Integrity Test to the employment of brain imaging exams by means of MRI or SPECT,[23] which are notably expanding worldwide especially in some countries in East Asia. Their characteristics and application show the potentialities of those tools in what concerns the prevention and efficient fight against corruption, qualifying them for use by the public manager and by the members of the external and internal control in the public administration.

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[21] THE ROYAL SOCIETY. **Bain Waves Module 4**: Neuroscience and the Law. London: The Royal Society, 2011.

[22] Ibidem.

[23] Those are image exams produced by means of magnetic resonances or scans.

The main objective of those tests is to preventively create the understanding that any potential public agent, notably those who are going to have some control over public expenditure, shall be analyzed in a wider and more scientific way in terms of honesty.

We hereby register their use and recognition by the UN[24] and by Transparency International[25] in regards to the different polices[26] and we highlight the fact that integrity tests may be applied to the other public sectors, especially those where the "seduction for corruption" is more damaging to society.[27]

In parallel with their success, the absence of studies that evaluate the impact of those techniques on the public administration and on the Brazilian Law point at the need for further deepening in this area.

The idea that it is possible to anticipate or to confirm the predisposition of individuals to commit illegal acts through the Integrity Test raised discussions on the prevention of corruption to another level.

In this new logic, attributes existing in individuals – such as honesty, trust and coherence – started to be asked and taken as the starting point to establish a final judgment on people's general tendency to commit crimes in the future.

When working with personality attributes, integrity tests opened the field for other techniques to try to scrutinize individual personality and point at faults or disruption that could significantly compromise the professional and correct performance of the public server.

The idea of genome mentioned by Dutton[28] perfectly describes the effort of researchers to find the human personality traits that are able to evolve and characterize counterproductive and antisocial Behavior. By means of the responses given to options that a set of descriptions offers on the same factor, it is possible to identify the traits that emphasize the presence or the triggering of psychopathic disorders.[29] That is the reason why this test is at the origin of later attempts to diagnose personality disorders such as psychopathy.

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[24] UN. **UN Convention against Corruption**. UN General Assembly, Oct. 31, 2003. Available at: https://www.unodc.org/lpo-brazil/pt/corrupcao/marco-legal.html. Access on: Oct. 31, 2016.
[25] TRANSPARENCY INTERNATIONAL. POPE, Jeremy. TI Source Book 2000 – **Confronting Corruption**: the Elements of a National Integrity System. Available at:
http://archive.transparency.org/publications/sourcebook. Access on: May 5, 2015.
[26] ROTHLEIN, Steve. **Conducting Integrity Tests on Law Enforcement Officers**, abril/2010. Available at: http://www.llrmi.com/articles/legal_update/le_integrity_tests.shtml. Access on: May 5, 2015.
[27] UNITED NATIONS. **United Nations Handbook on Practical Anti-Corruption Measures for Prosecutors and Investigators**. Sep. 2004, p. 93. Available at: http://www.unodc.org/documents/afghanistan/Anti-Corruption/Handbook_practical_anticorruption.pdf. Access on: May 5, 2015.
[28] DUTTON, K. **The Wisdom of Psychopaths:** What Saints, Spies, and Serial Killers Can Teach Us about Success. New York: Scientific American, 2013.
[29] According to SERAFIM, A. P.; SAFFI, F. **Psicologia e práticas forenses**. 2. ed. Barueri: Manole, 2014; HIKAL, Wael. **Manual Básico de Teorías Criminológicas de la Personalidad**: Revelando la Personalidad

Nevertheless, psychopathy, in contrast to what people commonly experience in interactions with individuals who have personality disorders, does to concern the existence of attributes that are necessarily violent and cruel, and that can lead them to commit violent crimes against life. Some of those techniques take advantage of more general traits of personality such as the *Big Five Personality Test*,[30] which reduces them to five factors: openness to experience, conscientiousness, extroversion, agreeableness and neuroticism.

