OCEAN Personality Testing for Employee Recruitment and Retention

Exploring Key Workplace Challenges, Opportunities, Traits, and Domains to Inform Evidenced Action Plans for International Pharmaceutical Companies

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Contents

Abstract

The challenges faced by international pharmaceutical companies and their Human Resources departments involving effective recruitment, selection, and retention of employees have become a central focus in competitive international VUCA markets. Personality-informed interventions may be critical in international companies' efforts to optimize selection and recruitment, as well as addressing work and well-being-related challenges faced by current employees in order to achieve sustainable retention. However, caution should be exercised when implementing personality assessment models, particularly when automated with the use of technology. This case study provides (1) an evaluation of strengths and weaknesses of OCEAN personality testing in critical areas of employment, such as recruitment, selection, and retention; (2) an exploration of key workplace challenges, opportunities, personality traits, and domains; and (3) considerations of workplace-level adoption of novel technologies, such as Artificial Intelligence, Machine Learning, and Large Language Models, in employment practices and ethical considerations for their fair implementation, with the goal to inform evidence-driven action plans.

Introduction

Challenges in International Markets

The challenges of international pharmaceutical companies and their Human Resources (HR) departments toward effective recruitment (the active process of searching for prospective employees and encouraging them to apply for the offered job positions; Mahmood, 2014; Pandey & Kshirsagar, 2024), selection (the process of identification and nomination, customarily through a job offer, of suitable candidates; Babapour et al., 2018), and retention (the ability to maintain employees for a prolonged period of time; Das, 2013; Hejase et al., 2016; Kalyanamitra et al., 2020; Memon et al., 2023; Shenoy & Sharma, 2022) of employees, particularly in entry-level sales divisions, have become a central focus in competitive international VUCA (volatility, uncertainty, complexity, and ambiguity; the acronym has been used to describe such characteristics and challenges, as encountered in today's world; see Mack et al., 2016) markets (Suksod & Cruthaka, 2020).

Such challenges have extended to the international pharmaceutical company and working employees of DF, an HR Executive. For example, DF's international pharmaceutical company has seen a rise in staff turnover, particularly in the sales division, and a report by DF's assistant revealed that company employees have been struggling with their workplace well-being, namely the overall quality of an employee's life as it occurs in the working environment, which may include aspects such as mental health (Schulte & Vainio, 2010). Reported burnout, emotional exhaustion, high job pressure, and disengagement were listed by employees as reasons for leaving the company, hence DF's interest in an evidenced action plan which would be informed by personality.

Personality and Assessment Tools

Personality is defined as a stable set of traits and styles representing an individual's dispositions and uniqueness (Bergner, 2020; Roberts & Yoon, 2022). As a potential antidote to VUCA-related challenges, personality and its representative traits are relatively stable and enduring across an individual's adult life (Bergner, 2020; Bleidorn et al., 2022; Cobb-Clark & Schurer, 2012; Rantanen et al., 2007). Therefore, personality-informed interventions may provide DF's international pharmaceutical company with a valuable methodology to overcome the uncertain processes of selection and recruiting, as well as address work and well-being-related challenges experienced by current employees.

Key areas for discussion in business recruitment and personality psychological research, which DF's HR department as well as the company's board of directors should

consider, include the efficacy, selection, and benefits of personality assessment methods and tools. Benefits may include the achievement of a more accurate fit between job requirements and applicants, more effective and personalized mental health and well-being interventions to maximize current employees' well-being and performance, and support for long-term retention by addressing employees' specific needs (Bouton & Moore, 2011; Goodstein & Lanyon, 1999; Nirmala et al., 2023; Preedy & Watson, 2010; Rothstein & Goffin, 2006; Wilsher, 2015).

Personality assessment tools that should be considered by DF's international pharmaceutical company include those leveraging technological advancements in Artificial Intelligence (AI, "the science and engineering of creating intelligent machines" [Hamet & Tremblay, 2017; McCarthy et al., 1955]) and Machine Learning (ML, an AI subdomain which makes use of data and algorithms to produce statistical inferences and emulate human learning [Algren et al., 2021; Awad & Khanna, 2015]), which may offer a higher predictive computational power, precision, and efficiency when handling personality data. For example, this technology may be used to facilitate and streamline personality-based assessments in recruitment by predicting outcomes through profiling personality data as it relates to the job role and prerequisite criteria, as well as for personality-informed conflict prediction among employees and as an aid for processes such as conflict resolution (Mozaffari et al., 2023).

An Employee-Centered Approach

On the other hand, employees have dealt with disengagement (Sawasdee et al., 2020; Tirastittam et al., 2020), burnout (Haghani et al., 2022; Santos et al., 2022), and emotional exhaustion (Syarief & Pramitha, 2020), which have affected their emotional well-being and may have contributed toward the high turnover rates, as described in DF's case. Preventive measures and interventions to support employees' well-being may benefit from the use of personality assessment tools, providing DF's HR department with the ability to make informed intervention decisions using empirical measures of personality traits and individual needs (Anglim et al., 2020; Boult et al., 2018; Oswald & Hough, 2011). These interventions could be implemented to help HR departments provide more sustainable working arrangements by accounting for employees' personality traits to adopt thoughtful employee allocation strategies through personality-informed conflict predictions and applying ad-hoc solutions to situations that are interpersonal and/or within the individual's organizational role.

Ultimately, personality-oriented psychometric assessments could provide an effective modality for DF's international pharmaceutical company to optimize and facilitate

the management of complex, employee-centric, and role-specific processes (e.g., employees' recruitment, selection, retention, and performance enhancement). Such assessments have already been positively received by HR professionals for ease of use, practicality, and positive outcomes (Furnham, 2008).

