



Maslach Burnout Inventory – General Survey: French validation in a representative sample of employees

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Abstract

Background: This study presents the French validation of the Maslach Burnout Inventory – General Survey (MBI-GS). The MBI-Human Services Survey, MBI-Educators Survey and MBI-GS questionnaires have been validated in numerous languages and are currently being used in many countries, as attested by the abundant literature on the subject. Burnout has received considerable media attention around the world as public awareness grows about this increasingly prevalent phenomenon. As a major social issue that can potentially affect any employee in any field, we felt it was both timely and necessary to conduct a validation study adapted to French culture.

Methods: After performing both forward and back translations, a questionnaire was administered to a representative sample of 1,312 French employees.

Results: Psychometric analysis revealed excellent internal consistency for the three dimensions of MBI (Exhaustion, Cynicism and Professional Inefficacy), a factorial structure almost identical to that reported in the original study, and satisfactory convergent validity. Average scores were grouped into five clusters of identifying variables chosen to provide a

clear picture of mean scores in France: gender, age, occupational status, company size and business sector. Hierarchical classification analysis based on respondents' scores for Exhaustion, Cynicism and Professional Inefficacy resulted in six distinct employee profiles. These groups are described and analyzed considering both MBI scores and responses to additional psychological health questionnaires designed to measure indicators of strain (stress, anxiety and depression symptoms, and need for recovery). These results are discussed in the context of preventing work-related burnout and more broadly, toward preventing psychosocial risks.

Conclusions: The factorial structure shares strong similarities with those found in the literature for versions of the MBI which have been translated into different languages, analyses showed excellent internal consistency in the three sub dimensions and the convergent validity has been demonstrated. Applying cross-correlation to scores for the three dimensions of burnout with scores on other instruments for assessing psychological disorders, allowed us to identify “at risk” profiles which produced highly relevant results with regard to burnout prevention.

Trial registration: data were collected by OpinionWay in accordance with the requirements of European regulation n° 2016/679/EU.

Keywords : French validation of MBI-GS; burnout; French norms; cluster analysis; psychosocial risks

1. Introduction

The phenomenon of burnout has been studied for over 40 years. Clinical observations of employees affected by this syndrome led to the first scientific descriptions enabling the clear identification of the physical and psychological manifestations of burnout (Pines, Aronson & Kafry, 1981; Maslach, 1982; Freudenberger & Richelson, 1980). It was through these pilot investigations that burnout would be defined as the expression of three concomitant symptoms: exhaustion, depersonalization and feelings of reduced professional efficacy. The first questionnaire study to evaluate these three dimensions was developed by Maslach and Jackson (1981) and was designed specifically for people whose occupations rely heavily on interpersonal communication. They called this new tool for assessing burnout the Maslach Burnout Inventory — Human Services Survey (MBI-HSS). Soon thereafter, the same authors

would publish a modified version designed to measure burnout in people working in educational settings which they called the Maslach Burnout Inventory — Educators Survey (MBI-ES; Maslach & Jackson, 1986). Finally, as it became evident that burnout was not exclusive to people working in assistance or support settings, a third version of the questionnaire proved necessary to assess symptoms of burnout experienced by professionals in any occupational setting: the Maslach Burnout Inventory — General Survey (MBI-GS) (Maslach, Jackson & Leiter, 1996). While the number of categorical variables and the specific wording of these three questionnaires differed slightly (22 items for HSS and ES, 16 for GS), all three were designed to measure the same dimensions. The only notable difference was made to the MBI-General Survey where “Depersonalization” as a dimension of burnout would be changed to “Cynicism”, which effectively allowed the GS to assess burnout in generic terms without targeting a specific profession. Similarly, the dimension of Exhaustion relates to physical and emotional fatigue caused by workplace stress without indicating if this fatigue is specifically related to relationships with other people, as is the case in the HSS and ES versions. It assesses the person’s feelings of being overextended and depleted of emotional and physical resources to do their job. The Cynicism scale measures a person’s indifference or distance attitude, feelings of detachment and ultimately, total disengagement with the work itself. The dimension of Professional Efficacy refers more broadly to self-assessment of professional competence and measures the degree to which a person has lost confidence in their ability to make a creative and effective contribution to meaningful work.

1.1. Models of Burnout Development

Various models have been described in the literature for conceptualizing burnout development. These models describe symptoms associated with the three dimensions of burnout as they appear in sequential stages and the relationships between the three components themselves (Bakker, Demetouri & Schaufeli, 2002). According to the original model underlying the MBI, employees develop feelings of indifference and cynicism toward their job, coworkers and organization as a defense mechanism in response to high demands and general overload in their work environment (Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001; Leiter & Maslach, 1988; Leiter & Schaufeli, 1996). Moore (1998) showed that employees exhausted by their work exhibited increasing signs of indifference and cynicism regardless of the initial cause of their fatigue. The trouble with cynicism as a reactive coping strategy is that it can cause a loss of energy and to a drop in job performance, it prevents the individual from feeling invested in their work, and ultimately leads to feelings of professional incompetence. The individual no longer feels that they are able to do their job properly. This model predicts

that physical exhaustion is the symptom that occurs first signaling that an individual is having trouble handling stress associated with their work environment, and that this precipitates detachment and cynicism developed to counter this fatigue. The dysfunctional aspect of this reaction is that, in the long-term, it can generate feelings of professional ineffectiveness. From a psychometric perspective, this model assumes, therefore, that higher levels of cynicism are associated with increasing exhaustion (positive correlation between the dimensions of exhaustion and cynicism), and that a gradual decrease in professional efficacy are accompanied by growing feelings of cynicism (negative correlation between the dimensions of cynicism and professional efficacy).