Prepared by Paul Costa and Robert McCrae and also known as Personality Inventory NEO (NEO PI-R, *Revised Neo Personality Inventory*), that test is similar, according to Kevin Dutton,[31] to "a genome of human personality", as we can see on the table below:

Table 1 – The model of the five great factors of personality[32]

FACTOR	DESCRIPTION
Openness to experience	Imagination.....Practicality, Likes variety.....Likes routine, Independent......Conformist.
Conscientiousness	Organized......Desorganized, Careful.....Careless, Disciplined.....Impulsive.
Extroversion	Sociable.....Shy, Fun.....Sober, Affectionate.....Reserved.
Agreeableness	Kind.....Cruel, Reliable.....Suspicious, Helpful.....Useless.
Neuroticism	Concerned.....Calm, Insecure.....Self-assured, Sorry for him/herself.....Happy about him/herself

Recent studies demystify that trait traditionally associated to psychopaths. Kevin Dutton[33] highlights essentially seven characteristics in psychopaths that help deconstruct that myth: wickedness, charm, focus, tenacity, the absence of fear, awareness and action. Those characteristics suggest that psychopaths may be found in different places and that the lack of the violence element makes them look more alike most human beings and, thus, difficult to identify.

At the level of public service and Law, government departments may employ psychopaths whose corruption acts – going from a fraudulent bidding process to purchase school meals to the violation of morality and impersonality principles by engaging relatives in

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Antisocial. 2. ed. Azcapotzalco: Flores Editor, 2013; and UMBACH, R.; BERRYESSA, C. M.; RAINE, A. Brain Imaging Research on Psychopathy: Implications for Punishment, Prediction, and Treatment in Youth and Adults. **Journal of Criminal Justice**, v. 43, 2015.

[30] An extensive list of personality tests is found online at the following electronic address: http://personality-testing.info/. The site lists the *Big Five Personality Test* among those that have scientific validity and allows carrying out tests and having access to the result of several tests.

[31] DUTTON, K. **The Wisdom of Psychopaths:** What Saints, Spies, and Serial Killers Can Teach Us about Success. New York: Scientific American, 2013. p. 38.

[32] Ibidem, p. 39.

[33] Ibidem, p. 185-186.

the public service – are disguised under a personality having a "varnish" of normality. So, how to diagnose them?

The main tool used to diagnose psychopaths is still Robert Hare's Reviewed Psychopathy Checklist (PCL-R). That researcher at the University of British Columbia developed a formula that intends to gather data on broad areas of a person's life from family and love relationships to educational background. That information is collected not only from interviews with the person under evaluation, but also from reports provided by people close to him or her.

The PCL-R scale was adapted in Brazil by Professor Hilda Morana[34] in the attempt to adjust it to the national context, refining the minimum score that could separate psychopaths from non-psychopaths. The author's work allowed for the broad application of the instrument inside the Brazilian criminal system in order to differentiate ordinary criminals from recidivist ones (psychopaths).[35]

The PCL-R evaluates twenty items that mirror two factors: the interpersonal/emotional factor (Factor 1) and the one related to the lifestyle/antisocial (Factor 2). Each one of the characteristics is assessed by using 0 (does not apply), 1 (applies somehow) and 2 (applies) and the total score is analyzed in comparison to a minimum score that is usually around 30.[36]

Another important instrument to assess psychopathy, according to Kevin Dutton,[37] is the Levenson Self-Report Psychopathy Scale (LSRPS). Created by Hanna Levenson, the LSRPS intends to reach the psychopath by assessig the intensity through which he/she adheres or disagrees from a total of twenty-six items in a scale that goes from "totally disagree" to "totally agree".

Evidently, both the LSRPS (Levenson Self-Report Psychopathy Scale) and the PCL-R (Reviewed Psychopathy Checklist) still operate in the declaratory form, that is, the examinees or the examiners answer questionnaires or go through evaluations whose answers are converted into points and submitted to a minimum score and that indicates the existence or

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[34] MORANA, Hilda Clotilde Penteado. **Identificação do ponto de corte para a escala PCL-R (Psychopathy Checklist Revised) em população forense brasileira:** caracterização de dois subtipos da personalidade; transtorno global e parcial. 2003. Thesis (Doctor's Degree in Science) – Faculty of Medicine, University of São Paulo, São Paulo, 2003.

[35] AMBIEL, R. A. M. Diagnóstico de psicopatia: a avaliação psicológica no âmbito judicial. **Psico-USF**, v. 11, n. 2, Jul./Dec. 2006.

[36] KIEHL, K. Can Neuroscience Identify Psychopaths? In: GAZZANIGA, M. S.; RAKOFF, J. S. **A Judge's Guide to Neuroscience:** a Concise Introduction. Santa Barbara: University of California, 2010. p. 47-53.