Background

The Five-Factor Model of Personality

The Five-Factor Model (FFM) of personality (Costa & McCrae, 1996; Digman, 1990) has been defined by its authors as "an empirical generalization about the covariation of personality traits" (Costa & McCrae, 2008) and has been widely employed in the domains of business, HR, and management (Fetvadjiev & van de Vijver, 2015; Hodgkinson & Gill, 2015; Pareke & Hayu, 2016). The FFM is commonly known as the Big Five or under the acronym OCEAN, which describes the five factors, namely openness (the propensity toward pursuing novelty and challenging predetermined information; Boyd, 2020), conscientiousness (the inclination toward being goal directed, planning, and conforming to and abiding by socially prescribed norms; Roberts et al., 2009), extraversion (the proclivity toward active social engagement and the outgoing pursuit of social settings and activities; Taylor & Broffman, 2011), agreeableness (the disposition for positive cooperation and empathic prosocial behavior; Caprara et al., 2010; Habashi et al., 2016), and neuroticism (the propensity to experience negative emotions; Liu et al., 2021; Widiger & Oltmanns, 2017).

Personality assessments based on the FFM may provide DF's company with a robust basis for long-term growth through the identification of relevant job-specific personality traits and personality-informed long-term development plans focused on enhancing the potential of employees and maximizing their performance while supporting their well-being (Giannoukou, 2023; Li, 2023; Silvestre, 2022; Thoresen et al., 2004). Furthermore, such assessments may offer essential aid in overcoming the obstacles met by companies and their employees—prospective and senior alike—in today's VUCA world.

Action plans and interventions based on FFM personality assessments, as applied in organizational psychology, may be used to assist companies in addressing HR challenges (Bouton & Moore, 2011; Wilsher, 2015), such as those faced by DF and her company (see Introduction section for case study summary), and pertain to the domains of recruitment, selection, and retention in the workplace. Understanding personality traits as they apply to different domains and sub-domains, such as recruitment, job performance (the combined behaviors of one or more employees as they pertain to their work and to the employing organization's goals; Brandão & Jordão, 2011; Fogaça et al., 2018), job engagement (the

synthesis of behaviors and attitudes as they pertain to high motivation, dedication, and enthusiasm at work; Eacock & Barber, 2022; Zeidan & Itani, 2020), job satisfaction (the sum total of positive and negative emotions as they pertain to different aspects of one's work; Adhikari, 2022; Cebotari, 2022), and workplace well-being—as well as exploring the relationship between personality traits and discussed domains of interest—would be necessary for DF to lay the foundations of an evidenced personality-informed action plan or intervention.

Analysis and Intervention Strategies

Employee Recruitment and Selection

Available resources for employee selection and recruitment may be limited; hence, efficient and cost-effective solutions would be highly desirable for DF's company so that resources can be swiftly reallocated based on more urgent and specific needs (i.e., to support employees' retention and well-being). The use of modern psychometric tools in the context of online recruiting has been found to substantially lower costs associated with hiring (Bouton & Moore, 2011) and concurrently preserve time and other resources while providing valuable candidate insights (Nirmala et al., 2023; Preedy & Watson, 2010).

Opportunities and challenges for companies such as DF's have been instated in recent times in the domains of recruitment and selection by the rise of new technology (Lievens & Chapman, 2019). Hence, companies and HR departments alike now have to adapt to the rise of AI, ML, and Large Language Models (LLMs; i.e., AI systems able to learn from large volumes of text data; Lin et al., 2023), as well as all positive and negative aspects derived from the use of such technological tools. New opportunities include access to larger pools of applicants, faster delivery of recruitment questionnaires, and deeper insights into potential candidates' suitability. New challenges for DF's company include ensuring data protection of potential candidates from data breaches and hacking (Lareo, 2024), managing additional ethical responsibilities arising from the use of technology, and addressing the eventuality of LLMs' implicit biases (Bai et al., 2024; Gallegos et al., 2024) and consequential errors in the assessment of potential employees.

However, DF's company should bear in mind that any adoption and administration of psychometric tests—particularly when enriched with the use of novel technologies already mentioned—would require recognition and adoption of ethical and legal responsibilities, such as engaging in bias awareness, practicing attentiveness and proactivity toward employees' mental health and well-being, and ensuring data protection and privacy compliance while addressing employees' privacy concerns regarding personal data storage

and handling, as detailed by local and state legislations and professional psychological bodies which set ethical guidelines for the use of psychometric assessments. These include the British Psychological Society (BPS; Baron & Bartram, 2006; *Code of Good Practice for Psychological Testing*, n.d.; *Guidelines on Testing and Test Use*, n.d.; *Using Online Assessment Tools for Recruitment*, 2010) in the United Kingdom and the American Psychological Association (APA; American Psychological Association, 2020) in the United States.

The FFM personality traits most pertinent to and positively associated with common recruitment and selection criteria include conscientiousness and extraversion (Dunn et al., 1995; Gridwichai et al., 2020; Rothmann & Coetzer, 2003; Salgado, 1997; Thoresen et al., 2004). The use of FFM-based inventories for employee recruitment and selection, as they pertain to DF's circumstances, is thus recommended (Salgado, 2003).

Employee Retention

The issue of retention is central to DF's case. Dependent psychological sub-domains of retention include job performance, job engagement, job satisfaction, and workplace well-being. Since variations in well-being may affect other workplace domains (e.g., job performance, job satisfaction, and job engagement), well-being can also be considered a meta-domain. Therefore, particular importance and resources should be allocated to ensure adequate care and support for employees' workplace well-being. The subsequent section in the present case study discusses workplace well-being, while the relationships between FFM traits and the sub-domains of job performance, engagement, and satisfaction are addressed in this section.

The relationship between personality traits and work performance has been examined using the FFM, and the two have been found to be consistently associated (Kaushik & Koul, 2018; Oh et al., 2011; Salgado, 2003; Silvestre, 2022; Tett et al., 1991). In the domain of job performance as it relates to burnout, relevant in the case of DF, Li (2023) suggested that employee burnout has been negatively associated with extraversion, conscientiousness, and openness, positively associated with neuroticism, and has not been significantly correlated with agreeableness. Robins et al. (2018) supported the direct relationship between burnout and neuroticism while acknowledging that mediating factors could render such a relationship complex and hinting at another direct relationship, namely between extraversion, conscientiousness, and engagement.

