

# The Biological Face of Management: A PsychoBioDynamic Approach to Effective Organizational Homeostasis

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## Abstract

This study introduces the PsychoBioDynamic Management (PBDM) model, a novel human-centered management framework that integrates emotional intelligence, lifestyle balance, and biological self-regulation as determinants of managerial effectiveness. Traditional management theories (Classical, Neo-Classical, and Modern) have been criticized for neglecting the biological and emotional dimensions of human behavior in organizational contexts. Addressing this gap, the PBDM model conceptualizes managerial performance as a function of psychobiological equilibrium, proposing that a manager's empathy, self-regulation, and health-related lifestyle directly affect the well-being and job satisfaction of subordinates. A cross-sectional empirical study was conducted with 458 participants from Greek organizations, including 228 managers and 230 subordinates. The managers' PBDM profiles were constructed using the Wong and Law Emotional Intelligence Scale (WLEIS) to measure empathy and self-regulation, and a bio-behavioral lifestyle questionnaire assessing factors influencing key hormonal biomarkers (e.g., cortisol, oxytocin). Employees' job satisfaction was measured through the Employee Satisfaction Inventory (ESI). Statistical analysis using Pearson correlation and Kruskal–Wallis tests revealed a significant positive relationship between the managerial PBDM profile and employee job satisfaction ( $r = 0.173$ ,  $p < 0.05$ ). Moreover, higher levels of PBDM applicability were associated with significantly greater employee satisfaction ( $\chi^2(2) = 7.490$ ,  $p = 0.024$ ). The findings support the hypothesis that managerial emotional and biological balance enhances organizational homeostasis by promoting employee satisfaction and well-being. The study concludes that focusing on the manager's psychobiological health and emotional competencies offers a powerful, evidence-based strategy for improving management effectiveness and resilience in modern organizations. The PBDM approach thus establishes a new interdisciplinary paradigm, bridging management science, psychology, and biology, and positioning management as a biologically modulated process essential for sustainable organizational harmony.

## Keywords

PsychoBioDynamic Management (PBDM), Emotional Intelligence, Hormonal Biomarkers, Organizational Homeostasis, Empathy, Self-Regulation, Job Satisfaction.

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## Introduction

Business operations, efficiency, and performance depend directly on management style (Noe, 1996) (Johnson, 2011) (Becker & Gerhart, 2017). Living in a global financial crisis, existing management models seem to be inefficient seeking new management approaches/ styles that place human being at the core of companies and organizations to meet their aims and challenges.

The classical economic theory has been questioned due to two generic inadequacies. Firstly, it does not take into consideration fact that the brain is constructed to support 'automatic' processes, and second that Humans' behavior is affected by unrecognized influence of finely tuned affective (emotion) systems that are localized in particular brain regions and whose basic design humans share with many other animals (Camerer, et al., 2005). These two systems are vital for daily functioning, because when affective systems are perturbed or damaged, by brain damage, alcohol, imbalances in neurotransmitters, stress, or the 'heat of the moment,' the deliberative system is generally unable to do the job itself (Camerer, et al., 2005).

For those reasons, the present paper aims, taking into consideration emotional intelligence competencies, such as Empathy, Social Skills, and Lifestyle, to discuss a new approach that may very well influence the emotional and brain status, the Psycho-Bio-Dynamic Management Approach encompasses the need of the lifestyle investigation, and finally the personnel's performance. To this extend the next section tries to answer whether the existing management theories efficient to the organizations to be followed by the sections that discuss the proposed new approach, the PsychoManagement and Psycho-Bio-Dynamic Management Approach, with reference to employees' job satisfaction and performance, while the final section concludes.

## From Classical Management to PsychoManagement: Towards a Human-Centered Paradigm

Classical, Neo-classical, and Modern Management theories have long served as the cornerstone of organizational practices aimed at enhancing employee performance and productivity. Rooted in rational and procedural principles, these models emphasize efficiency, division of labor, and control mechanisms as fundamental drivers of organizational success (Kitana, 2016). Historically, while some organizations flourished under these doctrines, others failed to adapt effectively, revealing significant limitations in their applicability to contemporary contexts. The central question that emerges is whether these traditional approaches remain adequate for addressing the complexities of modern organizational life.

Classical theories, for instance, overlook the individuality of employees, treating them as interchangeable units within a mechanistic system. As Saxena (2019) and Pindur et al. (1995) note, such models prioritize structure and process over human diversity, making them incompatible with the dynamic, personalized nature of today's workplaces. The Neo-classical

approach introduced a more human dimension, recognizing social relations within organizations (Ferdous, 2017; Kiechel III, 2012). However, by focusing primarily on interpersonal relations rather than individual human needs, this school often overemphasized group cohesion at the expense of organizational goals, occasionally generating conflict and inefficiency. Similarly, Modern Management theory, including the Systems and Contingency approaches, integrates human factors into management but lacks specific guidelines for developing the emotional and cognitive capabilities necessary for effective leadership (Hussain et al., 2019; Kitana, 2016).

A further limitation across all these theories is their detachment from the rapid evolution of information and communication technologies and the globalization of markets. They were constructed through a largely techno-economic lens, with minimal engagement with recent scientific insights from behavioral economics or neuroscience that explain decision-making as a psycho-biological process (Ferdous, 2017). Consequently, these models appear increasingly obsolete in understanding how emotions and neurochemical processes shape managerial behavior (Elias & Saucier, 2006).

The emergence of Emotional Intelligence (EI), as introduced by Goleman (1998), marked a crucial shift toward more human-centered management models. Research has since explored the integration of EI into management and leadership frameworks (Rahim et al., 2002; Moghadam et al., 2011; Edelman & Knippenberg, 2018), emphasizing that effective management is inseparable from emotional awareness, empathy, and self-regulation. Yet, emotional responses are deeply rooted in neuroendocrine and chemical processes (Elias & Saucier, 2006), suggesting that managerial behavior must be examined not only at the behavioral but also at the psycho-biological level. This recognition lays the foundation for a New Management Approach—PsychoManagement—which aligns managerial performance with emotional intelligence, self-awareness, and lifestyle balance.

Within this framework, job satisfaction becomes a central construct linking employee well-being and managerial emotional competence. Job satisfaction is defined as the employee's positive or negative evaluation of their job (Spector & Fox, 2003). High satisfaction is associated with better performance, reduced absenteeism, and lower turnover rates (Spector, 1994), as well as stronger emotional commitment (Markovits et al., 2010). Empirical studies demonstrate a positive relationship between employees' EI and their level of job satisfaction (Es-lami & Gharakhani, 2012; Anari, 2012; Wolfe & Kim, 2013; Zak-ieh et al., 2013; Kafetsios & Zampetakis, 2008), indicating that emotionally intelligent employees tend to regulate emotions and interpersonal relations more effectively.

Demographic factors such as gender, education, age, and marital status have also been examined, though findings vary. While early studies reported gender-based differences (Murray & Atkison, 1981; Tang & Talpade, 1999), more recent research finds no consistent correlation (Oshagbemi, 2000). Education and experience appear more strongly associated with satisfaction (Metle, 2003; Okpara, 2004; Greenberg & Baron, 1995; Drafke & Kossen, 2002; Cimete et al., 2003). Nonetheless, beyond these demographic determinants, managerial behavior

remains a dominant influence. Studies show that democratic leadership and supervisors who demonstrate empathy and concern for employees significantly enhance job satisfaction (Packard & Kauppi, 1999; Brewer & Hensher, 1998; Basset, 1994).

Furthermore, the emotional intelligence of managers plays a critical role in fostering a positive work environment. Effective communication, both verbal and non-verbal, as well as the manager's ability to provide emotional and technical support, contribute directly to satisfaction and team morale (Robbins et al., 2003; Sherman & Bohlander, 1992; Wech, 2002; Ramsey, 1997; Riggio et al., 2003; Darioly & Mast, 2014). High-EI managers not only communicate more effectively but also regulate their emotional responses during interactions (Riggio et al., 1989), thereby creating psychological safety and trust among subordinates (Gentry et al., 2007).

In this context, PsychoManagement extends the Emotional Intelligence paradigm by emphasizing the psycho-physiological balance of the manager as a determinant of organizational harmony. Enhancing managerial empathy and social skills leads to improved communication, stronger relationships, and a sense of emotional security within teams (Spitzberg & Dillard, 2001; Redmond, 1989; Gentry et al., 2007; Lountzis & Palaskas, 2022). Managers with internal balance—both mental and physical—are better equipped to manage their emotions, understand others, and express ideas constructively (Goleman, 1998; Sinha & Sihna, 2007). Consequently, PsychoManagement, as a human-centered and emotionally intelligent approach, enhances employee satisfaction and organizational performance (Shukla et al., 2016; Hefferman et al., 2008; Rahim & Malik, 2010; Kaura, 2011; Orhan & Dincer, 2012; Abi & Jijo, 2012; Singh & Jain, 2013; Springer, 2011; Papathanasiou & Siati, 2014; Al Ali et al., 2011; Zervopoulos & Palaskas, 2010).