Golembiewski, Munzenrider & Stevenson (1986) took a more differential approach by proposing what they called the “phase model”, which considers that the burnout experience can take several forms by combining high or low scores for the three dimensions. Notably, they proposed that a person can switch from one configuration to another. According to this model, the most classical scenario begins with increasing levels of cynicism and is based on the premise that responding to overwhelming work stressors with a certain degree of detachment can, at least initially, be beneficial. This state of cynicism would then lead to a process of developing reduced professional efficacy, as proposed by the original MBI model. Exhaustion in this case represents the final stage of burnout.

Lee & Ashforth (1993) drew comparisons between these two described models. Their analyses resulted in a modified version of the Leiter & Maslach Model (1988) wherein they examined the mediation role of cynicism. According to their model, feelings of cynicism and reduced professional efficacy stem directly from the individual’s state of exhaustion, which effectively remains the first symptom associated with burnout.

To test these three models, Taris, Le Blanc, Schaufeli & Schreurs conducted their own longitudinal study in 2005 after a review of the literature resulted in no matching results. Their analyses showed that the two models proposed by Leiter & Maslach (1988) and by Lee & Ashforth (1993) were consistent with their data (with a slight advantage given to the first model) where higher levels of exhaustion cause increased cynicism, which in turn resulted in higher work-related inefficiency. Cynicism in this case appears as an inappropriate coping strategy; professional detachment may be necessary in some cases as a protective mechanism against stressful aspects of the work environment, but when too high, can have a detrimental impact on perceptions of self-efficacy, on a person’s self-esteem and their sense of accomplishment at work. The authors do state, however, that this pattern is neither automatic

nor is it widespread. For one of the studied groups (comprised of teachers), they observed that the cynicism component eventually led to elevated levels of exhaustion measured one year later. Burnout development models should, therefore, be modulated, and might be further adapted to specific populations (to account for constraints inherent in the working environment and individual characteristics).

Although research on burnout has been prolific in terms of linking construct to variables, no single conceptual model has emerged to explain its development and subsequent impact. The majority of authors agree, however, that the two main dimensions at the “core” of burnout are exhaustion and cynicism. Certain studies have considered only these two dimensions (e.g. Maslach, 2011; Trépanier, Fernet, Austin & Menard, 2015). The most recent trend has been to give more attention to interindividual variability, despite the risk of complicating prevention. Notably, several studies have highlighted the relationship between certain personality traits and the three dimensions of MBI with the objective of developing targeted care in earlier stages to people who may be at greater risk for experiencing burnout (e.g. Häätinen, Kinnunen, Mäkikangas, Kalimo, Tolvanen, & Pekkonen, 2009; Häätinen, Kinnunen, Pekkonen, & Aro, 2004; Leiter and Maslach, 2016; Mäkikangas & Kinnunen, 2016).

1.2. The causes of burnout related to the work environment

Following the publication of the MBI-GS, the authors then examined the factorial structure of the questionnaire. Numerous studies had previously demonstrated the strength of the three-dimensional structure for the MBI-HSS and MBI-ES versions, and the same proved true for the MBI-GS: the research validated the robustness of the three-dimensional structure for professionals working in a range of fields, and from various countries (e.g. Bakker, Demerouti, & Schaufeli, 2002; Bria, Spânu, Băban, & Dumitrașcu, 2014; Demerouti, Bakker, Vardakou, & Kantas, 2003; Kitaoka-Higashiguchi, Nakagawa, Morikawa, Ishizaki, Miura, Naruse et al., 2004; Langballe, Falkum, Innstrand, & Aasland, 2006; Leiter & Schaufeli, 1996; Papineau, Morin, Legault, Demers, Chaturvedi, & Côté, 2005; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002; Schutte, Toppinen, Kalimo, & Schaufeli, 2000; Storm & Rothmann, 2003; Taris, Schreurs, & Schaufeli, 1999). Their follow-up investigation focused on factors related to the professional and personal life environments that would most likely to influence the dimensions of exhaustion, cynicism and professional efficacy.

Studies which have shown that relationships exist between the three dimensions of burnout, demands in the work environment, resources available to the employees and their psychological well-being are mainly based on the Conservation of Resources Theory (COR)

(Hobfoll, 1989; Hobfoll & Freedy, 1993). The central idea supporting this theory is that burnout arises as a result of an imbalance, or mismatch, between demands in the work environment and the individual's available resources. According to Lee & Ashforth (1996), the main structural causes in the work environment are role conflict (corresponding to multiple and competing demands, and value conflict), role ambiguity (referring to a lack of information needed to perform good work, and poorly defined individual roles), stressful events, workload and pressure at work to perform. The most important resources relate to social support (which research has shown is more impactful from a supervisor than from colleagues), those related to information or control, to participation in decision making and to autonomy. According to the COR theory, prolonged exposure to job stressors can lead to both physical and emotional exhaustion. The resources, if present, may initially help the individual by mitigating the negative effect of job demands and exhaustion, but if these resources become depleted or are lost altogether, the same individual can build feelings of cynicism as a defense mechanism. Moreover, the resources stimulate a positive work-related state of mind, which in turn fosters positive organizational outcomes, such as performance (professional efficacy). Weakening of these resources not only leads to exhaustion but contributes to reduced professional efficacy or reduced personal accomplishment. The main consequences are successive drops in work engagement, job satisfaction, commitment levels and an increasing desire to leave work. Each of these feelings can be precursors to burnout. (Hätinen, Kinnunen, Pekkonen & Aro, 2004).

