SUMMARY

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EDITORIAL

It Takes Two to Tango: The Pursuit of Employee Well-being through 'Good Work'

HELEN PLUUT*
Department of Business Studies, Leiden University, Leiden, The Netherlands

MEREL M. CORNAX
Department of Business Studies, Leiden University, Leiden, The Netherlands

A few years ago, before the outbreak of COVID-19, stress was coined the health epidemic of the 21st century by the World Health Organization. It goes without saying that work stress is at the core of this societal problem. An extensive body of research in the I/O psychology field shows that various occupational hazards contribute to mental health problems in the work population: blurred work-home boundaries (Pluut & Wonders, 2020), illegitimate and nonpromotable tasks (Semmer et al., 2015), workload and excessive work behaviors (Molino, Bakker, & Ghislieri, 2016), job insecurity (De Witte, Vander Elst, & De Cuyper, 2015), dysfunctional and abusive leadership (Schyns & Schilling, 2013), and a psychologically unsafe climate (Dollard & Bakker, 2010) are but a few examples.

The Netherlands Scientific Council for Government Policy (WRR) recently published a report titled '*Better work: Society's new mission*'[1], which is a call to consider the quality of work (for everyone who is willing and able to work) as a societal challenge for businesses, institutions, social partners, and the government. In light of such societal problems as work intensification, burnout, and work-life imbalance, the WRR report discusses who is responsible for 'good work' – that is, a healthy and safe work environment in which employees are productive – and argues that this responsibility lies first and foremost with work organizations:

"Quality of work is not an individual problem, but a problem of the modern work organization, and of society. The focus should not just be on how employees can deal with work stress, but first and foremost on how risk factors for stress on the job can be kept to a minimum. Companies and institutions are primarily responsible for improving connectedness and autonomy at work." (p. 119, translation by authors)

With this report, the WRR underlines the important role of employers and the value of 'good employership' in the pursuit of employee well-being. In this editorial, we aim to share our vision on two questions that are central to this matter. First, what does 'good employership' mean and what do we consider 'good work'? And second, who is responsible for what and to what extent when it comes to employee well-being? We approach these questions from two perspectives by integrating our knowledge in the field of I/O

* Correspondence concerning this article should be addressed to Helen Pluut, Department of Business Studies, Leiden University; Kamerlingh Onnes Building, Steenschuur 25, PO Box 9520, 2300 RA Leiden; Phone: +3171 527 5386; E-mail: h.pluut@law.leidenuniv.nl.

[1] G.B.M. Engbersen et al., "Het betere werk: de nieuwe maatschappelijke opdracht" (WRR-Rapport 102), Den Haag: Wetenschappelijke Raad voor het Regeringsbeleid 2020. For English news items, see https://english.wrr.nl/latest/news/2020/01/15/wrr-report-102-invest-in-quality-of-work-now and Let's have a better look at job quality, says Dutch WRR - Bio Based Press

psychology (empirical perspective) and the labor law domain (normative perspective).[2] In doing so, we provide an interdisciplinary view on what good employership means – or should mean. We focus less on the physical environment of work and more so on the psychosocial aspects of the organization of work, to ultimately build a psychologically infused conceptualization of good employership.

What is 'good employership'?

From an I/O psychology perspective

The three levels of analysis in Organizational Behavior – individual, group, and organization – can help to gain insight in what it means to be a 'good employer'. Here, the main research question would be: Which factors at the level of the organization, the group, and the individual have an influence on the health, safety, and well-being of employees? Scholars have added a fourth level, pertaining to the leader, resulting in the IGLO framework (see e.g., Nielsen & Christensen, 2021).

Occupational hazards and workplace resources can occur at any of these levels and in any job (Bakker & Demerouti, 2018). In line with the dual perspective of the Job Demands-Resources (JD-R) model, good employership can be conceptualized on the one hand as building workplace resources that have the potential to promote well-being and on the other hand as mitigating or eliminating job demands that would trigger a health impairment process.

In their review, Nielsen and colleagues (2017) identified psychological capital (consisting of hope, self-efficacy, resilience, and optimism) and job crafting as resources at the individual level; social support, person-group fit, and team climate at the group level; leader-member exchange, transformational and transactional leadership, and supervisor support at the leader level; and autonomy, HR practices, perceived organizational support, and person-organization fit as workplace resources at the organizational level. In a similar vein, different characteristics at multiple levels of the organization may constitute psychosocial risks for health and safety at work, such as personality traits like type A or imposter syndrome at the individual level, interpersonal conflict and facetime norms at the group level, abusive supervision and supervisor excessive work behaviors at the leader level, and unsupportive work-family climate, work interruptions, overtime, and role ambiguity at the organizational level (Bakker & Demerouti, 2018; Roczniewska et al., 2022). Given that the various levels interact to determine employee well-being, good employers address demands and resources at the individual, group, leader, and organizational levels.

From a labor law perspective

The IGLO levels of analysis covered by OB and I/O psychology research can be complemented by a macro level factor: legislation. Governments and international institutions can help foster the quality of work for people by means of laws and regulations.

In the Netherlands, the Dutch Civil Code prescribes a general standard for '*being a good employer'* (art. 7:611). This standard prescribes that "the employer is obliged to act as a good employer." Whereas this open norm leaves room for discussion and adaptation to societal developments, it also causes ambiguity and uncertainty regarding the rights and obligations of both employers and employees as well as the role of legislation herein. The norm is supplemented by other Dutch legislation that focuses more concretely on obligations of employers with regard to mitigating physical and psychosocial risks at work (i.e., the Working Conditions Act).

National and also EU and International Labour Organization (ILO) initiatives may increase employer's motivation and ability to implement interventions that address physical

[2] The authors do research in the field of Empirical Legal Studies (ELS), adopting an interdisciplinary approach to study law and behavior, for instance to gain insight in the functioning of the law in practice and to investigate (behavioral) assumptions underlying rules and regulations.

and psychosocial risks at work. At the level of the European Union, the Framework Directive on occupational health and safety (Directive 89/391/EEC) introduces measures to encourage improvement in the safety and health of workers. Employers across Europe have a legal obligation concerning the prevention, assessment, and combating of workplace risks, thus including psychosocial risk management. The principles laid down in this EU Directive set (minimum) requirements for national legislation of EU member states. Meanwhile, the ILO has recently added safety and health to its Declaration of Fundamental Principles and Rights at Work, which means that ILO member states must now commit to respecting and promoting the fundamental right to a safe and healthy working environment.

Pathways to 'good work'

Various concepts in the I/O psychology literature are closely related to good employership in the sense that they are about offering a healthy and safe work environment for workers, for instance workplace health promotion (e.g., Alonso-Nuez et al., 2022), decent work (a concept proposed by the ILO, but for an I/O psychology perspective on it, see Blustein, Olle, Connors-Kellgren, & Diamonti, 2016, or Duffy et al., 2017), and socially responsible human resource management (Omidi & Dal Zotto, 2022). All of these concepts refer to employee-centered and micro-level corporate social responsibility practices (see Low, 2016), which are fostered by the collaborative values and beliefs that are central to clan and adhocracy organizational cultures (Espasandín-Bustelo, Ganaza-Vargas, & Diaz-Carrion, 2021). This stream of research builds a business case for being a good employer, in line with a mutual gains perspective (Lau & May, 1998). That is, a focus on employees as internal stakeholders can lead to organizational improvements such as lower absenteeism and turnover (Grawitch, Gottschalk, & Munz, 2006), higher organizational legitimacy (Del-Castillo-Feito, Blanco-González, & Hernández-Perlines, 2022), and increases in a firm's intellectual capital (Martinez, López-Fernández, & Romero-Fernández, 2019). As Karnes (2009) put it: "If the employer is genuine in developing good relations, the data is overwhelmingly favorable in regards to the payback" (p. 195).

This literature offers various perspectives on good employership that can be seen as pathways to a healthy and safe work environment, or 'good work':

- *Leadership*. The quality of connections between employees and their managers seems a key ingredient for workplace well-being. Karnes (2009) posited that organizational leadership is at the core of good employment relationships: organizations that have the ability to lead properly, that is with social skills and high levels of emotional intelligence, can improve and build upon employer-employee relations. A review by Inceoglu, Thomas, Chu, Plans, and Gerbasi (2018) provides insights into the different types of leadership behaviors that can influence employee health and well-being as well as the differential processes that underlie this relationship. They identified social-cognitive, motivational, affective, relational and identification mechanisms by which leaders have an impact on employee well-being. These findings suggest that leadership may be one of the most influential factors in the pursuit of 'good work', given its association with some of the factors we will be discussing next. For instance, leaders have a critical role to play in creating a psychologically safe work climate (Newman, Donohue, & Eva, 2017), can stimulate or discourage the use of work-family policies (Crain & Stevens, 2018), and must show diversity-valuing behaviors to ensure implementation of an organization's mission on inclusion (Dwivedi, Gee, Withers, & Boivie, in press;

Korkmaz, Van Engen, Knappert, & Schalk, 2022).

- *Diversity and inclusion*. Health and well-being of employees are largely dependent on the extent to which organizations accommodate employees' need for relatedness at work (Deci, Olafsen, & Ryan, 2017). Good employers promote social inclusion and a sense of belonging for all its employees. Moreover, it is important that they have HR policies in place that are aimed at providing equal opportunities to all its employees and ensure fair treatment regardless of gender, age, religion, ethnicity, sexual orientation, disability, or social background (see Barrena-Martínez, López-Fernández, & Romero-Fernández, 2017). It starts with recruiting a diverse workforce, to promote greater equality of employment opportunities, but organizational imperatives to actively address bias and ensure equal pay and professional prospects are also needed. Such efforts toward inclusion closely resemble the discrimination-and-fairness perspective on diversity management (Ely & Thomas, 2001), which "is characterized by a belief in a culturally diverse workforce as a moral imperative to ensure justice and fair treatment of all members of society" (p. 245).
- *Training and development*. Development and growth are core values supporting health, safety, and well-being at work (Zwetsloot, Van Scheppingen, Bos, Dijkman, & Starren, 2013) and enabling employees to develop their skills and career is a core facet of internal CSR activities (Barrena-Martínez et al., 2017; Del-Castillo-Feito et al., 2022; Turker, 2009). Employee growth and development programs provide employees with the opportunity to expand their knowledge and improve their abilities and competencies, for instance through on-the-job training or leadership development (Grawitch et al., 2006). Continuous development and lifelong learning have become particularly important in light of rapid technological changes and new employment models (Comyn, 2018). With the increasing prevalence of precarious work, it is imperative that organizations promote the sustainability of careers (McDonald & Hite, 2018). Building individual employability is about enhancing the career development of employees within the organization, but they will also be better prepared to search for and find employment and promotional opportunities elsewhere.
- *Support for healthy lifestyle*. Employers can help promote healthy lifestyle behaviors by offering specific health programs and services on-site. Examples are health checks, sports facilities, exercise programs, healthy menus, employee assistance programs for alcohol and drug addiction, stress management interventions, and mindfulness trainings (Alonso-Nuez et al., 2022; Grawitch et al., 2006). The use and effectiveness of such health promotion initiatives are highly dependent on the work environment (Van der Put & Van der Lippe, 2020). Recognizing that workplaces are not always conducive to health and certain organizational practices can make it difficult for employees to care for their own well-being, employers are encouraged to "do" health promotion (Shain & Kramer, 2004). That is, organizational health promotion ideally targets not only personal health behaviors but also organizational risk factors, and is embedded in a health-promoting culture that has the support of management (DeJoy & Wilson, 2003).

- *Employee involvement*. Participation is at the heart of healthy and safe work environments (Zwetsloot et al., 2013). To get employees involved in decision-making and fulfill their need for autonomy, employers can think of such practices as participatory decision-making, self-managed work teams, empowerment, consultation with workers, taking action in collaboration, and transparent communication, some of which are closely related to inclusive leadership (Korkmaz et al., 2022). Employee involvement may be the most popular way to build a healthy and safe workplace because it allows the organization to draw on a diverse set of perspectives and skills to solve its problems (Grawitch et al., 2006).
- *Recognition and rewards*. Good employers allow employees to be rewarded for their efforts, contributions, and achievements at work (Grawitch et al., 2006). Rewards can take many forms, and they can convey or confirm competence, but they can also feel controlling and therefore frustrate employees' need for autonomy (Deci et al., 2017). It is therefore important to build workplaces that are first and foremost supportive of intrinsic work values, such as meaningful work relationships and personal development, such that employees are intrinsically motivated for at least parts of their jobs. Moreover, recognition program should be carefully designed so as not to undermine autonomous motivation and engagement in the workplace. While adequate compensation and fair appraisal processes are dimensions of 'good work' (Duffy et al., 2017; Omidi & Dal Zotto, 2022), pay, contingent bonuses, and status are examples of extrinsic rewards that may undermine autonomous motivation. Positive feedback and showing appreciation (i.e., verbal rewards), however, can enhance intrinsic motivation (Deci et al., 2017) and are key to the employer-employee relationship (Karnes, 2009).
- *Work-life balance*. Decent work should allow for free time (for non-work activities) and rest (Duffy et al., 2017), but employers can go one step further and create healthy and sustainable workplaces by helping employees balance the multiple – and sometimes conflicting – demands of their life domains (Grawitch et al., 2006; Kossek, Valcour, & Lirio, 2014). Work-life balance has been implemented in various organizational policies and practices that give employees the flexibility to balance their personal and professional lives (see Barrena-Martínez et al., 2017). Today, most developed countries uphold an employee's statutory right to request flexible work arrangements (e.g., flexible working time, working from home). Access to such work-life policies increasingly drives the job search decisions of employees (Sánchez-Hernández, González-López, Buenadicha-Mateos, & Tato-Jiménez, 2019). Work-life balance can therefore be a major selling point for employers, particularly in the wake of the COVID-19 pandemic.
- *Psychosocial safety and employee voice*. Good employers provide working conditions in which employees feel physically, psychologically, and interpersonally safe and should have policies and practices in place for the protection of worker health and safety (Duffy et al., 2017; Grawitch et al., 2006). Socially responsible organizations also adopt policies and practices that promote social dialogue and fair and open communication (Barrena-Martínez et al., 2017), to truly encourage employee voice on health and safety matters. Examples of

formal voice mechanisms are work councils and grievance procedures, while informal discussions and open door policies allow for informal voice (Mowbray, Wilkinson, & Tse, 2015). Trust and justice are core values associated with a blame-free and psychologically safe culture (Zwetsloot et al., 2013), one in which employees are allowed to make mistakes, dare to take risks, experiment with new ideas, voice concerns, report incidents, and seek and give feedback (Edmondson, 1999). Psychosocial safety climate may be the cause of causes as it is a precursor of a multitude of factors in the work environment (Dollard & Bakker, 2010).

Who is responsible for what?

'Good employeeship'

Similar to legislation on the duties of the employer, national and international laws also prescribe obligations of employees. For instance, in addition to 'being a good employer', article 7:611 of the Dutch Civil Code prescribes a general standard for '*being a good employee*'. In OB literature, examples of 'good employeeship' can be found in concepts that describe the employer-employee relationship, such as organizational citizenship behavior (Organ, 2018).

Yet, we must be wary of the implications of a focus on good employeeship. Research shows that 'good' behaviors such as organizational citizenship may be at odds with the health of employees (e.g., causing citizenship fatigue; Bolino, Hsiung, Harvey, & LePine, 2015) and their ethical decision-making (Bolino & Klotz, 2015). Moreover, if we think of individual and nonwork predictors of well-being, we find ourselves on a slippery slope because it might lead to blaming the individual employee for ill-being. An over-individualization of the responsibility for well-being may come at the expense of focusing on policy and how work is organized to bring about employee well-being (Maravelias & Holmqvist, 2016).

On EU level, Directive 89/931/EEC prescribes that it is each worker's responsibility "to take care as far as possible of his own safety and health and that of other persons affected by his acts or omissions." Of great importance here, however, is that the Directive also states that "the employer shall have a duty to ensure the safety and health of workers in every aspect related to the work" and that "the workers' obligations in the field of safety and health at work shall not affect the principle of the responsibility of the employer."

A developing norm

Responsibilities in the relationship between employer and employee remain subject of an ongoing discussion. Both from a practical and legal perspective, good employership can be considered a norm – and as with any norm, it is subject to (societal) change (see also Karnes, 2009).

When we observe the employer-employee relationship in the Dutch historical context, for instance, we see a shift in the responsibilities allocated and the expectations that the parties have towards each other (Roozendaal, 2011). The industrial revolution was characterized by strong intensification of labor, a dominant position of the employer, and employment relations without legal restrictions. The position of the employee became less precarious only at the end of the 19th century, when the first legal initiatives on work safety and labor hours were introduced. When the female employment rate increased during the 1980s, employment conditions were adjusted to account for care duties. During the 1990s, the emergence of a particular type of employment relation from the United States, in which the individual employee carried almost all responsibility for the work, influenced several Dutch industries. And the economic growth that has characterized the last couple of decades came with increases in employers' demands for overtime and extended availability, which has led to the blurred home/work boundaries and the accompanying challenges we are now so aware of, accelerated by the rise of telework.

These examples illustrate why our current notions of good employership cannot be observed in a vacuum. Knowledge of historical developments is needed to understand why certain beliefs about the responsibilities of employers and employees exist – and, additionally, to recognize and acknowledge that the (collective) vision on good employership will be a permanent 'work in progress'.

Shared responsibility

Historically, then, it seems there have been multiple shifts in the focus of responsibility from the individual employee to the employer (and vice versa), but legislation to safeguard employee well-being has expanded over time. Meanwhile, institutions such as the Dutch WRR and the ILO increasingly urge us to move to a shared notion of responsibility.

In our view, shared responsibility does not imply distributing the elements of responsibility among the parties involved, nor do we encourage to put responsibility in between the parties. In fact, shared responsibility might just result is no responsibility being taken at all. With our vision on shared responsibility, we aim to place emphasis on the partnership of the actors in the employment contract. To pursue well-being of employees, collaboration between individual workers and (representatives of) the organization is crucial (De Prins, Stuer, & Gielens, 2020).

Apart from the accountabilities determined in laws and regulations, both the employer and employee should have a strong sense of responsibility in order to ensure safety and health in the workplace. Feeling responsible is important because work-related matters of well-being often address a 'gray area' for which the law does not dictate clear rules. In such cases, 'doing the right thing' should be intrinsically motivated, with legislation primarily functioning (both literally and figuratively) as a safety net. Assuming responsibility should also be reflected in the attitude that the parties have towards each other: is there suspiciousness and controlling behavior, or a trusting relationship in which both parties feel treated fairly? Ideally, an open and genuine dialogue between the employer and employee is central to the employment relationship – not only to create a feeling of shared responsibility, but also because well-being often requires a tailor-made approach.

We believe that many of the pathways to 'good work' that we discussed are ways to foster this workplace dialogue, showing how I/O psychology scholarship can inform legal and organizational policies on good employership. We hope that the key questions put forward herein inspire scholarly work and debate on what it means to be a good employer. Most importantly though, we hope that our vision on good employership functions as a call for action for employers to go the extra mile in taking care of their most valuable asset: the employee.

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RESEARCH ARTICLE

Conscientiousness and Cognitive Abilities: A Meta-Analysis

RUXANDRA NICOLAU*
Department of Psychology, University of Bucharest, Romania

ANDREEA D. CORBEANU*
Department of Psychology, University of Bucharest, Romania

DRAGOȘ ILIESCU
Department of Psychology, University of Bucharest, Romania
Department of Industrial Psychology, Stellenbosch University, South Africa

Abstract

This paper analyzes the current state of knowledge regarding the relationship between Conscientiousness and cognitive ability. The association between the two variables, the correlation between the sub-factors of Conscientiousness and cognitive ability and the impact of the sample type on the relationship were explored. Following a systematic literature review, 81 unique studies were identified. In terms of inclusion criteria, studies had to (1) report any link between Conscientiousness and cognitive ability, (2) conceptualize Conscientiousness through the Big Five model, and (3) report a measure of cognitive ability (regardless of conceptualization). Several random-effects meta-analyses were conducted, obtaining meta-analytical correlations of .02, -.06 and -.06 between Conscientiousness (global) and cognitive abilities (global), crystallized intelligence and fluid intelligence, respectively. Moreover, for the correlations between the facets of Conscientiousness and cognitive abilities, 6 random-effect models were carried out, however the evidence was statistically significant only in the case of order and achievement striving scales. Finally, the sample type was considered as a potential moderator of the relationship between conscientiousness and cognitive ability, but it was not supported by the available data. These findings were discussed within the context of the relevant literature and several limitations and directions for future research were also taken into consideration.

Keywords

Conscientiousness, cognitive ability, Big Five, fluid intelligence, crystallized intelligence

Given that personality is at the root of human behavior, numerous studies focus on the relationship between it and various outcomes. Over time, research in the field has revealed a five-factor structure (e.g., Schmitt et al., 2007), which is currently the most used in personality evaluation. The five factors (openness to experiences, Conscientiousness, extraversion, neuroticism, and agreeableness) have also become central constructs of the scientific literature, where their applicability is found in every branch of psychology. Among them, Conscientiousness is a key construct, as it is related to aspects such as physical health (Moffitt et al., 2011) or longevity (Kern & Friedman, 2008), but also to variables such as

*Correspondence concerning this article should be addressed to Andreea Corbeanu, Department of Psychology, University of Bucharest, Panduri Street, no. 90, Bucharest, Romania. E-mail: andreea.corbeanu@fpse.unibuc.ro.
*the authors contributed equally to this work

academic performance (Noftle & Robins, 2007), performance at work (Dudley, Orvis, Lebiecki, & Cortina, 2006) or leadership (Judge, Bono, Ilies, & Gerhardt, 2002). As Roberts, Lejuez, Krueger, Richards and Hill (2012) also mention, it may seem that in order to live a long, healthy, happy and successful life, we ought to look as closely as possible at Conscientiousness.

Alongside personality, cognitive abilities are equally central to the scientific literature. For instance, it is well-known and almost unanimously accepted that intelligence is the single most important predictor of job performance (e.g. Hunter & Schmidt, 1996; Schmitt, 2014). In short, the relationship between Conscientiousness and cognitive abilities has long been studied in the literature, within several disciplinary perspectives and with applicability in areas such as organizational, educational, cognitive psychology (e.g., Lang, Kersting, Hülsheger, & Lang, 2010; Salgado, Moscoso, & Berges, 2013; Schmitt, 2014).

The current paper has three important objectives and subsequent contributions to the scientific literature. First, we comb through the inconsistencies and contradictory opinions (e.g., Luciano et al., 2006; Moutafi et al., 2006) of the research on the topic of Conscientiousness and cognitive abilities, when it comes to the association and the magnitude of the relationship. We answer to the current lack of consensus, through a systematic review and meta-analysis of the relevant literature. Given that both are primary constructs of the scientific literature, meta-analytically integrating the available findings and building consensus is warranted. Secondly, we turn to a more granular focus, and examine whether there is a difference between the narrow traits (i.e., facets) of consciousness and cognitive abilities. This endeavor contributes to identifying how each of the six components of Conscientiousness (i.e., order, sense of duty, deliberation, self-realization, self-discipline, competence) specifically relates to cognitive abilities, leading to a more comprehensive understanding of the entire construct, which is a theoretical contribution to the scientific literature. An additional benefit of examining the narrow traits of Conscientiousness in relation to cognitive abilities lies in the enhancement of predictive validity. Based on the Brunswik symmetry, which describes the relationships between the levels of abstraction and aggregation certain constructs have and the conceptual correspondence between them (Wittman & Süß, 1999), comparing different levels of generalization for the same construct against the same predictor – in this case, cognitive abilities- could be particularly revealing when it comes to the predictive validity of the entire construct (Rammstedt et al., 2018). Finally, our work investigates a potential moderator (i.e., sample type) on the strength of the association between cognitive abilities and Conscientiousness, to determine whether the type of sample considered in the studies has any effect on the strength of association between the study variables. The importance of this endeavor is highlighted by the fact that it enables us to understand whether the relationship between cognitive abilities and Conscientiousness generalizes across study samples or is confined to specific criteria. Furthermore, it expands the work of Murray et al. (2014), who first brought this idea under question.