By integrating emotional intelligence with an understanding of human psychology and neurophysiology, PsychoManagement transcends traditional theories, offering a comprehensive model that aligns managerial effectiveness, employee satisfaction, and organizational sustainability within a unified psycho-biological framework.

## PsychoBioDynamic Management (PBDM): A New Approach

The emergence of a new managerial paradigm appears inevitable, as traditional theories no longer suffice to address the complex demands of contemporary organizations. PsychoBioDynamic Management (PBDM) integrates the principles of Emotional Intelligence (EI) with the manager's lifestyle and psychobiological balance, offering a holistic framework that bridges the gaps left by Classical, Neo-Classical, and Modern Management theories.

This model acknowledges the individuality of employees, emphasizing empathy and self-regulation as key mechanisms through which managers respond to each employee's unique needs. Empathy, as a central component, allows managers to understand and address the emotional realities of their subordinates. Unlike previous models that merely emphasized social relations, PBDM focuses on the manager's ability to

regulate emotions during communication, thereby enhancing relational dynamics and authenticity.

Furthermore, PBDM introduces practical and teachable guidelines for cultivating self-awareness, empathy, and emotional control, highlighting its adaptability and potential for continuous improvement. Drawing from advances in neuroscience, behavioral psychology, and physiology, it incorporates scientific developments that enable constant evolution and integration of new knowledge into management practices.

Consequently, the PBDM model is structured around two fundamental pillars:

- Emotional Intelligence, emphasizing
- Empathy: understanding and sharing others' emotions.
- Social skills: facilitating communication and message transmission.
- Lifestyle, encompassing behaviors that sustain physical, emotional, and cognitive balance.

According to Goleman's (1998) five domains of EI, these two characteristics are essential for effective leadership. Riggio et al. (1989) further define three foundational social skills—encoding (expressive skills), decoding (sensitivity), and regulation (control of communication)—which operate across both nonverbal (emotional) and verbal (social) domains of communication.

A healthy lifestyle complements these emotional capacities by maintaining neuroendocrine stability. As Kafatos et al. (1999) demonstrated, behavioral factors such as diet, smoking, and stress strongly affect mental health, while regular physical activity has been linked to improved psychological well-being even in elderly populations (Krawczynski & Olszewski, 2000). A balanced lifestyle thus enhances both emotional regulation and managerial effectiveness.

## The “Bio” Factor of PBDM Approach

The “Bio” component of the PsychoBioDynamic Management approach underscores the biological foundations of emotion and behavior. Diet, exercise, and hormonal balance form an interconnected system that directly influences emotional stability and managerial functioning.

Nutrition and lifestyle habits are key determinants of mental health. Poor dietary patterns, such as frequent fast-food consumption, contribute to obesity and related psychological issues (Ζέρβα & Ζερδίλα, 2009). Conversely, home-prepared, nutrient-rich food supports physical and hormonal balance. Regular exercise enhances both physical and mental resilience by increasing norepinephrine—a neurotransmitter that moderates stress responses—and releasing endorphins, which induce feelings of euphoria and well-being. Exercise has even been found as effective as antidepressants in alleviating symptoms of depression and anxiety (Wegner et al., 2015).

At the hormonal level, several key substances—cortisol, oxytocin, testosterone, vasopressin, progesterone, and insulin—play critical roles in shaping emotional and behavioral responses (Molnar & Gair, 2013).

- Cortisol, the primary stress hormone, regulates mood and alertness; prolonged elevation due to chronic stress

leads to anxiety, depression, and physiological dysfunctions (Kaimal et al., 2016). Diets high in carbohydrates and fats further stimulate cortisol release (Andrews et al., 2002; Epel et al., 2000; Sher, 2005; Kudielka et al., 2009).

- Oxytocin facilitates trust, social bonding, and stress reduction; its secretion increases through positive social interactions such as hugging, laughing, or listening to music (Avvívou, 2021; Holt-Lunstad et al., 2008).
- Testosterone influences motivation, confidence, and aggression, with imbalances linked to mood swings, irritability, or depression (Harvard Medical School, 2015; Lee et al., 2012; Wehr et al., 2010; Cherney, 2020).
- Vasopressin (ADH) regulates water balance and supports social behaviors such as pair-bonding, trust, and kin protection (Carson et al., 2015; Lim & Young, 2004; Carter, 2007; Ferguson et al., 2002). Its levels are affected by hydration, caffeine, alcohol, and dietary salt (Armstrong, 2002; Armstrong et al., 2005; Grandjean et al., 2000; Parlesak et al., 2004).
- Progesterone, essential for reproductive health, also modulates mood and stress tolerance; nutrients such as zinc, vitamins C, B6, and E, and magnesium promote its optimal secretion (Di Renzo et al., 2016; Mayo, 1997; Egwurugwu et al., 2013; Brighten, 2016).
- Insulin, regulating glucose metabolism, directly affects mood and cognitive clarity; both hypo- and hyperglycemia are associated with emotional instability and fatigue (Voet & Voet, 2010; Berg & Tymoczko, 2002; NIDDK, 2008; NHS, 2018; Galan, 2019).

These biological mechanisms underscore that emotional intelligence and managerial performance are inseparable from physical health. Thus, the Bio dimension of PBDM integrates physiological awareness into management, emphasizing that optimal decision-making and leadership effectiveness emerge from psychobiological equilibrium.

In summary, PsychoBioDynamic Management proposes a scientifically grounded, human-centered model that unites emotional intelligence, lifestyle, and biological awareness into a single, adaptive management framework. By aligning the manager's emotional and physiological states with organizational objectives, PBDM aspires to create balanced leaders capable of fostering both human satisfaction and sustainable performance in the modern workplace.

## Research: Methodology & Tools

The new tendency of management adopts a more management emotion-oriented approach as the managers should address their emotional status as well as that of their subordinates (Ashkanasy & Dorris, 2017) (Miller & Koesten, 2008).

The two (2) domains of EI, Empathy, and Self-Regulation, have been selected as the basis of the new proposed management approach because they are crucial components of effective communication (Gompertz, 1960) (Cairns, et al., 2021) (Mellon, 2016) (Riggio, 2014). Of course, the lifestyle – in terms of nutrition and habits – may affect the emotional status of someone (in our study: of managers), and hence, the total management

approach (PBDM) is affected in total and influences the subordinates' satisfaction. Existing studies (Eslami & Gharakhani, 2012) (Anari, 2012) (Kafetsios & Zampetakis, 2008) have confirmed statistically the positive relationship between the exogenous overall EI score with employees' satisfaction endogenous variable. Taking into consideration that applied management, as well as the emotional support of the employees are able to influence the subordinates' job satisfaction (Koustelios, 2001) (Peterson, et al., 2003) (Robbins, et al., 2003), our study focuses on the bipolar between applied PBDM and Subordinates' Satisfaction.

The new approach consists of the two (2) dimensions of the EI and managers' lifestyle. Thus, each of the three (3) PBDM pillars – Empathy, Self-Regulation, and Lifestyle – were quantified and measured.

*Main Hypothesis (H0): The PBDM approach has a positive impact on the Employees' Job Satisfaction (ESI).*

For the scope of this research, the new management approach (PBDM) is by an equally weighted index of the three exogenous variables, empathy (OEA), ability to self-regulate emotion (SR), and lifestyle (NHL), of our sample data. The index provides information on the applicability of the new approach (i.e., how capable someone is to implement the PBDM).

## Sample

The sample includes Greek companies/ organizations of various sectors and sizes. Particularly, it was asked managers/ supervisors and their direct subordinates/ employees to fill out a questionnaire with sincerity and spontaneity.

## Sampling method

The simple random sampling method opted for the present empirical research. The simple random sampling has several advantages due to the simple way in its design and consequently also in the application. Units in the population are all equally likely to be included in the survey and this is also an advantage because equal weight is given to all units. In addition, simple random sampling is considered to be an unbiased approach to collecting responses from a large group. At the same time, despite its simplicity, simple random sampling also has disadvantages. One of them is that the members of the population cannot be identified and recorded one by one. Also, if the population spans a large geographic area, selecting sample members according to simple random sampling may result in population members for the sample that are scattered throughout the population (Παπαγεωργίου, 2015).

The questionnaires distribution was conducted from the 30<sup>th</sup> of January until the 17<sup>th</sup> of March 2022. The number of responses collected was 458: 228 are managers/ supervisors and 230 subordinates.

## Questionnaires

To collect the required information from a large number of respondents, it was necessary to use a standard questionnaire, which will then be codified and analyzed through the statistical

processing of the data. In order to produce valid results relevant to the subject being investigated, appropriate questions were stated in the designed sections of the questionnaire.

Our questionnaire is the result of picking cherries from other published questionnaires and our own specified questions.

The questionnaires that were used for this thesis research were identified during the literature review. Having taken into consideration that the research would be applied to Greek companies, we were looking for a **reliable** and **valid** questionnaire in Greek. The book "Τα ψυχομετρικά εργαλεία στην Ελλάδα" ("The Psychometric Tools in Greece") includes reliable and valid questionnaires ready for use (Stalikas, et al., 2012).