In 2001, Maslach, Schaufeli & Leiter described more precisely the six key organizational areas of work life where an imbalance or mismatch of demands-resources can take place. For these authors, and according to the COR theory, each of these areas corresponds to a specific expectation a person has developed about their work environment, and that burnout will occur when the person's expectations begin to differ from their actual professional experience. These six domains provide a comprehensive framework for understanding the work-life interface. An individual's symptoms of approaching burnout will not necessarily be linked to all six areas. And depending on the sensitivity level of the person, each domain can have various degrees of impact on one or several dimensions of burnout. We briefly describe the domains as defined by Maslach, Schaufeli & Leiter (2001) as workload, control, reward, community, fairness, and values and their central relationships with the dimensions of burnout. Workload, when it is excessive, is most directly related to the exhaustion dimension of the MBI as recovery becomes increasingly difficult if the burden persists. If the workload is less

demanding but the person is either less qualified or lacks interest in the work they are asked to do, the outcome will be similar.

A lack of control over one's work environment leads to feelings of ineffectiveness or lower professional efficacy; this can manifest if a person feels they have insufficient control over the resources needed to work, or if they have not been given the authority to work in the manner they feel is most effective. Managers may also suffer from this lack of control (just as they can be subjected to overwhelming workloads) when they feel responsible for the results of their team and have not been given enough latitude to achieve the objectives set by their own superiors.

Not feeling properly rewarded is also closely related to professional efficacy. While the most obvious and expected form of reward may be financial (being poorly rewarded would equate to not receiving a salary commensurate with achievements or workload), a lack of recognition can have just as strong an impact. Lack of praise or appreciation by others leads to a sense of inefficiency and can similarly have a negative impact on a person's sense of pride.

The notion of community is the fourth domain which refers to connections and sharing feelings with others in the workplace (even if these are occasionally negative), and the exchange involved in helping others or receiving help. This form of sharing and social support reinforces the culture of shared values. If a person isolates themselves or is isolated by others, he or she will no longer feel a sense of belonging. The nature of situations that tend to have the greatest impact on the sense of community, either directly or indirectly, are serious interpersonal conflicts between colleagues which cannot be resolved by superiors or through managerial action. These types of conflicts can be damaging and lead to a drop or total loss of sense of community.

For mutual respect to exist between individuals and before a sense of community can develop, employees need to feel that they are working in an atmosphere based on fairness, which likewise strengthens each person's self-esteem. Mismatch in the area of fairness may correspond to an unbalanced work distribution, or to salaries, bonuses or promotions awarded in a manner deemed unfair. In the case of interpersonal conflict, if the two parties are not given equal opportunity to voice their concerns, feelings of injustice will be felt by at least one of the two. The lack of fairness impacts the exhaustion dimension in terms of the emotional energy needed to manage the stress of the situation. This dynamic is also likely to fuel a deep sense of cynicism.

A conflict of values is the area involved most in the context of predicting burnout. This can exist at three levels: in terms of one's own work, of the workplace organization or of the company itself. Indeed, an employee may be asked to work in a way that conflicts with his or her own values. The individual may also feel that their own values do not match those related to the organization of their department, or that their personal career goals conflict with values of the company or institution.

Dubreuil, Laughrea, Morin, Courcy & Love (2009) were particularly interested in examining the role of social support from colleagues and organization-level support (from superiors) as mediating variables between the two dynamics of role conflict and burnout and role clarity and burnout. Effectively, their results showed that the quality of a person's relationships with both their superior and their colleagues can have an adverse effect on conflicts and role clarity, and that these factors can exacerbate the development of burnout. The nature of these relationships could prompt the individual to begin feeling less engaged in their work, and reinforce the negative perception their colleagues or supervisor may already have of this person, marking the beginning of a vicious circle. On the other hand, these authors found that support from colleagues and/or a superior, whether social in nature or more practical (concrete material assistance), did not appear to play a mediating role between the effects of role conflict or role ambiguity and the development of burnout. More recently, Trépanier, Fernt, Austin & Ménard (2015) focused on the interplay between the two core dimensions of burnout and work engagement (as opposite ends of two continua). More specifically, they investigated the energy and identification continua (vigor-exhaustion and dedication-cynicism) and their impact on the relationship between burnout and the factors of work overload, job autonomy and recognition. They found that an overly demanding workload and a lack of recognition will influence both dimensions of exhaustion and cynicism, whereas a lack of control or job autonomy will influence only cynicism.

In conclusion, a similar argument can be made about interindividual variability, which we described earlier in the context of the stages of burnout development. Research has shown that personality traits play a role in determining which of the three burnout dimensions will affect an individual most, and that a person who experiences trouble in one area could have a positive experience in another. For example, as Maslach, Schaufeli & Leiter (2015) explained, an employee can feel they have the capacity to manage a heavy workload if they feel they are receiving the right recognition or have sufficient support from their colleagues or their supervisor. Along these same lines, other individuals might feel that being recognized for

their work is more important than a potential conflict of values. The authors proposed that preventing burnout should necessarily involve considering the organizational context by analyzing the six key areas of the work environment and employees' perceptions of each. These six factors were included in a questionnaire called The Areas of Worklife Survey (AWS) created to assess how perceived characteristics of the work setting contribute to experiencing work engagement or burnout. It was developed as a companion piece to the MBI (the psychometric properties are provided by Leiter & Maslach, 2004).