Conscientiousness

Conscientiousness is defined as a spectrum of constructs that describe individual differences, in relation to the tendency to be self-possessed, responsible towards others, hardworking, orderly, and following the rules (Roberts et al., 2009). Conscientiousness is most often considered a personality trait, reflecting relatively enduring and automatic patterns of thoughts, feelings and behaviors that differentiate people from one another (Roberts & Jackson, 2008).

Although Conscientiousness is widely regarded in the literature as one of the five or six broad personality traits, there are contradicting opinions about the distinct number of facets it incorporates. Different models propose any number between two to eight sub-factors of personality (Costa & McCrae, 1992; Lee & Ashton, 2004; MacCann et al., 2009). This precise delineation of sub-factors is important because the different facets of Conscientiousness have differentiated relationships with other

variables, and the correlation between Conscientiousness and certain constructs is influenced by the number of facets taken into account.

The bulk of the scientific literature seems to be focused on six particular facets of Conscientiousness (i.e., order, sense of duty, deliberation, self-realization, self-discipline and competence). These sub-factors were initially proposed in the Big Five taxonomy and described in what follows (Costa & McCrae, 1992). Order measures the degree to which a person can remain organized, and has a major impact on the way in which the objectives of one's professional life are chosen and pursued. The sense of duty facet assesses the person's adherence to norms, as well as the degree to which moral principles and obligations are observed. The self-realization dimension refers to the degree to which an individual is preoccupied with personal achievement, but it can be a starting point for work addiction. Self-discipline captures one's ability to undertake and complete tasks, despite distractions and boredom. Deliberation captures one's tendency to carefully and lengthily consider all aspects involved in a certain context before acting, to be cautious. Finally, competence refers to the degree to which an individual feels capable and effective, and out of all the facets of Conscientiousness, it is the one that displays the greatest correlation with self-esteem and with a locus of the internal control (Costa & McCrae, 1991).

When it comes to how the Conscientiousness personality trait and its facets have been approached in research, two are the most often used measures, namely the NEO Personality Inventory (Costa & McCrae, 2008) and the HEXACO Scale (Lee & Ashton, 2018). The first is based on five-factor structure of personality, while the former on a six-factor model. We will briefly detail each measure in what follows.

The NEO Personality Inventory (Costa & McCrae, 2008) is perhaps the best-known measure of personality and, subsequently, of Conscientiousness. Based on the Big Five taxonomy, it is built around a five-factor conceptualization of personality, which further includes six sub-factors for the Conscientiousness dimension (i.e., order, sense of duty, deliberation, self-realization, self-discipline and competence). Among the advantages of using NEO-PI-R are its good psychometric characteristics or the arrangement of several distinct facets, which allow for an internal validation of results (Quirk, et al., 2003). However, although the NEO-PI-R has an impressive amount of empirical data behind it, it also comes with several caveats, as its factors are based on confirmatory factorial analysis, which has several limitations. Most importantly, the mutual relationships between the items of the test that make up the factors are not explicitly modelled and are therefore ignored (Goekoop, et al., 2012). This could have a negative impact, as some of these interactions may be of disproportionate importance compared to others (for example, some items may be correlated with many or fewer other items, may show stronger or weaker correlations, explain more of the variation in the scores of the factors, or have causal dominance over others).

Compared to the NEO personality inventory, the HEXACO Scale (Lee & Ashton, 2018) is conceptualized around a six-factor model of personality, through the addition of the facet of honesty-humility. This is in contrast to the NEO model of personality, where the factor of honesty-humility is included in the agreeability and Conscientiousness (Anglim & O'Connor, 2018) dimensions. Within the HEXACO framework, the Conscientiousness factor has been described largely the same as the Five Factor Model Conscientiousness dimension (Lee & Ashton, 2018). One caveat is that in the case of the HEXACO model, the Conscientiousness factor is not operationalized by any terms that refer to a moral conscience in particular, such as "sincere" or "honest", as those are attributed to the honesty-humility dimension (Anglim & O'Connor, 2018).

Cognitive abilities

Likely the most well-known and used model that describes human intelligence and cognitive abilities is the Cattell-Horn-Carrol

model (CHC; Roberts & Lipnevich, 2011). This model derives from the three-layer model proposed by Carroll (1993) and is also based on the theory of fluid and crystallized intelligence (Cattell, 1941; Horn, 1965). According to the CHC model, there are three layers: (1) layer I contains primary or narrow mental abilities (such as inductive reasoning or speed de reaction), (2) layer II is comprised of broader abilities (fluid intelligence and crystallized intelligence), and (3) layer III, is represented by the *g* factor (general intelligence). In this context, fluid intelligence refers to the vast ability to reason, form concepts and problem solving using familiar information to completely new procedures (Schneider & McGrew, 2012). This factor is very close to the *g* factor used by Carroll (1993). Crystallized intelligence (*Gf*) refers to the breadth and depth of knowledge acquired by a person, the ability to communicate knowledge and the ability to reason using previously learned experiences or procedures (Schneider & McGrew, 2012). Although the CHC model has been characterized as the most comprehensive and empirically supported psychometric model of the structure of cognitive abilities (McGrew, 2005), it is not without criticism. One of the main limitations of the CHC model refers to the way in which confirmatory factorial analysis was used in studies focusing on CHC theory. This questioned the empirical fundamentals of the model, as it was observed, for example, the constant use of small, unrepresentative samples (McGhee & Lieberman, 1994), such as the imposition of post-hoc adjustments to achieve the expected results (McGill & Dombrowski, 2019).

When it comes to measuring cognitive abilities, it should be noted that the vast majority of new and revised individually administered intelligence tests, are either based on the CHC Theory or are inspired by the CHC Theory (Keith & Reynolds, 2010). The Woodcock-Johnson test (WJ-R) was the first major intelligence test, administered individually, based on the Gf-Gc theory, and the Woodcock-Johnson III tests of cognitive abilities (WJ-III) were the first individual cognitive tests based solely on CHC theory (Woodcock, McGrew, & Mather, 2001). Another measure is the Stanford-Binet test, which has probably changed more than any other intelligence test in its recent iterations. It goes from its classic format that mainly measures the g-factor, to a scale based, in part, on the Gf-Gc Theory in its fourth edition (Thorndike, Hagen, & Sattler, 1986), and finally back to a scale centered largely on the CHC theory in its fifth edition (Roid & Pomplun, 2005). Finally, an important place is taken by the Reynolds Intellectual Assessment Scales (RIAS; Reynolds & Kamphaus, 2003). RIAS is a relatively new intelligence test, and the CHC theory has been used as a theoretical guide in its development. Four subtests make up the basic scale, which was developed to provide a measure of *g*, as well as an evaluation of verbal and nonverbal intelligences (corresponding to crystallized and fluid intelligence, respectively).

Conscientiousness and cognitive abilities

Currently there is a scientific lack of consensus when it comes to the relationship between Conscientiousness and cognitive abilities. The available evidence is split into three possible scenarios: either (1) no relationship (e.g., Bartels et al., 2012), (2) a negative association (e.g., Furnham & Moutafi, 2012; Moutafi et al., 2006; Soubelet & Salthouse, 2011); or (3) a positive, or small positive association (e.g., Baker & Bichsel, 2006; Luciano et al., 2006) between the two study variables.

In this meta-analysis, we subscribe to the Intelligence Compensation Hypothesis (ICH; Moutafi et al., 2004), as a potential explanation for the relationship between Conscientiousness and cognitive abilities. This posits that people displaying lower cognitive abilities tend to compensate by employing a higher level of Conscientiousness, so as to maintain a standard of performance comparable to that of people with higher cognitive abilities. What is more, individuals with a higher cognitive capacity do not feel the need to make a considerable effort, since they can easily accomplish any task. Based on the explanatory mechanisms of the ICH, as well as the body of scientific literature reporting a negative relationship between cognitive abilities and

Conscientiousness, we put forth the following hypothesis:

Hypothesis 1: There is a negative association between Conscientiousness and cognitive abilities.

It is equally important to study the link between the sub-factors of Conscientiousness and cognitive abilities. Such an investigation may provide a more nuanced perspective of the association between Conscientiousness and cognitive abilities and reveal the differential associations various facets might have with one's level of cognitive abilities. This pursuit could also while also bring more clarity around to the source of the insignificant negative relationship between the two variables. Furthermore, examining the effects of personality only at the level of factors can mask the effects at the facet level if they are in opposite directions (Ziegler et al., 2010). Similarly, the conceptualization of cognitive abilities only at their widest level (as general intelligence or *g*) does not take into account certain relationships that different cognitive abilities can have with Conscientiousness.

Based on the above considerations, we also advance the following hypothesis:

Hypothesis 2: The association between Conscientiousness and cognitive abilities differs depending on the facets of Conscientiousness.

We expect the facets of competence and sense of duty to be positively correlated with cognitive abilities. In the case of the former, this would be consistent with the scientific literature (e.g., Luciano et al., 2006). In other words, a person who has higher cogitive abilties would be more likely to be more confident in themselves and in the skills they have. When it comes to the former, we posit that individuals who have higher levels of cognitive abilities would also have a more pronounced sense of duty, owing to their cognitive skills. This explanation has also beeen put forth in previous research (e.g., Rammstedt et al., 2018).

Hypothesis 2a: There is a positive relationship between competence and cognitive abilities.

Hypothesis 2b: There is a positive relationship between a sense of duty and cognitive abilities.

Since self-discipline captures the ability to undertake and complete tasks despite distractions, a higher level of cognitive abilities would facilitate this process so that the individual could set goals and channel their resources towards their intended purpose. Therefore, we advance the following hypothesis:

Hypothesis 2c: There is a positive relationship between self-discipline and cognitive abilities.

For two other sub-factors of Conscientiousness, deliberation and the self-realization, negative associations with cognitive capacity are expected. On the one hand, in terms of deliberation, the scientific literature reports a link between increased intelligence and more prompt responses to cognitive tasks (e.g. Jensen, 2006), which would imply a lower level of planning. Another explanation could be that those people who show a higher level of cognitive abilities create an adaptive mechanism of low deliberation that has led them to cope with the complexity of life. When it comes to the self-realization, the ICH Theory (Moutafi et al., 2004) might be applicable, suggesting that individuals with higher levels of cognitive abilities might be less inclined to prove themselves.

Hypothesis 2d: There is a negative relationship between deliberation and cognitive abilities.

Hypothesis 2e: There is a negative relationship between the self-realization and the cognitive abilities.

Finally, for the order subfactor, the relationship with cognitive abilities is expected to be positive or close to zero. The scientific literature hypothesized that persons with lower levels of cognitive abilities compensate through higher levels of organisation and planning (e.g., Moutafi et al., 2004; Rammstedt et al., 2016), however the evidence is mixed (e.g., Rammstedt, et al., 2018).

Hypothesis 2f: There is a positive relationship between order and cognitive abilities.

Moderators

An in-depth understanding of the relationship between Conscientiousness and cognitive abilities should also account for potential moderating effects. We focus on the idea that the sample type could influence the relationship studied (Murray et al., 2014; Rammstedt et al., 2018). There is evidence (Murray et al., 2014) that the presence of a moderator in the relationship between conscientiousness and cognitive abilities could change its sign, or statistical significance. If samples are selected on the criteria of professional or academic performance, there will be a negative association between the two variables. For example, if the sample consists of students/employees, this also involves a certain level of performance or achievement that will influence the relationship. It has been suggested that this negative association could have been artificially created, because individuals with low cognitive abilities and/or low conscientiousness would be absent from such a sample (Murray et al., 2014). As a result, the true association between these constructs may be zero or positive at the population level, but the use of specially selected research samples for this purpose has sometimes led to the emergence of a negative association.

Almost all studies available in the scientific literature that investigate the relationship between Conscientiousness and cognitive abilities include populations of students/employees (e.g., Furnham et al., 2007), and as such these samples are relatively homogenous in terms of education, age, experience in the labor market and levels of cognitive abilities. A sample that is more representative of the adult population (which might include individuals with lower levels of Conscientiousness and cognitive abilities) could alter both the sign and statistical significance of the relationship. As such, it could happen that in the case of such a sample, the relationship between the variables could be positive, or absent. Based on the above, we suggest the following hypothesis:

Hypothesis 3: The sample type is a moderator of the relationship between Conscientiousness and cognitive abilities.

Hypothesis 3a: In the context in which the sample includes only student/employee populations, Conscientiousness and cognitive abilities show a negative, statistically significant correlation.

Hypothesis 3b: In the context in which the sample is representative of the general population, Conscientiousness and cognitive abilities show a positive, statistically significant correlation.

Method

Search strategy

Two complementary approaches were used to identify relevant studies. To test the link between Conscientiousness and cognitive abilities, a systematic review of the literature on the relationship between Conscientiousness and cognitive abilities was conducted.

The search key used was: (Neuroticism) OR (Extraversion) OR (Openness) OR (Agreeability) OR (Conscientiousness) OR (Big Five) OR (Personality) OR (Five Factor Model) OR (Big 5) OR (NEOAC) OR (OCEAN) OR (Disposition) AND (Intelligence) OR (Cognitive Ability) OR (IQ) OR (Aptitude) OR (Reasoning) OR (Logical Thinking) OR (Analytical Thinking) OR (Inductive Thinking) OR (Processing Speed) OR (Mental Speed) OR (Divergent Thinking). The following databases were searched: JSTOR, Nature, Proquest, PsycInfo, ScienceDirect, Scopus, Springer, Web of Science, Wiley.

In addition, an ancestor search was used to examine references of influential articles on the topic being studied in search of other works that might be included in the meta-analysis. Databases for unpublished research (i.e., dissertations) were also sought to minimize the impact of the publication bias.

The search process took place until august 2022. There were no time constraints placed on the actual search. The search string was maintained exclusively in English, and no papers written in another language were included.

A total of 486 articles were downloaded from the searched databases, following the online screening of the title and abstracts. 53 duplicates were identified and removed, with 433 studies eventually preserved. 174 articles were further excluded after a more in-depth

screening of the abstracts. The remaining 259 works were further analyzed against the established inclusion and exclusion criteria (see below). In total, 178 articles were excluded in this step. The remaining 81 papers were included in the final analysis (see Figure 1).

Coding

The data was encoded in an Excel spreadsheet, by the first and second author. Any disagreements were resolved qualitatively, through discussions, until full consensus was reached. The information collected was as follows: the author(s) and the year, sample size, sample information, type of design, the scale used to measure Conscientiousness, the scale used to measure cognitive abilities, as well as the correlation coefficients between each dimension of Conscientiousness and cognitive abilities. Where additional information was needed, every effort was made to find and include the missing data. There was no instance of missing data in the final database.

Inclusion/exclusion criteria

The following three inclusion criteria were used:

First, studies should report the link between Conscientiousness and cognitive abilities, even if this is not the main objective of the work. The research that did not report correlations between sub-factors of Conscientiousness and cognitive abilities were not excluded. The use of this criterion led to the elimination of 96 studies.

Second, we only considered studies that operationalized Conscientiousness by the rigors of the Big Five taxonomy. However, there were no constraints on how it was measured, as we accepted any kind of measures that were based on the Big Five Model. The second criterion led to the elimination of 24 studies.

Third, we've only included studies that report a level of cognitive ability, regardless of how it was reported. Since in terms of cognitive abilities there is no consensus in the operationalization of the construct, studies using another way of reporting outside the CHC model have not been excluded. The use of this criterion led to the elimination of 58 studies.

Lastly, we did not exclude any study based on the environment it was carried out, or the type of sample. As such, we have both employee and student samples available in the research.

Data analysis

The data extracted from the remaining studies were centralized, and the effect sizes were calculated for each study, based on the sample and correlation coefficients. The results were converted to Z (Fisher) scores as a result of the abnormal distribution of Pearson's r. In the case of multiple effect sizes on individual studies, robust variation estimation was used. The standardized effect sizes were then weighted by their respective sample size. We then carried out several random-effects meta-analyses, using the Comprehensive Meta-Analysis software (version 3.3.070), for each of the six sub-scales of Conscientiousness and cognitive abilities.

Additionally, homogeneity was assessed using the Q statistic, as well as the the I^2 values (Borenstein et al., 2011). The Q statistic represents the weighted sum of the square differences between the observed effect and the weighted average effect, and indicates a true heterogeneity in the effect studies, beyond random error. The I^2 is a measure of the proportion of the observed variance, which is reflected in the actual differences of effect size. Unlike the Q statistic, I^2 is not a measure that is sensitive to the number of studies included in the analysis (Borenstein et al., 2011). We considered a significant Q test result and a I^2 value greater than or equal to 75% as significant. For results above this threshold, we analyzed the dispersion of the size of the actual effect, as well as its determinants. To this end, we further conducted moderator analyses.

Finally, we used the one study removed analysis to detect any potential extreme values, or any study that majorly influences the results obtained. In this vein, we also analyzed funnel diagrams to determine the existence of publication bias.

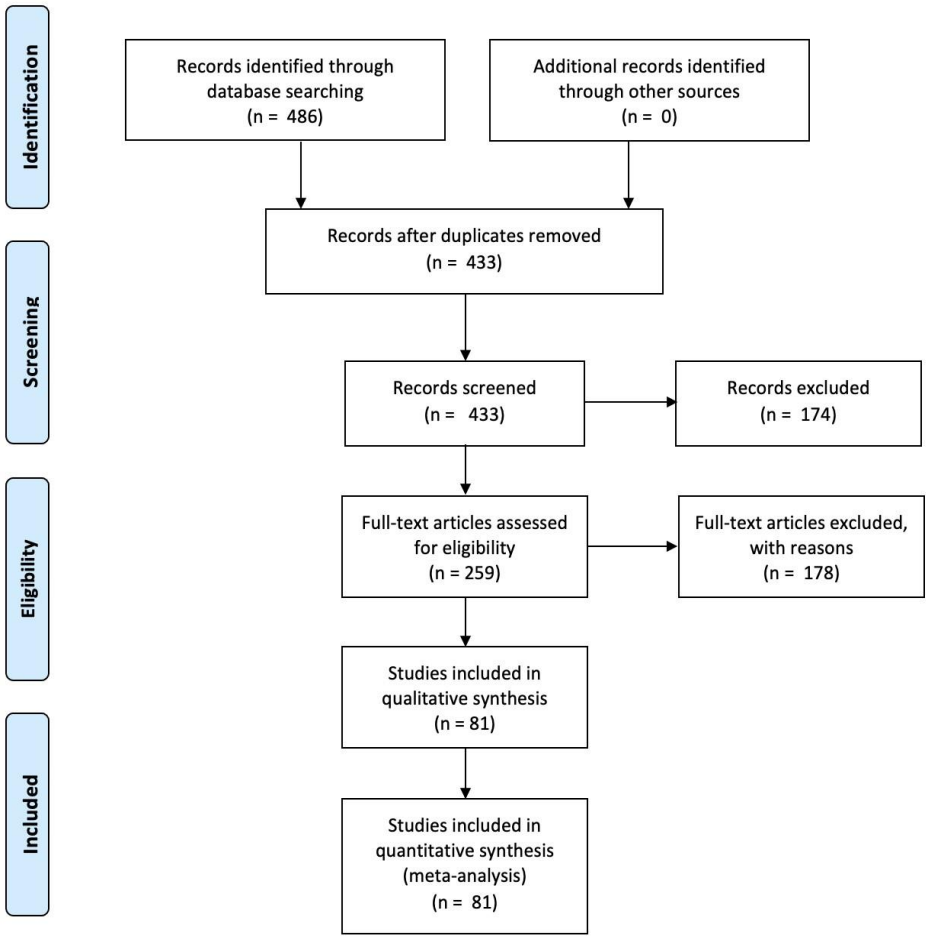

Figure 1. PRISMA diagram for the study selection process

Results

Characteristics of the studies

The analysis included 81 studies, with a total of 81 unique samples, and the number of participants ranged from 60 to 13648 (total N = 90685). All studies have reported at least one correlation between Conscientiousness and cognitive abilities (either globally or at the facet level). Regarding the questionnaires used for Conscientiousness, 15 papers (18.52%) used the International Personality Item Pool (IPIP, Goldberg et al., 2006), 37 papers (45.68%) used NEO Five-Factor Inventory (NEO-FFI/NEO-PI-R, McCrae, Costa, & Martin, 2005), and 29 studies (35.8%) used another questionnaire.

Referring to cognitive abilities, 58 studies (71.6%) presented an overall cognitive ability score, and the remaining papers (28.4%) exclusively mentioned another level of cognitive abilities (e.g. fluid of crystalized intelligence) Among the measures used are the Culture Fair Test (Cattell, 1940), Raven's Progressive Matrices (Raven, Raven, & Court, 2000), the Wonderlic Personnel Test (Wonderlic, 1992), the Braddeley Reasoning Test (Braddeley, 1968), WAIS-III (Ryan & Lopez, 2001), etc.

Overall effect sizes

The results of the analysis of the model on the link between Conscientiousness (global) and cognitive abilities (overall), on 58 independent

samples, showed a statistically insignificant relationship (r = .02; p > .05), with CI 95% ranging from -.01 to .04. The Q value of the overall effect was significant (Q(57) = 384.62, l^2 = 85.18; p < .00).

The results of the model analysis on the link between (global) Conscientiousness and crystallized intelligence, on 29 independent samples, showed a negative relationship, statistically significant (r = -.06; p < .01), with CI 95% ranging from -.10 to -.02. The Q-value of the overall effect was significant (Q(28) = 334.69, l^2 = 91.63; p < .00).

The results of the analysis of the model on the link between Conscientiousness (global) and fluid intelligence, on 31 independent samples, showed a negative, statistically significant relationship (r = -.06; p < .01), with CI 95% ranging from -.10 to -.02. The Q-value of the overall effect was significant (Q(30) = 303.95, l^2 = 90.13; p < .00)

Table 1 presents the relationship between Conscientiousness as a global construct and cognitive abilities.

Table 1. *Meta analysis results between Conscientiousness (global) and cognitive abilities (global)*

		N	*r*	CI	Q	l^2
Conscientiousness	Cognitive Abilities	58	.02	[-.01;04]	384.62**	72.29

Note: ** p < .01

Effect sizes on the dimensions of Conscientiousness

In addition to analyzing the results of the models regarding the link between Conscientiousness (global) and cognitive abilities (global)/crystallized intelligence/fluid intelligence, we also investigated the relationships between the facets of Conscientiousness and global cognitive abilities.

The result was the analysis of the model on the link between order and cognitive abilities, on 7 independent samples, showed a negative, statistically significant relationship (r = -.06; p < .05), with CI 95% ranging from -.11 to -.01. The Q value of the overall effect was significant (Q(6) = 37.39, l2 = 83.95; p < .00). Regarding the results of the model on the link between the sense of duty and cognitive abilities, on 6 independent samples, a statistically insignificant relationship was observed (r = -. 01; p > .05), with CI 95% ranging from -.04 to .02. The Q value of the overall effect was insignificant (Q (5) = 10.49, l^2 = 52.32; p > .05).

In connection with the results of the model between deliberation and cognitive abilities, on 7 independent samples, a statistically insignificant relationship was obtained (r = -.02; p > .05), with CI 95% ranging from -.07 to .04. The Q-value of the overall effect was significant (Q(6) = 38.71, l^2 = 84.50; p < .00).

The results of the analysis of the model on the link between self-realization and cognitive abilities, on 6 independent samples, suggested a negative, statistically significant relationship (r = -.05; p< .00), with CI 95% ranging from -.08 to -.02. The Q value of the global effect was insignificant (Q (5) = 10.63, l^2 = 52.94; p > .05).

For the link between self-discipline and cognitive abilities, the analysis on 7 independent samples suggested a statistically insignificant relationship (r = -.06; p < .01), with CI 95% ranging from -.09 to -.02. The Q-value of the overall effect was significant (Q(6) = 17.30, l^2 = 65.31; p < .01).