The related used questionnaires referred to the measurement of EI (empathy, self-regulation) and Employee Satisfaction. Regarding the issues of empathy and self-regulation, it was used the questionnaire suggested by Wong and Law – Wong & Law Emotional Intelligence Scale/ WLEIS (Wong & Law, 2002) and adjusted by Pr. K. Kafetsios (Kafetsios & Zampetakis, 2008). As far as the Employee satisfaction variable it was used the Employee Satisfaction Inventory – ESI as it was provided by Professor Athanasios Koustelios (University of Thessaly) for our research purposes. The respondents had to indicate their answers using the Likert scale.

Furthermore, we needed to collect information to measure the emotional balance status of the respondents. For this reason, a new was developed to categorize the participants into four (4) classes regarding the Emotional Balance Status (EBS): 1. High Emotional Balance Status, 2. Mid-High Emotional Balance Status, 3. Mid-Low Emotional Balance Status, and 4. Low Emotional Balance Status.

The questionnaire distributed to the Greek companies was based on a 180-degree concept. The managers answered self-report questions (for empathy and self-regulation) and employees/ subordinates answered the same questions for their direct manager. Using this method, we can compare the managers' self-assessment matches the subordinates' assessment.

The first part (demographics) was filled out by all participants. Empathy and Self-regulation were measured using the subscales of the Wong & Law questionnaire and the employees' job satisfaction related to their manager/ supervisor was measured using the relevant subscale of ESI questionnaire.

#### *Wong and Law Emotional Intelligence Scale (WLEIS)*

##### **The subscales of the questionnaire WLEIS include:**

- Self-Emotion Appraisal (SEA) – Q1 to 4
- Others' Emotion Appraisal (OEA) – Q5 to 8
- Use Of Emotion (UOE) – Q9 to 12
- Regulation Of Emotion (ROE) – Q13 to 16

The OEA measures empathy and the ROE the self-regulation. The questionnaire can be found free in the literature. The Greek version is adjusted by Pr. K. Kafetsios (Kafetsios & Zampetakis, 2008).

#### **Employee Satisfaction Inventory (ESI)**

The questionnaire ESI consists of the following subscales:

- Working Conditions – Q1 to 5
- Salary – Q6 to 9
- Promotions – Q10 to 12

- Work – Q13 to 16
- Supervisor – Q17 to 20
- Organization – Q21 to 24

The subscale Supervisor can measure the employee's satisfaction due to the direct management. This instrument cannot be found for free. However, Professor Koustelios has offered us the full questionnaire and the scoring method (Koustelios & Bagiatis, 1997).

## **Emotional Balance Status (EBS)**

The questionnaire consists of five (5) parts and includes sixty-nine (69) statements and questions. In the first part (A – 10 statements), the respondent is called to fill out demographic information like gender, age, marital status, etc. The second part (B – 20 statements) is related to the business/workplace's frame, the third part (C – 5 statements) refers to the colleagues/teams' habits, the fourth part (D – 10 statements) includes statements about nutrition and habits, and the fifth part (E – 25 statements) is related to the internal impact. More particularly, for part D, each statement describes a habit (dietary, or exercise).

The subscale of NHL (Part D) indicates the EBS score, and this subscale was used for our core hypothesis study. The scale of the PBDM index provides important information on the managers to apply the new proposed approach. The higher the score one achieves, the more able the manager is to apply the new approach.

## **Data Collection**

The questionnaires were distributed to Greek companies and organizations through Google Forms platforms in electronic form. The primary research was conducted by forwarding the forms to a random sample of companies that were approached by email and telephone communication to make sure that a representative sample of at least 300 respondents would participate in the survey. The contact details for the companies were found in the ICAP guide 2021 (edition: 56<sup>th</sup>, Volume 1 & 2). Social media (Facebook, LinkedIn, and Instagram) were used for the distribution of the questionnaires. The participation was voluntary and anonymous. In addition, there was a clear statement of confidentiality as well as clarification that there are no wrong or right answers except honest personal opinions. The use of the Google Forms platform as the main means of completing and collecting the data was evaluated as the most effective because it facilitated both the dissemination of the questionnaires and the collection of the data. Also, the automated registry of the data in a spreadsheet provided by the platform minimized the marginal errors.

## **Empirical research on the new managerial approach: PBDM**

The survey findings of the primary research are presented and analysed in the present paragraph. The descriptive statistics of sociodemographic data, scores of managers' empa-

thy, managers' self-regulation, employees' satisfaction, NHL, PBDM as well as the scores calculated for managers' empathy and self-regulation according to subordinates' perception are presented and discussed.

The primary research was carried out from the 30<sup>th</sup> of January until the 17<sup>th</sup> of March 2022. The number of responses collected was 458, almost split between 228 managers/ supervisors and 230 subordinates.

**Table 1. Sample description**

| Sample Descriptive statistics |        |                                 |        |                      |        |
|-------------------------------|--------|---------------------------------|--------|----------------------|--------|
| Gender                        |        | Marital Status                  |        | Employment Sector    |        |
| Male                          | 37.80% | Married                         | 54.60% | Private              | 86.90% |
| Female                        | 61.80% | Single                          | 27.30% | Public               | 9.60%  |
| Other                         | 0.40%  | Cohabit                         | 9.60%  | Private & Public     | 3.50%  |
| Age                           |        | Divorced                        | 7.60%  |                      |        |
| 18-25                         | 4.10%  | Widower/Widow                   | 0.90%  | Position             |        |
| 26-34                         | 19.20% |                                 |        | Principal (Manager)  | 28.60% |
| 35-44                         | 41.70% | Number of Children              |        | Supervisor (Manager) | 21.20% |
| 45-54                         | 24.90% | 0                               | 41.70% | Employee             | 50.20% |
| 55-64                         | 8.50%  | 1                               | 16.20% |                      |        |
| 65+                           | 1.50%  | 2                               | 35.20% | Years of Employment  |        |
|                               |        | 3                               | 6.30%  | <5                   | 36.00% |
| Education                     |        | 4+                              | 0.70%  | 6-10                 | 17.00% |
| Gymnasio                      | 0.40%  | Family Monthly Net Income (EUR) |        | 11-15                | 17.00% |
| High Sch.                     | 7.20%  | <1000                           | 16.80% | 16-20                | 13.80% |
| AEI (Bachelor)                | 31.00% | 1001-2000                       | 43.20% | 21-25                | 6.60%  |
| TEI                           | 10.00% | 2001-3000                       | 19.90% | 26-30                | 5.50%  |
| IEK                           | 7.20%  | >3000                           | 20.10% | >30                  | 4.10%  |
| MSc/MD/Meng                   | 41.30% | Employment                      |        |                      |        |
| PhD                           | 1.70%  | Employee                        | 80.30% |                      |        |
| Other                         | 1.10%  | Freelancer                      | 19.70% |                      |        |

## Research findings: managers

The number of sample responders holding managerial position are 228. Their Sociodemographic information, see Table 2, – gender, age, educational background, years of experience in the same company, position, marital status, the sector of employment, the number of children, the net family income, the weight, and height – was extracted from items 1 to 12 of the final questionnaire. The vast majority, 91.7%, of the sample managers work in the private sector with the gender been almost split between men managers 52.20% and women 46.9%. The majority of the managers belong to the age group of 35-44 and 45-54 (70.60%), with forty-four percent (44.30%) of them holding a degree in post-secondary education, while 68.40% been married and 73.20% parents.

Overall, in all three variables/components, i.e., empathy (OEA), the ability to self-regulate emotion (SR), and lifestyle (NHL), of the PBDM Index, the sample managers evaluate that they possess the ability to understand and evaluate the emo-

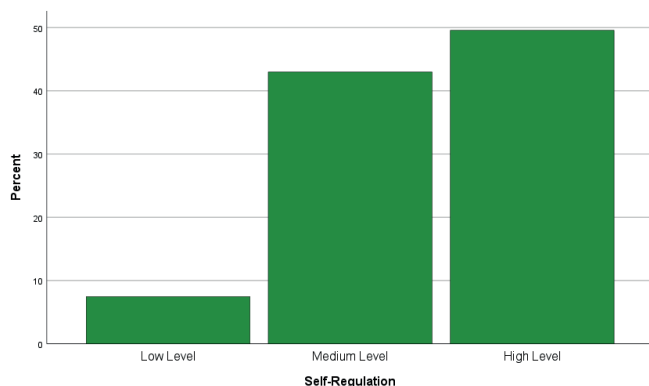
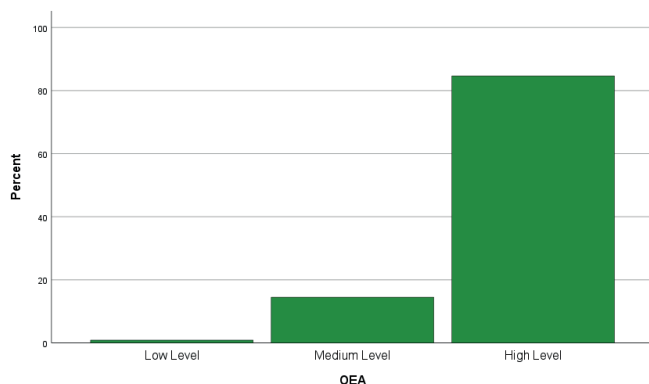
tions of others and to regulate their emotions, while at the same time they appear to follow a healthy lifestyle. In other words, they appear to evaluate highly all three (3) exogenous variable/components of the **PBDM index**.