1.3. The causes of burnout related to individual factors

Given that strong interindividual variations can exist in any working environment, it would be natural to assume that, as with any psychological disorder, a person's individual strengths or weakness would influence the development of burnout. Maslach (2003) reminds us that despite this widely held popular perception, people who are affected by burnout are not necessarily those who work too much, nor do they perceive themselves as being weak and incompetent. Research which has focused on individual characteristics has shown that relatively few personality traits directly influence burnout development, whether as protective factors or risk factors. Results from these studies, however, were not completely consistent and the studied personality traits showed no significant statistical influence.

A more comprehensive study along these same lines is worth mentioning which was conducted by Desjardins (2014) and which was based on much wider range of personality dimensions. In this investigation, the author assessed inter-correlations between the underlying dimensions included in three questionnaires for measuring personality trait constructs: the Personal Work Style questionnaire (with the variables Perfectionism, Self-esteem, Intolerance to uncertainty, Pressure to perform and Tendency to worry), the Sixteen Personality Factor Questionnaire (16PF) (with the variables Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-Consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privatness, Apprehension, Openness to Change, Self-Reliance, Perfectionism, and Tension), and the MBI-GS. The main results concern the "Emotional Stability" factor of the 16PF. This study makes a significant contribution toward explaining variance between the exhaustion and cynicism dimensions of burnout. The concept of emotional stability is considered as the opposite of neuroticism, one of the higher-order personality traits included in the Big Five (also known as the five-factor model, FFM). These results are consistent with those obtained by Bakker, Van Der Zee & Dollard (2006) who showed that neuroticism was the only predictor of the MBI dimension of exhaustion.

Emotional stability also plays an active role in predicting the cynicism dimension, together with self-esteem, internal locus of control and self-efficacy. While emotional stability appears here to be a reliable predictor for the two dimensions (when associated with other personality traits as they relate to cynicism), the additional percentage of variance explained remained relatively low (see Desjardins, 2014). This research does remain, however, one of the only investigations to date that has explored possible connections between personality traits and two of the three dimensions of the MBI.

Other factors related to personality deserve consideration. Maslach, Schaufeli & Leiter (2001) proposed that an employee's expectations about his or her work may also be one of the factors that could lead to the development of burnout. Expectations which are too high or unrealistic could lead a person to work more, to the point that they feel overextended or overtired and, eventually, to feeling cynical if his or her extra efforts do not lead to the expected results. Studies which tested this hypothesis, however, have not been validated.

The conclusion we can draw from what research to date indicates (we refer to sociodemographic characteristics in the current research in the section analyzing our results) is that work environment variables are stronger predictors of burnout than individual variables.

1.4. The consequences of burnout

Burnout is a serious disorder that can lead to a variety of adverse consequences. An employee suffering from burnout who continues to work (if they have not taken long-term leave sick leave) is more likely to exhibit withdrawal behavior such as absenteeism, lower efficiency and consequently, lower productivity. The employee will experience job dissatisfaction and will feel less committed to their work or their organization as a whole. According to Leiter & Maslach (2004), people who experience these feelings can, effectively, pass them on to their colleagues who, in turn, will develop negative emotions about their work environment. This is referred to collective burnout. At the individual level, the consequences are physiological (headaches, gastrointestinal disorders, hypertension, diabetes, sleep disorders, etc.), psychological (loss of self-esteem, anxiety, depression, suicidal thoughts, etc.), behavioral (absenteeism, prolonged breaks, isolation, low performance, cognitive difficulties, etc.), and social (negative impact on private life involving relationships with family or friends). In more precise terms, the consequences as they relate to the three dimensions of burnout are as follows: exhaustion as a disorder itself is easily identifiable; feelings of cynicism are reflected in disengagement, withdrawal, isolation from others both in and outside of the workplace; perceptions of professional efficacy lead to lower self-esteem, reduced productivity or

capability, job dissatisfaction, absenteeism and an increased desire to resign. Similarly, Trapanier, Fernt, Austin & Ménard (2015) demonstrated that the exhaustion dimension directly impacted measures of psychological distress and the intention to resign, which they also showed was a direct consequence of cynicism.

1.5. The relationships between burnout, depression and engagement

As we have just mentioned, depression and declining work engagement are possible consequences of burnout. For several years, researchers have questioned what, if anything, differentiates the two associations of burnout with depression and burnout with disengagement.

Depression and burnout are manifested by similar physical and psychological symptoms (low self-esteem, sleep disturbance, feelings of failure, etc.) and cross-sectional studies have confirmed that a relatively strong correlation exists between symptoms of depression and the established signs of burnout, especially exhaustion. The COR theory predicts that depressive symptoms will appear in an advanced stage of burnout, implying that depression occurs as a consequence (Cooper, Dewe & O’Driscoll, 2011; Leiter & Durup, 1994; Schaufeli & Enzmann, 1998). Longitudinal studies have validated this hypothesis (Hakanen & Schaufeli, 2012), while other investigations have highlighted the reciprocal nature of the relationship between burnout and depression (Ahola & Hakanen, 2007). Nevertheless, although burnout and depression differ at the statistical level, clinical differentiation can prove difficult as a very thin line separates confirmed diagnosis of depression from severe burnout if the initial causes are not identified and analyzed.