Last but not least, the results of the analysis of the model on the link between competence and cognitive abilities, on 6 independent samples, captured a statistically insignificant relationship (r = .02; p > .05), with CI 95% ranging from -.02 to .06. The Q value of the overall effect was significant (Q(5) = 18.04, l^2 = 72.29; p < .01).

Table 2 presents the relationship between the facets of Conscientiousness and cognitive abilities.

Table 2. *Meta analysis results between Conscientiousness facets and cognitive abilities (global)*

Facet		N	*r*	CI	Q	I^2
Order	Cognitive Abilities	7	-.06*	[-.11; -.01]	37.39**	83.95
Sense of duty		6	-.01	[-.04; .02]	10.49	52.32
Deliberation		7	-.02	[-.07; .04]	38.71**	84.50
Self-realisation		6	-.05**	[-.08; -.02]	10.63	52.94
Self-discipline		7	-.06	[-.09; -.02]	17.03**	65.31
Competence		6	02	[-.02; .06]	18/04**	72.29

Note: *$p < .05$; ** $p < .01$

Moderator effects

We also wanted to see if the type of sample (e.g. students, employees, general population, children) influences the relationship between Conscientiousness (global) and cognitive abilities (overall), using a mixed effects model, in which the dimensions of the effect are taken as a variable with random effects. The results obtained indicate that the sample type does not moderate the relationship between Conscientiousness (global) and cognitive abilities (global) (Q (57) = 384.62, $p > .05$).

Publication bias

To investigate whether publication bias was present, we generated and examined the Funnel plots. At the same time, we also ran the trim-and-fill procedure (Duval & Tweedie, 2000), with a random effects model. We performed these analyses for all six dimensions of Conscientiousness.

For the order dimension, the trim-and-fill procedure added one estimated study, with an effect size smaller than the average, which does not significantly influence the results (r = -.04; CI = [-.09; .02], Q = 53.13). The results obtained are consistent with the Funnel plot (Figure 2).

For the dimensions of sense of duty (Figure 3), deliberation (Figure 4), self-realization (Figure 5), self-discipline (Figure 6) and competence (Figure 7) the trim-and-fill procedure did not estimate any study with an effect size smaller than or larger than the average, which could influence the results obtained.

Overall, the results obtained do not indicate the presence of the publication bias in the sample included, in any of the six dimensions of Conscientiousness that were examined.

Discussions

This meta-analysis examined the relationship between Conscientiousness (conceptualized through the Big Five model, along with its six facets) and cognitive abilities. A systematic review of the literature was carried out, and the meta-analysis incorporated 81 studies (with a total of N = 90685 participants, from samples of students, children, adults, and the general population). The influence of one moderator, namely the type of sample, on the relationship between the two variables was also investigated.

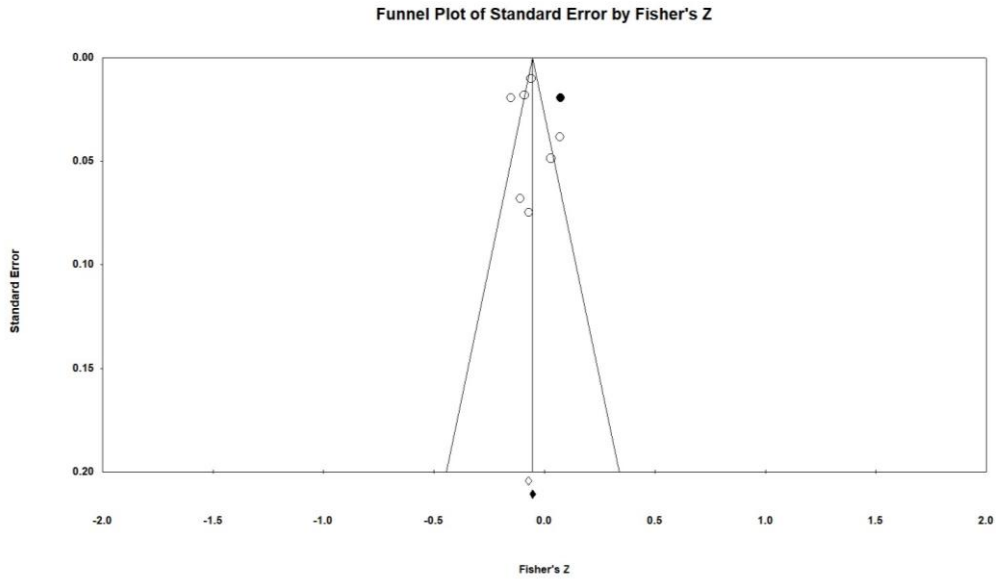

Figure 2. Funnel diagram for publication bias of order dimension and cognitive abilities, on 7 independent samples

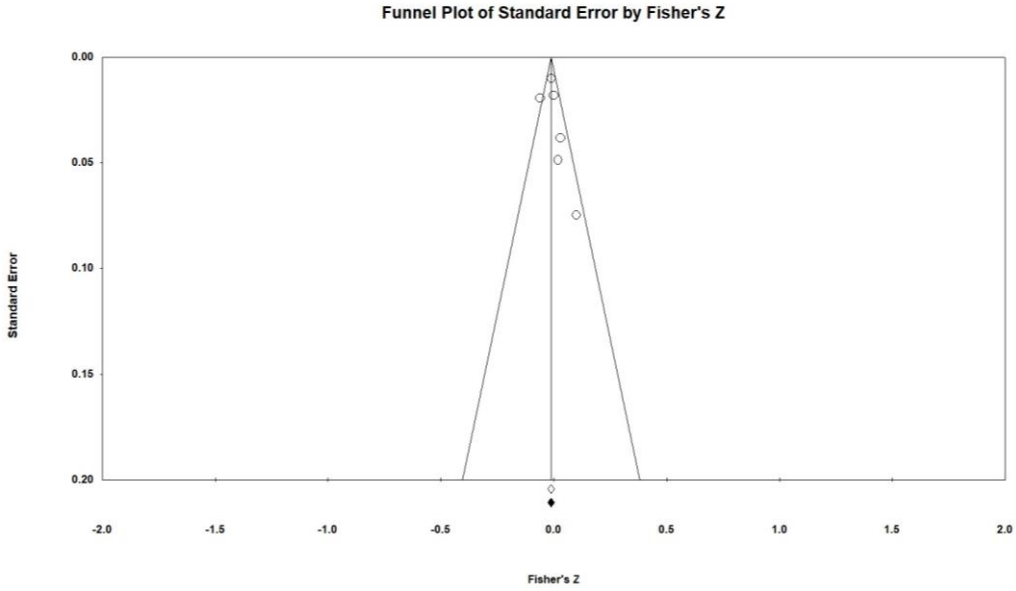

Figure 3. Funnel diagram for the publication bias of the sense of duty dimension and cognitive abilities, on 6 independent samples

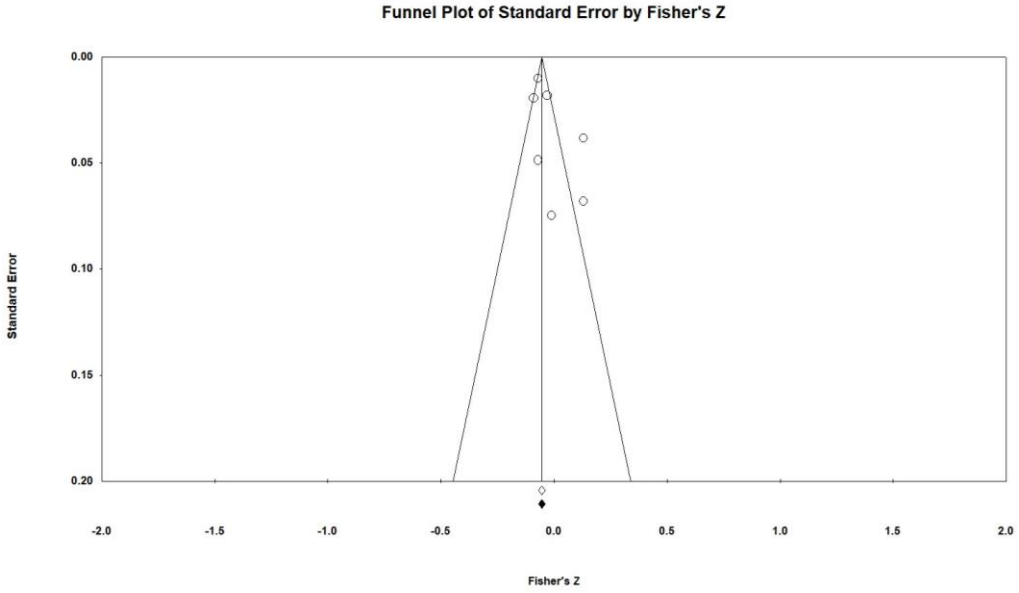

Figure 4. Funnel diagram for publication bias of the deliberation dimension and cognitive abilities, on 7 independent samples

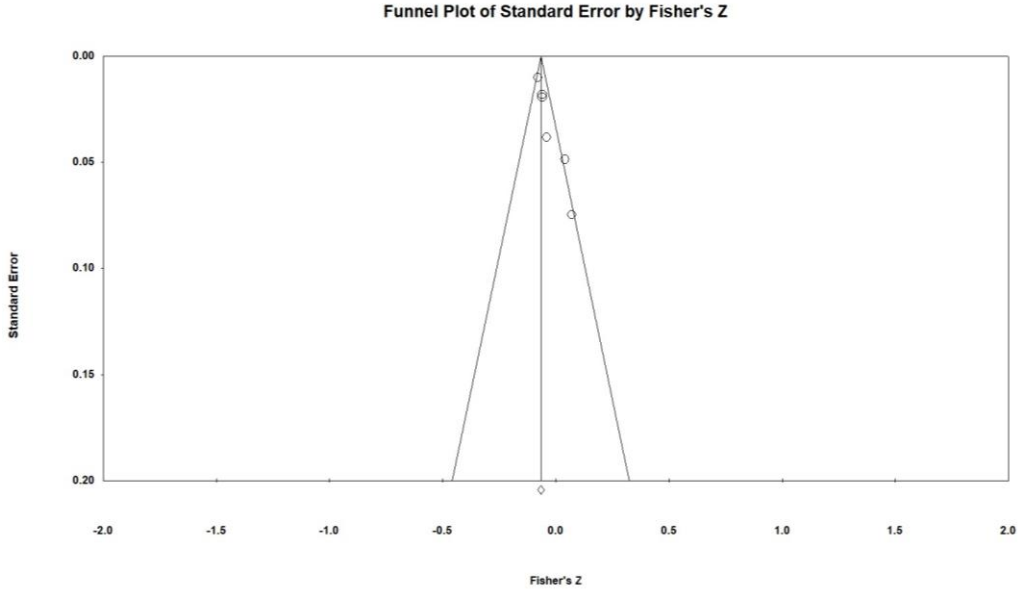

Figure 5. Funnel diagram for the publication bias of the self-realization dimension and cognitive abilities, on 6 independent samples

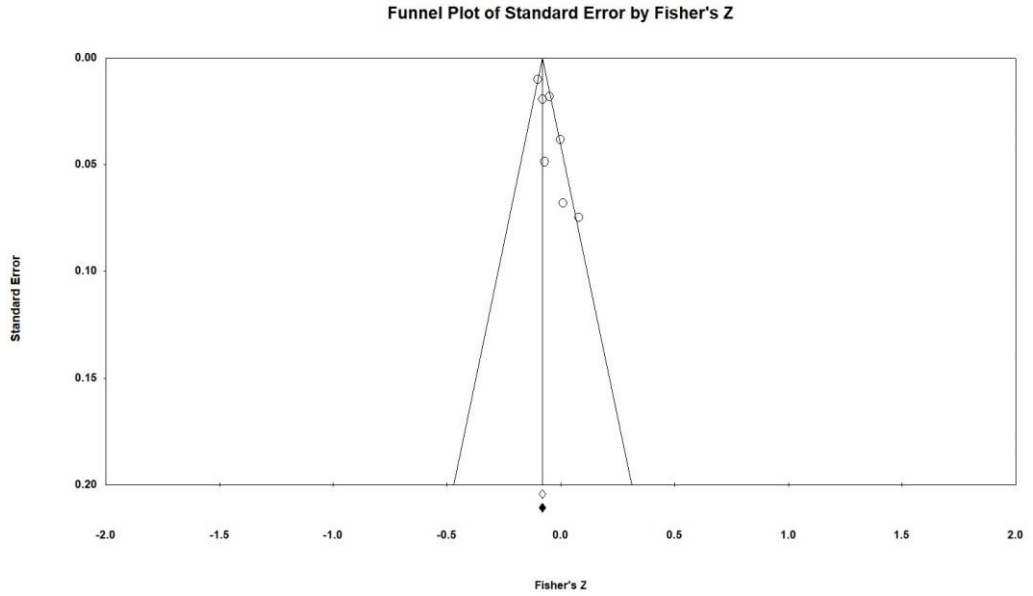

Figure 6. Funnel diagram for the publication bias of the self-discipline dimension and cognitive abilities, on 7 independent samples

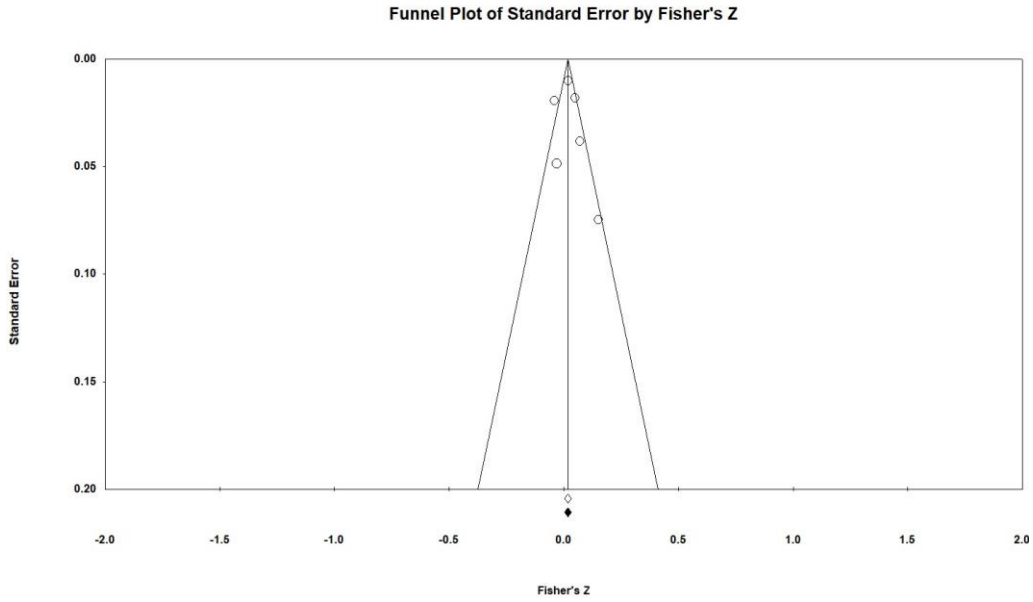

Figure 7. Funnel diagram for the publication bias of the competence and cognitive abilities dimension, on 6 independent samples

Main effects

Regarding the relationship between consciousnesses and cognitive abilities, the meta-analysis revealed a statistically insignificant association, close to zero, between the two variables, which is in dissonance with the first hypothesis of the work (*H1*). The results obtained are in line with other findings in the literature (e.g., Bartels et al., 2012), who argue that, for the general population, it is very likely that there will be no connection between these two constructs.

However, since there have been studies that have wanted to observe, in more detail, the relationship between Conscientiousness and cognitive abilities, we have also traced the associations between Conscientiousness and the two more prominent components of intelligence – fluid and crystalized intelligence. Both relationships reported a negative, statistically significant association, and the results are consistent with previous studies such, as Wood and Englert's work (2009) and support the Intelligence Compensation Hypothesis.

Sub-dimension effects

As illustrated in H2, we wanted to analyze the different relationships that the six facets of consciousness and cognitive abilities report in the literature.

The results obtained partially supported H2a, as although a positive association between competence and cognitive abilities was observed, it was statistically insignificant. The results are similar to other findings in the literature (e.g., Carretta et al., 2018; Furnham et al., 2007). Although we expected the association to be significant, it seems that a person who has higher cognitive abilities is not necessarily and more self-confident. A possible explanation is given by the existence of variables with a potential moderator effect, for example self-efficacy (Lumbantobing, 2020).

Regarding the relationship between the sense of duty and cognitive abilities, the proposed hypothesis (H2b) was not supported by the data, as the association was not statistically significant. There are similar results in the scientific literature (e.g., Furnham et al., 2007) and a possible explanation would be the interposition of variables such as compliance with the norms.

In the same vein, the H2c hypothesis was not supported by the data either, the relationship between self-discipline and cognitive abilities being statistically insignificant. Such an idea is also proposed by Kretzschmar, Spengler, Schubert, Steinmayr and Ziegler (2018), who argue that, at a more thorough glance, there is no connection between the facets of Conscientiousness and cognitive abilities. It is possible that the insignificant association is due to factors that influence the relationship, such as the need for realization. If the person does not identify a need for achievement that facilitates the completion of tasks despite potential distractions, the relationship between self-discipline and cognitive abilities will be insignificant.

In relation to the H2d hypothesis, it was partially supported by the data, since although the relationship between deliberation and cognitive abilities is negative, it is statistically insignificant. Although we expected a greater correlation between the two variables, it seems that the hypothesis is only partially supported by the results obtained. This is consistent with some other findings in the scientific literature (e.g., Jensen, 2006).

For the relationship between self-realization and cognitive abilities, the hypothesis (H2e) was supported by data, which supports the Intelligence Compensation Hypothesis. The results obtained are consistent with studies such as the ones carried out by Furnham et al. (2007) or Zajenkowski and Stolarski (2015).

Last but not least, the H2f hypothesis was not empirically supported, as the relationship between order and cognitive abilities was a negative one, statistically significant. Moutafi's work, Furnham & Crump (2006) There is evidence which suggests the idea and argues the negative relationship through the prism of the Intelligence Compensation Hypothesis (Moutafi et al., 2006).

Moderator effects

Based on the H3 hypothesis, we investigated whether the sample type could influence the

relationship between Conscientiousness (global) and cognitive abilities (globally), since the scientific literature claims that the negative relationship between the two variables is only present in student or employee populations. Contrary to our expectations, the sample type is not a moderator of the studied relationship, so H3 is not supported by the data. It may be that other variables (e.g. the sequence of realization) influence the relationship, this aspect being proposed by authors such as Moutafi, Furnham and Paltiel (2004). It is, however, difficult to capture the effects of this moderator, as there are few studies that have also reported levels of desire to realize.

Theoretical contributions

The contributions the present systematic review and meta-analysis brings to the current state of knowledge are threefold. Firstly, it provides a comprehensive analysis of all the currently available research on the topic of Conscientiousness and cognitive abilities, and generates consensus on this relationship. Following this analysis, the available data meta-analytically reveled no association between the study variables. This finding supports the argument of the Compensation of Intelligence Theory (Moutafi et al., 2004), which posits a negative, or at the very least no relationship between the Consciousness personality trait and cognitive abilities.

Secondly, by focusing on both the global constructs, as well as their dimensions, this paper adds to the completeness of the scientific literature. This meta-analysis tracked the relationship between the facets of Conscientiousness and cognitive abilities, which is useful in revealing the differential effects each of the dimensions has when it comes to cognitive abilities. This provides a more detailed understanding of the consciousness concept as a whole, as well as which particular aspects relate to cognitive abilities, and at what levels of generalization. Out of the six facets studied, only two (i.e., order and self-realization) revealed statistically significant, albeit negative, associations with cognitive abilities. The other four dimensions of conscientiousness (i.e., sense of duty, deliberation, self-discipline, and competence) were not statistically significant correlates of cognitive abilities.

Finally, this work contributes to the scientific literature by examining and discussing Conscientiousness and cognitive abilities on a broader level. One of the critiques that was frequently brought up in this line of research was that papers often employ samples which are comprised of some form of academic or professional performance (Murray et al., 2014), which will naturally skew the results. In contrast, the current paper is not limited to student/employee populations, but takes into account children, adults or even the general population of some countries, which increased the generalizability of the findings. In addition, examining the sample composition as a potential moderator of the relationship between Conscientiousness and cognitive abilities provides a broader understanding of the samples and population types where this effect could have occurred (Murray et al., 2004).

Practical implications

The results achieved are also relevant for practitioners. In this way, some implications can be extracted. For example, while some individuals with lower cognitive abilities may develop an increased Conscientiousness to compensate, others with low cognitive abilities may be discouraged by the possibility of failure. The latter may end up putting in less effort and getting less conscientiously involved as a result of the fact that this behavior brings them a lower gain. Conversely, greater rewards for conscientious behavior in individuals with high cognitive abilities could lead to greater reinforcement of this behavior. A person's social environment (for example, the rewards associated with intelligent and conscientious behavior) in combination with the other traits of the individual (e.g., motivation, sensitivity to reward, place of control) will likely determine whether and how Conscientiousness and cognitive abilities will relate.

Limitations and future research directions

Like any meta-analysis, this paper presents several limitations in terms of the studies included in the analysis. First, the vast majority of studies use a cross-sectional design, which does not allow for causal inferences. Secondly, another limitation of the meta-analysis is that we have not corrected for reliability, either for Conscientiousness and its facets, or for cognitive abilities. This may determinate a downward bias in the size of the observed effect (Wiernik & Dahlke, 2020). Thirdly, most of the measures used in studies to assess Conscientiousness were self-report, which may mean that the collected answers could be biased favorably.

In terms of future directions, it is preferable for studies in the field to focus more on the relationship between the narrow features of Conscientiousness and cognitive abilities, as it would facilitate a better understanding of the association between the two constructs. One could also explore the possibility of having a curvilinear relationship between Conscientiousness and cognitive abilities.

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RESEARCH ARTICLE

Grit as a Mediator between Core Self-evaluations and Mental Health Complaints: The Moderating Role of Workload

GEANINA BALAN
Department of Psychology, West University of Timişoara, Romania

DELIA VÎRGĂ
Department of Psychology, West University of Timişoara, Romania

Abstract

The present study focuses on the possible mediating effect of the grit concept in the relationship between core self-evaluations and mental health complaints. It also examines the moderating role of workload in the relationship between core self-evaluations and grit. The data was collected online from a convenience sample of 224 employees (55.4% females) and analyzed with PROCESS macro. The results brought support to the moderated mediation model in which grit partially mediates the relationship between core self-evaluation and mental health complaints, and workload moderates the relationship between core self-evaluation and grit. Overall, our results emphasize the positive impact of core self-evaluations and grit on health complaints while highlighting the boost effect of workload.

Keywords

grit, core self-evaluations, workload, mental health complaints

Introduction

Maintaining good mental health is essential for people to lead healthy and productive lives. In 2018, on average, one in nine adults (11%) in EU countries had symptoms of psychological distress, and in 2017 there were 11 suicides per 100,000 inhabitants (OECD/European Union, 2020). In addition to the negative impact on individuals, poor mental health also has a negative impact on organizations (Kessler et al., 2009). For example, several studies have found significant annual losses in human capital costs and productivity associated with poor mental health (e.g., 36 billion dollars; Kessler et al., 2009, 11.8 billion Australian dollars; Lee et al., 2017).