Fukuzaki and Iwata (2021) conducted a meta-analysis to examine the relationship between FFM personality traits and job engagement and determined that conscientiousness was the strongest positively associated trait. Extraversion, openness, and agreeableness

were found to be positively associated as well, while a negative association was found with neuroticism (also supported, in large measure, by Janssens et al., 2019; Prokesova et al., 2019). The authors concluded by stating the necessity to consider multiple dimensions of the psychosocial work environment in order to enhance job engagement, certainly an advisable direction for DF's evidence action plan, as the company has faced multiple challenges.

Personality traits such as extraversion and conscientiousness were found to positively influence employees' work performance and satisfaction, while neuroticism was found to have a negative impact on the two (Giannoukou, 2023). In regards to the broader domain of career satisfaction, Seibert and Kraimer (2001) suggested that extraversion is positively related to satisfaction, while a negative correlation, particularly strong in people-oriented occupations, was found with neuroticism and agreeableness.

Information related to the relationship between FFM traits and domains (e.g., recruitment and selection sub-domains) may be used by DF to compile ad-hoc inventory items for specific employee questionnaires. For guidance on questionnaire length, see Kost and de Rosa (2018), Sahlqvist et al. (2011), and Shenoy and Sharma (2022).

Workplace Well-Being

According to the World Economic Forum, two billion people in the workforce worldwide are affected by mental health challenges, and the cost of such challenges amounts to $1 trillion per year (Loh et al., 2023). Well-being and mental health support are fundamental to ensuring the maximization of a workforce's productivity, output, and job performance (Isham et al., 2020; Schulte & Vainio, 2010; Wright & Cropanzano, 2000). Factors negatively impacting well-being to be taken into account may be categorized as (1) from within the workplace (e.g., job insecurity [Darvishmotevali & Ali, 2020] and workplace discrimination [Xu & Chopik, 2020]) and (2) from outside of the workplace (e.g., world events such as the COVID-19 pandemic [Yu et al., 2021]). While organizations may have a limited understanding of what occurs outside of office hours, initiatives can be taken to provide assessments of well-being and mental health, as well as employees' support needs, and tailor personality-informed interventions to reduce workplace stressors. Therefore, HR supervisor-guided strategies and interventions focused on employees' engagement and well-being should be encouraged (Heyns et al., 2022) and can benefit from and be supported and informed by the current understanding of personality.

Personal states such as individual well-being can be measured with self-reported questionnaires or inferred, with great caution, respect, and thoughtfulness, to avoid making incorrect and biased assumptions (see Limitations section) through associated personality

traits (Parent-Lamarche & Marchand, 2019; Sun et al., 2018). Well-being can be measured using a variety of constructs (e.g., subjective well-being and psychological well-being); therefore, it is important to identify which construct(s) would be the most relevant to the context in which the measurement is set to take place.

The relationship between personality traits and well-being was explored by the FFM authors, who stated that dispositions of personality seem to affect psychological well-being (McCrae & Costa, 1991). Psychological well-being has been defined as the "inter- and intraindividual levels of positive functioning that can include one's relatedness with others and self-referent attitudes that include one's sense of mastery and personal growth" (Burns, 2017). Subjective well-being, also referred to as self-reported well-being, is understood as the self-evaluation of an individual's life and feelings (Krueger & Stone, 2014; Panel on Measuring Subjective Well-Being in a Policy-Relevant Framework et al., 2013) and can be subdivided into three components, namely life satisfaction, positive affect, and negative affect (Andrews & Withey, 1976; Proctor, 2014), while psychological well-being can be subdivided into six components, namely autonomy, self-acceptance, personal growth, positive relations with others, purpose in life, and environmental mastery (Ryff, 1989). Thus, psychological well-being is considered a more stable predictor of future well-being than subjective well-being (Joshanloo, 2019).

Furthermore, there is evidence for a stronger relationship between psychological well-being and personality factors than the latter and subjective well-being (Grant et al., 2009). The purported mutual influence, as well as distinctiveness, of well-being constructs has been tested and, although it is actively debated, the proposition of relative substantial independence appears to have a higher prevalence (Chen et al., 2013). It is recommended, however, to consider the ways in which the psychological constructs pertaining to employee well-being can work together, as new and more efficient models may arise to the benefit of employees and organizations alike (see Page & Vella-Brodrick, 2009).

Regarding psychological well-being, according to McCrae and Costa (1991), the personality traits of extraversion, neuroticism, and openness were identified as having systematically affected well-being, with neuroticism having a negative association and extraversion having a positive association to psychological well-being. Similar conclusions regarding extraversion and neuroticism have been drawn by other studies (see Kokko et al., 2015).

In discussing subjective well-being, according to Zhai et al. (2013), extraversion would be the strongest predictor of subjective well-being (and a prime Big Five factor for job satisfactions), with conscientiousness and neuroticism being prominent traits also affecting well-being (see also Brajša-Žganec et al., 2011; Fadda & Scalas, 2016). The identified

relationship between extraversion, neuroticism, and conscientiousness and employees' well-being can be found in other research studies (Grant et al., 2009; Parent-Lamarche & Marchand, 2019). While the study was conducted in China, the authors' findings suggest that the relationship between these three Big Five traits and subjective well-being may be transferrable across cultures (a similar conclusion was also drawn by McCrae et al., 1998).

Soto (2015) conducted a study in Australia and concluded that subjective well-being is positively associated with extraversion, agreeableness, and conscientiousness and negatively associated with neuroticism. This study also suggests that elements of well-being and personality traits may affect each other over time, supporting the presence of a stable relationship between personality and well-being.

Limitations

It is worth mentioning one of the main criticisms of Western personality assessment models, namely the cultural limitations in the personality inventory (e.g., missing traits from other cultures). Furthermore, provided that measures and conceptualizations of well-being and personality may vary across cultures and populations, companies such as DF's should be mindful when setting a standard for well-being and personality-based assessments and company policies (Haybron & Tiberius, 2015; Youngman, 2017) and ensure the fair treatment of every candidate and employee, including respecting everyone's rights, personal information, and dignity, in accordance with the law (Calvasina & Calvasina, 2016; Cavico et al., 2015; Olšovská & Švec, 2017).