The concept of engagement has been the subject of debate among researchers studying burnout and has resulted in two schools of thought. While there is general agreement that engagement with work refers to a positive, productive and motivational state, a shift has taken place in that, more and more, the thinking is that it should be defined more positively as an independent and distinct concept rather than negatively defined as the antithesis of burnout. The most developed and accepted theory proposed that engagement is the opposite of burnout (Maslach & Leiter, 1997; Schaufeli, Salanova, González-Romá & Bakker, 2002). These last authors cited noted, however, that the absence of burnout does not necessarily imply the presence of engagement or vice versa, and questioned if the two states should be measured with one instrument. This led them to develop the Utrecht Work Engagement Scale, a questionnaire comprised of three dimensions (high energy, strong involvement, and a sense of efficacy) as the direct opposites of exhaustion, cynicism and what they refer to as professional

inefficacy. Several works confirmed strong negative correlations between the MBI and the Utrecht Work Engagement Scale (Cole, Walter, Bedeian & O’Boyle, 2012; Crawford, LePine & Rich, 2010; Taris, Ybema & van Beek, 2017), while other authors observed weaker correlations between the two subscales (Mäkikangas, Feldt, Kinnunen, & Tolvanen, 2012). The takeaway from these studies is that it would be overly simplistic to state that a continuum exists between engagement and burnout, for what has emerged is that the links between burnout and engagement are complex. Subsequent investigations which involved **developmental profiles of burnout and work engagement underlined this fact by** revealing that the two concepts can occur simultaneously, and that one is not necessarily the consequence or the opposite of the other.

In addition to the association of depression with engagement, it appears that other psychological states have established connections with certain dimensions of burnout which ultimately stem from job dissatisfaction (Maslach & Schaufeli, 1993) and workaholism (Schaufeli, Taris & van Rhenen, 2008). All of these concepts seem to intersect in a complex manner and can have varying degrees of impact on an employee’s psychological and physical health. None of these notions of association (or the subdimensions they are composed of), however, can be characterized by a regular continuum that is easily identifiable and which manifests in the same way for each person.

1.6. The present study

The MBI-HSS, MBI-ES and MBI-GS questionnaires have been validated in numerous languages and are currently being used in many countries, as attested by the abundant literature on the subject. Burnout has received considerable media attention around the world as public awareness grows about this increasingly prevalent phenomenon. As a major social issue that can potentially affect any employee in any field, we felt it was both timely and necessary to conduct a validation study adapted to French culture. This need was reflected in the report sponsored by the Directorate-General for Labor and published in 2015 entitled “Professional Exhaustion (The Burnout Syndrome) - Better Understanding for More Effective Action”, and by the recommendation to “strengthen burnout prevention” issued by the 3rd Occupational Health Plan enacted the same year.

The MBI-HSS was validated in French for both Canada by Dion & Tessier (1994) and France (Lheureux, Truchot, Borteyrou & Rasclé, 2017), and the MBI-GS version was validated for Canada by Papineau, Morin, Legault, Demers, Chevrier & Côté in 2005. Further motivation for this work is that certain linguistic differences exist between Canadian French and

European French, and the fact that there has been no research to date studying the psychometric properties of the MBI-GS in France, a country characterized by the diversity of its working population.

Our objectives are as follows:

- i. Analyze the psychometric properties of the French version of the MBI-GS;
- ii. Study the correlations between the dimensions of MBI and other psychological health questionnaires;
- iii. Present the French “standards”;
- iv. Apply the person-oriented statistical approach by identifying different personality profiles among the French population.

2. Method

2.1. Participants and procedure

A sample of 1,312 employees were asked to participate in a voluntary survey designed and administered by our partner OpinionWay (an independent market research firm specialized in survey data collection and analytics). Respondents were instructed to fill out a questionnaire made available on a dedicated website. The group from which this data is drawn is a representative sample of the general working population in France (quota sampling methods were used, and data was weighted from each respondent). Data analysis grouped respondents by age, gender, sector of activity, company size, managerial or leadership functions and, where applicable, the number of supervised employees. The data collection took place in April 2016.

Participants included in the OpinionWay panel responded on condition of anonymity and after completing a consent form. This investigation received approval from the National Commission for Data Protection and Liberties (CNIL-France).

2.2. Measures

The full questionnaire given to the participants consisted of three elements: the MBI-GS, the Need for Recovery scale (VanVeldhoven, 2008), the Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983), and the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). The participants also provided the sociodemographic variables mentioned above.

2.2.1. *Burnout: MBI-GS*

The 16 items of the MBI-GS were submitted for both forward and back translations from the English version provided by Maslach via the Mind Garden website which were then compared to the French-Canadian version. The wording of the items in European French, agreed upon by a group consisting of three psychologists and one academic, was first tested for clarity by a group of 30 volunteers. Structural modifications to certain sentences were applied following the advice and comments of this test group. The same verification steps were then followed for the corrected version which was issued to a second group of 20 volunteers: the questionnaire was understood and interpreted in the same way by all respondents. The finalized version of items listed in the French version of the MBI-GS was adapted accordingly and, as reflected in the original version, included five items specific to the dimension of Exhaustion, five items for the Cynicism dimension and six items for the dimension of Professional Efficacy. Finally, the items were randomized to obtain the definitive French version of the MBI-GS.

The types of answers respondents could choose from were: “never”, “a few times a year or less”, “once a month”, “a few times a month”, “once a week”, “a few times a week, and “every day”. Each answer was assigned a coded value from 0 to 6. Thus, scores for scales of Exhaustion and Cynicism ranged from 0 to 30, and the scale of Professional Efficacy ranged from 0 to 36. High scores obtained for the first two dimensions and low for the third indicated the presence of burnout.

2.2.2. *Need For Recovery: NFR*

The NFR scale is an instrument used to assess work-induced fatigue and the quality of employees' recovery time. It measures the intensity of a person's fatigue after a day of work and the time it takes to recover his or her energy without having completely recovered their physical and psychological resources.