Employees with high levels of personal resources (e.g., core self-evaluations) are more confident, energetic, and better equipped to face challenges and recover quickly from work demands (Desrumaux et al., 2015). These employees are also associated with sustainable individual and organizational performance, such as greater customer satisfaction and loyalty, productivity, safety, and overall profitability, as well as reduced turnover and absenteeism (Spreitzer & Porath, 2012; Harter, Schmidt & Hayes, 2002). According to the Conservation of Resources theory (COR, Hobfoll, 2001), personal

*Correspondence concerning this article should be addressed to Delia Vîrgă, Ph.D., Department of Psychology, West University of Timisoara, Bv. Vasile Parvan, no. 4, Timisoara, 300223, Romania, Phone: +40 722 620 205, ORCID https://orcid.org/0000-0002-9321-4520, Email: delia.virga@e-uvt.ro

resources are essential for promoting well-being and buffering against stressors. Both core self-evaluation and grit can be considered personal resources, and numerous studies have shown that these concepts are associated with several aspects of well-being in most studies (e.g., McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Muenks, Wigfield, Yang, & O'Neal, 2017). At the same time, some studies suggest a positive link between the components of core self-evaluations and grit. Studies that indicate the direction of the relationship between grit and parts of CSE show that these components predict grit (e.g., locus of control and self-efficacy). Grit is a relatively new concept in the literature; therefore, the literature on the antecedents of grit is still young, and much more research is needed to uncover how grit can be developed (Van Zyl, Olckers, & van der Vaart, 2021, p. 175). Also, no studies have verified the possible mediation of the concept of grit in the relationship between core self-evaluations and mental and/or physical health. The Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2017) postulates that high job demands (e.g., workload) may exhaust employees' resources and lead to energy depletion and health problems. Also, the extension of the original JD-R model has included employees' personal resources (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007), and subsequent studies have shown that positive self-evaluations (including self-efficacy and self-esteem) or locus of control can mitigate the negative impact of job demands and, at the same time, have a positive relationship with work engagement and performance. Thus, we expect the workload to play a significant moderating role in this model.

This paper aimed to test the mediating role of grit in the relationship between core self-evaluations and mental health complaints. In this paper, mental health complaints are operationalized as a component of well-being, although well-being has a broader scope. The article also examines the moderating effect of workload on the relationship between core self-evaluations and grit.

Theoretical framework

Core self-evaluations (CSE) is defined as a high-order personality, including four personality traits: locus of control, general self-efficiency, self-esteem, and neuroticism/emotional stability, which involves an individual's baseline evaluation of his ability and value (Xiao, Wu, Ye, & Wang, 2014; Barać, Đurić, Đorđević, & Petrović, 2018). Self-esteem describes individuals' beliefs about their own worth and competence (Judge, Locke, & Durham, 1997). Self-efficacy represents one's belief about one's ability to deal with life's challenges (Bandura, 1997). Locus of control can be defined as an individual's feelings of control over their own life; locus is internal if the individual feels that he can generally control his outcomes (Rotter, 1966). Emotional stability, finally, pertains to a person's tendency to feel calm and secure (Chang, Ferris, Johnson, Rosen, & Tan, 2012). Thus, people with a high level of CSE evaluate themselves in a consistently positive manner in different situations and consider themselves capable, worthy people who have control over their own lives (Judge, Van Vianen & De Pater, 2004). CSE components are fundamental to individuals' self-appraisals of their worth and capabilities and have been conceptualized and supported as essential to individuals' psychological and physical well-being (McKee-Ryan et al., 2005).

Though CSE is considered trait-like and resistant to change, Debusscher, Hofmans, and De Fruyt (2017) argued that CSE could be conceptualized as a person-related resource. Related to grit, current evidence suggests that it is a personal quality developed through mindsets, skills, and enabling environments (Duckworth, 2016). Grit has been defined as passion and persistence in achieving long-term goals (Duckworth, Peterson, Matthews & Kelly, 2007). Based on Duckworth et al. (2007), gritty is far more essential and critical to achieving long-term goals than innate talents or intelligence. These authors began conceptualizing this concept by interviewing high achievers in academia, journalism, medicine, law, banking, and painting. Even though some aspects of motivation varied by field of activity (e.g., artists described their desire to "do things" and athletes said they

were "driven to compete"), the same trends were observed: high performers talked about the importance of returning to the same goals rather than changing direction and starting another activity; also discussed the need to work diligently despite setbacks and delays, doing "whatever it takes" to continue toward the desired goal. Based on these interviews, Duckworth et al. (2007) developed a questionnaire for further research on goal attainment. The questionnaire items are clustered into two related factors indicating the tendency to remain loyal to the same goals over time (i.e., passion for long-term goals) and the propensity to diligently devote effort toward goals even in the face of setbacks (i.e., perseverance for long-term goals).

Goals are mental representations of future states that guide behavior with or without our awareness (Austin & Vancouver, 1996; Klein, Cooper, & Monahan, 2013). Most goals demonstrate a hierarchical structure, whereby the lower-order goal is a means to the end of its higher-order goal (Carver & Scheier, 1982). The higher goal is the individual's compass, which provides direction and meaning to all lower-order goals in the hierarchy (Barrick, Mount, & Li, 2013; Höchli, Brügger, & Messner, 2018). The higher goals for which gritty individuals sustain their passion for years derive from their deepest interests and values (Barrick et al., 2013). According to the grit review by Schimschal, Visentin, Kornhaber, and Cleary (2021), there is mixed support for the two-factor structure of the grit concept. Still, despite this debate, studies have found that passion and perseverance are essential for achieving goals. Also, recent studies have shown the importance of grit in the success of companies (Dugan, Hochstein, Rouziou, & Britton, 2019; Mueller, Wolfe, & Syed, 2017).

CSE and mental health complaints

The COR theory supports the relationship between CSE and health complaints (Hobfoll, 2001). According to this theory, people with a large set of personal resources are more likely to gain other resources. People who experience resource gains report greater health and well-being and are more possible to invest in additional resources (Ten Brummelhuis & Bakker, 2012). At the same time, the decrease in resources leads to a decline in health and well-being. In the present article, mental health complaints are an indicator of well-being, even though well-being encompasses a wide range of factors.

Several studies directly or indirectly support the link between CSE and mental or physical health. McKee-Ryan et al. (2005) established in their meta-analysis a strong relation between CSE and the physical and mental health of unemployed people, the connection being stronger between CSE and mental health. The same relationship was obtained by Vîrgă and Rusu (2018) in their study on the unemployed. Zhang and Zhao (2009) showed a negative and significant relationship between CSE and mental health symptoms among college students. The same association was later confirmed by Xiang et al. (2019). The meta-analysis by Chang et al. (2012) demonstrated a negative relationship between CSE and burnout. Thus, based on these arguments, we can formulate the following hypothesis:

Hypothesis 1: Core self-evaluations are negatively related to mental health complaints.

CSE and grit

CSE is a higher-order construct encompassing positive self-views, including self-esteem, self-efficacy, locus of control, and neuroticism/emotional stability (Judge, 2009). Previous studies have indicated the intense association grit has with self-efficacy (Muenks et al., 2017), self-esteem (Weisskirch, 2016; Dugan et al., 2019), emotional stability (Eskreis-Winkler et al. al., 2014; Blalock, Young, & Kleiman, 2015) and locus of control (Çelik & Sarıçam, 2018;). Therefore, we expect a significant relationship between CSE and grit based on COR theory. People who experience resource gains report more health and well-being and "are better able to invest in additional resources" (Ten Brummelhuis & Bakker, 2012, p. 535). In this context, we can formulate the following hypothesis:

Hypothesis 2: Core self-evaluations are positively related to grit.

Grit and mental health complaints

The links between grit and physical and/or mental health have been extensively researched. Some recent studies do not support an association between grit and specific aspects of well-being, arguing that grit is not a significant predictor of depression and does not directly increase life satisfaction (Vela, Lerma, & Ikonomopoulos, 2017; Jin & Kim, 2017). However, most studies have indicated a strong association between grit and several aspects of well-being, suggesting that individuals with high levels of grit have an increased likelihood of achieving higher levels of well-being (Muenks et al., 2017; Goodman, Disabato, Kashdan & Kauffman, 2018; Sharkey et al., 2017; Kannangara et al., 2018). Moreover, it also reduced anxiety sensitivity among US young adults (Moshier et al., 2016). Based on previous arguments, we can formulate the following hypothesis:

Hypothesis 3: Grit is negatively related to mental health complaints.

Previous research has shown that personality and well-being can manifest through reciprocal relationships (Soto, 2013). Some studies have shown a link between components of CSE and grit and indicate the direction of the relationship has found that locus of control and self-efficacy predict grit (e.g., Dugan et al., 2019). Also, the literature shows that positive affect is an antecedent of grit (Schimschal et al., 2021). According to Chang et al. (2012), employees with high levels of CSE have a strong sensitivity to positive information and show a higher level of approach motivation, which in turn stimulates employees to experience higher levels of PA (being defined as "*positive emotions and the experience of feeling happy* "; De Neve & Oswald, 2012, p. 19954). Emphasizing these aspects, but also the relationships mentioned above between CSE and health complaints, CSE and grit, and respective grit and health complaints, we can formulate the following hypothesis:

Hypothesis 4: Grit mediates the relationship between core self-evaluations and mental health complaints.

One of the reference theoretical models in research on well-being and motivation at work is the JD-R model, developed by Bakker & Demerouti (2017). According to this theory, through a process of deterioration of an employee's health, job demands are the best predictors of burnout. The job demands that have received the most attention in the literature are related to the tasks and functions of a job and refer in particular to workload (Cooper et al., 2016; Purohit & Vasava, 2017). Workload can be understood from its quantitative perspective, referring to the perception of an excessive amount of work about the time available for it, and its qualitative dimension, which refers to the quality and complexity of the work to be performed (Parasuraman & Purohit, 2000)

The recent extension of the original JD-R model also included employees' personal resources (Xanthopoulou et al., 2007). Studies have shown that positive self-evaluations (which include self-efficacy and self-esteem) or locus of control over the situation are positively related to job engagement and performance (Bakker & Demerouti, 2017). Also, gritty individuals show greater resilience and determination in threatening contexts (Maddi, Matthews, Kelly, Villarreal, & White, 2012). Based on the aspects mentioned above, we can formulate the following hypothesis:

Hypothesis 5: The relationship between core self-evaluations and grit is stronger for employees with a high workload on the job.

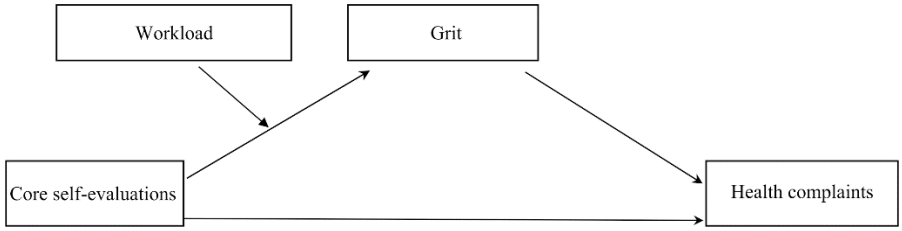

Figure 1. The theoretical model

Methodology

Study design

The design of this study is cross-sectional, with the data being collected through an online questionnaire within a set time frame in 2022 and further analyzed statistically.

Participants and procedure

Participants were recruited with the help of HR department representatives from different organizations and using social media platforms (e.g., Facebook and LinkedIn). Based on the announcement about the research sent to various organizations, interested employees were self-selected for the study. An online questionnaire was created for data collection through the QuestionPro platform. Participants employed for at least three months within an organization were eligible. A convenience sample was used. Thus, 224 people aged between 23 and 64 (M = 44.97, SD = 10.85) voluntarily participated in this study. The sample comprised 55.4% female participants and 44.6% males.

Measures

CSE was measured using the Core Self-Evaluation Scale developed by Judge et al. (2003). This scale measures core self-evaluations as a single construct and does not include subscales for its components (self-efficacy, self-esteem, locus of control, and neuroticism). Each of the twelve items was scored on a Likert scale from 1 to 5 (1 = *strongly disagree*, 5 = *strongly agree*). The scale's internal consistency was good, with Cronbach's alpha coefficient being .84.

Mental health complaints were assessed with the Romanian translation of the MHI-5 screening test by Berwick et al. (1991) (Vîrgă & Iliescu, 2017). It comprises five items (e.g., "During the past month, how often have you felt down and sad?") rated on a 6-point Likert scale (1 = *never*, 6 = *always*). A high score indicated poor mental health. The scale's internal consistency was good, with Cronbach's alpha coefficient being .77.

Grit was measured with the short scale developed by Duckworth and Quinn (2009). The scale consists of eight items and has two subscales: consistency of interest (example item "I often set a goal to achieve but later choose another goal.") and persistence of effort (example item "I finish whatever I start."). The items were rated on a 5-point Likert scale, where 1 means "*does not suit me very well*" and 5 "*suits me very well*". The internal consistency of the scale was good, with Cronbach's alpha coefficient being .72; also, the internal consistency was good for the two subscales: the consistency of the interest subscale (Cronbach's alpha = .82) and the persistence of effort subscale (Cronbach's alpha = .72).

Workload was measured using the scale from the Work Experience and Evaluation Questionnaire (QEEW; Van Veldhoven & Meijman, 1994). This includes five items (example item: Do you have too much work?) rated on a 5-point Likert scale (1 = *never*, 5 = *always*). The internal consistency of the scale was good (Cronbach's alpha =.87).

Results

The statistical analysis of the collected data was carried out using the SPSS for Windows v. 22.0 program, and the mediated moderation model (Model 7) was estimated with the PROCESS macro in SPSS.

Table 1 shows the correlation analysis and the descriptive statistics. Thus, CSE correlated positively and significantly with grit ($r = .51$, $p < 0.01$) and negatively and significantly with mental health complaints ($r = -.58$, $p < 0.01$), and with workload ($r = -.14$, $p < 0.05$). Grit was negatively and significantly related to mental health complaints and workload ($r = -.45$, respectively, $r = -.21$ $p < 0.05$). Finally, the workload was positively and significantly related to mental health complaints ($r = .34$, $p < 0.01$).

We used model 7 from PROCESS macro to test our hypotheses; the results are shown in *Table 2*, and the coefficients are from a bootstrap analysis.

Table 1. *Descriptive statistics and correlation between variables (N=224)*

Variables	*M*	*SD*	1	2	3	4
Core self-evaluation	42.87	6.47	-			
Workload	13.63	4.44	-.14*	-		
Mental health complaints	13.09	4.11	-.58**	.34**	-	
Grit	30.64	4.78	.51**	-.12*	-.45**	-

** $p < .01$, * $p < .05$

Table 2. *Mediated moderation indicator table*

Variables	Outcome					
	Grit			Mental Health Complaints		
	Coeff.	SE	p	Coeff.	SE	p
Core self-evaluation	.38*	.04	<.001	-.30*	.03	<.001
Workload	-.04	.06	.48	-	-	-
Core self-evaluation * Workload	.02*	.009	.01	-	-	-
Grit	-	-	-	-.18*	.05	<.001
	R^2=.29			R^2=.37		
	F (3,220) = 30.18*, p<.00			F (2,221) = 65.82*, p<.001		

** $p < .01$, * $p < .05$

First, the PROCESS analysis showed that CSE is negatively and significantly related to mental health complaints (b = -.30, p<.001), which confirms Hypothesis 1. A high level of CSE predicts lower mental health complaints. Second, the result showed that CSE is positively and significantly related to grit, offering support for Hypothesis 2. Hypothesis 3 was confirmed too, and grit is significantly negatively associated with mental health complaints (b = -.18, p<.01). A high level of grit predicts lower health complaints. We also tested if grit mediates the relationship between CSE and health complaints. Based on a total of 5000 replications (corrected and accelerated bias), bootstrap analyses presented in Table 2 show a significant partial mediation effect of grit.

Finally, we explored the moderation effect of workload. There is a statistically significant positive moderating effect of workload on the relationship between CSE and grit, the interaction variable being significant (b = .02, p<.05). As seen in Figure 2, the relationship between CSE and grit is slightly stronger for people who experience higher levels of workload.

Discussions

This paper investigated the mediating relationship of the grit concept in the relationship between CSE and mental health complaints. Also, we examined the moderating role of workload in the relationship between CSE and grit based on COR and JD-R theories.

First, CSE was negatively associated with mental health complaints. Thus, based on COR theory, these results align with previous studies results. The meta-analysis by McKee-Ryan et al. (2005) established a strong link between CSE and the physical and mental health of the unemployed.

Table 3. *Indirect effects of the mediation model*

Value	Workload	Effect	SE	95% Bootstrap CI
Mean -SD	-4.33	-.05	.02	[-.095; -.015]
Mean	0	-.07	.02	[-.117; -.023]
Mean +SD	4.33	-.08	.03	[-.147; -.030]
Index of moderated mediation	-.004		.002	[-.0088;-.0007]

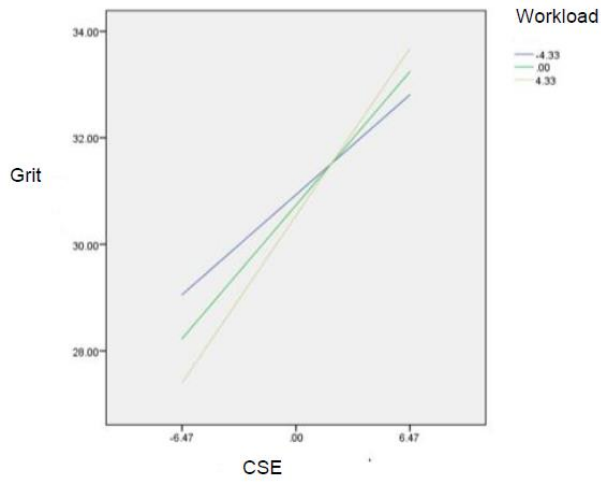

Figure 2. Moderation effect of workload

Also, in the meta-analysis by Chang et al. (2012), a negative association between CSE and mental health complaints was established. Other studies on student samples directly confirm the association between CSE and mental health symptoms (Zhang & Zhao, 2009; Xiang et al., 2019). Accordingly, employees who have a habit of consistently viewing themselves in a favorable light in various circumstances and believe that they are competent, deserving individuals who possess control over their lives (high CSE) would be negatively associated with mental health complaints (they will be less demoralized, sad or agitated).

Second, the results confirmed a significant positive association between CSE and grit. Previous studies have shown positive associations of CSE components with grit. Muenks et al. (2017) established the link between grit and self-efficacy, and Weisskirch (2016) showed a strong link with self-esteem. Also, Young and Kleiman (2015) showed the association between grit and emotional stability, and Çelik and Sarıçam (2018) revealed the link between grit and locus of control. Therefore, employees with a high CSE, those who consistently evaluate themselves positively in different situations and perceive themselves as competent, valuable people with power over their existence, would be positively associated with the grit construct. This allows them to focus on long-term goals and persist in their efforts, even when facing challenges and setbacks.

Third, the results supported the negative association between grit and mental health complaints. The results obtained are consistent with most of the studies that have shown that grit is associated with lower depression (Anestis & Selby, 2015; Jin & Kim, 2017; Lovering et al., 2015; Musumari et al., 2018; Datu, King, Valdez, & Eala, 2019) and with a decrease in anxiety levels (Musumari et al., 2018). Thus, employees with higher perseverance and passion for long-term goals tend to report fewer mental health complaints.

Forth, the partial mediating role of grit in the relationship between CSE and mental health complaints was demonstrated. A high level of CSE leads to a high level of grit and lower health complaints. Because mediation is partial, grit does not fully explain the relationship between CSE and health complaints. This result complements the three previously tested hypotheses. Both CSE and grit are characterized by positive affectivity. Related to CSE, employees with high levels of this construct have been shown to have a strong sensitivity to positive information and experience more positive emotions and situations in which they feel happy (Chang et al., 2012). In the review of grit by Schimschal et al. (2021), positive thought and behavior patterns, including self-efficacy, positive emotions, and goal commitment, were identified as antecedents (thus, CSE can be an antecedent). A possible explanation for this is given by Fredrickson (2001), who explains that positivity broadens an individual's perspective, increasing one's ability to explore different interests and build commitment by overcoming challenges. The second explanation is that in the face of adversity, people with higher levels of self-efficacy persevere through higher levels of confidence in their abilities and ability to succeed. As argued earlier, the literature provides ample evidence of the link between CSE and mental health complaints, on the one side, and grit and health complaints, on the other side. At the base of these relationships is the COR theory; thus, CSE with grit together form a pool of personal resources (grit is considered a personal resource that can be developed, and CSE is viewed as a personality trait). According to this theory, as people experience resource gains, they report more health and well-being (Ten Brummelhuis & Bakker, 2012). At the same time, the decrease in resources leads to a reduction in health and well-being.

Fifth, the moderating role of workload in the relation between CSE and grit, postulated by hypothesis, was proved. Thus, people with a high workload experience a stronger connection between CSE and grit. Still, the association is present and less intense for people with a lower workload level (see Figure 2). Although according to the JD-R theory, individuals tend to utilize their resources more in stressful situations, even those brought about by high demands (Demerouti & Bakker, 2011). De Reuver, Van de Voorde, and Kilroy (2021) found that an increased workload moderated the association between opportunity-enhancing high-performance work system practices and absenteeism.

Another explanation for these results relates to how workload is perceived. Employees may see stressors (in our case, workload) as challenges or obstacles to achieving goals. Gritty people show greater resilience and determination in threatening contexts (Maddi et al., 2012). Despite obstacles, they are oriented toward reaching long-term goals through perseverance and passion. Muenks, Yang, and Wigfield (2018) argue that the more adaptive response experienced by those high in grit to high workload may result from self-regulatory processes, such as maintaining a sense of self-efficacy.

Theoretical implications

As theoretical implications for grit, a relatively recent construct in the specialized literature, this paper confirmed grit's connection with the health status of employees. Moreover, the study brings more knowledge to understanding grit's antecedents. In current studies, only positive emotions, self-efficacy, and goal commitment are predicted as antecedents (Schimschal et al., 2021), proving that CSE, a higher construct, can be considered an antecedent. Another theoretical implication can be related to the workload mobilizing personal resources, increasing the intensity of the relationship between CSE and grit. The results are based on the recent extension of the original JD-R model (Xanthopoulou et al., 2007) and support the critical role of personal resources at work. Also, grit is a partial mediator between CSE and health complaints, serving as a link between CSE and mental health complaints. It plays a processual role in forming a pool of resources with CSE to reduce health complaints under high workload conditions.

Practical implications

As a result of its motivational origins, grit is thought to be responsive to behavioral modification, modeling, training, and development, as well as to interventions that target the specific motivations underlying work interests (Jordan, Wihler, Hochwarter, & Ferris, 2019). According to Kautz and colleagues (2014), non-cognitive skills develop through interactions with the external environment. Because context is an essential enabler of non-cognitive skills, employees need opportunities for trial-and-error and self-reflection for grit to emerge and mature (Duckworth, 2016). They must engage in deliberate practice, with endless opportunities to explore and develop their interests within the broader goal-setting process. Also, employees' work interests must be encouraged and re-encouraged frequently for goal hierarchies to consolidate. In addition, employees need opportunities to develop goals and strategies for accomplishing them through tasks and reflecting on appropriate methods (Duckworth, 2016). Reflection on previous goals serves as a reference point for further adaptation. Thus, managers need to create an engaging and encouraging work context that provides stimulation and feedback to employees (Bashant, 2014).

Developing a growth mindset

Because gritty individuals are more likely to have a growth mindset at their core, scientists argue that the distinction between a growth and a fixed mindset is critical to understanding how grit develops over time (Duckworth, 2016; Jordan, Ferris, Hochwarter, & Wright, 2019). Individuals with a fixed mindset believe intelligence is inherent and unchanging (Dweck, 2006). In comparison, those with a growth mindset believe that personal attributes and abilities are likely to change and thus can be developed over time (Lee, 2018). Therefore, the alternative offered by Jordan et al. (2019) is for managers to provide access to workshops highlighting the malleable nature of skills and the ever-growing potential of human capacity. As part of this training, managers should give the employees neuropsychological research demonstrating our skills' developmental nature throughout life. Managers can also use counter-attitudinal reflection by asking employees to identify a situation in their lives that they initially struggled with but now on reflection considered relatively easy to complete (Heslin, 2010). Overall, just like a muscle when properly exercised, the opportunities for growth and development in goal setting are endless.