Other limitations include (1) the inability to ensure that individuals do not impersonate traits nor inauthentically respond to personality questionnaires and, in accordance with the position's perceived requirements, to meet demand characteristics (Fleeson & Wilt, 2010; Judge et al., 2008), (2) the bandwidth-fidelity dilemma (namely, the need for equity between the number of questions investigated and the accuracy of answers collected [Cronbach, 1990]; Kroeck & Brown, 2004; Ones & Viswesvaran, 1996; Salgado et al., 2015), and (3) novel technology challenges, such as LLMs' implicit biases (Bai et al., 2024; Gallegos et al., 2024) and data breaches (Lareo, 2024), which may cause assessment errors and data protection and privacy risks affecting current and prospective employees.

Despite limitations and acknowledgements of the insufficiencies presented (Dimitriou & Galanakis, 2022), the Big Five personality model is still considered one of the best models available today and can provide a valuable basis for informed, company-level, employee-focused action plans and interventions for DF's pharmaceutical company.

Conclusion

In conclusion, DF's company's need for an evidenced action plan is evident by virtue of its employees' struggles. The development of such action plan should be an informed process that begins with the selection of a personality measurement model and the development of model applications primarily focused on understanding and addressing employees' individual differences and psychological needs through data collection (e.g., through online questionnaires), analysis, and consequent actionable data-driven insights. The FFM framework provides a substantial theoretical basis for data collection, analysis, and decision-making as it applies to DF's case and the company's needs, and it may be accompanied by other assessment tools. However, caution should be exercised when implementing personality assessment models, particularly when automated with the use of technology, and ethical and legal considerations should be addressed prior to their deployment. Explored constructs, findings, limitations, and relationships between FFM personality traits, novel technologies, and the domains of employees' recruitment, selection, retention, and workplace well-being should be considered in order to compile inventory item questionnaires aimed at understanding employees' individual differences and needs and provide an evidenced basis for both imminent and future interventions.

References

Adhikari, P. (2022). Satisfaction as the moderator between discrimination and stress at work. *Tribhuvan University Journal*, *37*(1), 15–29. https://doi.org/10.3126/tuj.v37i1.48207

Algren, M., Fisher, W., & Landis, A. E. (2021). Machine learning in life cycle assessment. In J. Dunn & P. Balaprakash (Eds.), *Data Science Applied to Sustainability Analysis* (pp. 167–190). Elsevier. https://doi.org/10.1016/B978-0-12-817976-5.00009-7

American Psychological Association, A. T. F. on P. A. and E. G. (2020). *APA guidelines for psychological assessment and evaluation* [dataset]. https://doi.org/10.1037/e510142020-001

Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being*. Springer US. https://doi.org/10.1007/978-1-4684-2253-5

Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin, 146*(4), 279–323. https://doi.org/10.1037/bul0000226

Awad, M., & Khanna, R. (2015). Machine learning. In M. Awad & R. Khanna, *Efficient Learning Machines* (pp. 1–18). Apress. https://doi.org/10.1007/978-1-4302-5990-9_1

Babapour, J., Gholipourb, A., & Mehralian, G. (2018). Human resource management challenges to develop pharmaceutical industry: Evidence from developing countries. *Iranian Journal of Pharmaceutical Research*, *17*(Suppl2), 224–238.

Bai, X., Wang, A., Sucholutsky, I., & Griffiths, T. L. (2024). *Measuring implicit bias in explicitly unbiased large language models* (arXiv:2402.04105). arXiv. https://doi.org/10.48550/arXiv.2402.04105

Baron, H., & Bartram, D. (2006). *Using online assessment tools for recruitment*. The British Psychological Society (BPS). https://cms.bps.org.uk/sites/default/files/2022-07/using_online_assessment_tools_for_recruitment.pdf

Bergner, R. M. (2020). What is personality? Two myths and a definition. *New Ideas in Psychology*, *57*, 100759. https://doi.org/10.1016/j.newideapsych.2019.100759

Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *148*(7–8), 588–619.

Boult, M., Schaubhut, N., Thompson, R., & Dost, N. (2018). Wellbeing and personality type in the workplace: An international comparison. *Assessment and Development Matters*, *10*(4), 7–11. https://doi.org/10.53841/bpsadm.2018.10.4.7

Bouton, M., & Moore, M. (2011). The cult of personality testing: Why assessments are essential for employee selection. *The Journal of Medical Practice Management: MPM*, *27*(3), 144–149.

Boyd, P. (2020). Openness. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 3333–3340). Springer International Publishing. https://doi.org/10.1007/978-3-319-24612-3_1258

Brajša-Žganec, A., Ivanović, D., & Lipovčan, L. K. (2011). Personality traits and social desirability as predictors of subjective well-being. *Psihologijske Teme*, *20*(2), 261–276.

Brandão, C., & Jordão, F. (2011). *The individual performance of top managers in the public sector*. European Association of Work and Organizational Psychology, Maastricht, The Netherlands.

Burns, R. A. (2017). Psychosocial Well-Being. In N. A. Pachana (Ed.), *Encyclopedia of Geropsychology* (pp. 1977–1984). Springer. https://doi.org/10.1007/978-981-287-082-7_251

Calvasina, G., & Calvasina, R. V. (2016). *Using personality testing as part of the employee selection process: Legal and policy issues for employers*. *19*, 112–120.

Caprara, G. V., Alessandri, G., Di Giunta, L., Panerai, L., & Eisenberg, N. (2010). The contribution of agreeableness and self-efficacy beliefs to prosociality. *European Journal of Personality*, *24*(1), 36–55. https://doi.org/10.1002/per.739

Cavico, F. J., Mujtaba, B. G., Lawrence, E., & Muffler, S. C. (2015). Personality tests in employment: A continuing legal, ethical, and practical quandary. *Advances in Social Sciences Research Journal*, *2*(4), 60–84. https://doi.org/10.14738/assrj.24.1004

Cebotari, V. (2022). The importance of managing the psychosocial potential of human resources for employee job satisfaction. *Economics, Social and Engineering Sciences*, *3–4*, 172–184. https://doi.org/10.54481/ecosoen.2022.3-4.20

Chen, F. F., Jing, Y., Hayes, A., & Lee, J. M. (2013). Two concepts or two approaches? A bifactor analysis of psychological and subjective well-being. *Journal of Happiness Studies*, *14*(3), 1033–1068. https://doi.org/10.1007/s10902-012-9367-x

Cobb-Clark, D. A., & Schurer, S. (2012). The stability of big-five personality traits. *Economics Letters*, *115*(1), 11–15. https://doi.org/10.1016/j.econlet.2011.11.015

Costa, P. T., & McCrae, R. R. (1996). *The five factor model of personality: Theoretical perspective*.