Next, the managers' self-evaluation of empathy (OEA) and self-regulation (SR) were rated in three (3) classes based on the score: Low (1.00 to 2.33), Medium (2.34 to 3.67), and High (3.68 to 5.00) Level (see Graph 1 & 2).

It becomes obvious from Graph 1a and Graph 1b respectively that over 80% of the survey managers exhibit a high level of empathy and that more than 90% of the participants belong to the medium and high level of ability of self-regulation of the emotion. These sample finding together with the related discussion of our new management approach, which sets as a precondition managers' empathy and self-regulation of emotion to be high, the discussion and analysis of the third variable, lifestyle, follows, is a very encouraging finding to proceed with the further analysis of our sample qualitative and quantitative information.

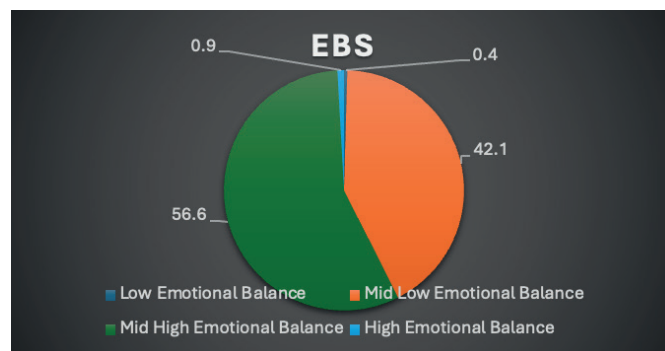
**Table 2. Managers' Sociodemographic**

|                            |               | Frequency | Percentage |
|----------------------------|---------------|-----------|------------|
| <b>Gender</b>              | Male          | 119       | 52.20%     |
|                            | Female        | 107       | 46.90%     |
|                            | Other         | 2         | 0.90%      |
| <b>Age</b>                 | 18-25         | 1         | 0.40%      |
|                            | 26-34         | 26        | 11.40%     |
|                            | 35-44         | 88        | 38.60%     |
|                            | 45-54         | 73        | 32.00%     |
|                            | 55-64         | 33        | 14.50%     |
|                            | 65+           | 7         | 3.10%      |
| <b>Marital Status</b>      | Married       | 156       | 68.40%     |
|                            | Single        | 36        | 15.80%     |
|                            | Cohabit       | 15        | 6.60%      |
|                            | Divorced      | 18        | 7.90%      |
|                            | Widower/Widow | 3         | 1.30%      |
| <b>Number of Children</b>  | 0             | 61        | 26.80%     |
|                            | 1             | 40        | 17.50%     |
|                            | 2             | 102       | 44.70%     |
|                            | 3             | 24        | 10.50%     |
|                            | 4+            | 1         | 0.40%      |
| <b>Years of Employment</b> | <5            | 51        | 22.40%     |
|                            | 6-10          | 47        | 20.60%     |
|                            | 11-15         | 29        | 12.70%     |
|                            | 16-20         | 38        | 16.70%     |
|                            | 21-25         | 26        | 11.40%     |
|                            | 26-30         | 18        | 7.90%      |
|                            | >30           | 19        | 8.30%      |



**Graph 1. Managers' empathy (a)/ Self-Regulation (b)**

The third component of the PBDMm index is NHL. NHL was developed for measuring the degree of a healthy lifestyle that a manager follows. The score of NHL corresponds to a category of emotional balance status (EBS) – Graph 2. Focusing on this, the following graph shows the distribution of the emotional balance status of the managers who participated in the research:



**Graph 2. Emotional Balance Status of Managers based on the NHL Scores**

The majority of the managers belong to Mid-High (56.6%) and to Mid-Low Emotional Balance category (42.1%). Almost 1% (0.9%) belongs to High EBS and 0.4% to the lowest category.

## Research findings: subordinates

Participants, according to our sample, having a subordinate position are 377. Their sociodemographic information, see Table 3, – gender, age, marital status, number of children, years of employment – was extracted from items 1 to 12 of the final questionnaire. Most of the subordinates' work in the private sector with a frequency of 322 and a percentage of 85.40%. Regarding the gender, women managers are 68.70% and men 30.80%. Most of the subordinates belong to the age group of 35-44 (44.30%). Forty-three per cent (43.80%) hold a degree in post-secondary education, with 53.60% been married and 43.50% parents.

Table 3. Subordinates' Sociodemographic

|                            |               | Frequency | Percentage |
|----------------------------|---------------|-----------|------------|
| <b>Gender</b>              | Male          | 116       | 30.80%     |
|                            | Female        | 259       | 68.70 %    |
|                            | Other         | 2         | 0.50%      |
| <b>Age</b>                 | 18-25         | 19        | 5.00%      |
|                            | 26-34         | 83        | 22.00%     |
|                            | 35-44         | 167       | 44.30%     |
|                            | 45-54         | 82        | 21.80%     |
|                            | 55-64         | 23        | 6.10%      |
|                            | 65+           | 3         | 0.80%      |
| <b>Marital Status</b>      | Married       | 192       | 50.90%     |
|                            | Single        | 114       | 30.20%     |
|                            | Cohabit       | 39        | 10.30%     |
|                            | Divorced      | 29        | 7.70%      |
|                            | Widower/Widow | 3         | 0.80%      |
| <b>Number of Children</b>  | 0             | 175       | 46.40%     |
|                            | 1             | 65        | 17.20%     |
|                            | 2             | 113       | 30.00%     |
|                            | 3             | 22        | 5.80%      |
|                            | 4+            | 2         | 0.50%      |
| <b>Years of Employment</b> | <5            | 156       | 41.40%     |
|                            | 6-10          | 59        | 15.60%     |
|                            | 11-15         | 67        | 17.80%     |
|                            | 16-20         | 49        | 13.00%     |
|                            | 21-25         | 21        | 5.60%      |
|                            | 26-30         | 16        | 4.20%      |
|                            | >30           | 9         | 2.40%      |

## The new approach – PBDM indices

Following up from our under consideration main hypothesis, it is required the three (3) variables, (OEA) , (SR) and lifestyle (NHL) to be used to an equally weighted index, the **PBDMm index**, defined as the self-perception of our samples managers about each of the three components of the index, which a -priori is expected to determine the subordinates satisfaction defined by the sample subordinates, their common statistics are quoted in Table 4.

Worth noticing that the minimum of the variable SR is half of the other two and the distinctive high mean of the variable OEA together within the large variance of the variable SR suggesting a wide range in the answers around the calculated mean value.

The fact that each of the three components of the PBDMm are weakly correlated, see Table 5, reflects the richness of our index encompassed information and variation in explaining the employees' job satisfaction.

Table 4. PBDM - Descriptive Statistics

| <b>PBDMm</b> | <b>Descriptive Analysis</b> | <b>N</b>         | <b>Minimum</b>   | <b>Maximum</b>   | <b>Mean</b>      | <b>Std. Deviation</b> | <b>Variance</b>  | <b>Skewness</b>  |                   | <b>Kurtosis</b>  |                   |
|--------------|-----------------------------|------------------|------------------|------------------|------------------|-----------------------|------------------|------------------|-------------------|------------------|-------------------|
|              |                             | <b>Statistic</b> | <b>Statistic</b> | <b>Statistic</b> | <b>Statistic</b> | <b>Statistic</b>      | <b>Statistic</b> | <b>Statistic</b> | <b>Std. Error</b> | <b>Statistic</b> | <b>Std. Error</b> |
|              | OEA                         | 228              | 2.00             | 5.00             | 4.094            | 0.518                 | 0.268            | -0.598           | 0.161             | 1.370            | 0.321             |
|              | SR                          | 228              | 1.00             | 5.00             | 3.516            | 0.760                 | 0.578            | -0.298           | 0.161             | 0.098            | 0.321             |
|              | NHL                         | 228              | 2.00             | 4.30             | 3.090            | 0.418                 | 0.175            | -0.038           | 0.161             | -0.064           | 0.321             |

Table 5. Correlations - OEA, SR, NHL

| <b>Correlations of managers self-perception of:</b>                                 |                     |            |           |            |
|-------------------------------------------------------------------------------------|---------------------|------------|-----------|------------|
|                                                                                     |                     | <b>OEA</b> | <b>SR</b> | <b>NHL</b> |
| <b>OEA - Managers report for their empathy</b>                                      | Pearson Correlation | 1          | 0.031     | 0.066      |
|                                                                                     | Sig. (2-tailed)     |            | 0.641     | 0.318      |
|                                                                                     | N                   | 228        | 228       | 228        |
| <b>SR – Communication - Managers report for their capability of self-regulation</b> | Pearson Correlation | 0.031      | 1         | .147*      |
|                                                                                     | Sig. (2-tailed)     | 0.641      |           | 0.027      |
|                                                                                     | N                   | 228        | 228       | 228        |
| <b>NHL</b>                                                                          | Pearson Correlation | 0.066      | .147*     | 1          |
|                                                                                     | Sig. (2-tailed)     | 0.318      | 0.027     |            |
|                                                                                     | N                   | 228        | 228       | 228        |

\* Correlation is significant at the 0.05 level (2-tailed).