This scale is comprised of ten items for which the range of responses are dichotomous (yes or no). A final overall score on Need for Recovery is calculated by summing the scores obtained for the ten questions. The response modalities are coded as 0 to 1, the score increases depending on the need for recovery and may vary between 0 and 10.

2.2.3. *Perceived Stress: PSS*

The Perceived Stress Scale, well known and widely used in French companies, evaluates the imbalance between an individual's perceptions about the demands of their work environment and their perceptions about the resources they need to successfully manage those demands. Imbalance between the demands and the perceived resources which becomes too pronounced or too prolonged over time can lead to stress, which can negatively affect the person's physical and mental health. The version used in this research was comprised of 10 items with response types adjusted to reflect frequency ("never" to "often"). An overall score of a person's perceived stress was calculated as the sum of responses to the ten questions (with each response coded from 1 to 5). The score increased according to the intensity of the stress experienced and could vary from 5 to 50.

2.2.4. Symptoms of anxiety and depression : HADS

The Hospital Anxiety and Depression Scale (HADS) consists of seven items related to anxiety symptoms and seven items related to symptoms of depression. The four response types varied depending on the questions (for example, "most of the time" to "never", or "yes, very clearly" to "not at all"). Responses were coded from 0 (the most favorable) to 3 (the least favorable). The total score for measuring anxiety symptoms was calculated by adding the scores of responses related to anxiety, and that for symptoms of depression was the sum of scores of responses related to depression. As such, two scores could be obtained ranging from 0 to 21.

2.2.5. Socio-demographic variables

Participants also indicated their gender, year of birth, sector of activity, occupation, the size of their business or organization, and whether they held managerial positions (and if so, the number of employees under their supervision). All questions, with the exception of birth year, were close-ended.

3. Results and discussion

3.1. Descriptive statistics and reliability analysis

We first tested the distributions for each item, including those for the three dimensions of MBI, for normality using the Kolmogorov-Smirnov test with Lilliefors correction, $p < 001$ for each analysis. Table 1 shows the characteristics of the three dimensions.

Table 1 Mean (M), standard deviation (SD), minimum (Min), maximum (Max), α for Cronbach and Pearson correlation between MBI dimensions.

	M	SD	Min	Max	α	1.	2.
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Exhaustion	13.40	8.14	0	30	.90		
Cynicism	12.31	8.05	0	30	.86	.64**	
Professional Efficacy	25.91	7.48	0	36	.87	-.03 ^{ns}	-.20**

** : $p < .001$; ^{ns} : not significant

The internal consistency of each dimension was very good, even excellent. With regard to correlations between the three dimensions, our findings corresponded to what has been reported in the literature, which was a higher positive correlation between exhaustion and cynicism, and a negative weak correlation (while significant) between cynicism and professional efficacy. By contrast, the link between exhaustion and professional efficacy was not significant. These results are in line with the burnout development model proposed by Leiter & Maslach (1988), and confirmed by Taris, Le Blanc, Schaufeli & Schreurs (2005).

3.2. Validity analysis: factorial structure

We conducted an Exploratory Factor Analysis (EFA) for all participants and for several subgroups using SPSS 22.0 (Extraction of Principal Components, with eigenvalues greater than 1). The rotation requested was oblique (Oblimin rotation with Kaiser normalization) given that some factors were correlated. The three-factor structure proved to have a superior fit over the one and two factor structures, and accounted for, respectively, 36.01%, 22.76% and 7.74% of the variance (eigenvalues were 5.8, 3.6 and 1.2), which rendered a total of 66.51 % and, effectively, a very good result (KMO = .90, Bartlett's test ($\chi^2(120) = 12162$, $p < .001$). Table 2 presents the matrix structure after rotation.

Table 2 Factor loadings of each item of the three factors for the analysis of all participants.

Items	Factor 1	Factor 2	Factor 3
MBI-Ex1	.84	-.02	.44
MBI-Ex2	.87	.11	.35
MBI-Ex3	.80	-.08	.59
MBI-Ex4	.79	-.11	.54
MBI-Ex5	.92	-.01	.52
MBI-C1	.53	-.11	.85
MBI-C2	.54	-.07	.84

MBI-C3	.31	-.09	.67
MBI-C4	.47	-.18	.81
MBI-C5	.45	-.27	.77
MBI-PE1	.03	.71	.07
MBI-PE2	-.01	.78	-.23
MBI-PE3	.02	.78	-.03
MBI-PE4	-.01	.75	-.27
MBI-PE5	.05	.83	-.20
MBI-PE6	-.07	.81	-.21

The exhaustion and cynicism dimensions are shown here to be correlated (in this analysis, factors 1 and 3 correlate to .51), and we would expect that the weights for items for the exhaustion dimension would significantly saturate factor 3 and vice versa. However, considering that a difference of at least .20 between weights is sufficient to determine if an item belongs to a factor, we see here that no item simultaneously saturates these two factors which leads to certain doubts as to belonging. Concerning correlations between the other factors, our results were similar to those we have just described: factors 2 and 3 were correlated to -.17 and there was no correlation between factors 1 and 2.