Costa, P. T., & McCrae, R. R. (2008). The five-factor theory of personality. In *Handbook of personality: Theory and research* (3rd ed., pp. 159–181). The Guilford Press.

Cronbach, L. J. (1990). *Essentials of psychological testing*. Harper & Row. https://books.google.it/books?id=AwQlAQAAIAAJ

Darvishmotevali, M., & Ali, F. (2020). Job insecurity, subjective well-being and job performance: The moderating role of psychological capital. *International Journal of Hospitality Management*, *87*, 102462. https://doi.org/10.1016/j.ijhm.2020.102462

Das, B. (2013). Employee retention: A review of literature. *IOSR Journal of Business and Management*, *14*, 08–16. https://doi.org/10.9790/487X-1420816

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, *41*(1), 417–440. https://doi.org/10.1146/annurev.ps.41.020190.002221

Dimitriou, E., & Galanakis, M. (2022). Organizational psychology re-invented—The big five personality traits model as a reliable behavior framework in the workplace. *Psychology*, *13*(05), 798–804. Crossref. https://doi.org/10.4236/psych.2022.135053

Dunn, W. S., Mount, M. K., Barrick, M. R., & Ones, D. S. (1995). Relative importance of personality and general mental ability in managers' judgments of applicant qualifications. *Journal of Applied Psychology*, *80*(4), 500–509. https://doi.org/10.1037/0021-9010.80.4.500

Eacock, G., & Barber, L. (2022). The science of assessing and cultivating work engagement in organizations. In *The Science of Assessing and Cultivating Work Engagement in Organizations*. Routledge. https://doi.org/10.4324/9780367198459-REPRW214-1

Fadda, D., & Scalas, L. F. (2016). Neuroticism as a moderator of direct and mediated relationships betwee n introversion-extraversion and well-being. *Europe's Journal of Psychology*, *12*(1), 49–67. Crossref. https://doi.org/10.5964/ejop.v12i1.985

Fetvadjiev, V. H., & van de Vijver, F. J. R. (2015). Five factor model of personality, universality of. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)* (pp. 249–253). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.25067-8

Fleeson, W., & Wilt, J. (2010). The relevance of Big Five trait content in behavior to subjective authenticity: Do high levels of within-person behavioral variability undermine or enable authenticity achievement? *Journal of Personality*, *78*(4), 1353–1382. https://doi.org/10.1111/j.1467-6494.2010.00653.x

Fogaça, N., Rego, M. C. B., Melo, M. C. C., Armond, L. P., & Coelho Jr., F. A. (2018). Job performance analysis: Scientific studies in the main journals of management and psychology from 2006 to 2015. *Performance Improvement Quarterly*, *30*(4), 231–247. https://doi.org/10.1002/piq.21248

Fukuzaki, T., & Iwata, N. (2021). Association between the five-factor model of personality and work engagement: A meta-analysis. *Industrial Health*, *60*(2), 154–163. https://doi.org/10.2486/indhealth.2021-0051

Furnham, A. (2008). HR professionals' beliefs about, and knowledge of, assessment techniques and psychometric tests. *International Journal of Selection and Assessment*, *16*(3), 300–305. https://doi.org/10.1111/j.1468-2389.2008.00436.x

Gallegos, I. O., Rossi, R. A., Barrow, J., Tanjim, M. M., Kim, S., Dernoncourt, F., Yu, T., Zhang, R., & Ahmed, N. K. (2024). *Bias and fairness in large language models: A survey* (arXiv:2309.00770). arXiv. https://doi.org/10.48550/arXiv.2309.00770

Giannoukou, I. (2023). The role of employees' personality characteristics in job performance and satisfaction during digitization years. *Technium Business and Management*, *6*, 126–135. https://doi.org/10.47577/business.v6i.9579

Goodstein, L. D., & Lanyon, R. I. (1999). Applications of personality assessment to the workplace: A review. *Journal of Business and Psychology*, *13*(3), 291–322. https://doi.org/10.1023/A:1022941331649

Grant, S., Langan-Fox, J., & Anglim, J. (2009). The big five traits as predictors of subjective and psychological well-being. *Psychological Reports*, *105*(1), 205–231. Crossref. https://doi.org/10.2466/pr0.105.1.205-231

Gridwichai, P., Kulwanich, A., Piromkam, B., & Kwanmuangvanich, P. (2020). *Role of personality traits on employees job performance in pharmaceutical industry in thailand*. *11*(3). https://doi.org/10.5530/srp.2020.3.21

Habashi, M. M., Graziano, W. G., & Hoover, A. E. (2016). Searching for the prosocial personality: A big five approach to linking personality and prosocial behavior. *Personality and Social Psychology Bulletin*, *42*(9), 1177–1192. https://doi.org/10.1177/0146167216652859

Haghani, H., Moosivand, M. M., & Gilan, I. (2022). Burnout in the nigerian pharmaceutical industry: A study on impact on creativity, commitment, and turnover intentions due to 'Japa' syndrome. *Interdisciplinary Research Journal of Management and Social Sciences*, *9*(3), 44–55.