To further enlighten the hidden info of the created PBD-Mm Index, its three components OEA, SR and NHL, deserve a little bit more of analysis. More specifically, the managers' average empathy score (i.e., others' emotions appraisal – OEA) is 4.094 with a standard deviation of 0.518. The ability of the managers to self-regulate their emotions, the average score is 3.516 with a standard deviation of 0.760. As far as the NHL score (i.e., indication of a healthy lifestyle), the average score is 3.090 with a standard deviation of 0.418. Therefore, the mean score of the managers' empathy is considered to have a satisfactory level. Small differences can be focused on the mean scores for self-regulation and NHL.

In the frame of our study, we asked subordinates to appraise their managers' empathy as well as self-regulation. As already mentioned, managers' lifestyle was excluded as it was very difficult to be evaluated and measured by employees. In that respect, a new index is generated, the **PBDMs**, based on these two (2) variables: OEA' and SR'. **PBDM<sub>s</sub>** is referred to the subordinate's perception of the managers ability to **PBDM** and consequently to affect the subordinates job satisfaction. Further statistical analysis is presented in following paragraphs.

It would be very interesting a comparison between the indices **PBDMm** and **PBDMs**. However, the **PBDMm** index consists of three (3) variables. For this reason, we created a new index, the **PBDMm1**, in order for the correlations of the job satisfaction with both indices to be compared.

The **PBDM** index was categorized into four (4) classes/levels based on the score ranges suggested by (Aisyah Bt Ramli, et al., 2013) : Low (1.00 to 2.00), Medium Low (2.01 to 3.00), Medium High (3.01 to 4.00), and High (3.68 –to 5.00) Level of applicability. Each of the four classes corresponds directly to manager's ability to apply the new management approach. The sample data show that more than 80% of the managers belong to medium-high levels, while the rest percentage is split into medium-low and high levels. The calculated **PBDMm index** as a whole and by classes is expected to, according to our main hypothesis, to influence the degree of employee satisfaction.

## Employees' Job Satisfaction from subordinates' perspective

The Employees' Job Satisfaction index, (ESI) was estimated using the managers evaluation about their subordinates' job satisfaction, defined **ESIm**, and second by taking into consideration the subordinates' self-evaluation of their job satisfaction, defined **ESIs**.

The job satisfaction of the subordinates is defined the dependent variable being determined by the management approach adopted by their supervisors. The relevant information was selected by the corresponding section of our questionnaire, where the subordinates are asked to define on a range their job satisfaction according to the applied management of their direct managers.

**Table 6. Employees' Job Satisfaction due to their managers - Descriptive Statistics**

| Descriptive Analysis | N         | Minimum   | Maximum   | Mean      | Std. Deviation | Variance  | Skewness  |            | Kurtosis  |            |
|----------------------|-----------|-----------|-----------|-----------|----------------|-----------|-----------|------------|-----------|------------|
|                      | Statistic | Statistic | Statistic | Statistic | Statistic      | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| <b>ESIs</b>          | 377       | 1.00      | 5.00      | 3.880     | 0.927          | 0.859     | -0.853    | 0.126      | 0.251     | 0.251      |

The subordinates' job satisfaction as indicated by the sample employees was tested whether it is correlated first with first the **PBDMm** index which reflects the self-evaluation of the managers on its three components, second with the **PBDMm<sub>1</sub>** index which reflects the self-evaluation of the managers, excluding the NHL component to be comparable the **PBDMm1** index to the **PBDM<sub>s</sub>** index, which reflects the subordinates perception about their managers two abilities, i.e. OEA' and SR' – as defined previously in paragraph. The results confirm the positive correlation between the **ESI** and the three **PBDM** indices.

The Employees Satisfaction Index, **ESIs**, was categorized into three (3) classes based on the score ranges suggested by (Aisyah Bt Ramli, et al., 2013): Low (1.00 – 2.33), Mid (2.34 – 3.67), and High (3.68 – 5.00) Level of satisfaction. Almost 65% of the sub-

ordinates, Graph 6, who participate in our sample declared high level of satisfaction, with the stating a very low satisfaction level.

## Employees' Job Satisfaction from management perspective

The managers/ supervisors were asked to fill in an inverted questionnaire regarding their direct subordinates due to the applied management. That is, the managers should answer to the inverted statements of how they evaluate their employees' job satisfaction (**ESIm** – Table 7) because of the management, i.e., **PBDMm**. In this way, we will be able to check if the answers given by the subordinates much or are close or not to the answers given by their managers.

**Table 7. Employees' Job Satisfaction from managers perspective - Descriptive Statistics**

| Descriptive Analysis | N         | Minimum   | Maximum   | Mean      | Std. Deviation | Variance  | Skewness  |            | Kurtosis  |            |
|----------------------|-----------|-----------|-----------|-----------|----------------|-----------|-----------|------------|-----------|------------|
|                      | Statistic | Statistic | Statistic | Statistic | Statistic      | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| <b>ESIs</b>          | 209       | 2.50      | 5.00      | 4.462     | 0.484          | 0.235     | -0.990    | 0.168      | 1.220     | 0.335      |

Based on the above, it seems that there is a difference between the ESIs and ESI<sub>m</sub>. It is noticed that these variables have different minimum and same maximum scores. It is very interesting that the minimum grade for satisfaction from the managers' perspective was double than one indicated by the employees. The mean values of ESIs and ESI<sub>m</sub> are 3.880 and 4.462 respectively. Hence, the managers evaluate their ability to keep their subordinates satisfied much higher than what subordinates indicate. In addition, these variables are uncorrelated ( $r=0.065$ ,  $p>0.05$ ).

Our study will examine the PBDM indices in correlation with satisfaction as reported by both managers and subordinates (ESI<sub>m</sub> and ESIs), focusing on the ESIs because this is the real and experienced satisfaction that concerns our research.

## Testing the hypotheses of the PBDM approach

The main hypothesis – as well as the sub-hypotheses – of this research have been tested to investigate the correlation and the statistical significance of the variables.

### The tested hypotheses

The hypotheses that is going to be tested is:

*Main Hypothesis (H<sub>0</sub>): The PBDMm approach has a positive impact on the Employees' Job Satisfaction (ESIs).*

Next was examined whether a degree of statistically correlation existed between the employees' satisfaction due to the management and the total score of PsychoBioDynamic Management - PBDMm (see Table 9). The Pearson correlation findings confirm statistically that there is a strong positive relationship, ( $r=0.173$ ) at 95% level of significance, between the variables ESIs and PBDM, which is in line with our a-priori **main hypothesis** (H<sub>0</sub>), i.e., that *the PsychoBioDynamic Management (PBDMm) approach has a positive impact on the employees' job satisfaction (ESIs)*.

**Table 8. Correlation between ESIs and ESI<sub>m</sub>**

|             |                     | ESI   | ESI'  |
|-------------|---------------------|-------|-------|
| <b>ESI</b>  | Pearson Correlation | 1     | 0.065 |
|             | Sig. (2-tailed)     |       | 0.447 |
|             | N                   | 377   | 138   |
| <b>ESI'</b> | Pearson Correlation | 0.065 | 1     |
|             | Sig. (2-tailed)     | 0.447 |       |
|             | N                   | 138   | 209   |

The effect of the emotional intelligence domains related to the employees' job satisfaction has been examined and resulted in a positive association between them (Sy, et al., 2006). The new management approach consists of two (2) basic dimensions of emotional intelligence: empathy, and self-regulation (Goleman, 1998) (Mayer, et al., 2000). The third element of the PBDMm is the managers' lifestyle. The way someone lives (e.g., habits, nutrition) may affect the emotional status balance. In that frame, the acceptance of the main hypothesis (H<sub>0</sub>) corresponds to what is reported in the literature (Carmeli, 2003)

(Yue, et al., 2022) (Belias, et al., 2014) (Nadinloyi, et al., 2013) (Negoro & Wibowo, 2021).

In addition, it was performed the Kruskal-Wallis H (K-W H) test for investigating the correlation between the employees' satisfaction and levels of PBDMm applicability. The K-W H test was performed because it is a rank-based nonparametric test. Using this test, it is determined whether there are statistically significant differences between two or more groups of an independent variable on a continuous ordinal dependent variable. All the assumptions are tested/verified prior to the application of the K-W H test. All the observations are independent. The dependent variable (ESIs – Employees' Satisfaction) has been measured at an ordinal/continuous level. The independent variable (PBDM Applicability level) consists of four (4) diverse groups (Low, Medium Low, Medium High, and High). Based on the above, the K-W H test can be performed.