This analysis was replicated on all groups that consisted of more than 160 respondents, which is the minimal number of respondents when there are 16 available variables (see Hair, Anderson, Tatham & Black, 1998). This allowed us to analyze the following groups: men, women, respondents aged 29 years and under, aged 30 to 39 years, 40 to 49 years, 50 years and over, managers, non-managers, respondents working for businesses with less than 10 employees, from 10 to 49 employees, from 50 to 499 employees, from 500 to 4999 employees, from 5000 employees and over, respondents working in the industrial sector, in business services and the sector of Education, Health and Social Action. These analyses produced similar and satisfactory results in terms of correlations between scores, coefficients of internal consistency, percentage of variance explained by the three-factor solution (these factors being identical to those presented for the combined population). The three-factor solution appeared robust and invariant for groups characterized by very different variables

Numerous studies have previously tested the dimensionality of the MBI model and compared factor structures allowing for one, two and three dimensions. The strongest results in terms of

data fit adequacy supported using a three-factor structure, which we used to verify the factorial validity of the questionnaire used in our study. We tested the three-dimension model **by conducting Confirmatory Factor Analysis (CFA) with the software LISREL 9.1**, and using the **Maximum Likelihood Estimation method**. **In terms of goodness-of-fit indices to assess how well the model captured covariance between all items, we were unable to build on the significance of χ^2** , since this index is almost always high when using large samples. Instead, we used the two indexes recommended by Hu & Bentler (1999), which are the Root Mean Square Error of Approximation (RMSEA), and the Adjusted Goodness of Fit Index (AGFI) which corrects the Goodness of Fit Index (GFI), depending on the model's degrees of freedom. A good fit between the hypothesized model and the observed data should be indicated by an RMSEA value lower than .08 (Browne & Cudeck, 1993), and by AGFI values greater than .90 (Bentler & Bonett, 1980). Additionally, we used the Normed Fit Index (NFI) and Non-Normed Fit Index (NNFI) to assess the global model fit. Hoyle (1995) estimated that a model can be considered acceptable when the NFI and NNFI coefficients are greater than .90.

The first model tested showed insufficient adequacy of internal consistency coefficients (see Table 3), while they were close to conventional values. To improve the model, we allowed for correlated errors between five item pairs, with the items belonging to the same dimension of the MBI. The final model of the questionnaire structure is shown in Figure 1.

Table 3 Fit statistics for the LISREL models.

Model	χ^2	d.f.	RMSEA	AGFI	NFI	NNFI
1	1136.17	101	.088	.86	.91	.90
2	748.18	96	.072	.90	.94	.93

1 : initial model ; 2 : model allowing for correlated errors between five item pairs.

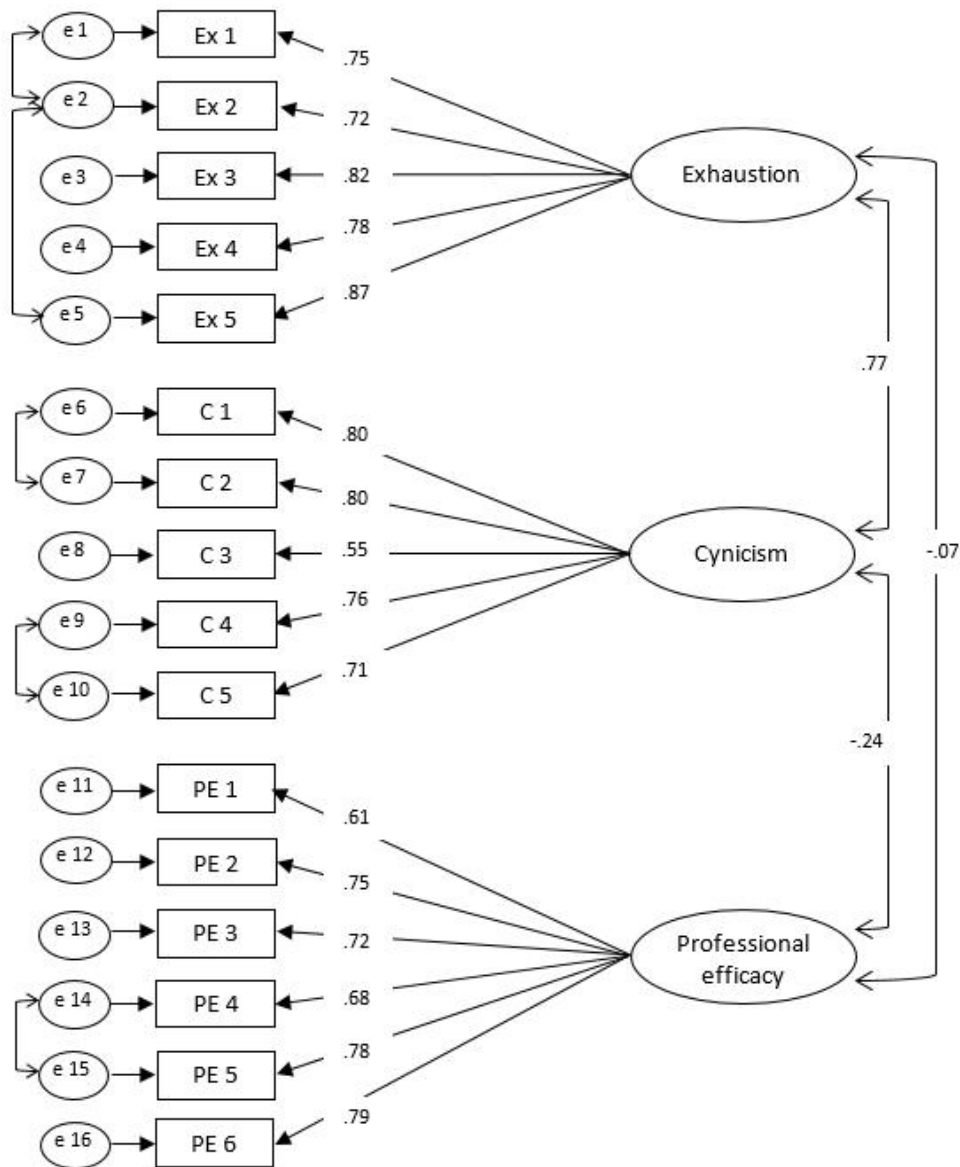


Fig. 1. Final model of factorial structure for the French version of the MBI-GS. All factor loadings and covariances are significant at $p < .001$.