Hamet, P., & Tremblay, J. (2017). Artificial intelligence in medicine. *Metabolism*, *69*, S36–S40. https://doi.org/10.1016/j.metabol.2017.01.011

Haybron, D. M., & Tiberius, V. (2015). Well-Being Policy: What Standard of Well-Being? *Journal of the American Philosophical Association*, *1*(4), 712–733. https://doi.org/10.1017/apa.2015.23

Hejase, H. J., Dirani, A. E., Hamdar, B., & Hazimeh, B. (2016). Employee retention in the pharmaceutical companies: Case of lebanon. *IOSR Journal of Business and Management (IOSR-JBM)*, *18*(4), 58–75. https://doi.org/10.9790/487X-1804015875

Heyns, M. M., McCallaghan, S., & De Wet, E. H. (2022). The role of supervisor support and basic psychological needs in predicting work engagement, burnout and turnover intentions in a medical contract research service setting. *Research in Social and Administrative Pharmacy*, *18*(6), 2981–2988. https://doi.org/10.1016/j.sapharm.2021.07.009

Hodgkinson, G. P., & Gill, C. M. H. D. (2015). Five-factor model of personality. In *Wiley Encyclopedia of Management* (pp. 1–3). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118785317.weom110101

Isham, A., Mair, S., & Jackson, T. (2020). *Wellbeing and productivity: A review of the literature* (22; CUSP Working Paper Series). Centre for the Understanding of Sustainable Prosperity. https://bradscholars.brad.ac.uk/bitstream/handle/10454/18268/pp-wellbeing-report.pdf?sequence=2

Janssens, H., De Zutter, P., Geens, T., Vogt, G., & Braeckman, L. (2019). Do personality traits determine work engagement? Results from a Belgian study. *Journal of Occupational & Environmental Medicine*, *61*(1), 29–34. https://doi.org/10.1097/JOM.0000000000001458

Joshanloo, M. (2019). Investigating the relationships between subjective well-being and psychological well-being over two decades. *Emotion*, *19*(1), 183–187. https://doi.org/10.1037/emo0000414

Judge, T. A., Klinger, R., Simon, L. S., & Yang, I. W. F. (2008). The contributions of personality to organizational behavior and psychology: Findings, criticisms, and future research directions. *Social and Personality Psychology Compass*, *2*(5), 1982–2000. https://doi.org/10.1111/j.1751-9004.2008.00136.x

Kalyanamitra, P., Saengchai, S., & Jermsittiparsert, K. (2020). Impact of training facilities, benefits and compensation, and performance appraisal on the a job satisfaction. *Systematic Reviews in Pharmacy*, *11*(3), 166–175. https://doi.org/10.5530/srp.2020.3.19

Kaushik, S., & Koul, N. (2018). *Evaluation of personality characteristics on employee performance: A study in pharmaceutical knowledge process outsourcing companies*.

Kokko, K., Rantanen, J., & Pulkkinen, L. (2015). Associations between mental well-being and personality from a life span perspective. In *Personality and Well-being Across the Life-Span* (pp. 134–159). Palgrave Macmillan UK; Crossref. https://doi.org/10.1057/9781137439963_8

Kost, R. G., & de Rosa, J. C. (2018). Impact of survey length and compensation on validity, reliability, and sample characteristics for ultrashort-, short-, and long-research participant perception surveys. *Journal of Clinical and Translational Science*, *2*(1), 31–37. https://doi.org/10.1017/cts.2018.18

Kroeck, K. G., & Brown, K. W. (2004). Work applications of the big five model of personality. In *Comprehensive handbook of psychological assessment, Vol. 4: Industrial and organizational assessment* (pp. 109–129). John Wiley & Sons, Inc.

Krueger, A. B., & Stone, A. A. (2014). Measuring subjective wellbeing: Progress and challenges. *Science (New York, N.Y.)*, *346*(6205), 42–43. https://doi.org/10.1126/science.1256392

Lareo, X. (2024, September 3). *Large language models (LLM)*. European Data Protection Supervisor. https://www.edps.europa.eu/data-protection/technology-monitoring/techsonar/large-language-models-llm

Li, Y. (2023). The impact of personality traits on work performance. *SHS Web of Conferences*, *180*, 03018. Crossref. https://doi.org/10.1051/shsconf/202318003018

Lievens, F., & Chapman, D. (2019). Recruitment and selection. In *The SAGE Handbook of Human Resource Management* (pp. 123–150). https://ink.library.smu.edu.sg/lkcsb_research/5988

Lin, Z., Zhang, D., Tao, Q., Shi, D., Haffari, G., Wu, Q., He, M., & Ge, Z. (2023). Medical visual question answering: A survey. *Artificial Intelligence in Medicine*, *143*, 102611. https://doi.org/10.1016/j.artmed.2023.102611

Liu, S., Lithopoulos, A., Zhang, C.-Q., Garcia-Barrera, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during COVID-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Personality and Individual Differences*, *168*, 110351. https://doi.org/10.1016/j.paid.2020.110351

Loh, E., Bhargava, R., & Way, L. C. (2023, October 10). *World mental health day: How a collaborative approach to well-being can lead to a healthier workforce*. World Economic Forum. https://www.weforum.org/agenda/2023/10/mental-health-collaborative-well-being-healthier-workforce/

Mack, O., Khare, A., Krämer, A., & Burgartz, T. (Eds.). (2016). *Managing in a VUCA world*. Springer International Publishing. https://doi.org/10.1007/978-3-319-16889-0

Mahmood, M. (2014). Strategy, structure, and HRM policy orientation: Employee recruitment and selection practices in multinational subsidiaries. *Asia Pacific Journal of Human Resources*, *53*. https://doi.org/10.1111/1744-7941.12057

McCarthy, J., Minsky, M. L., Rochester, N., Corporation, I. B. M., & Shannon, C. E. (1955). *A proposal for the dartmouth summer research project on artificial intelligence*.