**Table 9. Correlation between ESIs, ESI<sub>m</sub> and PBDMm**

|                        |                     | PBDMm   | ESI    | ESI'    |
|------------------------|---------------------|---------|--------|---------|
| <b>PBDMm</b>           | Pearson Correlation | 1       | 0.173* | 0.433** |
|                        | Sig. (2-tailed)     |         | 0.037  | 0.000   |
|                        | N                   | 228     | 147    | 209     |
| <b>ESIs</b>            | Pearson Correlation | 0.173*  | 1      | 0.065   |
|                        | Sig. (2-tailed)     | 0.037   |        | 0.447   |
|                        | N                   | 147     | 377    | 138     |
| <b>ESI<sub>m</sub></b> | Pearson Correlation | 0.433** | 0.065  | 1       |
|                        | Sig. (2-tailed)     | 0.000   | 0.447  |         |
|                        | N                   | 209     | 138    | 209     |

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

A Kruskal-Wallis H test showed (Table 10) that there was a statistically significant difference in employees' satisfaction between the different PBDM applicability levels,  $\chi^2(2) = 7.490$ ,  $p = 0.024$ , with a mean rank pain score of 48.79 for the Medium Low level, 72.63 for Medium High level and 98.93 for the High level. Therefore, the degree to which one applies the new management approach (PBDMm) has a differential and statistically significant effect on employees' job satisfaction.

**Table 10. Kruskal-Wallis H test results**

| Ranks                          |                           |     |           |
|--------------------------------|---------------------------|-----|-----------|
| Employees' Satisfaciton - ESIs | PBDMm Applicability Level | N   | Mean Rank |
|                                | Medium Low                | 7   | 48.79     |
|                                | Medium High               | 126 | 72.63     |
|                                | High                      | 14  | 98.93     |
|                                | Total                     | 147 |           |

| Test Statistics <sup>a, b</sup> |                        |       |
|---------------------------------|------------------------|-------|
|                                 | Employees Satisfaction |       |
| Kruskal-Wallis H                | 7.490                  | 72.63 |
| df                              | 2                      | 98.93 |
| Asymp. Sig.                     | 0.024                  |       |

a. Kruskal Wallis Test

b. Grouping Variable: PBDMm Applicability Level

## Conclusion

The existing management theories should be improved, if not replaced. New management models should be developed in accordance with the market and manpower needs. The last decades the emotional intelligence has contributed to the management improvement.

The evaluation and interpretation of the findings and results of the empirical research highlight the importance of managers possessing the two basic dimensions of emotional intelligence, empathy, and the ability to self-regulate emotion. Then a healthy lifestyle – which can lead to an emotional balance – is the third factor of the new management approach. More specifically, it was observed that managers and supervisors who are qualified to implement the PBDM have a positive effect on the subordinates' job satisfaction.

Having asked subordinates to fill in a questionnaire that will respond to the abilities of their managers' empathy and emotion regulation, the further processing of these data showed an important difference between the managers' and subordinates' perceptions regarding applied management and job satisfaction. From the totality of the findings and results of the specific doctoral thesis, it appears that the combination of these three components that make up the new management approach has a positive effect on employee satisfaction. This leads to the conclusion that PsychoManagement is an important starting point for the development of new theories in the field of management which will have as their ultimate goal not only the satisfaction of the existing ones but also the profitability of the company. In addition, the overall statistical findings confirm the lack of communication from top to bottom. The differences between the indices, PBDMm and PBDMs – ESI<sub>m</sub> and ESI<sub>s</sub>, support that there is a misconception of how the managers realize their subordinates' job satisfaction that the real one.

## References

- Abi, E. & Jijo, G., 2012. Emotional Intelligence and Job Satisfaction: A Correlational study. *Research Journal of Commerce and Behavioral Science*, 1(4), pp. 124-141.
- Aisyah Bt Ramli, S. et al., 2013. Influence of Behavioral Factors on Mobile Phone Usage among Fishermen: The Case of Pangkor Island Fishermen. *Asian Social Science*, 9(5), pp. 162-170.
- Al Ali, O. E., Garner, I. & Magadle, W., 2011. An Exploration of the Relationship Between Emotional Intelligence and Job Performance in Police Organizations. *Journal of Police and Criminal Psychology*.
- Anari, N. N., 2012. Organizational Commitment. *Journal of Workplace Learning*.
- Andrews, R. C. et al., 2002. Abnormal Cortisol Metabolism and Tissue Sensitivity to Cortisol in Patients with Glucose Intolerance. *The Journal of Clinical Endocrinology & Metabolism*, 87(12), pp. 5587-5593.
- Armstrong, L. E., 2002. Caffeine, Body Fluid-Electrolyte Balance, and Exercise Performance. *International Journal of Sport Nutrition and Exercise Metabolism*, Volume 12, pp. 189-206.
- Armstrong, L. E. et al., 2005. Fluid, Electrolyte, and Renal Indices of Hydration during 11 Days of Controlled Caffeine Consumption. *International Journal of Sport Nutrition and Exercise Metabolism*, 15(3), pp. 252-265.
- Ashkanasy, N. M. & Dorris, A. D., 2017. Emotions in the Workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, Volume 4, pp. 67-90.
- Basset, G., 1994. The case against job satisfaction. *Business Horizons*, 37(3), pp. 61-68.
- Becker, B. & Gerhart, B., 2017. The Impact of Human Resource Management on Organizational Performance: Progress and Prospects. *Academy of Management Journal*, 39(4).
- Belias, D., Koustelios, A., Vairaktarakis, G. & Sdrolas, L., 2014. *Organizational Culture and Job Satisfaction of Greek Bankin Institutions*. Madrid, Spain, Procedia - Social and Behavioral Sciences, pp. 314-323.
- Berg, J. M. & Tymoczko, J. L., 2002. *Biochemistry*. 5th Edition ed. New York: W H Freeman.
- Bhardwaj, A., Mishra, S. & Jain, T. K., 2021. *An analysis to understanding the job satisfaction of employees in banking industry*. s.l., s.n., pp. 170-174.
- Brewer, A. M. & Hensher, D. A., 1998. The importance of organisational commitment in managing change: experience of the NSW private bus industry. *Transportation Res. - E: Logistics and Transportation Review*, 34(2), pp. 117-130.
- Brighten, D. J., 2016. *9 Ways to Improve Low Progesterone & Boost Fertility*. s.l.: drbrighten.com.
- Cairns, P. et al., 2021. Empathy maps in communication skills training. *Communication Skills*, 18(2), pp. 142-146.
- Caldwell, H. K. & Young, W. S., 2006. Oxytocin and vasopressin: Genetics and behavioral implications. In: A. Lajtha & R. Lim, eds. *Handbook of Neurochemistry and Molecular Neurobiology: Neuroactive Proteins and Peptides*. Berlin, Germany: Springer, pp. 573-607.
- Camerer, C., Loewenstein, G. & Prelec, D., 2005. Neuroeconomics: How Neuroscience Can Inform Economics. *Journal of Economic Literature*, Volume XLIII, pp. 9-64.
- Carmeli, A., 2003. The relationship between emotional intelligence and work attitudes, behavior and outcomes An examination among senior managers. *Journal of Management Psychology*, 18(8), pp. 788-813.
- Carson, D. S. et al., 2015. Arginine Vasopressin Is a Blood-Based Biomarker of Social Functioning in Children with Autism. *PLoS One*, 10(7), p. e0132224.
- Carter, C. S., 2007. Sex differences in oxytocin and vasopressin: Implications for autism spectrum disorders?. *Behavioural Brain Research*, 176(1), pp. 170-186.
- Cherney, K., 2020. *8 Testosterone-Boosting Foods*, s.l.: healthline.com.
- Cimete, G., Gencalp, N. S. & Keskin, G., 2003. Quality of life and job satisfaction of nurses. *Journal of Nursing Care Quality*, 18(2), pp. 151-158.
- Darioly, A. & Mast, M., 2014. The Role of Nonverbal behavior in Leadership. In: R. E. Riggio & S. J. Tan, eds. *Leader Interpersonal and Influence Skills, The Soft Skills of Leadership*. NY/London: Routledge, pp. 73-100.
- Di Renzo, G. C. et al., 2016. Progesterone in Normal and pathological pregnancy. *Hormone Molecular Biology and Clinical Investigation*, 27(1), pp. 35-48.
- Drafke, M. & Kossen, S., 2002. *The Human Side of Organizations*. 8th ed. New Jersey: Prentice-Hall, Inc..
- Dulewicz, V., Higgs, M. & Slaski, M., 2003. Measuring emotional intel-