[37] DUTTON, K. **The Wisdom of Psychopaths:** What Saints, Spies, and Serial Killers Can Teach Us about Success. New York: Scientific American, 2013.

the inexistence of psychopathic traits. That characteristic in the tests allows them to be applied to a wide variety of areas, to a certain extent.

In what regards the use of those tests by public or private entities, Dutton highlights the existence of a particularly interesting instrument among the above mentioned models. When trying to identify the presence of psychopathic traits hidden under leadership characteristics in business leaders, Business Scan (B-Scan)[38] predicts corrupt or psychopathic behavior by checking the "correct phraseology and language inside a corporate environment".[39]

The decreased activities in the prefrontal cortex,[40] for example, and the amygdala – areas that are directly related to empathy and to affective feelings – would be responsible for inducing individuals to antisocial behavior. That is the reason why, according to international experts and researchers, people who commit crimes have no trouble differentiating right and wrong, that is, recognizing that they act outside the law. On the contrary, those individual's deficiency rests on the way they deal with their feelings and emotions while they fail to follow the rules.

Raine[41] draws attention to the fact that there are only a few studies that especifically address the use of neuroimaging or even neuropsychiatry regarding corrupt employees that have committed white-collar crimes. Differently from the conclusions drawn from the studies with violent psychopaths, the criminal practice is explained by the fact that perpetrators have better developed executive brain functions.

It is clear that, we would be able to digress into whether failing to comply with rules and antissocial behavior in the public sector is an antisocial personality disorder or a psychopathy[42] in what concerns the Brazilian reality. Those cold and calm public agents, even in situations of danger, simply cannot identify with the suffering they impose on other

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[38] According to B-SCAN's oficial page in the internet, two versions of the test are under development: self-evaluative B-SCAN and B-SCAN 360. For more information, refer to http://www.b-scan.com.

[39] DUTTON, K. **The Wisdom of Psychopaths:** What Saints, Spies, and Serial Killers Can Teach Us about Success. New York: Scientific American, 2013. p. 125.

[40] YANG, Y.; RAINE, A. Prefrontal Structural and Functional Brain Imaging Findings in Anti-social, Violent, and Psychopathic Individuals: a Meta-Analysis. **Psychiatry Research: Neuroimaging**, v. 174, p. 81-88, 2009.

[41] RAINE, A. et al. Increased Executive Functioning, Attention, and Cortical Thickness in White-Collar Criminals. **Human Brain Mapping**, v. 33, p. 2932-2940, 2012.

[42] UMBACH, R.; BERRYESSA, C. M.; RAINE, A. Brain Imaging Research on Psychopathy: Implications for Punishment, Prediction, and Treatment in Youth and Adults. **Journal of Criminal Justice**, v. 43, p. 295-306, 2015.

people[43] and, to the limit, according to Babiak and Hare,[44] they are able to manipulate and mislead even "very well-trained researchers".

Pursuant to studies carried out in the field of neurolaw,[45] imaging exams produced by means of magnetic resonance or scan (MRI ou SPECT/PET) would be able to identify areas in the brain where the low activity of that organ would be responsible for predisposition for criminal behavior.

According to Adrian Raine,[46] the results "are widely coherent with the idea that white-collar criminals engage into careful and rational calculations of the costs and benefits of their crimes".

The idea that an abnormality regarding brain functions and activities produces corrupt antisocial behavior is at the base of another attempt to explain corrupt behavior presented by Mona Sobhani and Antoine Bechara from the idea of the "somatic marker of corrupt behavior".[47]

The conclusions were drawn from the results obtained through the Iowa Gambling Task (IGT), an experience developed by Antonio Damásio and by Bechara himself, which evaluates the reactions of people along decision making processes so as to identify at the origin of those processes not rational calculations, but biological processes related to emotions.[48]

Although the IGT helps understand, for example, how people make choices to their own disadvantage, its main utility is to offer strong evidence in regards to the somatic marker according to which emotions play a fundamental role in decision making processes.[49]

Within that perspective, Antoine Bechara points at the difference between two forms of corruption or psychopathy: those that are "learned" and those that are called "primary or true".