Limitations and suggestions for future research

A first limitation relates to the cross-sectional design of the paper, which prevents testing or making causal claims. Future studies based on an experimental or longitudinal design may assist in establishing causality. Another limitation and, simultaneously, a research direction is measuring the workload as a central dimension. Future studies can approach workload from two perspectives to better understand the moderating relationship, quantitative and qualitative. Future longitudinal studies can better capture the dynamics of the relationships between variables, and this can also be done by using samples of participants from specific work domains.

Conclusions

This paper examined the role of grit in the relationship between CSE and mental health complaints. CSE, as individuals' beliefs about their worth and competence, was related to mental health complaints. Grit has been shown to mediate the relationship between CSE and health complaints. At the same time, the moderating role of workload in the relationship between CSE and grit was highlighted. Therefore, individuals with higher workloads demonstrate a stronger association between their CSE and their perseverance and passion for long-term goals.

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RESEARCH ARTICLE

Meaningful Work and Counterproductive Work Behaviors: A Serial Mediation

ALEXANDRU-ANDREI SÎRBU
Assessment and Individual Differences Lab, University of Bucharest, Romania

IOANA EMILIA DOROBANȚU
Assessment and Individual Differences Lab, University of Bucharest, Romania

BOGDAN OPREA
Assessment and Individual Differences Lab, University of Bucharest, Romania

ANDREI ION*
Assessment and Individual Differences Lab, University of Bucharest, Romania

Abstract

Counterproductive work behaviors (CWB) are a set of volitional actions that stem from an intention to harm organizations and their stakeholders (e.g., employees, clients, investors). While, increasingly, more research has been conducted with the aim to explain, predict and prevent CWB from occurring, very little research has investigated the role of motivational constructs such as meaningful work in mitigating the emergence of CWB. The present study draws on The Theory of Purposeful Work Behavior to argue that meaningful work can play a significant role in preventing CWB, and that job satisfaction and organizational commitment serve as mediating factors in the link between meaningful work and CWB. A total of 237 participants participated in a serial mediation, cross-sectional study. The results support the indirect effect of meaningful work on CWB, via job satisfaction and organizational commitment. We conclude that meaningful work is an important factor that is capable of deterring CWB by triggering relevant job attitudes.

Keywords

meaningful work, counter-productive work behaviors, serial mediation

Counterproductive work behaviors (CWB) consist of volitional acts that harm or intend to harm organizations and their stakeholders (Spector & Fox, 2002). CWB is rather prevalent in the workplace, and a plethora of studies have found that employees' CWB negatively impacts companies, colleagues and clients alike (e.g., Tepper et al., 2017; Howard et al., 2020). Counterproductive work behaviors serve as an umbrella term encompassing a cluster of ever-expanding harmful behaviors at work, such as aggression, transgression, or retaliation (Spector and Fox, 2010). Any behavior that can or might cause harm to others or the organization is deemed as a counterproductive behavior (Sackett, 2002; Spector and Fox, 2002). More insidious examples include employees chatting on social media during work hours, complaining about leaders and the company, job hopping, and corruption (Wang et al., 2020).

*Correspondence concerning this article should be addressed to Andrei Ion, Assessment and Individual Differences Lab, University of Bucharest, 50 Panduri St., 5th District, Bucharest, Romania, University of Bucharest, Romania. Email: andrei.ion@fpse.unibuc.ro

More extreme examples of CWBs include huge scandals such as the Facebook–Cambridge Analytica data scandal (Wong, 2019) or the Siemens scandal (Venard, 2018), culminating in extensive fines and other repercussions (Davies & Rushe, 2019). Despite its prevalence and impact, a growing number of studies point out that CWBs are not exclusively perpetrated by ill intended, unprincipled individuals (Bandura, 2016; Moore & Gino, 2013; Newman et al., 2020), instead, evidence reveals how under certain conditions, employees with no precedent whatsoever in this regard can also engage in CWBs (Bandura, 2016; Moore & Gino, 2013; Newman et al., 2020; Welsh et al., 2020; Xi et al., 2021).

Although CWB are one of the three major sub-domains of job performance (e.g., Sackett & Lievens, 2008) and while the cumulative evidence with regard to key social and psychological processes that explain the adoption and manifestation of counterproductive work behavior continues to grow (Belschak et al., 2018; Chugh & Kern, 2016; Welsh et al., 2015), much less is known about the individual or contextual factors that might prevent engagement in CWBs.

One promising concept which can act as a deterrent for counterproductive work behavior is meaningful work, a concept defined by Pratt and Ashforth (2003) as work that is personally significant and worthwhile. Steger and colleagues (2012) proposed a three-dimensional model of meaningful work that comprises (1) positive meaning in work, (2) meaning making, and (3) greater good. Positive meaning is the subjective experience that what one is doing has personal significance. Meaning making is the experience that work attributes to meaning in life as a whole. Greater good is the desire to make a positive impact on others. The concept is treated from a subjective experience perspective.

A slew of research published recently has shown that employees who consider their work to be meaningful are more productive, more satisfied and they're less likely to leave the organization (Allan et al., 2019; Bailey, Yeoman, et al., 2018) and they are also healthier, happier, more resistant to stressful situations, and have a purpose in life (Robertson et al., 2019).

While a number of studies that investigate the link between meaningful work and job performance have been published (e.g., Lam et al., 2016; Shockley et al., 2016), the focus of the studies has been split between three main types of performance, namely self-rated job performance (Allan et al., 2016; Harris et al., 2007), organizational citizenship behaviors (Lam et al., 2016; Steger et al., 2012), and withdrawal intentions (Arnoux-Nicolas et al., 2016).

In a meta-analysis conducted by Allan and colleagues (2019) that utilized meta-analytic structural equation modelling (MASEM), meaningful work has been shown to predict, via a mediated model, a variety of proximal and distal outcomes. The best MASEM fitting model identified in the study was the one in which meaningful work predicted work engagement, organizational commitment, and job satisfaction and these variables, subsequently predicted self-rated performance, organizational citizenship behaviors, and withdrawal intentions (Allan et al., 2019).

Of particular interest for the present study is the fact that the above-mentioned study's findings highlight the indirect effects that stem from meaningful and impact withdrawal intentions, a subtype of counterproductive work behaviors (Carpenter & Berry, 2017). The MASEM pathways from meaningful work to withdrawal intentions were significant via work engagement (95% CI [0.5, 0.10]), job satisfaction (95% CI [−0.46, −0.41]), and organizational commitment (95% CI [−0.10, −0.05]).

The conceptual model which can best integrate and explain these findings is currently The Theory of Purposeful Work Behavior (Barrick, Mount, & Li, 2013) that outlines a framework which encompasses both antecedents and outcomes of meaningful work. The theory postulates that the experience of meaningful work is generated by the interaction between purposeful goal strivings (which themselves stem from the individual level of personality traits) and task and social job characteristics, and that this experienced meaningfulness is able, in turn, to influence a myriad of work outcomes, among which counterproductive work behaviors is explicitly mentioned. Unfortunately, the

theory does not advance specific testable hypotheses on the potential mechanism that link meaningful work to counterproductive work behaviors and simply specifies task-specific motivation processes (namely, self-efficacy, action goals, expectations) as mediating factors between meaningful work and job satisfaction and performance. This proposed mechanism currently lacks the empirical support needed to validate this part of the theory and the conceptual and measurement ambiguity of the explicitly proposed factors hinders research efforts.

Thus, in order to better integrate the available theory with the available empirical findings, we propose an alternative mechanism through which meaningful work impacts counterproductive work behaviors based on Allan and colleagues' (2019) meta-analytical findings and, in order to broaden the scope of these results we also test this link while taking into account a broader conceptualization of counterproductive work behaviors which includes withdrawal as well as employer-oriented sabotage, verbal abuse towards colleagues, and theft (Spector et al., 2010).

Building on the rationale above, this study analyses the relationship between meaningful work and counterproductive work behaviors, using job satisfaction and organizational commitment as mediators for this association due to these constructs having been found to act as proximal outcomes of meaningful work that in turn predict different types of work performance, including withdrawal, a subtype of counterproductive work behavior (Allan et al., 2019).

Job satisfaction is defined as the extent to which people like (or dislike) their jobs (Spector, 1997) while organizational commitment is defined as the employee's acceptance of organizational goals and values, willingness to exert effort on behalf of the organization, and desire to maintain membership in the organization (Meyer et al., 2002). We propose that job satisfaction and organizational commitment could mediate the relationship between meaningful work and counterproductive work behaviors (see Figure 1) because these two variables have been shown to act as mediators between meaningful work and other performance related constructs and as they are known to be negatively related to counterproductive work behaviors (Allan et al., 2019; Meyer et al., 2002; Scott & Lewis, 2017).

With regards to the directionality of the mediating relationships, we propose that, in our model, job satisfaction predicts organizational commitment and not the other way around. This is due to the conceptualization of meaningful work that emphasizes the subjective value of and importance to oneself of one's work which seems more closely linked, from a conceptual standpoint, to job satisfaction since this attitude is formed based on characteristics that have a more direct, unmitigated impact on one's perception of one's work. In comparison acceptance of organizational goals and values and willingness to exert effort on behalf of one's employer seem to us to be more distal effects of meaningful work as meaningful work has been shown to lead to job satisfaction even in the absence of organizational commitment (Steger et al., 2012).

That being said, while research on the causal relationship between job satisfaction and organizational commitment does not seem to have reached consensus, with studies pointing to job satisfaction predicting organizational commitment, to organizational commitment predicting job satisfaction and, to the two constructs reciprocally influencing each other (e.g., Vandenberg and Lance, 1992; Curry et al., 1986; Currivan, 1999; Huang & Hsiao, 2007), the cumulative evidence does point towards the conclusion that the two constructs are highly correlated with each other, yet conceptually distinct (Woznyj et al., 2022). This leads us to believe that in order to establish which of these two constructs predicts the other, it is more important to consider the theoretical nature of the relationships included in the study, which in our case point toward job satisfaction being the predictor of organizational commitment and not vice versa.

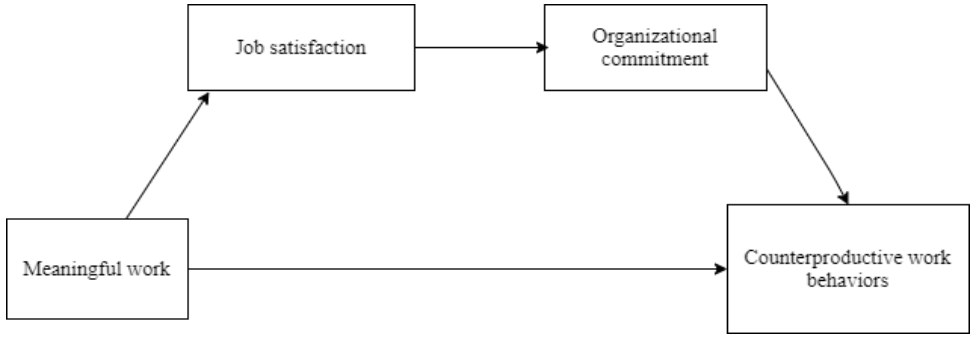

Figure 1. Hypothesized theoretical model

Therefore, we expect that employees who experience higher levels of meaningful work are more likely to also experience job satisfaction and organizational commitment which, in turn, will negatively impact counterproductive work behaviors:

Hypothesis 1: Meaningful work is negatively related to counterproductive work behaviors.

Hypothesis 2: The relationship between meaningful work and counterproductive work behaviors is serial mediated by job satisfaction and organizational commitment.

Method

Procedure and participants

A convenience sampling method was used for this study. The instruments were shared on Facebook and LinkedIn groups through an online questionnaire. The questionnaire also contained a GDPR statement which informed the respondents of their data protection. Those who completed the questionnaire didn´t receive any financial compensation but they had the possibility to learn more about the research. The sample comprised 237 respondents from Romania, of whom 187 were females (78.9%), with a mean age of 38.9, ranging from 21 to 62 years. The majority of the participants reported having obtained an academic degree (64.5%), with 28.6% reporting to have graduated high school, and 6.9% reporting to have graduated technical or vocational colleges. 72.9% of the respondents indicated that they work for a privately owned organization, while 21.5% indicated that they work for a governmental institution, and 5.48% indicated working for both. A large variety of industries are represented in our sample, such as IT, Health services, Public administration, Marketing, Construction, Energy production and distribution, Banking, Mass Media, NGOs, Education and eCommerce.

Measures

Meaningful work was assessed using *The Work and Meaning Inventory* (*WAMI;* Steger et al., 2012). The inventory is composed of three subscales measuring Positive Meaning (e.g., "I have found a meaningful career"), Meaning-Making through Work (e.g., "My work helps me better understand myself"), and Greater Good Motivations (e.g., "The work I do serves a greater purpose"), totaling 10 items which are rated on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Job satisfaction was assessed using the three-item *Job satisfaction- Subscale from the Michigan Organizational Assessment Questionnaire* (Tepper, 2000). A sample item was "All in all, I am satisfied with my job". The items are rated on a 7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree).

Organizational commitment was assessed using the 9-item scale of *Organizational Commitment* (Cook & Wall, 1980). The scale contains items such as: "I feel myself to be part of the organization" and "The offer of a bit more money with another employer would not seriously make me think of changing my job". The items are rated on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Counterproductive work behaviors were assessed using the *Counterproductive Work Behavior Checklist (CWB-C;* Spector et al., 2010). The scale consists of 10 items (e.g., "Told people outside the job what a lousy place you work for", "Insulted or made fun of someone at work"). The items are rated on a 5-point Likert scale ranging from 1 (Never) to 5 (Everyday).

Data analysis

SPSS, version 23, was used for the data analysis, and the serial mediation model was tested with the PROCESS add-on, model 6 (Hayes, 2017). The PROCESS add-on is a statistical instrument based on OLS (*Ordinary Least Squares*) regression. It is used to estimate the direct and indirect effects in mediation models, single or multiple way interactions in moderation models, and for indirect conditional estimate effects in mediated moderations with one or more mediators or moderators (*PROCESS Macro for SPSS and SAS*, 2021). The indirect effect was tested through the bootstrap method, with a 95% confidence interval.

Results

Preliminary data analysis

We calculated the Mahalanobis, Cooks, and Leverage distance values to check for outliers in our data (Field, 2018) and we excluded 14 cases, thus resulting a final sample of 223 participants. After that, we ran a correlation analysis between the variables and then we analyzed the tolerance level and the VIF (Variance Inflation Factor) because there were certain correlations bigger than r > .30. The tolerance level declared values smaller than the threshold value of .70 but a value of VIF < 10 signaled that there wasn't any significant collinearity between the variables included in the study (Field, 2018). We attribute the low tolerance level obtained on the fact that job satisfaction and organizational commitment have been shown to correlate strongly which each other (Woznyj et al., 2022).

Descriptive statistics and correlations

Table 1 presents the mean, standard deviation, and correlations between the 4 variables. Meaningful work significantly correlated with both job satisfaction (r = .57) and organizational commitment (r = .61). The correlation between meaningful work and counterproductive work behaviors (r = -.17) provides support for our first hypothesis, which proposed that meaningful work is negatively associated with counterproductive work behaviors. The biggest positive correlation is between job satisfaction and organizational commitment (r = .71), followed by the correlation between meaningful work and organizational commitment (r = .61). Both job satisfaction and organizational commitment were negatively correlated with counterproductive work behaviors at highly similar coefficients (r = -.35). All the correlations are significant at p < .01, namely p < .001.

Table 1. *Descriptive statistics and correlations*

Variables	M	SD	1	2	3	4	5	6
1. Age	38.9	12.48	-	-	-	-	-	-
2. Gender	1.79	0.41	.12	-	-	-	-	-
3. Meaningful work	38.26	9.02	-.04	.01	(.93)	-	-	-
4. Job satisfaction	12.11	2.488	.01	-.01	.572**	(.74)	-	-
5. Organizational commitment	32.96	6.667	.03	.03	.617**	.715**	(.80)	-
6. Counterproductive work behaviors	17.36	4.490	-.09	-.01	-.172*	-.354**	-.359**	(.79)

Notes: Gender was encoded 1 for male, 2 for female; scale reliabilities on the diagonal. $^{*}p$ < .01; $^{**}p$ < .001, N = 223

The serial mediation results show that the total indirect effect of MW on CWB is supported by the data. Subsequently, both job satisfaction (b_1 = -.43, t = -2.55, p < .05) and organizational commitment are negatively related to CWB (b_2 = -.18, t = -2.87, p < .001).

We have used the PROCESS add-on (version 3.4) to test the serial mediation (Hayes, 2013) and model 6 for serial mediation. Figure 2 presents the mediation model in which meaningful work influences counterproductive work behaviors through 4 paths (a_1b_1, a_2b_2, $a_1d_{21}b_2$, $c´$). The arrows indicate the model's path and a_1, a_2, b_1, b_2, d_{21}, c, and $c´$ are the path's coefficients.

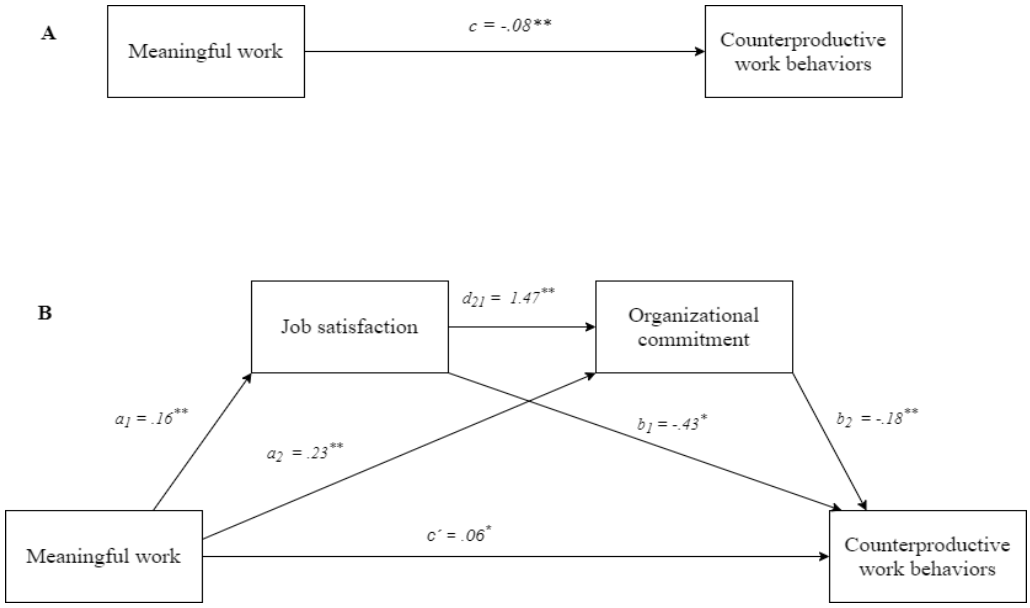

Figure 2. The statistical diagram of the serial mediation model, **p < .001, *p < .05

Figure 2A presents the total effect of meaningful work on counterproductive work behaviors (path c), without the mediators, meaningful work having a significant effect on the dependent variable (c = -.08, p < .001). In Figure 2B, the direct effect (path $c´$) is .06 (p < .05) when the mediators are added. This means the total indirect effect of MW on counterproductive work behaviors, through job satisfaction and organizational commitment, is significant, resulting in a partial mediation. As displayed in Table 2, the 95% bias-corrected confidence interval produced by the PROCESS Macro, based on 5000 bootstraps; confirms that the total indirect effect is negative and significant (-.14). The first indirect effect, MW on counterproductive work behaviors, through job satisfaction ($X \rightarrow M1 \rightarrow Y$), *a1b1* = -.07 is negative and significant (CI 95% between -.12 and -.02), and the second indirect effect, meaningful work on counterproductive work behaviors, through organizational commitment ($X \rightarrow M2 \rightarrow Y$), *a2b2* = -.04 is negative and significant (CI 95% between -.07 and -.01). The third indirect effect ($X \rightarrow M_1 \rightarrow M_2 \rightarrow Y$), estimated as $a_1d_{21}b_2$ = -.01 is also negative and significant.

Thus, the data analysis results support an indirect effect of meaningful work on counterproductive work behaviors, with job satisfaction and organizational commitment as serial mediators. Table 2 presents the values of the total, direct and indirect effects.

Table 2. *Total effect, direct and indirect effect of meaningful work on the dependent variable through the mediators*

Effect	*Point estimate*	*SE*	*t*	*p*	*Lower*	*Upper*
Total effect	-.085	.033	-2.589	.010**	-.150	-.020
Direct effect	.064	.040	1.601	.110*	-.014	.114
Total indirect effect	-.149	.029			-.209	-.096
Indirect effect (X → M1→Y)	-.066	.026			-.119	-.016
Indirect effect (X→M2→Y)	-.041	.015			-.075	-.015
Indirect effect (X→M1→M2→Y)	-.041	.014			-.074	-.015

*Note: *p < .05, **p < .01*

Discussion

The aim of this study is twofold. First, we were interested in advancing the literature on meaningful work and expanding the Theory of Purposeful Work Behavior (Barrick et al., 2013) by testing a potential mechanism through which meaningful work can predict valuable outcomes for organizations, namely counterproductive work behaviors. Second, we answer a call for more research on preventing counterproductive work behavior (Fida et al., 2021), a set of behaviors which are widespread and which lead to serious consequences for organizations across the globe.

We investigated a potential relationship between meaningful work and counterproductive work behaviors, two constructs that have not, to our knowledge, been linked in the literature to date, and we proposed a mechanism through which meaningful work can have an indirect effect on counterproductive work behaviors, by suggesting that job satisfaction and organizational commitment could act as serial mediators and proximal attitudes that have a deterring effect on counterproductive work behaviors (Judge et al., 2006).

Overall, our findings show support for the negative association between meaningful work and counterproductive work behaviors, and also supported the serial mediation proposed. Meaningful work was strongly related to both job satisfaction and organizational commitment, which is consistent with what we know from the literature (see Allan et al., 2019; Fairlie, 2011; Jiang & Johnson, 2017) and it was also negatively related, both directly and indirectly, with counterproductive work behaviors.

A potential explanation for the relationship between meaningful work and counterproductive work behaviors might be traced to the scientific literature on illegitimate tasks (Zhao et al., 2022). Illegitimate tasks are perceived as unnecessary or unreasonable work assignments that violate what can reasonably be expected of a given employee (Zhou et al., 2018; Semmer et al., 2007; Semmer et al., 2015). This type of task has been consistently shown to robustly predict counterproductive work behaviors (Zhao et al., 2022; Zhou et al., 2018) and they have also been identified in previous research as contributing to the experience of meaningless work, which can be defined as the subjective experience of perceiving one's work as being pointless, unfulfilling and worthless (Bailey & Madden, 2016).

Since illegitimate tasks are of unreasonable and unnecessary tasks which one might perceive as meaningless work, and since this type of task can be perceived by an employee as threatening to one's professional identity and perception of respect at work (Semmer et al., 2010) it is of no surprise that

they have also been classified by researchers as a particular case of injustice (Meier & Semmer, 2018; Semmer et al., 2010, 2015). Thus, an employee might blame their employer for being unfairly assigned tasks that are unreasonable, beyond the scope of their work and unnecessary leading to perceptions of unfairness and ultimately, to counterproductive work behaviors (Zhou et al., 2018).

Therefore, it would be reasonable to expect that having the perception of one's work as being meaningful might deter counterproductive work behaviors as, the latter is a facilitator of attitudes such as job satisfaction and organizational commitment which are responsible for desirable outcomes such as organizational citizenship behaviors (Allan et al., 2019) and as meaningful work has been consistently liked with task significance, which is defined as the degree to which employees perceive their work as significantly impacting other people and which is a desirable characteristic of one's work (Allan et al., 2017).