- ligence: content, construct, and criterion-related validity. *Journal of Managerial Psychology*, pp. 405-420.
- Edelman, P. & Knippenberg, D. v., 2018. Emotional intelligence, management of subordinate's emotions, and leadership effectiveness. *Leadership & Organization Development Journal*, 39(5), pp. 592-607.
- Egwurugwu, J. N. et al., 2013. Effects of zinc on male sex hormones and semen quality in rats. *Niger J Physiol*, 28(1), pp. 17-22.
- Elias, L. J. & Saucier, D. M., 2006. *Neuropsychology: Clinical and Experimental Foundations*. Boston, Massachusetts (USA): Allyn & Bacon.
- Epel, E. S. et al., 2000. Stress and Body Shape: Stress-Induced Cortisol Secretion Is Consistently Greater Among Women With Central Fat. *Psychosomatic Medicine*, Volume 62, pp. 623-632.
- Eslami, J. & Gharakhani, D., 2012. Organizational Commitment and Job Satisfaction. *ARNP Journal of Science and Technology*, pp. 85-91.
- Ferdous, J., 2017. A JOURNEY OF ORGANIZATION THEORIES: FROM CLASSICAL TO MODERN. *International Journal of Business, Economics and Law*, 12(2), pp. 1-4.
- Ferguson, J. N., Young, L. J. & Insel, T. R., 2002. The neuroendocrine basis of social recognition. *Frontiers in Neuroendocrinology*, 23(2), pp. 220-224.
- Galan, N., 2019. *What to know about blood sugar spikes*. [Online] Available at: <https://www.medicalnewstoday.com/articles/317215>
- Gentry, W. A., Weber, T. J. & Sadri, G., 2007. *Empathy in the Workplace: A Tool for Effective Leadership*. New York: Center for Creative Leadership.
- Goleman, D., 1998. *Working With Emotional Intelligence*. London: Bloomsbury.
- Gompertz, K., 1960. The Relation of Empathy to Effective Communication. *Journalism & Mass Communication Quarterly*, 37(4), pp. 533-546.
- Grandjean, A. C., Reimers, K. J., Bannick, K. E. & Haven, M. C., 2000. The Effect of Caffeinated, Non-Caffeinated, Caloric and Non-Caloric Beverages on Hydration. *Journal of the American College of Nutrition*, 19(5), pp. 591-600.
- Greenberg, J. & Baron, R. A., 1995. *Behavior in Organizations: Understanding & Managing the Human Side of Work*. 5th ed. Trenton: Prentice Hall College Div.
- Harvard Medical School, 2015. *Harvard Health Publishing - Harvard Medical School*. [Online] Available at: <https://www.health.harvard.edu/drugs-and-medications/testosterone--what-it-does-and-doesnt-do>
- Hefferman, T., O'Neill, G., Travaglione, T. & Droulers, M., 2008. Relationship marketing: The impact of emotional intelligence and trust on bank performance. *International Journal of Bank Marketing*, 26(3), pp. 183-199.
- Holt-Lunstad, J., Birmingham, W. .. & Light, K. C., 2008. Influence of a "Warm Touch" Support Enhancement Intervention Among Married Couples on Ambulatory Blood Pressure, Oxytocin, Alpha Amylase, and Cortisol. *Psychosomatic Medicine*, 70(9), pp. 976-985.
- Hussain, N., Haque, A. u. & Baloch, A., 2019. Management Theories: The Contribution of Contemporary Management Theorists in Tackling Contemporary Management Challenges. *Journal of Yaşar University*, Issue 14, pp. 156-169.
- Johnson, R. R., 2011. Officer Attitudes and Management Influences on Police Work Productivity. *American Journal of Criminal Justice*, 36(4), pp. 293-306.
- Joo, K. W. et al., 2004. Antidiuretic action of oxytocin is associated with increased urinary excretion of aquaporin-2. *Nephrology Dialysis Transplantation*, 19(10), pp. 2480-2486.
- Kafatos, A. et al., 1999. Regional, demographic and national influences on attitudes and beliefs with regard to physical activity, body weight and health in a nationally representative sample in the European Union. *Public Health Nutrition*, 2(1a), pp. 87-95.
- Kafetsios, K. & Zampetakis, L. A., 2008. Emotional intelligence and job satisfaction: Testing the mediatory role of positive and negative affect at work. *Personality and Individual Differences*, pp. 712-722.
- Kafetsios, K. & Zampetakis, L. A., 2008. Emotionally intelligence and job satisfaction: Testing the mediatory role of positive and negative affect at work. *Personality and Individual Differences*, Volume 44, pp. 712-722.
- Kaimal, G., Ray, K. & Muniz, J., 2016. Reduction of Cortisol Levels and Participants'. *Journal of the American Art Therapy Association*, 33(2), pp. 74-80.
- Kaura, P., 2011. Enormity of Emotional Intelligence in India Banking Sector. *International Research Educational Consortium*, 12(1), pp. 165-177.
- Kiechel III, W., 2012. The Management Century. *Harvard Business review*.
- Kitana, A., 2016. OVERVIEW OF THE MANAGERIAL THOUGHTS AND THEORIES FROM THE HISTORY: CLASSICAL MANAGEMENT THEORY. *INDIAN JOURNAL OF MANAGEMENT SCIENCE (IJMS)*, VI(1), pp. 16-21.
- Koustelios, A. D., 2001. Personal characteristics and job satisfaction of Greek teachers. *International Journal of Educational Management*, 15(7), pp. 354-358.
- Koustelios, A. D. & Bagiatas, K., 1997. THE EMPLOYEES SATISFACTION INVENTORY (ESI) DEVELOPMENT OF A SCALE TO MEASURE SATISFACTION OF GREEK EMPLOYEES. *Educational and Psychological Measurement*, 57(3), pp. 469-476.
- Krawczynski, M. & Olszewski, H., 2000. Psychological well-being associated with a physical activity programme for persons over 60 years old. *Psychology of Sport and Exercise*, 1(1), pp. 57-63.
- Kudielka, B. M., Hellhammer, D. H. & Wüst, S., 2009. Why do we respond so differently? Reviewing determinants of human salivary cortisol responses to challenge. *Psychoneuroendocrinology*, 34(1), pp. 2-18.
- Lee, D. et al., 2012. Association of hypogonadism with vitamin D status: the European Male Ageing Study. *European Journal of Endocrinology*, 166(1), pp. 77-85.
- Li, C. et al., 2008. Molecular Mechanisms of Antidiuretic Effect of Oxytocin. *Journal of the American Society of Nephrology*, 19(2), pp. 225-232.
- Lim, M. M. & Young, L. J., 2004. Vasopressin-dependent neural circuits underlying pair bond formation in the monogamous prairie vole. *Neuroscience*, 125(1), pp. 35-45.
- Lountzis, G. & Palaskas, T., 2022. "Psychomanagement": A New Management Approach. *"Greek Economic Outlook" Journal*, Issue 47, pp. 90-102.
- Markovits, Y., Davis, A. J., Fay, D. & von Dick, R., 2010. The Link Between Job Satisfaction and Organizational Commitment: Differences Between Public and Private Sector Employees. *International Public Management Journal*, pp. 177-196.
- Mayer, J. D., Caruso, D. R. & Salovey, P., 2000. Emotional Intelligence Meets Traditional Standards for An Intelligence. *Intelligence*, 27(4), pp. 267-298.
- Mayo, J. L., 1997. A Natural Approach to Menopause. *Applied Nutritional Science Reports*, 5(7).
- Mellon, C. A., 2016. *Effective Followership Characteristics: Self-Regulation and Intercultural Communication Competence*. Knoxville: University of Tennessee.