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[43] DUTTON, K. **The Wisdom of Psychopaths:** What Saints, Spies, and Serial Killers Can Teach Us about Success. New York: Scientific American, 2013.

[44] BABIAK, P.; HARE, R. D. **Snakes in Suits**: When Psychopaths Go to Work. New York: HarperCollins, 2006. p. 68.

[45] RAINE, A. From Genes to Brain to Antisocial Behavior. **Current Directions in Psychological Science**, v. 17, n. 5, p. 323-328, 2008.

[46] RAINE, A. et al. Increased Executive Functioning, Attention, and Cortical Thickness in White-Collar Criminals. **Human Brain Mapping**, v. 33, p. 2932-2940, 2012.

[47] SOBHANI, M.; BECHARA, A. A Somatic Marker Perspective of Immoral and Corrupt Behavior. **Soc Neurosci**, v. 6, n. 5-6, p. 640-652, 2011.

[48] SCHNEIDER, D. D. G.; PARENTE, M. A. D. M. P. O desempenho de adultos jovens e idosos na Iowa Gambling Task (IGT): um estudo sobre a tomada de decisão. **Psicologia: Reflexão e Crítica**, v. 19, n. 3, p. 442-450, 2006.

[49] AREIAS, G.; PAIXÃO, R.; FIGUEIRA, A. P. C. O Iowa Gambling Task: uma revisão crítica. **Psicologia: Teoria e Pesquisa**, v. 29, n. 2, p. 201-210, Apr./Jun. 2013.

In the first case, psychopathic or corrupt behavior comes up due to cultural stimuli while, in the second case, brain activities are severely compromised and that determines the behavior. In individuals where corruption is learned, somatic markers are apparently normal, while in individuals whose corruption or psychopathy is primary, there are no somatic or emotional responses when they are engaged in corruption practices.[50] The conclusion to which Mona Sobhani and Antoine Bechara[51] get are put in the following terms:

> [...] the results are coherent with the perspective that psychopathic behaviors [...] are associated to low performance in IGT, thus reflecting possible abnormalities in the activation of the somatic marker circuit.

The difference between Raine's studies on white-collar criminals and Sobhani and Bechara's studies on corrupt individuals and psychopaths does not invalidate the studies carried out by the researchers. Both of them deal with abnormalities regarding brain executive functions and areas.

In regards to the studies based on somatic markers, it is important to understand that the IGT does not directly evaluate prefrontal cortex functions as a whole, but just part of them (ventromedial), putting aside the analysis of other subregions that are also connected to the executive functions and, thereby, that are also able to influence the behavior of people in society. That is one of the reasons why the studies, although converging in what relates to brain abnormalities, present a different understanding on the level of brain activity in corrupt individuals.

Finally, the variations in the application of IGT, the minimum score for the classification of individuals and the versions that were introduced after presentation in the early 90's suggest that application should be more careful and strict, as some experts say.[52]

3 CONCLUSIONS OF THE FUNCTIONAL RESEARCH ON THE CORRUPT PUBLIC AGENT IN BRAZIL[53]

Our proposal was to analyze cases of corruption in the Brazilian public service by only considering the sample of occurrences in the Executive Power, including all records for the

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[50] SOBHANI, M.; BECHARA, A. A Somatic Marker Perspective of Immoral and Corrupt Behavior. **Soc Neurosci**, v. 6, n. 5-6, p. 640-652, 2011.

[51] Ibidem, p. 649.

[52] AREIAS, G.; PAIXÃO, R.; FIGUEIRA, A. P. C. O Iowa Gambling Task: uma revisão crítica. **Psicologia: Teoria e Pesquisa**, v. 29, n. 2, p. 201-210, Apr./Jun. 2013.

[53] MOURÃO DE OLIVEIRA, Licurgo J. **Orçamento público biopolítico**: corrupção, transparência e efetivação dos gastos. 2016. 631f. Thesis (Doctor's degree in Law). Faculty of Law, University of São Paulo, 2016.

Federal Government, the state of Minas Gerais and the city of Belo Horizonte in 2015, latest data base available.

In the absence of data regarding somatic markers in government records, we checked what corrupt acts were more frequently seen in administrative activities and we also investigated the influence of institutional and personal factors on the phenomenon. Although notably based on objective data, the study does not disregard the importance of subjective indicators. Conversely, it constantly reiterates the value of that kind of data in reducing measurement errors and in enriching quantitative information available.