Theoretical and practical implications

Based on the Theory of Purposeful Work Behavior (Barrick, Mount, & Li, 2013), this study makes a relevant theoretical contribution by providing empirical inquiry and support for a part of the theory which is considerably less defined, namely the processes through which meaningful work impacts work outcomes and by proposing a path through which meaningful work can reduce the occurrence of counterproductive work behaviors, thereby also contributing to the sparse literature on factors that help prevent counterproductive work behaviors. While there are a number of previous studies that have focused on the relationship between meaningful work and withdrawal behaviors (see Allen et al., 2019), and while withdrawal has been identified as being a subset of counterproductive work behaviors (Carpenter & Berry, 2017), no other study to date has expanded the investigation to other concepts that are also part of the counterproductive work behaviors construct. Notably, our study has adopted a broader definition of counterproductive work behaviors which encompasses abuse toward others, production deviance, sabotage and theft (Spector et al., 2006).

From a practical standpoint, our study highlights multiple beneficial effects that meaningful work has in the workplace, namely its impact in preventing counterproductive work behaviors to its positive effect on job satisfaction and organizational commitment. As counterproductive work behaviors have been shown to be highly damaging for both organizations and employees alike, the importance of identifying and implementing measures aimed at deterring employees from exhibiting such behaviors is paramount.

Fortunately, research on factors that promote meaningful work provides many recommendations that organizations can draw from and apply in the workplace (Lysova et al., 2019) and successful interventions aimed at promoting meaningful work have also been researched (Fletcher & Schofield, 2021). Some of the science-backed recommended solutions that employers and practitioners in the field of work and organizational psychology can successfully implement to bolster meaningful work are: (a) developing HR practices that are focused on the engagement and development of the employee (upskilling and reskilling programs, career mentorship, effective, extensive and enjoyable socialization programs, etc.), (b) communicating the organizational mission, (c) promoting ethical leadership, (d) implementing job crafting opportunities and job co-design processes (processes in which both the employee and their manager have the opportunity to define the scope of the given role), (e) working in safe and fair conditions and many others (Lysova et al., 2019).

Limitations and future research directions

Several limitations of the current study could be addressed in future research. The first limitation is that we used a cross-sectional design, which does not allow us to infer causality between the variables measured. This means that future studies should use a longitudinal, experimental, or quasi-experimental design to establish a better

casualty between these variables. Secondly, the use of self-reported questionnaires implies that our data may include the risk of common variance bias (Podsakoff et al., 2003) and other response biases such as socially desirable responding. In our defense, Conway and Lance (2010) consider that self-report measurements are the only way to measure subjective feelings and emotions, such as the meaningfulness of one's work. Additionally, we collected no identification data from our respondents and we explicitly communicated that we are in no way associated with any employer for which our participants might be working and we hope that this decreased a potential inclination to respond favorably to the questionnaire.

Another limitation of the study is that we used a convenience sample via online social media platforms. Future studies should use a randomized sample, as well as a much bigger sample, that is more representative of the general population.

Finally, future studies may want to further expand the number of concepts that fall under the conceptual umbrella of counterproductive work behaviors and include, for instance, cyberloafing and cyberslacking (Tandon et al., 2022) which, although are subtypes of counterproductive work behavior, they were not taken into consideration in this study or focus more on highlighting the impact of meaningful work on individual subtypes of counterproductive work behaviors (such as abuse, theft or production deviance) rather that a general unidimensional approach of the construct.

Conclusions

Our study contributes to the understanding of meaningful work by outlining and providing support for a mechanism through which it can negatively impact counterproductive work behaviors, namely by highlighting the role of job satisfaction and organizational commitment as serial mediators, adding to the slew of beneficial outcomes which can be significantly influenced by employees' perception of their work as being meaningful. The implications of our results are both theoretical and practical: first, because they provide empirical support for the part of the Theory of Purposeful Work Behavior that details meaningful work's impact on work outcomes and second by drawing attention to yet another benefit that fostering meaningful work can bring to an organization.

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RESEARCH ARTICLE

Grit's Incremental Validity over Non-Cognitive Predictors of Job-Relevant Outcomes

ANDREI ION
Department of Psychology and Cognitive Science, Faculty of Psychology and Educational Sciences, University of Bucharest, Bucharest, Romania
Assessment and Individual Differences Lab, University of Bucharest, Romania

BIANCA IANCU
Department of Psychology, Faculty of Psychology and Educational Sciences, University of Bucharest, Bucharest, Romania

Abstract

This study analyzes grit's validity in predicting several work-relevant outcomes (in-role performance, counter-productive work behaviors, job satisfaction) over the Five-Factor Model, and core self-evaluations. Hierarchical regression analyses were used in order to estimate grit's incremental validity over the canonical five-factor dimensions and core-self-evaluation. Findings indicate that grit does not explain significant amounts of variance in job-related outcomes.

Keywords

grit, personality, core self-evaluations, job satisfaction, counter-productive work behaviors, performance

Research on personality and its implications for various health, work-related or educational outcomes remained popular throughout the decades. In the realm of I/O psychology the general consensus regarding personality's importance in respect to work relevant outcomes shifted radically over the decades, from considering that personality traits are of little relevance in respect to workplace outcomes (e.g., Guion & Gottier, 1965) to asserting their centrality to I/O psychology (Judge et al., 2008).

Meta-analytical reviews expanded our understating regarding personality's contribution to the workplace. The emergence and popularization of the Five Factor Model of Personality (FFM) enabled a unitary approach to measuring and validating the use of personality in work settings. FFM personality traits were identified as robust predictors in respect to various outcomes (e.g.: Barrick and Mount, 1991, Berry et al., 2007, Chiaburu et al., 2011). Personality traits generally outperform other non-cognitive predictors of job performance, most of their explanatory power in respect to job performance being linked to conscientiousness (e.g., Schmidt & Hunter, 1998). Relying on personality measures for selection purposes, not only increases the predictive validity of the selection system, but

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*Correspondence concerning this article should be addressed to Bianca Iancu, Department of Psychology, University of Bucharest, 90th Panduri Ave., Bucharest, 030018, Romania. Tel/Fax: 0040 756 696285. Email: bianca-adriana.iancu41@s.fpse.unibuc.ro

it also reduces the adverse impact against certain protected groups (e.g., Hough et al., 2001). To date, most of the criticism surrounding the validity and utility of personality dimensions in the workplace has been dispelled (e.g., Sackett & Lievens, 2008).

However, some issues concerning personality's role in the workplace are still unresolved, remaining dormant throughout the past decades. First, one of the most severe criticisms regarding personality in the workplace has to do with its relatively low validity in predicting various work-relevant outcomes, personality traits typically accounting for less that ten percent unique variance in job performance (Woods et al., 2013). This issue remains one of critical unresolved challenges understanding the actual importance of individual differences in the workplace (e.g., Morgeson et al., 2007; Ones et al., 2007). Various "lenses" have been used in order to accurately understand this relationship. One of them consists in exploring dimensions lying beyond the FFM dimensions (e.g., Lee et al., 2005). Second, an early but still relevant criticism consists in the limitation of the FFM in describing personality, more specifically, there are various personality traits not adequately captured within the FFM that might account for supplementary performance-relevant variance (Schneider, et al., 1996).

Drawing from these two limitations, we estimate the incremental validity of a relatively new personality construct, grit, in predicting work-relevant outcomes (job performance and job satisfaction) over the established and widely acclaimed non-cognitive predictors of job performance, more precisely FFM personality traits and core-self evaluations (CSEs).

Grit, a predictor of long-term success

Grit is one of the non-cognitive predictor that received an increased attention over the past couple of decades. As a trait sitting outside of the FFM, grit was defined as "perseverance and passion for long term goals" (Duckworth et al., 2007, p. 1087). Grit has been associated with various life outcomes, accounting for an unique, although relatively small-sized proportion of variance in respect to academic success and job performance over the typical FFM personality traits (Duckworth et al., 2007, Eskreis-Winkler et al., 2014, Ion et al. 2019). However, one issue eliciting vivid debates had to do with grit's insufficient differentiation from conscientiousness. The two constructs seem to have "phenotypic correlations of approximately .70" (Rimfeld et al., 2016). Even so, the passion scale shares less variance with conscientiousness comparing to perseverance (Schmidt et al., 2018), making grit and conscientiousness difficult to differentiate, but not identical (Werner et al., 2019). This lack of differentiation from conscientiousness was also retrieved in a comprehensive via a meta-analytical review (Credé et al., 2017). Consequently, any further explorations regarding grit's potential role in predicting various outcomes, must adequately control potential overlaps with conscientiousness.

While its role in accounting for academic outcomes seems to be supported by empirical findings, grit's importance in respect to occupational or workplace outcomes was not thoroughly identified. For example, grit proved to significantly predict important life outcomes, explaining a unique, although minor variance in academic success or job retention (e.g., Duckworth, 2013; Duckworth & Eskreis-Winkler, 2013; Duckworth et al., 2007; Eskreis-Winkler et al., 2014; Von Culin et al., 2014). This dimension has been negatively related with the number of career changes, suggesting its potential relevance in predicting career stability (Duckworth & Quinn, 2009). Furthermore, grit displayed incremental validity over the Five-Factor dimensions in predicting educational attainment (e.g., Duckworth & Quinn, 2009). Grit scores were predictive of associated college and graduate school grade point averages (e.g., Duckworth & Quinn, 2009). Grit seems to predict job success in teaching positions (e.g., Duckworth et al., 2009). Studies conducted across other domains indicated that grit was a better predictor than self-control in respect to completion of training program (Duckworth et al., 2007). Another recent empirical investigation revealed that grit is positively related with task persistence, especially when persons were on

losing streak (e.g., Lucas et al., 2015). However, the few replications conducted in this domain showed that grit did not always predict academic outcomes. For instance, grit did not predict student academic achievement and course success in a sample of first-year Canadian college students (e.g., Bazelais et al., 2016). Similar results were found in an American study where grit had no predictive validity in relation to school success beyond Conscientiousness (e.g., Ivcevic & Brackett, 2014). Previous empirical research suggested that grit predicted in-role performance and job satisfaction over and beyond FFM personality traits (Ion et al., 2019). However, the findings from this investigation were hampered by some important limitations. First, it was relatively underpowered, having an overall sample of only 170 employees. Second, considering the conceptual criticism surrounding this construct (e.g.: Crede et al, 2017) its overlap with other personality variables might explain its association with job performance and other job-relevant outcomes (Ion, et al., 2019). Hence, it is crucial to establish whether grit can be considered a valid predictor of occupational outcomes while controlling not only for FFM personality traits, but also for other personality constructs relevant in predicting such outcomes, such as core-self evaluations.

To understand whether this new variable could prove to have any relevance in I/O psychology, its relevance for work-related outcomes must be established. In so far, research provided only circumstantial evidence regarding grit's relevance for various occupational outcomes. For instance, Zissman and Ganzach (2020) showed that grit predicted performance only when there was "context-specific passion for work", motivating employees to exert more effort at work even though they are drawn to it naturally in a work environment (Kim et al., 2019). Although, empirical studies tapping into this domain argued that "dedication to achieve long term goals and objectives" explains why people having moderate standings on the strongest predictors of job performance (e.g. cognitive ability), systematically obtain high degrees of job performance. Therefore, gritty people pursue long-term goals and are less discouraged by failure (Credé et al., 2017) due to their ability to "bounce back from stressful or negative emotional experiences" (Stoffel & Cain, 2018). For example, controlling for experience, education and age, grit score predicted entrepreneurs' performance one year later and positively impacted managerial performance (Southwick et al., 2019).

Beyond FFM traits, core-self evaluations

Two decades have passed since Judge et al. (1998) formulated the first description of a broad meta-trait which captures inter-individual differences in evaluations people make about their own person, their environment and the world as a whole. Known as "Core Self Evaluation" (CSE), this concept encompasses four different lower order traits – namely, self-efficacy, self-esteem, locus of control and emotional stability (Judge et al., 1998). Although these traits are not new and have been extensively studied separately, along with CSE came the possibility to explain the complex relations that have been previously found to exist between those lower order traits through a higher order factor (e.g., Erez & Judge, 2001; Judge et al., 2002).

Ever since the outset of the concept, concerns have been raised regarding the redundancy of the CSE when compared to other personality models. Those concerns have meanwhile been addressed by studies which have shown CSE's relevance in terms of the incremental validity it brings - in addition to FFM - in predicting outcomes such as job satisfaction or job performance (e.g., Judge & Bono, 2001; Judge et al., 2003; Judge et al., 1998). Other consequence variables which have been studied along with CSE as antecedent include motivation, job attitudes, job satisfaction, job performance, citizenship behavior, counterproductive work behavior (e.g., Judge et al., 2011).

CSEs consistently predicts job satisfaction (Judge & Bono, 2001). In this meta-analytic paper it was shown that the four components have a relationship with job satisfaction between $\rho = .24$ and $\rho = .45$ (Judge & Bono, 2001) and at an aggregate level of $r = .41$ (Erez & Judge, 2001). Other studies have also

supported these finding (e.g, Judge et al.; Judge et al., 2008). Furthermore, studies conducted in other cultures are also reaching similar results (e.g, Judge et al., 2004). More recently, another meta-analysis conducted by Chang et al. (2012) has shown a similar relationship between CSE and job satisfaction (ρ = .36 and ρs = .44 corrected for randomness).

Apart from predicting job satisfaction, CSEs consistently predict job performance. Its operational validity ranging from ρ = .19, which was the weakest and was found for emotional stability, and ρ =.26, which was the strongest and was found for self-esteem (Judge & Bono, 2001). The average correlation for all four components is ρ =.23. Other studies have identified robust relationship between CSE and objective or subjective job performance (Erez & Judge, 2001). The relationship is generally mediated by motivation (Bono & Judge, 2003). Further evidence come from Chang et al. (2012), who obtained a relationship of ρ = .19 with task performance and ρ = –.17 with counter-productive work behaviors (CWB) the last outcome included. A more recent study shows a more complex relationship between within person fluctuation in CSE and within person fluctuation in task performance and CWB (Debusscher et al., 2016).

Grit and self-efficacy

There is a paucity of investigations regarding the interplay between grit and self-efficacy in predicting various outcomes, ranging from educational attainment to psychological health or to work related outcomes. For example, Usher et al., (2019) explored how the two traits predict educational attainment and broader academic success. Self-efficacy outperformed grit in accounting for variance in teacher ratings of math and reading, and also in academic achievement (Usher et al., 2019). The same investigation reported that self-efficacy fully or partly mediated grit's impact on the various academic outcomes (Usher, et al., 2019). Another empirical investigation reported that both grit and self-efficacy predicted the adoption and maintenance of healthy behaviors (Ciaccio, 2019). A relatively recent meta-analytical review concluded that grit consistently predicted academic achievement across multiple cultures (Lam & Zhou, 2022).

To conclude, we posit that some similarities could be identified between grit and CSE. Namely, just like CSE, grit 1) is also a higher order personality domain, 2) exhibiting similarities with the Five-Factor Model, and 3) is accompanied by bold claims regarding its predictive power for relevant industrial organizational psychology outcomes. At this moment, it could be said that the CSE is a well-established construct in the realm of organizational-relevant individual differences. Therefore, we test whether the increment added by grit in predicting organizational relevant outcomes goes above and beyond that of CSEs.

The overarching objective of the current investigation is bifold: first, we aim to replicate the findings reported by Ion et al., (2019) describing grit as a solid predictor of job performance and job satisfaction over and beyond FFM traits; second, we aim to identify the degree to which grit accounts for job-relevant outcomes over core-self-evaluations, a robust predictor of occupational outcomes.

Methods

Participants

For the purposes of this study, we collected data from 461 Romanian participants, in two samples.

The first sample consisted of 188 adult employees, among them 137 women (73%) and 51 men, with ages between 22 and 60 (*M* = 35.74, *SD* = 6.97). Most participants (107) had a Bachelor degree, 75 participants had a post-university degree, while only 3.2% had a high school degree. About 69% of participants were employed in non-managerial positions, while the rest had managerial roles.

The second sample included 273 participants, 180 women (66%) and 93 men, with ages between 18 and 55 (*M* = 27.78, *SD* = 7.81). About 60% of the participants (166) had a Bachelor degree, 31.9% had a post-university degree, and 7.3% had a high school degree. The majority of participants had non-managerial roles, while almost 30% were in managerial positions.

Measures

All measures were Romanian versions translated according to recommended testing guidelines (Hambleton, 2005). The versions that did not already have a Romanian equivalent were translated by 4 doctoral level psychologists into Romanian from their original English versions and then back-translated in order ensure semantic equivalence.

Personality was measured based on the Five-Factor Model using the 60-item Romanian version of the NEO-FFI (Costa & McCrae, 1992). The five domains were measured with items rated on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). Internal consistencies for the five dimensions ranged between .70 (Neuroticism) and .76 (Extraversion). The inventory employs typical self-report items (e.g. "I rarely feel fearful or anxious").

Core self-evaluations were measured with a 12-item questionnaire comprised of items measuring self-esteem, generalized self-efficacy, locus of control and neuroticism (Judge et al., 2003). One example item of the scale is 'I am filled with doubts about my competence'. The items were rated on a scale from 1 (strongly disagree) to 5 (strongly agree). Internal consistency as measured with Cronbach's Alpha was .81 for Sample 1 and .87 for the second sample.

We used a two-dimensional 12-item inventory to measure grit (Duckworth et al., 2007) which has shown very good psychometric characteristics (Duckworth & Quinn, 2009). Some example items are 'Setbacks don't discourage me' or 'I often set a goal but later choose to pursue a different one', measured on a scale from 1 (not like me at all) to 5 (very much like me). Internal consistency reliability as measured with Cronbach's Alpha was .75 and .77, respectively.

In-role performance. In-role performance was measured with 7 items from an inventory proposed by Williams and Anderson (1991), rated on a five-point scale. An example item of this inventory is 'I adequately fulfil responsibilities specified in the job description'. Reliabilities for the performance measures were .69 and .73, respectively.

Counter-productive work behaviors (CWB). CWB was measured with a 10-item questionnaire developed by Spector et al. (2010). The items, such as 'I came to work late without permission' or 'I insulted someone about their job performance' were measured on a scale from 1 (never) to 5 (every day). Alpha Cronbach for our samples was .68 and .75.

Job satisfaction. Overall job satisfaction was measured with a 5-item scale (Judge et al., 1998), rated on a scale from 0 (strongly disagree) to 10 (strongly agree). Some sample items are 'I feel fairly well satisfied with my job' or 'Each day of work seems like it will never end". Alpha Cronbach for our samples was .87 and .89.

Procedure

We administered the measures online. The survey was disseminated via email and social networks to adult Romanian employees in two consecutive years (2016 and 2017). The candidates were explained their rights as volunteers and were provided with contact information for further details or questions. Those who agreed to participate in the study were then provided with the link to the set of questionnaires. Only those participants who were over 18 and employed at the time were selected to take part in the study.

Results

All the analyses were conducted with MPlus, version 8 (Muthen & Muthen, 1998-2017). Following the recommendations of Ployhart et al. (2003), we conducted confirmatory factor analyses (CFA) for our variables. Personality was the only exception, due to concerns regarding the use of CFA for personality (Borkenau & Ostendorf, 1990; Church & Burke, 1994), which is why we conducted exploratory structural equation modeling (ESEM) for this measure. The results are reported in Table 1.

While some measures showed a good fit, such as the NEO-FF-I in sample 1 (*CFI* = .953, *RMSEA* = .039), others showed less than ideal fit (e.g., grit in both sample 1 – *CFI* = .914, *RMSEA* = .058 and sample 2 – *CFI* = .904, *RMSEA* = .095) or even a poor of fit (e.g.,

CWB in either sample 1 – *CFI* = .880, *RMSEA* = .057 or sample 2 – *CFI* = .867, *RMSEA* = .080). Because of its poor goodness of fit, the CWB measure was eliminated from further analyses.

Table 1. *Confirmatory and exploratory structural equations modeling*

Measure	Framework	Model	χ^2(df)	CFI	RMSEA (90% CI)	SRMR	χ^2(df)	CFI	RMSEA (90% CI)	SRMR
NEO-FF-I	ESEM	5 factors (4 correlated errors for sample 2)	114.78 (100)	.953	.039 (.011 - .052)	.053	363.91 (96)	.903	.099 (.090 - .011)	.037
Grit	CFA	1 factor (4/8 correlated errors)*	82.02 (50)	.914	.058 (.034 - .080)	.064	117.35 (46)	.904	.095 (.076 - .114)	.083
In-Role Performance	CFA	1 factor (2 correlated errors for sample 2)	31.20 (14)	.920	.081 (.042-.119)	.052	36.41 (12)	.943	.086 (.055 - .119)	.048
CWB	CFA	1 factor	56.69 (35)	.880	.057 (.027 - .084)	.065	84.75 (35)	.867	.080 (.060 - .100)	.059
JS	CFA	1 factor	26.62 (5)	.931	.152 (.098 - .111)	.045	29.96 (5)	.906	.135 (.091 - .184)	.051

Note: * = 4 and 8, respectively, correlated errors for sample 1 and sample 2.

The analyses examining grit's incremental validity over non-cognitive variables in predicting the job-relevant outcomes measured for the first sample are summarized in Table 2 and Table 3, and for the second sample in Table 4 and Table 5.

Table 2. *Incremental validity of grit over demographics and personality traits sample 1*

		In-role Performance			Job Satisfaction		
Step	Independent variable	β	Adjusted R^2	ΔR^2	β	Adjusted R^2	ΔR^2
1	Gender	.32	.030		-.06	.044	
	Age	.01			.03		
2	Gender	.31	.252	.222***	-.08	.244	.117***
	Age	.00			.02		
	Neuroticism	-.23**			-.12		
	Extraversion	.00			.26*		
	Openness	.00			.05		
	Agreeableness	.16			-.06		
	Conscientiousness	.28***			.08		
3	Gender	.31	.252	.000	-.08	.244	.002
	Age	.00			.02		
	Neuroticism	-.24**			-.13		
	Extraversion	.00			.26*		
	Openness	.00			.04		
	Agreeableness	.16			-.06		
	Conscientiousness	.29**			.10		
	Grit	-.02			-.06		

Note: *B = Unstandardized B*, * p < .05, ** p < .01, *** p < .001.

Table 3. *Incremental validity over demographics and core-self evaluations sample 1*

		In-role Performance			Job Satisfaction		
Step	Independent variable	β	Adjusted R^2	ΔR^2	β	Adjusted R^2	ΔR^2
1	Gender	.32	.030		-.06	.044	
	Age	.02			.03		
2	Gender	.32*	.181	.151***	.05	.244	.200***
	Age	.00			.02		
	Core-self Evaluations	.40***			.46***		
3	Gender	.32*	.202	.021*	.05	.244	.000
	Age	.00			.02		
	Core-self Evaluations	.35***			.46***		
	Grit	.15**			-.02		

Note: *B* = Unstandardized *B*, * p < .05, ** p < .01, *** p < .001.

By accounting for gender and age, personality traits and grit, the results for both samples showed that Gender and Age were not statistically significant in predicting In-Role Performance, CWB or Job Satisfaction. Next, for both samples, personality traits exhibited medium sized relationships with all the work-relevant outcomes. More specifically, personality traits accounted for approximately 22% of the variance of In-Role Performance (R^2=.222, p<.001) in sample 1 and for roughly 37% in sample 2 (R^2=.367, p<.001). In addition, grit's inclusion in the prediction model resulted in a null increase to the model's explanatory power. About 12% (R^2=.117, p<.001) of Job Satisfaction variance was explained by personality traits in sample 1 and 13% (R^2=.132, p<.001) in sample 2. Including grit resulted in negligible gains in predictive validity in sample 2 (R^2=.032, p<.01). Its incremental validity over the other predictor in sample 1 was not significant.