- Metle, J. M. K., 2003. The Impact of Education on Attitudes of Female Government Employees. *Journal of Management Development*, 22(7), pp. 603-626.
- Miller, K. I. & Koesten, J., 2008. Financial Feeling: An Investigation of Emotion and Communication in the Workplace. *Journal of Applied Communication Research*, 36(1), pp. 8-32.
- Moghadam, A. H., Tehrani, M. & Amin, F., 2011. Study of the Relationship Between Emotional Intelligence (EI) and Management Decision Making Styles. *World Applied Sciences Journal*, 12(7), pp. 1017-1025.
- Molnar, C. & Gair, J., 2013. *Concepts of Biology*. 1st Canadian Edition ed. s.l.:B.C. Open Textbook Project.
- Murray, M. A. & Atkinson, T., 1981. Gender differences in correlates of job. *Canadian Journal of Behavioral Sciences*, 13(1), pp. 44-52.
- Nadinloyi, K. B., Sadeghi, H. & Hajloo, N., 2013. Relationship Between Job Satisfaction and Employees Mental Health. *Procedia - Social and Behavioral Sciences*, Issue 84, pp. 293-297.
- Negoro, M. C. W. & Wibowo, A., 2021. Empathetic leadership, job satisfaction and intention to leave among millennials in a start-up industry: needs' satisfaction as a mediating variable. *Journal of Indonesian Economy and Business*, 36(2), pp. 136-154.
- Newsome, J. H., 1979. Vasopressin: Deficiency, Excess and the Syndrome of Inappropriate Antidiuretic Hormone Secretion. *Nephron*, Volume 23, pp. 125-129.
- NHS, 2018. *Hyperglycaemia (high blood sugar)*. [Online] Available at: <https://www.nhs.uk/conditions/high-blood-sugar-hyperglycaemia/>
- NIDDK, 2008. *Hypoglycaemia*, s.l.: National Institute of Health.
- Noe, R. A., 1996. Is Career Management Related to Employee Development and Performance?. *Journal of Organizational Behavior*, 17(2), pp. 119-133.
- Okpara, J. O., 2004. Personal characteristics as predictors of job satisfaction: An exploratory study of IT managers in a developing economy. *Information Technology & People*, 17(3), pp. 327-338.
- Orhan, N. & Dincer, H., 2012. The Impacts of Emotional Intelligence Competency on Job Satisfaction in the Service Sector: An Application on the Turkish Banking Sector. *Asian Economic and Financial Review*, 2(5), pp. 617-634.
- Oshagbemi, T., 2000. Gender differences in the job satisfaction of university teachers. *Women in Management Review*, 15(7), pp. 331-343.
- Packard, S. H. & Kauppi, D. R., 1999. Rehabilitation Agency Leadership Style. *Rehabilitation Counseling Bulletin*, 43(1), pp. 5-11.
- Papathanasiou, S. & Siati, M., 2014. Emotional Intelligence and Job Satisfaction in Greek. *Research in Applied Economics*, 6(1), pp. 225-239.
- Parlesak, A., Pohl, C., Bode, J. & Bode, C., 2004. Water Metabolism in Rats Subjected to Chronic Alcohol Administration. *Nephron Physiol*, Issue 97, pp. 9-15.
- Peterson, D. K., Puia, G. M. & Suess, F. R., 2003. "Yo Tengo La Camiseta (I Have the Shirt On)": An Exploration Of Job Satisfaction and Commitment Among Workers In Mexico. *Journal of Leadership & Organizational Studies*, 10(2), pp. 73-88.
- Pindur, W., Rogers, S. E. & Kim, P. S., 1995. The history of management: a global perspective. *Journal of Management History*, 1(1), pp. 59-77.
- Rahim, M. A. et al., 2002. A MODEL OF EMOTIONAL INTELLIGENCE AND CONFLICT MANAGEMENT STRATEGIES: A STUDY IN SEVEN COUNTRIES. *The International Journal of Organizational Analysis*, 10(4), pp. 302-326.
- Rahim, S. H. & Malik, M. I., 2010. Emotional Intelligence & Organizational Performance: (A Case Study of Banking Sector in Pakistan). *International Journal of Business and Management*, 5(10), pp. 191-197.
- Ramsey, R. D., 1997. Employee morale: Does it matter anymore?. *Supervision*, 58(9), pp. 6-8.
- Redmond, M. V., 1989. The Functions of Empathy (Decentering) in Human Relations. *Human Relations*, 42(7), pp. 593-605.
- Riggio, R. E., 2014. A Social Skills Model for Understanding the Foundations of Leader Communication. In: R. E. Riggio & S. J. Tan, eds. *LEADER INTERPERSONAL AND INFLUENCE SKILLS The Soft Skills of Leadership*. New York: Routledge, pp. 31-49.
- Riggio, R. E., Riggio, H. R., Salinas, C. & Cole, E. J., 2003. The Role of Social and Emotional Communication Skills in Leader Emergence and Effectiveness. *Group Dynamics: Theory, Research, and Practice*, 7(2), pp. 83-103.
- Riggio, R. E., Tucker, J. & Coffaro, D., 1989. Social skills and empathy. *Personality and Individual Differences*, 10(1), pp. 93-99.
- Robbins, S. P., Odendaal, A. & Roodt, G., 2003. *Organisational behaviour*. 9th ed. Cape Town: Prentice-Hall Int..
- Saxena, N., 2019. *An Overview of Classical Management Theories: Review Article*. Jaipur, India, BICON-19.
- Sher, L., 2005. Type D personality: the heart, stress, and cortisol. *QJM: An International Journal of Medicine*, 98(5), pp. 323-329.
- Sherman, A. W. & Bohlander, G. W., 1992. *Managing Human Resources*. 9th ed. Ohio: South Western Publishing Co..
- Shukla, S., Adhikari, B. & Ray, M. M., 2016. Emotional Intelligence and Job Satisfaction: An Empirical Investigation. *Amity Global HRM Review*, pp. 54-61.
- Singh, J. K. & Jain, M., 2013. A STUDY OF EMPLOYEES' JOB SATISFACTION AND ITS IMPACT ON THEIR PERFORMANCE. *Journal of Indian Research*, 1(4), pp. 105-111.
- Sinha, S. & Sihna, D., 2007. Emotional Intelligence and Effective Communication. In: A. Kaul & S. K. Gupta, eds. *Management Communication: Trends & Strategies*. s.l.:Tata McGraw Hill, pp. 450-460.
- Smucker, M., Whisenant, W. A. & Pedersen, P. M., 2003. An investigation of Job Satisfaction and Female Sports Journalists. *Sex Roles*, 49(7), pp. 401-407.
- Spector, P., 1994. Using self-report questionnaires in OB research: A comment on the use of a controversial method. *Journal of Organizational Behavior*, pp. 385-392.
- Spector, P. & Fox, S., 2003. Reducing subjectivity in the assessment of the job environment: Development of the Factual Autonomy Scale (FAS). *Journal of Organizational Behavior*, pp. 177-196.
- Spitzberg, B. H. & Dillard, J. P., 2001. Social Skills and Communication. In: M. Allen, R. W. Preiss, B. M. Gayle & N. Burrell, eds. *Interpersonal Communication Research*. New York: s.n.
- Springer, G. J., 2011. A Study of Job Motivation, Satisfaction, and Performance among Bank Employees. *Journal of Global Business Issues*, 5(1), pp. 29-42.
- Stalikas, A., Triliva Sofia & Roussi, P., 2012. *The psychometric tools in Greece*. Athens: Pedio.
- Sy, T., Tram, S. & O'Hara, L. A., 2006. Relation of employee and manager emotional intelligence to job satisfaction and performance. *Journal of Vocational Behavior*, Volume 68, pp. 461-473.
- Sy, T. & Tram-Quon, S., 2006. Relation of employee and manager emotional intelligence to job satisfaction and performance. *Journal of Vocational Behavior*, Issue 68, pp. 461-473.
- Tang, T. L.-P. & Talpade, M., 1999. Sex Differences in Satisfaction with

- Pay and Co-Workers: Faculty and Staff at a Public Institution of Higher Education. *Public Personnel Management*, 28(3), pp. 345-349.
- Voet, D. & Voet, J., 2010. *Biochemistry*. 4th Edition ed. New York: Wiley.
- Wech, B. A., 2002. Trust context: Effect on organizational citizenship behavior, Supervisory Fairness, and Job Satisfaction Beyond the Influence of Leader-Member Exchange. *Business & Society*, 41(3), pp. 353-360.
- Wegner, M. et al., 2015. The effects of exercise on anxiety and depression disorders: Review of meta- analyses and neurobiological mechanisms. *CNS Neurol. Disorders Drug Targets*, Issue 13, pp. 1002-1014.
- Wehr, E. et al., 2010. Association of vitamin D status with serum androgen levels in men. *Clin Endocrinol (Oxf)*, 73(2), pp. 243-8.
- Wolfe, K. & Kim, H. J., 2013. Emotional Intelligence, Job Satisfaction, and Job Tenure among Hotel Managers. *Journal of Human Resources in Hospitality & Tourism*, pp. 175-191.
- Wong, C.-S. & Law, K. S., 2002. The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly*, Volume 13, pp. 243-274.
- Yue, Z. et al., 2022. Empathy and burnout in medical staff: mediating role of job satisfaction and job commitment. *BMC Public Health*, 22(1033).
- Zakieh, S., Fatemeh, A. & Mahmood, A. L., 2013. The effect of labor's emotional intelligence on their job satisfaction, job performance and commitment. *Iranian Journal of Management Studies*, pp. 27-43.

## Greek Bibliography

- Αννίνου, Β., 2021. Πώς να ενεργοποιήσετε τους 4 κύριους νευροδιαβιβαστές του εγκεφάλου σας, που επηρεάζουν την ευτυχία σας;;, s.l.: eductor.gr.
- Ζέρβα, Σ. & Ζερδίλα, Μ., 2009. Παχυσαρκία: Μία χρόνια νόσος. Το Βήμα του Ασκληπείου.
- Ζερβόπουλος, Π. & Παλάσκας, Θ., 2010. Εφαρμογή Μετρήσεων Απόδοσης – Αποτελεσματικότητας - Αποδοτικότητας στη Δημόσια Διοίκηση: Διεθνής και Ελληνική Εμπειρία, s.l.: MPRA.
- Παπαγεωργίου, Ι., 2015. Θεωρία Δειγματοληψίας. Αθήνα: ΣΕΑΒ.