As Benjamin Olken says,[54] there is no other option for the works aiming at analyzing the types and causes of corruption to become more accurate and, therefore, more relevant, but through objective data.

Information presented herein not only reaffirm the multicasual and multiform characteristics of corruption in the public administration, especially from the perspective of the public agents (who are still approached in a secondary way in regards to the production of studies on the corruption of political agents), but it also allows to reveal the profile of public servers expelled due to corruption.

In the city of Belo Horizonte's Executive Power, the proportions point at the **public server holding permanent offices in health institutions**, having worked for over five years for the public administration, female, aged 34 or more (between 45 and 54 years old). Married or single (the clear equivalence of proportions does not generate accurate data).

The server concluded high school and has monthly gross income between R$ 600.00 and R$ 1,350.00, which places him/her in class DE. **That is the functional profile of the municipal server who engages in corruption acts,** according to the research carried out.

In the state of Minas Gerais' Executive Power, we see a **public server holding permanent offices in social institutions. He/She has been in the public administration for over five years, male, aged 34 or more (over 55 years old) and he/she is married.**

The server concluded high school and receives a gross monthly salary between R$ 4,001.00 and R$ 7,800.00, that is, he/she is a member of class B2. **That is the functional profile of the state server who engages in corruption acts.**

In the Federal Government, we also see a public server holding permanent offices in social institutions, and who has been working in the public administration for over

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[54] OLKEN, Benjamin. Corruption Perceptions vs. Corruption Reality. **Journal of Public Economics**, v. 93, n. 7-8, p. 950-964, 2009.

five years. He/she has medical leaves in his/her functional file, male, aged 34 or more (over 55 years old), married.

He/she graduated from university and his/her remuneration is between R$ 7,801.00 and R$ 18,000.00, which places him/her in one of the highest social classes, B1. Receiving undue advantages is the most recurrent practice in what concerns this server. **That is the functional and social-economical profile of the federal server who engages in corruption acts.**

As already said, the profiles described above do not correspond to absolute evaluations of the impact of the variables taken in this research on the occurrence of corruption acts. In fact, those profiles consist in an assessment of the frequence of corruption acts according to those variables.

The Table below describes the social-economical profile of those who were dismissed due to corruption in the Executive Power in the city of Belo Horizonte, in the state of Minas Gerais and in the federal government in 2015. The profiles, consisting in the higher proportions seen in the analysis of the selected variables, point at the aspects that were more frequent, which may indicate more influence in carrying out corruption acts.

Table 2 – Consolidated profile of the public server expelled due to corruption acts (2015)

Variable	Description	City of Belo Horizonte	State of Minas Gerais	Federal Government
Nature of the dept.	Economic	8%	22%	21%
	Social	33%	**39%**	**64%**
	Educational	17%	26%	9%
	Health	**42%**	23%	19%
Nature of the position	Effective	**100%**	97%	98%
	Commissioned with no link	0%	3%	2%
Time at work	Less than 1 year	0%	0%	0%
	From 1 to 5 years	0%	0%	6%
	Over 5 years	**100%**	**100%**	**94%**
Gender	Male	42%	**65%**	**77%**
	Female	**58%**	35%	23%
Age	Young (under 34)	0%	0%	6%
	Adult (over 34 years)	**100%**	**100%**	**94%**
Marital status	Single	50%	39%	17%
	Married	50%	**52%**	**69%**
	Divorced	0%	9%	8%
	Other	0%	0%	6%
Education	Elementary school concluded	17%	3%	4%
	High school concluded	**58%**	**42%**	38%
	University graduation concluded	25%	19%	**57%**
	Post-graduation concluded	0%	36%	1%
Social class	DE	**33%**	10%	1%
	C2	25%	23%	3%
	C1	25%	19%	11%
	B2	17%	**29%**	31%
	B1	0%	19%	**38%**
	A	0%	0%	16%

We constantly reaffirm the need to recognize the phenomenon of corruption in Brazil especially in the public service as a complex, multicausal and multifaceted phenomenon.

Once we recognize it as such, we say that the models presented cannot be taken as the basis for other realities once they regard specific units inserted into a specific timeframe. However, as also mentioned above, since this is an exploratory study that throws light, as we believe, on little explored elements, we agreed to make inferences on the topic being analyzed.