Table 4. *Incremental validity over demographics and personality traits sample 2*

		In-role Performance			Job Satisfaction		
Step	Independent variable	β	Adjusted R^2	ΔR^2	β	Adjusted R^2	ΔR^2
1	Gender	.26	.025		.41	.046	
	Age	.02			.02		
2	Gender	.21	.391	.367***	.26	.178	.132***
	Age	.04			.01		
	Neuroticism	.03			-.11		
	Extraversion	-.01			.23**		
	Openness	.19***			-.00		
	Agreeableness	.06			.13*		
	Conscientiousness	.59***			.01		
3	Gender	.04	.392	.001	.25	.211	.032**
	Age	.01			.01		
	Neuroticism	.03			-.05		
	Extraversion	-.01			.23**		
	Openness	.19***			-.02		
	Agreeableness	.06			.13*		
	Conscientiousness	.58***			-.12		
	Grit	.03			.25		

Note: *B = Unstandardized B*, * p < .05, ** p < .01, *** p < .001.

Table 5. *Incremental validity over demographics and core-self evaluations sample 2*

		In-role Performance			Job Satisfaction		
Step	Independent variable	β	Adjusted R^2	ΔR^2	β	Adjusted R^2	ΔR^2
1	Gender	.26	.025		.42	.046	
	Age	.02			.02		
2	Gender	.16	.220	.195***	.34	.142	.096***
	Age	.00			.01		
	Core-self Evaluations	.45***			.32***		
3	Gender	.16	.226	.006	.34	.155	.013*
	Age	.00			.01		
	Core-self Evaluations	.39***			.22**		
	Grit	.11			.16*		

Note: *B = Unstandardized B*, * p < .05, ** p < .01, *** p < .001.

Adding grit over the other established non-cognitive predictors was significant only in respect to in-role performance in sample 1 (R^2=.021, p<.05) and Job Satisfaction in sample 2 (R^2=.013, p<.05). However, these increments were very small rendering grit's predictive power negligible.

Discussion

As previously shown (e.g. Ion et al., 2017), understanding the way in which new personality constructs, such as grit, can contribute to explaining the variance of work-relevant outcomes is an important stepping stone in establishing the practical values of that respective construct. This is especially relevant in the context of debates regarding the validity of personality in predicting outcomes, seen by some as low (Morgeson et al., 2007; Murphy, 2005) and by others as acceptable (Ones et al., 2007).

From a theoretical standpoint, despite its popularity, grit does not appear to be a solution for capturing more personality-related variance in job performance or job satisfaction, thus not offering potential solution to the narrow vs. broad personality traits in predicting work-related outcomes (Judge et al., 2014, Schneider et al., 1996).

From a practical angle, when it comes to explaining the outcomes considered in this study, it seems that grit is not bringing an explanatory contribution of sufficient magnitude compared to that of well-established personality measures such as FFM or CSEs. Grit was unable to predict any of the test's outcomes above other well-established personality dimensions. When it comes to In-Role performance and job satisfaction, the results are not consistent among samples. Grit's incremental value in predicting in-role performance over the five-factor personality dimensions is limited for both samples. The only significant relationship, but low in magnitude - was found in sample 1, indicating a small predictive increment that grit brings above that of CSEs.

Taken together, our findings suggest that grit's relevance and impact in the workplace is limited, rendering the construct redundant in explaining work-relevant outcomes beyond well-established personality dimensions.

Limitations

There are several issues that would warrant further discussion. First of all, since this study is cross-sectional, causality from grit to organizational outcomes cannot be implied. In this sense, further areas of research would include longitudinal designs and the inclusion of other outcomes (e.g., organizational citizenship behaviors, organizational commitment, turnover), especially since the author of the scale has claimed that this personality construct can change over the course of a person's lifetime, as a result of effort, environment and others (Duckworth, 2016). Second, the results could be plagued by common method bias, both criterion and predictor data being collected at the same time. Third, the study did not include any measures accounting for potential mechanisms linking predictors with criteria. Fourth, we did not account for a range of potential moderating effects stemming from job complexity or type of organization.

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RESEARCH ARTICLE

Death Anxiety and Extra-role Performance in Military and Non-military employees: A Predictive Study

MARIA IOANA TELECAN
Department of Psychology, Work and Organizational Psychology Research Center, Babeș-Bolyai University, Cluj-Napoca, Romania

LUCIA CLAUDIA RAȚIU
Department of Psychology, Work and Organizational Psychology Research Center, Babeș-Bolyai University, Cluj-Napoca, Romania

CLAUDIA LENUȚA RUS
Department of Psychology, Work and Organizational Psychology Research Center, Babeș-Bolyai University, Cluj-Napoca, Romania

Abstract

Death awareness in the military context has received little research attention despite the high exposure of military employees to death. Drawing on Terror Management Theory (TMT), Meaning Management Theory (MMT), and Conservation of Resources Theory (COR), this study investigated the impact of death anxiety on organizational citizenship behaviors (OCB) and counterproductive work behaviors (CWB) through meaningful work (MW). It also investigated the moderating role of type of profession (military vs. non-military) and death reflection on the relationship between death anxiety, on one hand, and OCB and CWB, on the other hand. Data were collected through self-reports from 177 employees from an Air Force military organization (N = 81) as well as non-military professions (N = 96) using a time-lagged research design. The most obvious finding was the positive relationship between meaningful work and OCB. Our data did not provide empirical support for the other hypotheses developed. The implications of these findings are presented and future research directions are proposed.

Keywords

death anxiety, death reflection, organizational citizenship behaviors, counterproductive work behaviors, meaningful work, military vs. non-military profession

Introduction

Many professions that require help and support (such as those in the medical field – doctors, nurses, or those who are part of safety and public order – military, law enforcement, and firefighting) are more prone to fatality rates than those in other fields (e.g., teachers,

*Correspondence concerning this article should be addressed to Maria I. Telecan, Department of Psychology, Work and Organizational Psychology Research Center, Babeș-Bolyai University, 37 Republicii Street, 400015, Cluj-Napoca, România, Email: mariatelecan@psychology.ro, Phone: 004-052792849
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programmers, engineers; Jacobsen & Beehr, 2022; Rațiu et al., 2021; Sliter et al., 2014). These employees may come into contact both directly (e.g., military personnel performing their military service in various theaters of operations) and indirectly (e.g., assisting in the death of others) with the signs of mortality, putting their own lives at risk while carrying out their jobs (Maftei & Holman, 2021; Rațiu et al., 2021). Death awareness has two distinct forms: death anxiety and death reflection (Belmi & Pfeffer, 2016; Yuan et al., 2019). Death anxiety refers to an individual's tendency to develop negative emotions as a result of existential worries about mortality (Sliter et al., 2014), while death reflection refers to *"an individual's deliberate cognitive processing of [their] mortality that focuses on the positive aspects of death, which encompasses concrete behavioral intentions to realize such positive aspects"* (Yuan et al., 2019, p. 419).

Although death awareness has an important role for employee outcomes, the literature has paid little attention to its role in the military contexts (e.g., Taubman & Findler, 2006). Moreover, the lack of explicit consensus on the conceptualization of death anxiety and death reflection makes it difficult to understand the mixed results related to employees' desirable behaviors such as helping behavior (as a facet of employee organizational citizenship behavior) and the extent to which these constructs can be investigated simultaneously. To our knowledge, only one study simultaneously examined the two facets of death awareness (i.e., death anxiety and death reflection) and helping behavior (i.e., Jacobsen & Beehr, 2022). Also, the literature does not clearly highlight how the effects of death anxiety leave a mark on employees' dark behaviors such as counterproductive work behaviors (CWB). There is only one study that investigated the extent to which distal defenses evidenced by the Terror Management Theory (Greenberg et al., 1986), such as strong identification with the organization and support from the supervisor, mitigate the detrimental effects of the threat of death on job satisfaction and CWB in healthcare professionals (Rațiu, et al., 2021). Moreover, the empirical literature has not explored the effects of death anxiety in relation to meaningful work (MW), organizational citizenship behaviors (OCB), and CWB for military professionals compared to employees working in other fields.

Lack of understanding of the consequences of death anxiety on individual-level outcomes, such as MW, OCB, and CWB may hinder the identification of ways to influence these outcomes, both in military and non-military organizations. Last but not least, although there is a constant call for research (Yuan et al., 2019), there is little empirical evidence in the literature regarding the relationship between death reflection and employee behaviors, particularly how and when these relationships occur (Belmi & Pfeffer, 2016). The literature reveals the impact that death reflection has on special occupations such as firefighters (Yuan et al., 2019) however, the relationship between death reflection and OCB, CWB is still limited especially in the military context. Our study aims to fill this gap in the literature by employing a time-lagged design with two data collection moments. Considering the tenets of the Terror Management Theory (TMT; Pyszczynski et al., 1999), the Meaning Management Theory (MMT; Wong, 2013), and the Conservation of Resources Theory (COR; Hobfoll, 1989), our study examined the impact of death anxiety on OCB and CWB through MW. In addition, it investigated the moderating role of profession type (military vs. non-military) and death reflection on the relationship between death anxiety, on one hand, and OCB and CWB, on the other hand.

Our paper seeks to contribute to the literature on death awareness in military and non-military contexts in several ways. Specifically, it adds knowledge to the few empirical attempts to study the facets of death awareness in the military context (e.g., Taubman & Findler, 2006), in particular, in military aviation, and its impact on employee attitudes and behaviors. Also, the study seeks to understand the implications of the two facets of death awareness – death anxiety and death reflection, on employees' MW OCB, and CWB. Our study used a time-lagged design, which can provide strong clues

regarding the directionality of the relationships investigated in the present study (Edmonds & Kennedy, 2016).

From a practical perspective, the present study could provide information for both leaders and their followers regarding the role that death anxiety and death reflection have on employees' MW and other job-related behaviors.

Theoretical framework

Death anxiety and meaningful work

TMT asserts that thoughts about death cause intense anxiety (Solomon et al., 1991). Death anxiety is the outcome of emotional processing related to one's own mortality (Pyszczynski et al., 1999). The experience of death anxiety leads to aversive emotions such as fear and panic, which impacts employees' mental health, with an increased risk of poor work performance (Yuan et al., 2019).

In addition, there is a growing body of literature that recognizes the importance of questioning the meaning and purpose of work (e.g., Steger et al., 2012; Zhang et al., 2019). MW is the subjective perception that one's work is significant, contributes to the greater good, and encourages personal growth (Steger et al., 2012). Three dimensions of meaningful work are distinguished including positive meaning, greater good motivation, and meaning making (Steger et al., 2012). Positive meaning refers to the employees' subjective perception that their work has personal significance. Greater good motivation depicts how employees perceive that they can have a positive impact on others through the work they do. Meaning making refers to the perceived role of work in supporting personal growth and self-actualization.

MW has not been integrated into the TMT literature, but its role can be informed by similar constructs such as meaning in life (Zhang et al., 2019). Recent research reported a positive relationship between death anxiety and experienced meaning through search for meaning singly (Chang et al., 2021). Instead, other studies identified a negative relationship between death anxiety and variables related to the evaluation of meaning and significance. For instance, Routledge and Juhl (2010) found that those participants who were confronted with mortality cues and who rated themselves as having less meaning and significance in life were more likely to experience stronger death anxiety. Similarly, Zhang et al. (2019) showed that the attributes of meaning in life (presence of meaning, search for meaning, and self-esteem) were negatively related to death anxiety. Consistent with TMT referring to the awareness of death and its potential to create debilitating anxiety, we hypothesize that:

Hypothesis 1a: Death anxiety is negatively related to meaningful work.

Death anxiety and OCB

Organizational citizenship behavior reflects one's commitment in extra-role activities and which are beneficial to employees to accomplish the tasks (Podsakoff et al., 2000). OCBs are a form of discretionary behaviors of employees that are not a part of the formal job description but facilitate the achievement of organizational responsibilities (Podsakoff & MacKenzie, 1997). OCB has two dimensions: OCB-O (OCB directed towards the organization such as helping behavior, sportsmanship, organizational loyalty, compliance, and civic virtue) and OCB-I (OCB directed towards the individual such as individual initiative and self-development; Podsakoff et al., 2000). The literature on TMT suggests that employees who face death anxiety are less likely to engage in any form of OCB, because they are strict about the individuals they help (Greenberg et al., 1986). To provide support, these individuals need the organization and other members to share the same worldview. Employees with death anxiety can protect themselves from the existential threat of death by maintaining their own values as well as those of the community they belong to and by manifesting behavior that promotes their worldview or self-esteem (Greenberg et al., 1986; Lambert et al., 2014). These behaviors can take two distinct forms: from destructive behaviors, such as negative evaluation of individuals who oppose their worldview (McGregor et al., 1998), to apparently constructive behaviors that promote their worldviews (Jonas et al., 2002), such OCB. Based on TMT tenets, we argue

that there is a rather negative relationship between death anxiety and OCB. Employees who encounter death anxiety will be less likely to achieve OCB, because they need direct guidance on the ways by which they can be able to sustain and maintain the levels established by their worldview. Thus, we issue the following hypothesis:

Hypothesis 1b: Death anxiety is negatively related to OCB.

Death anxiety and CWB

The relationship between death anxiety and CWB can be framed using the Conservation of Resources Theory (COR; Hobfoll, 1989). CWB describes employees' deliberate actions that are harmful to the organization's interests and important rules, threatening the organization itself and/or its members (Spector & Fox, 2006). According to the COR theory, death anxiety can lead to stress because it undermines or diminishes resources such as *"objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions or energies"* (Hobfoll, 1989, p. 516). Individuals are driven to acquire or preserve these resources. Additionally, individuals may have a limited reservoir of resources. An individual would typically adopt a defensive mode in response to stress and resource loss to protect against further resource loss. Employees who face death anxiety are more likely to have negative thoughts and feelings related to death, which requires an abundance of cognitive and emotional resources to remove or suppress them.

Moreover, although the TMT converges towards the idea that death anxiety induces stress and tension and can lead to engagement in defensive behaviors, empirical studies provide mixed results. For instance, Rațiu et al. (2021), in a sample of 253 health professionals, found no significant association between death anxiety and CWB but a positive relationship was found between the two variables in the sample comprising participants from other occupations. Furthermore, the mortality threat did not mediate the association between death anxiety and CWB.

According to COR theory, when employees experience mortality cues, they are more prone to resource depletion and higher levels of death anxiety. Studies on the exposure of military personnel in the context of war (Vinokur et al., 2011) and forensic doctors' experience of mortality cues and stressors (van der Ploeg et al., 2003) support the idea that traumatic stressors and mortality cues can be related to burnout. In a sample of firefighters and nurses, Sliter et al. (2014) found that employees exhibiting elevated levels of death anxiety were more likely to experience burnout. In essence, being exposed to more salient mortality cues at work, employees are more likely to withdraw from work, as a self-protective strategy driven by anxiety. Taking this into account, we propose the following:

Hypothesis 1c: Death anxiety is positively related to CWB.

Meaningful work and OCB

The literature reveals that employees who perceive their work to be meaningful have desirable attributes for every organization, such as greater involvement in voluntary work and OCB behaviors (Im & Chung, 2018; Safitri & Sulistiyorini, 2022). When employees find their work valuable and enjoyable, they show a stronger sense of identity with their work and perceive it as an extension of themselves, and are more likely to engage in behaviors that are not rewarded by their organization. Indeed, meta-analytical findings showed a small to moderate positive correlation between MW and OCB (Allan et al., 2019). Thus, we expect that:

Hypothesis 2a: Meaningful work is positively related to OCB.

Meaningful work and CWB

Previous research investigating meaningful work reveals that intrinsic motives such as task significance, meaningful work and commitment may discourage employees from involving in unethical workplace practices, cynicism (Cartwright & Holmes, 2006), withdrawal intentions (Steger et al., 2012) and cyberloafing (Usman et al., 2019). In addition, COR (Hobfoll, 1989) and MMT theories

(Wong, 2013) suggest that if employees perceive the value and contribution of their work to others, they remain connected by completing tasks showing increasing high levels of energy and effort, avoiding engagement in behaviors that would rather harm the organization and its members. Thus, we expect that:

Hypothesis 2b: Meaningful work is negatively related to CWB.

The mediator role of meaningful work between death anxiety and OCB and CWB

When employees encounter signs of mortality at work, death anxiety increases and they will tend to respond with efforts to reinforce the sense that their work is meaningful and contributes to a purpose (Pyszczynski et al., 2003) while also diminishing their involvement in OCB. By contrast, TMT theory has largely focused also on the negative emotional responses that individuals experience when facing death anxiety. However, individuals can restructure their world when they meet signs of mortality or think of death (Tedeschi & Calhoun, 2004). A shared world refers to a general set of beliefs and premises about the world that guide behavior, help interpret information as well as events, and assign them purpose and meaning (Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004). As such, we predict that:

Hypothesis 3a: Meaningful work mediates the relationship between death anxiety and OCB.

Employees who display high levels of meaningful work are discouraged from engaging in dysfunctional behaviors (Allan et al. 2019), such as absenteeism, tardiness and intentions to leave the organization, and other CWBs. In addition, employees who perceive that their work contributes to a higher purpose are more content and dedicated to their work (Geldenhuys et al., 2014), are more engaged in meeting organizational objectives and demonstrate prosocial behaviors (Khari & Sinha, 2017) at the expense of destructive and unethical workplace practices and behaviors (Demirtas et al., 2017). According to the predictions of the TMT (Pyszczynski et al., 1999) and MMT (Wong, 2013), we consider that employees' perception of meaningful work will foster a shared worldview and ultimately reduce the impact of death anxiety on engagement in CWB. Thus, we predict that:

Hypothesis 3b: Meaningful work mediates the relationship between death anxiety and CWB.

OCB might be differently understood in the context of professions. Compared to other occupational groups in civilian settings, OCB in military organizations is particularly valuable for accomplishment of challenging missions. It is expected for military personnel to comply with the cultural norms of selfless service and duty (Woodruff, 2022). Moreover, some OCB which are discretionary in the civilian context can be compulsory in military organizations (Rose et al., 2017). Given the lack of empirical studies on the relationship between death anxiety and OCB, we further advance the following hypothesis:

Hypothesis 4a: The type of profession (military vs. non-military) moderates the relationship between death anxiety and OCB, in the sense that this relationship becomes weaker in the case of military profession.

Military personnel are a unique occupational segment (Demerouti et al., 2019) that performs complex missions that require physical and mental effort, overtime hours, and often work in shifts, compared to a regular job. We expect that these employees can lose their personal resources and can no longer cope with professional requirements in an efficient way. Unlike other contexts, in the military context, the exposure to trauma and death is high (e.g., the death of co-workers; Byron & Peterson, 2002; Grant & Wade-Benzoni, 2009) leading employees in military occupations to be more prone than other jobs to death anxiety, emotional exhaustion, and absenteeism. Similarly, Jermier et al. (1989) found that physical threats in police work linked objective hazards to death anxiety, which was related to greater burnout and disinterest in the organization. The literature shows that those employees who perceive high levels of workplace danger are more likely to report strong intentions to resign, leave the organization, or be absent (Zaccaro & Stone,

1988). Consequently, when faced with death anxiety employees will be more likely to engage in behaviors such as behavioral disengagement through facets of absenteeism, tardiness, or even leaving the organization (Harrison et al., 2006)**.** Moreover, on the other side, military personnel report significantly lower engagement in CWB, showing that other factors, perhaps related to adherence to different professional ethics, military regulations, explain non-involvement in CWB**.** Thus, *w*e predict that:

Hypothesis 4b: The type of profession (military vs. non-military) moderates the relationship between death anxiety and CWB, in the sense that this relationship becomes weaker in the case of military professions.

Moderation role of death reflection between death anxiety and OCB and CWB

The literature to date investigating the relationship between death anxiety and OCB (Jacobsen & Beehr, 2022) describes that employees who are anxious about death prioritize helping others. This prioritization may act as a buffer against the negative emotions generated by death anxiety. According to Meaning Management Theory (MMT; Wong, 2013), individuals seek meaning and make meaning following two essential conditions: to live and discover means and goals to life (Wong, 2013). According to MMT, finding meaning in life is the most appropriate approach to reducing death anxiety. Furthermore, in order to set a defense mechanism against death anxiety, it is quite preferable to focus mainly on positive growth, because it is important for individuals to have a meaningful and significant life. Moreover, if individuals consider that their way of life is meaningful and play an active role in the community in which they live, then they may not feel the threat of inevitable mortality (Routledge et al., 2010). In general, TMT states that employees facing death anxiety can protect themselves from the threat of death by highlighting their own beliefs and the group they belong to, engaging in prosocial behavior such as OCB. In employees whose work regularly involves confronting mortality cues, high death reflection may be associated with a stronger motivation to help other people (e.g., community members, co-workers, patients; Yuan et al., 2019), prosocial behaviors such as OCB and willingness to volunteer and mentor (Grant & Wade-Benzoni, 2009). Also, these employees tend to show more sustained effort and persistence in tasks that favor other people (Grant, 2007).

From the COR theory (Hobfoll, 1989), employees who reflect on death tend to realize that time is limited and therefore pay more attention to how they allocate their resources. Previous literature reveals that death reflection encourages employees to decide on tasks, goals, and activities based on their own values (Lykins et al., 2007). Using a sample of 387 employees in China, Wei et al., (2021) found that death reflection triggered by the Covid-19 pandemic is positively related to role performance and OCB. It seems that employees in high death reflection redesign their jobs and take the initiative to provide more help or guidance, resulting in higher levels of OCB (Wei et al., 2021). Moreover, the positive impact of death reflection on OCB is revealed by the contingency model of death awareness (Grant & Wade-Benzoni, 2009), which states that employees who are high in death reflection are given a sense of meaning and identity when helping others (Grant & Wade-Benzoni, 2009). Thus, these employees will invest more time, effort and resources and will be more involved in OCB.

Together, TMT and MMT predict that reflecting about death in a rational and conscious manner usually leads individuals to distance themselves from their own person and to help others, leaving behind a desirable long-term outcome (i.e., individuals become more productive, prosocial, and engaging in helping behaviors, such as OCB). We hypothesize that:

Hypothesis 5a: Death reflection moderates the relationship between death anxiety and OCB, in the sense that this relationship becomes weaker with increased death reflection.

When it comes to their work, employees are more likely to adopt behaviors that are in accordance with the rules, regulations, and

procedures of the organization; therefore, they are less likely to engage in behaviors that inhibit performance at work and the achievement of work-related objectives, such as CWB (Zaghini et al., 2016). Therefore, employees who reflect on death will transcend the defensive attitude in front of mortality cues and will rather focus on the prosocial aspects of their work (Yuan et al., 2019), helping others and saving lives, at the expense of engaging in CWB behaviors. According to TMT predictions (Solomon et al., 1991), mortality indices trigger distal defenses, favor commitment to the common worldview, and, later, reduce engagement in CWB (Rațiu et al., 2021). We, therefore, hypothesize that:

Hypothesis 5b: Death reflection moderates the relationship between death anxiety and CWB, in the sense that this relationship becomes weaker with increased death reflection.

Method

Participants and procedure

This study employed a time-lagged survey to reduce the effect of the common method variance (CMV; Podsakoff et al., 2003). Usable data were collected in the two waves (one month gap) from 177 participants. In order to obtain the necessary matches in the responses of the two waves, each respondent generated his/her distinct code according to instructions provided by the researchers.

Our convenience sample included 81 military employees from the Romanian Air Force, and 96 participants derived from non-military professions (e.g., education, IT). The age of participants from the military sample ranged from 21 and 51 years (M = 37.39; SD = 7.84), while the participants' age from non-military professions ranged from 20 and 60 years (M = 40.15; SD = 11.17). Within the military sample, most of the participants were male (71; 87.70%), while within the non-military sample, most of the participants were female (72; 75.00%).

First, for the military sample we have granted the permission of the military organization to collect the data, in the pencil-and-paper format. Online data collection using Google Forms was employed to obtain data from non-military sub-sample. Second, informed consent was provided by each of the participants. Participants were informed that the participation was voluntary and data were anonymous and confidential. Data were collected in two moments (T1 and T2) with a lag of one month. At T1 death anxiety, death reflection, and meaningful work were measured, while T2 included measures OCB and CWB. Participation was voluntary and the data were analyzed at the individual level.