McCrae, R. R., Costa, P. T., Del Pilar, G. H., Rolland, J.-P., & Parker, W. D. (1998). Cross-cultural assessment of the five-factor model: The revised NEO personality inventory. *Journal of Cross-Cultural Psychology*, *29*(1), 171–188. https://doi.org/10.1177/0022022198291009

McCrae, R. R., & Costa, P. T., Jr. (1991). Adding liebe und arbeit: The full five-factor model and well-being. *Personality and Social Psychology Bulletin*, *17*(2), 227–232. Crossref. https://doi.org/10.1177/014616729101700217

Memon, M. B. G., Pitafi, A., & Khaskhely, M. (2023). Employee turnover due to job stress: National versus multinational pharmaceutical companies in pakistan. *European Journal of Business and Management Research*, *8*(6), Article 6. https://doi.org/10.24018/ejbmr.2023.8.6.809

Mozaffari, F., Rahimi, M., Yazdani, H., & Sohrabi, B. (2023). Employee attrition prediction in a pharmaceutical company using both machine learning approach and qualitative data. *Benchmarking: An International Journal*, *30*(10), 4140–4173. https://doi.org/10.1108/BIJ-11-2021-0664

Nirmala, M., Rajalakshmi, B., Mandava, S., Sarvepally, S. R. M., & Megana, M. (2023). Survey on personality detection for recruitment. *2023 International Conference for Advancement in Technology (ICONAT)*, 1–5. https://doi.org/10.1109/ICONAT57137.2023.10080507

Oh, I.-S., Wang, G., & Mount, M. K. (2011). Validity of observer ratings of the five-factor model of personality traits: A meta-analysis. *Journal of Applied Psychology*, *96*(4), 762–773. https://doi.org/10.1037/a0021832

Olšovská, A., & Švec, M. (2017). Use of psychological examinations of employees and job applicants in personnel management. In L. Mura (Ed.), *Issues of Human Resource Management*. InTech. https://doi.org/10.5772/67868

Ones, D. S., & Viswesvaran, C. (1996). Bandwidth–fidelity dilemma in personality measurement for personnel selection. *Journal of Organizational Behavior*, *17*(6), 609–626. https://doi.org/10.1002/(SICI)1099-1379(199611)17:6<609::AID-JOB1828>3.0.CO;2-K

Oswald, F. L., & Hough, L. M. (2011). Personality and its assessment in organizations: Theoretical and empirical developments. In *APA handbook of industrial and organizational psychology, Vol 2: Selecting and developing members for the organization.* (pp. 153–184). American Psychological Association. https://doi.org/10.1037/12170-005

Page, K. M., & Vella-Brodrick, D. A. (2009). The 'What', 'Why' and 'How' of employee well-being: A new model. *Social Indicators Research*, *90*(3), 441–458. https://doi.org/10.1007/s11205-008-9270-3

Pandey, R., & Kshirsagar, A. (2024). Review paper – recruitment and selection at ACE Human Capital Ltd. *Interantional Journal of Scientific Research in Engineering and Management*, *08*(01), 1–13. https://doi.org/10.55041/IJSREM28083

Panel on Measuring Subjective Well-Being in a Policy-Relevant Framework, Committee on National Statistics, Division on Behavioral and Social Sciences and Education, & National Research Council. (2013). Introduction. In A. A. Stone & C. Mackie (Eds.), *Subjective well-being: Measuring happiness, suffering, and other dimensions of experience [internet]*. National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK179225/

Pareke, F. J., & Hayu, R. S. (2016). Empirical investigation of five-factor model of personality. *AFEBI Management and Business Review*, *1*(1), 29. https://doi.org/10.47312/ambr.v1i1.28

Parent-Lamarche, A., & Marchand, A. (2019). Well-being at work from a multilevel perspective: What is the role of personality traits? *International Journal of Workplace Health Management*, *12*, 298–317. https://doi.org/10.1108/IJWHM-05-2019-0066

Preedy, V. R., & Watson, R. R. (Eds.). (2010). Psychometric testing. In *Handbook of Disease Burdens and Quality of Life Measures* (pp. 4300–4300). Springer New York. https://doi.org/10.1007/978-0-387-78665-0_6471

Proctor, C. (2014). Subjective well-being (SWB). In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 6437–6441). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2905

Prokesova, L., Vaculik, M., Kasparkova, L., & Prochazka, J. (2019). An integrated model of work engagement: How the satisfaction of basic psychological needs explains the relationship between personality and work engagement. *Psihologija*, *52*(3), 265–284. https://doi.org/10.2298/PSI181204004P

Rantanen, J., Metsäpelto, R.-L., Feldt, T., Pulkkinen, L., & Kokko, K. (2007). Long-term stability in the big five personality traits in adulthood. *Scandinavian Journal of Psychology*, *48*(6), 511–518. https://doi.org/10.1111/j.1467-9450.2007.00609.x

Roberts, B. W., Jackson, J. J., Fayard, J. V., Edmonds, G., & Meints, J. (2009). Conscientiousness. In *Handbook of individual differences in social behavior.* (pp. 369–381). The Guilford Press.

Roberts, B. W., & Yoon, H. J. (2022). Personality psychology. *Annual Review of Psychology*, *73*, 489–516. https://doi.org/10.1146/annurev-psych-020821-114927

Robins, T. G., Roberts, R. M., & Sarris, A. (2018). Understanding how personality impacts exhaustion and engagement: The role of job demands, and job and personal resources as mediators. *Australian Psychologist*, *53*(3), 253–262. Crossref. https://doi.org/10.1111/ap.12310

Rothmann, S., & Coetzer, E. P. (2003). The big five personality dimensions and job performance. *SA Journal of Industrial Psychology*, *29*(1). https://doi.org/10.4102/sajip.v29i1.88

Rothstein, M. G., & Goffin, R. D. (2006). The use of personality measures in personnel selection: What does current research support? *Human Resource Management Review*, *16*(2), 155–180. https://doi.org/10.1016/j.hrmr.2006.03.004

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081. https://doi.org/10.1037/0022-3514.57.6.1069

Sahlqvist, S., Song, Y., Bull, F., Adams, E., Preston, J., & Ogilvie, D. (2011). Effect of questionnaire length, personalisation and reminder type on response rate to a complex postal survey: Randomised controlled trial. *BMC Medical Research Methodology*, *11*(1), 62. https://doi.org/10.1186/1471-2288-11-62

Salgado, J. F. (1997). The five factor model of personality and job performance in the european community. *Journal of Applied Psychology*, *82*(1), 30–43. https://doi.org/10.1037/0021-9010.82.1.30

Salgado, J. F. (2003). Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology*, *76*(3), 323–346. https://doi.org/10.1348/096317903769647201

Salgado, J. F., Moscoso, S., Sanchez, J. I., Alonso, P., Choragwicka, B., & Berges, A. (2015). Validity of the five-factor model and their facets: The impact of performance measure and facet residualization on the bandwidth-fidelity dilemma. *European Journal of Work and Organizational Psychology*, *24*(3), 325–349. https://doi.org/10.1080/1359432X.2014.903241

Santos, P. M. D., Silva, C. R. D., Costa, D., & Torre, C. (2022). Burnout in the pharmaceutical activity: The impact of COVID-19. *Frontiers in Psychiatry*, *12*, 771462. https://doi.org/10.3389/fpsyt.2021.771462

Sawasdee, A., Saengchai, S., & Jermsittiparsert, K. (2020). The role of emotional demands, supervisor support and training opportunities towards work engagement among employees in pharmaceutical companies of thailand. *Systematic Reviews in Pharmacy*, *11*(3), 176–184.