In what regards corruption prevention and control, understanding the dynamics of the structuring of the public administration phenomenon depends on understanding the institutions and the individuals that are part of it. Those works have an empiric base that, subsidizing researchers and managers, can guide more effective actions to fight corruption. One of them is the broad implementation of the patrimonial investigation and the anticorruption publicity.

It is well known that the patrimonial inspection by the Courts of Accounts is a practice that was long forgotten. It is necessary to effectively follow Law n. 8.730 dated November 10, 1993, which set forth the obligation to submit statements of assets and income to take over positions, jobs and functions in the Executive, Legislative and Judiciary Branches.

Pursuant to § 7 of article 2 of the above mentioned law, the Courts of Accounts shall carry out the patrimonial investigation and then mandatorily forward the conclusions to the relevant Public Prosecution so as to attest, under the penalty of prevarication, according to article 4, § 2, that the statements of assets and income received are compatible with the patrimonial progress of the holder and with resources and availabilities declared.

Such practice would sum up to the efforts to criminalize the unjust enrichment of public agents so as to restrain the rooted practice of receiving bribery, may those deviations be caused by psychosomatic aspects or by the poor structural conditions of the public administration.

When the practice is criminalized, we point at the high levels, which are usually less susceptible to control, spreading intolerance towards corruption to the lower levels of the Administration so that all can be inserted into that new culture. It is relevant to say that unjust enrichment of public agents results from the harmful practice of corruption in its different modalities, as we were able to notice from the research.

The criminalization is recommended by the United Nations Convention against Corruption[55] once the absence of a specific criminal description makes it impossible to frame the unjust increase of a public agent's assets, fomenting corrupt practices.

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[55] UN. **UN Convention against Corruption**. UN General Assembly, Oct 31, 2003. Available at: https://www.unodc.org/lpo-brazil/pt/corrupcao/marco-legal.html. Access on: Oct. 31, 2016.

Corruption and embezzlement are generally the origin of unjust enrichment and they define the need for a patrimonial inspection administrative procedure by the Courts of Accounts and that rises from the obligation to submit the statement of assets.

During an *in-situ* reseach in East Asia during the 2nd International Conference on Public Policy[56] at the University of Hong Kong in 2016, we were able to notice the economic effects of the persistent fight against corruption, which was endemic in the 60's.

Within a short period of time, Hong Kong went up to the 17th position in the global ranking provided by Transparency International, basing its strategy on three pillars: investigation and punishment, prevention and education. There are still campaigns in the media aiming at the public opinion to stimulate denunciation of corruption and to clarify the harmful economic and social consequences of those acts.

Despite the massive amount of resources spent by the Brazilian government on publicity, the initiatives in terms of anticorruption campaigns are shy and secondary comparing to the institutional publicity that is generally distorted to promote public agents.

Investment on the enlightenment of the population is allied to the need of qualifying public agents through guiding courses on how to avoid acts that feature corruption.

The research carried out on the functional profile of the corrupt public agent in Brazil may be used to base the adoption of neuroscience to map the risk of corruption in the Brazilian public administration.

To try to predict the behavior of corrupt servers, we looked at data basically collected from two government sources: the Integrated System for the Administration and Human Resources (SIAPE) and the Records of Exclusions from the Federal Administration (CEAF). They were also used in the research.

With the help of those databases, we tried to create groups or samples of corrupt and non-corrupt servers. We also used the records of penalties imposed to federal public servers.

The fact that political agents had accounts that had been found irregular by the Courts of Accounts, for example, or that public servers underwent some Disciplinary Administrative Proceedings can express a kind of tendency to engage in corruption acts, a characteristic that allows the system, through its analyses, to separate them from non-corrupt agents, a hypothesis we validate with the conclusion of the research.

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[56] INTERNATIONAL CONFERENCE ON PUBLIC POLICY, 2. Hong Kong: International Public Policy Association, 2016. 765 p.

Thereby, the intention is to take advantage of the use of neuroscience to refine existing mechanisms to control and fight corruption based on the ability of the human brain to create associations between data and information on the servers and identify or eliminate someone's propension to engage in corruption acts. That unveils a new field for the evaluation and prevention of corruption and the effectiveness of public expenditure.

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