Measures

Death anxiety was measured with the six-item scale described in Belmi and Pfeffer (2016). A sample item is *"I am very much afraid to die"*. Answers were recorded on a five-point Likert-type scale ranging from 1 (*"Fully disagree"*) *to 5* (*"Fully agree"*) ($\alpha = .96$).

Death reflection was measured with the fifteen-item scale developed by Yuan et al. (2019). Although this instrument has five subscales measuring motivation to help (e.g., *"When I think about death, I feel like I should do more for the world"*), motivation to live (e.g., *"When I think about death, I make plans for my life"*), putting life in perspective (e.g., *"When I think about death, I can let go of the little problems"*), personal legacy (e.g., *"When I think about death, I think about what legacy I will have left behind"*), and connection to others (e.g., *"When I think about death, I want to spend more time with the people I care about"*), in our study we considered the overall mean of the items. Answers were recorded on a five-point Likert-type scale ranging from 1 (*"Fully disagree"*) to 5 (*"Fully agree"*). For this scale, $\alpha = .96$.

Meaningful work was evaluated with ten items from Steger et al. (2012). A sample item is *"I have found a meaningful career"*. Answers were recorded on a seven-point Likert-type scale ranging from 1 (*"Totally disagree"*) to 7 (*"Totally agree"*) ($\alpha = .90$).

Organizational citizenship behaviors were measured with the ten items from Podsakoff and colleagues (1990) (e.g., *"I consume a lot of time complaining about trivial matters"*). The answers were recorded on a seven-point Likert-type scale ranging from 1 (*"Fully disagree"*) to 5 (*"Fully agree"*) ($\alpha = .92$).

CWB was measured with the ten items scale developed by Spector et al. (2006). A sample item is *"You stayed home instead of going to work and said you were sick, even though you weren't"*. The answers were recorded on a five-point Likert-type scale ranging from 1 (*"Never"*) to 5 (*"Daily"*) (*α = .87*).

Control variables

Respondents' gender (1, "male", 2, "female"), age and personality traits (e.g., neuroticism and agreeableness) were controlled as these variables are susceptible to influence the perception of death anxiety and death reflection (Jacobsen & Beehr, 2022). For instance, Neimeyer and Moore (1994) found that younger people report higher levels of death anxiety than older people. In addition, women are susceptible to higher levels of death anxiety than men (Belmi & Pfeffer, 2016).

Neuroticism was evaluated using the six-item short from the neuroticism scale introduced by Soto and John (2017) containing items such as: *"I am a person that worries a lot"*. The answers were recorded on a five-point Likert-type scale ranging from 1 (*"Fully disagree"*) to 5 (*"Fully agree"*). Agreeableness were evaluated using the ten-item short form of the personality scale introduced by Gosling et al. (2003) containing items such as: *"Extraverted, enthusiastic"*. The answers were recorded on a seven-point Likert-type scale ranging from 1 (*"Disagree strongly"*) to 7 (*"Agree strongly"*). *Cronbach alpha* for neuroticism was .78, while for agreeableness .65. If these variables are not controlled, they can inflate the results of the study.

Data analysis

To test the hypotheses, two mediation-moderation analyses were conducted with the PROCESS v3.5 macro (in IBM SPSS v24), using a customized model derived from model 5 (Hayes, 2018). The customized model included one predictor (death anxiety), one outcome (OCB, CWB), four control variables (age, gender, neuroticism, and agreeableness), and two moderators (type of profession and death reflection).

Results

The means, standard deviations and correlations are presented in *Table 1*.

Table 1. *Means, standard deviations and correlations (N = 177)*

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Death anxiety T1	2.23	.97	1								
2. Death reflection T1	3.50	.74	.28***	1							
3. Meaningful Work T1	5.50	.99	-.07	.13	1						
4. OCB T2	4.60	1.08	-.11	-.06	.25***	1					
5. CWB T2	1.99	1.00	.18*	.18*	-.001	-.32***	1				
6. Age T1	38.89	9.86	.16*	.12	.08	.10	.14	1			
7. Gender T1	-	-	.18*	.16*	.20**	-.11	.24***	.06	1		
8. Neuroticism T1	2.30	.65	.40***	.11	-.16*	-.14	.14	.05	.21**	1	
9. Agreeableness T1	3.73	.55	-.15	-.06	.30***	.13	-.06	.02	.13	-.35***	1
10. Type of profession T1 (0-military vs. 1- non-military)	-	-	.26***	.23**	.23***	-.25***	.44***	.14	.63***	.19*	.04

**. Correlation is significant at the .01 level (2-tailed).

The results of the mediation analyses revealed no significant relationship between death anxiety, on one hand, and meaningful work (*b* = -.04, *p* = .64), OCB (*b* = .09, *p* = .55), and CWB (*b* = -.09, *p* = .46), on the other hand. Thus, Hypotheses 1a-1c were not empirically supported.

We found that meaningful work was positively associated with OCB (*b* = .34, *p* = .001), supporting Hypothesis 2a. In

contrast, meaningful work was not significantly negatively associated with CWB (b = -.12, p = .13). Thus, Hypothesis 2b was not empirically supported. We found that meaningful work was not a mediator of the relationship between death anxiety, on one hand, and OCB (-.01, *95%CI* [-.08; .04]) and CWB (.00, *95%CI* [-.02; .03]), on the other hand. Hypotheses 3a and 3b did not receive empirical support.

Contrary to our expectations, the type of profession (military vs. non-military) did not moderate the relationship between death anxiety, on one side, and OCB (b = -.11, R^2 = .003, p = .54, *95%CI* [−.45; .23]) and CWB (b = .16, R^2 = .003, p = .33, *95%CI* [-.16; .46]), on the other side. Hypotheses 4a and 4b did not receive empirical support. Also, we found that death reflection does not moderate the relationship between death anxiety and OCB (b = -.09, R^2 = .002, p = .43, *95%CI* [−.32; .14]), so Hypothesis 5a did not receive empirical support. Similarly, death reflection did not moderate the relationship between death anxiety and CWB (b = .10, R^2 = .004, p = .36, *95%CI* [−.11; .30]), and consequently, Hypothesis 5b was not empirically supported.

Discussion

This study aimed to investigate the impact of death anxiety on organizational citizenship behaviors and counterproductive work behaviors through meaningful work. It also investigated the moderating role of type of profession (military vs. non-military) and death reflection on the relationship between death anxiety, on one hand, and OCB and CWB, on the other hand.

Contrary to our hypothesis, data showed that death anxiety was not positively associated with meaningful work. Previous research (Routledge & Juhl, 2010; Zhang et al., 2019) reports a negative relationship between death anxiety and variables related to the evaluation of meaning in life. Moreover, between death anxiety and meaningful work other distal defenses (appropriate interpersonal relationships, affiliation) may emerge to support self-esteem to cope with the salience of death (Pyszczynski et al., 2021).

Hypothesis 1b, according to which death anxiety is negatively related to OCB, has not been empirically supported. Our findings contradict those from the literature that evidence that death anxiety is negatively related to OCB (OCB-I and OCB-O factors; Jacobsen & Beehr, 2022).

Death anxiety was not positively associated with CWB, and this hypothesisH_{1c} was not empirically supported. In the literature, we find similar evidence (Rațiu et al., 2021).

Our data empirically support the positive relationship between meaningful work and OCB (H_{2a}) which is consistent with previous empirical studies (Hulshof et al, 2020; Raub & Blunschi, 2014) that used employee samples from civilian jobs. Hypothesis (H_{2b}) was not empirically supported, as there was no statistically significant correlation between meaningful work and CWB. The results are quite surprising as other studies revealed meaningful work and CWB were in a negative relationship (Usman et al., 2021). We can conclude that, in our sample, employees are adherent to normative prescriptions and workplace regulations which negatively predict engagement in CWB.

In addition, the mediation models in our study were not empirically supported (*Table 2*). A plausible explanation could be that employees call on other proximal defenses that are likely used to alleviate death anxiety. Employees can strengthen their defense mechanisms by acquiring certain occupations and responsibilities, engaging in OCB to lessen the negative effects of workplace death anxiety and CWB behaviors. To be able to adapt to this reality, employees must seek and give meaning to both their lives and their work (Kahraman & Erkent, 2022; Langs & Giovacchini, 2018). In this study, hypotheses 5a and 5b were not supported by the data *(Table 2)*. There is evidence in the literature that employees who engage in death reflection are more likely to engage in prosocial behaviors such as OCB and have a high availability to volunteer and mentor (Grant & Wade-Benzoni, 2009). Regarding hypothesis 5b, one possible explanation is that CWB behaviors are not tolerated in the workplace, especially in workplaces where individuals' lives are exposed to danger (e.g.,

military, firefighters, doctors, etc.). Employees are likely to feel pressure to go to work on time even when they have encountered signs of work-related fatalities (Sliter et al., 2014), and felt that they lacked resources (e.g., energy, well-being) because absenteeism or being late would put their colleagues' lives at risk.

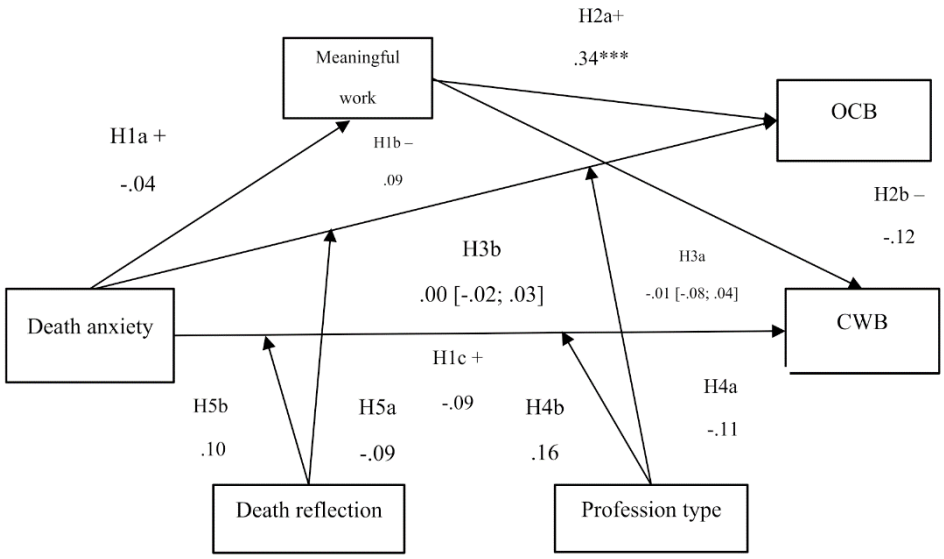

Figure 1. The overall mediation moderated model

Tabel 2. *Hierarchical Regression Results for Testing Mediation and Moderation Effects of Type Profession, Death Reflection on the Death Anxiety, OCB and CWB Relationship*

Relationships	Model 1 (Mediation effect)	Model 2 (Moderation effect)	Supported
H3a: Death anxiety → Meaningful Work → Organizational citizenship behaviors	(-.01; 95% CI = [-.08; .04])		No
H3b: Death Anxiety → Meaningful Work→ Counterproductive work behaviors	(.00; 95% CI = [-.02; .03])		No
H4a: Death Anxiety × Type Profession → Organizational citizenship behaviors		*b* = -11; R2 = .003, *p* = .54, *95%CI* [−.45; .23]), p > .05	No
H4b: Death Anxiety × Type Profession → Counterproductive work behaviors		*b* = .16, R2 = .003, *p* = .33, *95%CI* [-.16; .46]), p > .05	No
H5a: Death Anxiety × Death Reflection → Organizational citizenship behaviors		*b* = -.09, R2 = .002, *p* = .43, *95%CI* [−.32; .14]), p > .05	No
H5b: Death Anxiety × Death reflection → Counterproductive work behaviors		*b* = .10, R2 = .004, *p* = .36, *95%CI* [−.11; .30]), p>.05	No

Theoretical and practical implications

Our work is one of the first empirical attempts to compare military professionals with others by investigating the relationship between death anxiety and death reflection, OCB, CWB, and MW. In the attempt to explain the relationships between the variables, we integrated three essential theories, namely TMT (Pyszczynski et al., 1999), MMT (Wong, 2013) and COR (Hobfoll, 1989). To highlight the relationship between death anxiety and MW we used the MMT theory (Wong, 2013) which suggests that the best approach to reduce death anxiety is to rationalize the acceptance of mortality, to seek meaning and to make sense. Furthermore, in the present study the relationship between MW and CWB was not supported. In the literature (Usman et al., 2019), this relationship is negative and is supported by the COR theory. By investigating the relationship between death anxiety and death reflection in two different occupational contexts (military and non-military), we broaden the scope of domains in which employees may identify with these two workplace experiences.

We answer existing calls for research for the simultaneous investigation of death anxiety and death reflection (Jacobsen & Beehr, 2022) in different occupational settings.

Based on these findings, interventions can be designed and implemented within organizations to target increased perceptions of meaningful work which will subsequently translate into more OCB behaviors. In these interventions leaders can be encouraged to provide sufficient contextual resources (such as social and instrumental support) in the performance of work activities, in order to diminish the feelings of inequity of "non-essential" employees compared to their peers "essential" (Ouwerkerk & Bartels, 2022). Our findings revealed that the type of profession (military vs. non-military) did not moderate the relationship between death anxiety, on one hand, and OCB and CWB, on the other hand. This suggests that interventions aimed at promoting meaningful work can be implemented similarly in different occupational settings (e.g., mountain rescuers, and electrician maintenance).

Limitations and future research directions

Our study has several limitations. Although we used a predictive design with two waves, having one month apart between them prevents us from drawing strong conclusions about cause-effect relationships. Future studies could use research designs that could provide stronger information about causal relationships, such as (quasi-) experimental designs. In this regard, vignettes could be used to better particularize death anxiety and death reflection given their different outcomes in terms of attitude, motivation, and work behavior (Grant & Wade-Benzoni, 2009).

Except for the type of profession, all variables included in our study were measured using self-reports. In our study, the agreeableness scale had a Cronbach alpha below the accepted level of .70, namely .65, which could influence the relationship between the variables. Future research could use a more precise assessment of death anxiety and death reflection by asking participants to report or detail events in which they encountered mortality cues from their workplace (e.g., after an airplane incident among aircrew).

Our study used both pencil-and-paper data collection methods for the military sample, as well as online methods such as Google Forms for the non-military sample. This could introduce methodological variations. Future studies should consider using the same procedure to collect data from different occupations.

Another limitation might be the composition of the sample. We used employees derived from a single military unit and only a few non-military occupations (e.g., IT programmers, educators, teachers). Future research could replicate our findings using larger groups, different military units' occupations to increase the generalizability of the findings. Additionally, we focused on a specific work context characterized by a number of job requirements that make employees more prone to mortality rates

(military sample). However, this does not mean that other work environments are free from mortality cues. Future research could investigate death anxiety and death reflection in groups of employees in other settings such as mountain rescuers, electrician maintenance and repair or construction workers to reinforce the conclusions drawn from this study and to further generalize the results. One reason for the lack of significant results may be the fact that the two time points with a one-month interval between them were too short to fully capture significant relationships. Furthermore, Podsakoff et al., (2003) point out that a short lag, such as ours of one month, may not help avoid common method bias, since respondents may remember their previous answers and relate to current responses which may contaminate the outcomes. As such, we encourage future studies to extend the time interval between the measurements.

Engaging in OCB behaviors may be one of the ways through which employees can gain the self-esteem needed to cope with salience of death (e.g., Jonas et al., 2011), as well as important interpersonal resources that can act as a buffer against death threats (Pyszczynski et al., 2021). Thus, we propose as a future research direction to investigate the role of mechanisms such as self-esteem and other personal resources in explaining the indirect relationship between OCB and death anxiety. Future studies may also investigate whether commitment to and trust in shared beliefs about life, death, and death in employee social groups could explain the indirect relationship between death anxiety and OCB.

Further studies are needed to establish the potential influence of death reflection and death anxiety on meaningful work. Researchers could consider potential mechanisms which could explain the relationship between death reflection, respectively death anxiety on meaningful work such as the initiation of feelings of regret, thoughts about the meaninglessness of death (Tomer & Eliason, 1996; Bergman et al., 2018) as well as optimism. All suggested mechanisms could serve as protective functions against death anxiety.

Conclusions

This paper adopted several theoretical lenses to investigate the impact of death anxiety on employees' meaningful work and behaviors as conditioned by death reflection and the occupational context (military vs. non-military context). We identified a significant positive relationship between meaningful work and OCB. Contrary to our expectations, meaningful work is not a key mediator in the relationship between death anxiety, OCB and CWB. Also, type of profession (military vs. non-military) and death reflection were not moderators of the relationship between death anxiety, OCB and CWB. These findings are of interest to both organizations and employees to know to what extent to promote the perception of meaningful work in order to increase engagement in OCB behaviors.

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Psihologia Resurselor Umane, **21** (2023), 79-82

PUBLISHING STANDARDS

Psychology of Human Resources – guide for authors

THE EDITORS

This document represents the "Guide for Authors". It covers the format and language to be used for manuscripts submitted to Human Resources Psychology. Also, this document can be found on the webpage of the Romanian Association of Industrial and Organizational Psychology (www.apio.ro).

This "Guide for Authors" follows the 6th APA Publication Manual.

Manuscript Submission and Format

All manuscripts for the journal Human Resources Psychology should be submitted to the following e-mail address: revista@apio.ro.

To edit the manuscript please use Times New Roman 12-point type, 1.5 line spacing and the A4 page setting. Each page will be numbered in the upper right corner. The top and side margins should be left of at least one inch or 2.54 cm. A full example of a manuscript can be found in the 6th APA Publication Manual.

Publications

Accepted papers are copy-edited and retyped. Authors have to review edits and proofread their work. The editor of Human Resources Psychology will contact the corresponding author after the editor assigns your work to an issue.

If your work is accepted, please keep the editor informed of changes in your contact information and of long absences.

Front Page

The first page of the manuscript should include the following information:

1. Title

The title should be a concise statement of the main topic and should identify the variables or theoretical issues under investigation and the relationship between them. It should be typed in sentence case, centered between left and right margins, and positioned in the upper half of the page.

2. Author name(s) and institutional affiliation(s)

Author name(s) will be presented in the following form: first name, middle initial(s), and last name.

Institutional affiliation should reflect the institution/location where the author(s) were when the research was conducted. When an author has no institutional affiliation, the city and state of residence below the author´s name should be specified. The institutional affiliation should be centered under the author's name, on the next line.

3. Author´s note

This section should include the following:

- First paragraph should include the departmental affiliations at the time of the study for all authors as follows: name of the author as it appears in the byline, comma, department name, comma, university name, semicolon, next

author name, and so on, and end with a period.
- Second paragraph should include any changes in author affiliation subsequent to the time of the study as follows: [author´s name] is now at [affiliation].
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Place the author note on the title page, below the title, byline, and affiliation. Center the label *Author Note.* Start each paragraph of the note with an indent, and type separate paragraphs for the authors' names and current affiliations, changes in affiliations, acknowledgments, and special circumstances, if any, along with the person to contact. The author note is not numbered or cited in the text.

Abstract Page

The abstract as well as the title of the work go on page 2. The abstract should be no longer than 150 words. The label *Abstract* should appear in sentence case, centered, at the top of the page. Type the abstract itself as a single paragraph without paragraph indentation. Place a running head (short title).

The abstract will be written in English. It is necessary to include 3-5 key words after each abstract, in all these three languages.

Main body text pages

In preparing your manuscript, begin the introduction on page 3. Type the title of the manuscript in sentence case centered at the top of the page, and then type the text. The remaining sections of the article follow each other without a break; do not start a new page when a new heading occurs.

This section should include the following:

- Introduction of the problem. This section will present the specific problem under the study and describe the research strategy. There is no need to label this section as Introduction.
- Explore importance of the problem. This section states why the problem deserves new research. State explicitly this problem according to the type of the study (empirical study, literature review and meta-analysis, methodological paper and case study).
- Describe relevant scholarship by discussing the relevant related literature and demonstrating the logical continuity between previous and present work.
- State each tested hypothesis clearly and provide a theoretical argument for how it was derived from theory or is logically connected to previous data and argumentation.

Method

This section describes in detail how the study was conducted, including conceptual and operational definitions of the variables used in the study. Authors should include the following:

- Sample description, by describing the main characteristics with particular emphasis on characteristics that may have bearing on the interpretation of results.
- Sampling procedure by describing the procedures for selecting participants in terms of sampling method, the percentage of the sample approached that participated, the number of participants who selected themselves into the sample.
- Sample size, power and precision.
- Measures and covariates by describing the methods used to collect data and to enhance the quality of the measurements.
- Research design.
- Experimental manipulations or procedures.
- Task description.

Results

This section summarizes the collected data and the analysis performed on the data to test the proposed hypotheses. Report the data analysis in sufficient detail to justify your conclusions. For more information please consult the 6th APA Publication Manual.

Discussion

This section evaluates and interprets the implications of the results, especially with respect to original hypotheses. Examine, interpret, and qualify the results and draw inferences and conclusions from them. Emphasize any theoretical or practical consequences of the results.

Also, the limits of the study and possible future studies can be considered in this section.

References

References are your entries in the *alphabetical list at the end* of your article or research note. This list should include all the works you have cited throughout the manuscript. The references should be formatted as follows:

1. Periodicals (selective examples)

Author, A.A, Author, B. B., & Author, C. C. (year). Title of article. *Title* of *Periodical, xx,* pp-pp. doi: xx.xxxxxxxxxx

Author, A. A., Author, B. B., Author, C. C., Author, D. D., Author, E. E., Author, F.F., … Author, Y.Y. (year). Title of article. *Title* of *Periodical, xx,* pp-pp. doi: xx.xxxxxxxxxx

Author, A.A, Author, B. B., & Author, C. C. (year). Title of article. *Title* of *Periodical, xx,* pp-pp.

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2. Books

Author, A. A. (year). *Title of work.* Location: Publisher.

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3. For chapters in a book or entry in a reference book (selective example)

Author, A.A., & Author, B.B. (year). Title of chapter or entry. In A. Editor, B. Editor, & C. Editor (Eds.), *Title of book* (pp. xxx-xxx). Location: Publisher.

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4. Meeting and symposia (selective examples)

Contributor, A.A., Contributor, B.B., Contributor, C.C., & Contributor, D.D. (Year, Month). Title of contribution. In E.E. Chairperson (Chair), *Title of symposium.* Symposium conducted at the meeting of Organization Name, Location.

Presenter, A.A. (Year, Month). *Title of paper or poster.* Paper or poster session presented at the meeting of Organization Name, Location.

5. Unpublished works (selective examples)

Author, A.A. (Year). Title of manuscript. Unpublished manuscript [or "Manuscript submitted for publication," or "Manuscript in preparation"].

For a detailed description of the procedure related to the citation of other types of work than those listed above, consult the 6th APA Publication Manual.

Footnotes

Footnotes are used to provide additional content or to acknowledge copyright permission status.

Appendices

The appendices of the manuscript (labeled APPENDIX A, APPENDIX B etc.) contain materials that supplements article content such as lengthy methodological procedures, calculations of measures, scales etc.

Tables and Figures

The author should number all tables and figures with Arabic numerals in the order in which they are first mentioned in the text, regardless of whether a more detailed discussion of the table or figure occurs later in the paper. The author should label them as Table 1, Table 2, and so on or Figure 1, Figure 2, and so on. List all tables first followed by figures. Place tables and figures after appendices at the end of the manuscript, and indicate the position of each in the text as follows:

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Each table or figure needs an introductory sentence in your text. The format agreed is the standard (canonical) one. Each table should report one type of analysis (which is identified in the title), and each vertical column and horizontal row should contain only one type of data.

Citation

It is important to put in the Reference section every work you have cited throughout the manuscript. The author can cite in-text as follows:

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(Johnny, 2011, p. 13)

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When the original work is out of print, unavailable through usual sources, the author should give the secondary source in the reference list and in the text you should name the original work and give a citation for the secondary source

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Thank you for paying attention to the conventions outlined in this guide – it will help the work of everyone involved in the publication of this journal.