Schulte, P., & Vainio, H. (2010). Well-being at work – overview and perspective. *Scandinavian Journal of Work, Environment & Health*, *36*(5), 422–429. https://doi.org/10.5271/sjweh.3076

Seibert, S. E., & Kraimer, M. L. (2001). The five-factor model of personality and career success. *Journal of Vocational Behavior*, *58*(1), 1–21. Crossref. https://doi.org/10.1006/jvbe.2000.1757

Shenoy, R., & Sharma, P. (2022). Why do employees leave? A study on employee' psychology and its influence on engagement and organizational politics. *Cardiometry*, *23*, 423–432. https://doi.org/10.18137/cardiometry.2022.23.423432

Silvestre, A. A. (2022). Personality traits, motivation, and performance of employees in a pharmaceutical company in the philippines: Basis for performance improvement plan. *Psychology and Education: A Multidisciplinary Journal*. https://doi.org/10.5281/ZENODO.6547994

Soto, C. J. (2015). Is happiness good for your personality? Concurrent and prospective relations of the big five with subjective well-being. *Journal of Personality*, *83*(1), 45–55. https://doi.org/10.1111/jopy.12081

Suksod, P., & Cruthaka, C. (2020). The relationship between human resources practices and organizational performance in pharmaceutical industry of thailand. *Systematic Reviews in Pharmacy*, *11*(3), 67–76.

Sun, J., Kaufman, S. B., & Smillie, L. D. (2018). Unique associations between big five personality aspects and multiple dimensions of well-being. *Journal of Personality*, *86*(2), 158–172. https://doi.org/10.1111/jopy.12301

Syarief, F., & Pramitha, S. R. (2020). Emotional labor in the indonesian pharmaceutical sector and organizational deviance by employees: Role of surface acting, emotional exhaustion, and job burnout. *Systematic Reviews in Pharmacy*, *11*(2), 714–724.

Taylor, S. E., & Broffman, J. I. (2011). Psychosocial resources: Functions, origins, and links to mental and physical health. In J. M. Olson & M. P. Zanna (Eds.), *Advances in Experimental Social Psychology* (Vol. 44, pp. 1–57). Academic Press. https://doi.org/10.1016/B978-0-12-385522-0.00001-9

Tett, R. P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology*, *44*(4), 703–742. https://doi.org/10.1111/j.1744-6570.1991.tb00696.x

The British Psychological Society. (n.d.-a). *Code of good practice for psychological testing*. The British Psychological Society (BPS). Retrieved 26 June 2024, from https://cms.bps.org.uk/sites/default/files/2022-07/ptc09_code_of_good_practice_amended.pdf

The British Psychological Society. (n.d.-b). *Guidelines on testing and test use*. The British Psychological Society. Retrieved 26 June 2024, from https://www.bps.org.uk/guidelines-testing-and-test-use

The British Psychological Society. (2010, March 31). *Using online assessment tools for recruitment*. The British Psychological Society (BPS). https://www.bps.org.uk/guideline/using-online-assessment-tools-recruitment

Thoresen, C. J., Bradley, J. C., Bliese, P. D., & Thoresen, J. D. (2004). The big five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. *Journal of Applied Psychology*, *89*(5), 835–853. https://doi.org/10.1037/0021-9010.89.5.835

Tirastittam, P., Sirikamonsin, P., Li, H., & Aun-a-nan, A. (2020). The influence of work-related supports on employee engagement in the pharmaceutical industry in thailand. *Systematic Reviews in Pharmacy*, *11*(2), 576–585.

Widiger, T. A., & Oltmanns, J. R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry*, *16*(2), 144–145. https://doi.org/10.1002/wps.20411

Wilsher, S. (2015). Behavior profiling: Implications for recruitment and team building. *Strategic Direction*, *31*(9), 1–5. https://doi.org/10.1108/SD-02-2015-0023

Wright, T. A., & Cropanzano, R. (2000). Psychological well-being and job satisfaction as predictors of job performance. *Journal of Occupational Health Psychology*, *5*(1), 84–94. https://doi.org/10.1037/1076-8998.5.1.84

Xu, Y. E., & Chopik, W. J. (2020). Identifying moderators in the link between workplace discrimination and health/well-being. *Frontiers in Psychology*, *11*, 458. https://doi.org/10.3389/fpsyg.2020.00458

Youngman, J. F. (2017). The use and abuse of pre-employment personality tests. *Business Horizons*, *60*(3), 261–269. https://doi.org/10.1016/j.bushor.2016.11.010

Yu, J., Park, J., & Hyun, S. S. (2021). Impacts of the COVID-19 pandemic on employees' work stress, well-being, mental health, organizational citizenship behavior, and employee-customer identification. *Journal of Hospitality Marketing & Management*, *30*(5), 529–548. https://doi.org/10.1080/19368623.2021.1867283

Zeidan, S., & Itani, N. (2020). Cultivating employee engagement in organizations: Development of a conceptual framework. *Central European Management Journal*, *28*(1), 99–118. https://doi.org/10.7206/cemj.2658-0845.18

Zhai, Q., Willis, M., O'Shea, B., Zhai, Y., & Yang, Y. (2013). Big Five personality traits, job satisfaction and subjective wellbeing in China. *International Journal of Psychology*, *48*(6), 1099–1108. https://doi.org/10.1080/00207594.2012.732700