The factorial weights of the items on their respective scales were very satisfactory (with standardized estimates between .55 and .87). The item C3 was cause for reflection as it was shown to have the lowest factorial weight, which has been the case in previous studies. Leiter and Schaufeli (1996) also showed that this item had the lowest factorial weight. Schutte, Toppinen, Kalimo and Schaufeli (2000) excluded it from their model altogether, as did Bria, Spânu, Băban and Dumitrașcu (2014) who observed an exceptionally low standardized estimate of .21 (the other items varied from .51 to .85). Even if C3 had the lowest weight in our own study, it was still considerably higher than those reported in other works and we decided to include it our analysis.

Another significant difference is that we observed no existing links between the exhaustion and professional efficacy dimensions. We were able to confirm the absence of any significant correlation between scores for these two dimensions (see section 3.1.), and between factors 1 and 2 of the EFA (see section 3.2), by the CFA analysis. Interestingly, low to moderate correlations between exhaustion and professional efficacy have previously been reported in the literature. We found this result particularly interesting in the context of our own analysis of the differential effects of personality profiles.

3.3. Convergent and Divergent Analyses

We calculated the correlations between the scores of the different questionnaires. These results are shown in Table 4.

Table 4 Correlations between MBI scores and NFR, PSS and HADS scores.

	NFR	PSS	HADS-A	HADS-D
MBI-Ex	.68**	.56**	.50**	.54**
MBI-C	.41**	.40**	.38**	.48**
MBI-PE	-.07	-.22**	-.28**	-.31**

MBI-Ex: Exhaustion ; MBI-C: Cynicism; MBI-PE: Professional Efficacy ; HADS-A: anxiety score ; HADS-D: depression score

** : $p < .001$

The highest correlation occurred for the exhaustion score on the NFR questionnaire, which we expected given that a similar concept was being evaluated by the two scales. Indeed, the need for recovery assesses the degree of physical and emotional fatigue that persists after a day of work and gauges the level of difficulty an individual has recovering his or her energy to engage themselves in a new day of work the next morning. The exhaustion score was also relatively strongly correlated to the scores reflecting perceived stress, symptoms of depression and anxiety symptoms. As the state of exhaustion can be a symptom of all three states (stress, depression, and anxiety), we expected to find links between these different psychological disorders.

The cynicism dimension also proved to be significantly and positively correlated for the other four questionnaires. While we expected this correlation given that cynicism is itself strongly correlated with exhaustion, the fact that the strongest correlation was with symptoms of depression suggests to us that cynicism may very well be interpreted as a coping strategy.

When a person believes that they no longer have the resources to cope with the stressors of his or her environment (state of stress), or when he or she suffers from anxiety in that they live in constant fear of danger (real or imagined), or loses total interest in things that normally provide pleasure (we can recall five of the seven items of the scale of symptoms of depression in HADS concerning anhedonia), it is not surprising that a link exists with the dimension of cynicism, which relates broadly to a distance attitude, withdrawal, isolation from others and disengagement.

The results pertaining to the dimension of professional efficacy were very interesting, notably in that we observed no relationship between this dimension and the NFR scale. This implies that an employee with a strong need of recovery does not necessarily feel that they are ineffective at work. In our view, this dynamic is still consistent with what we know about the consequential effects of stress: increased feelings of stress can augment existing anxiety or depression, which in turn can feed an already growing impression that one is incapable of being effective at work.

In a more global sense, these analyses also shed light on the two questionnaires used in this study. According to our own results and studies which have focused on the NFR scale (see Dupret, Bocéréan, Feltrin, Chemolle & Lebon, in submission), high work-related fatigue may very well be a precursor to burnout, or at the very least, a signal of developing burnout when we consider its links to the other two dimensions of the MBI. The scale for measuring symptoms of depression in HADS, as expected, showed close relationships to the three scales of burnout given that the personality characteristics evaluated are among those used to diagnose clinical depression. That said, while burnout and depression share common symptoms and, as revealed in their measured relationships, can occur together, they are very different conditions. In effect, we conducted an EFA on data of all participant responses to items on both the MBI and HADS-D using SPSS 22.0 (Extraction of Principle Components, with eigenvalues greater than 1). The rotation requested was oblique (Oblimin rotation with Kaiser Normalization) given that factors are related. The best fit solution considered four factors and accounted respectively for 32.46%, 13.10%, 7.53% and 7.97% of the variance (eigenvalues were 7.47, 3.58, 1.73 and 1.14), for a total of 60.52% (KMO = .92, Bartlett Test ($\chi^2(2, 253) = 14713, p < 0.001$)). Table 5 presents the structure matrix after rotation and very clearly shows the differentiation between the four scales introduced in the analysis.

Table 5 Factor loadings of each item on the MBI and on the Depression scale for the analysis of all participants.

Items	Factor 1	Factor 2	Factor 3	Factor 4
MBI-E1	.41	-.03	.47	-.83
MBI-E2	.31	-.11	.38	-.87
MBI-E3	.59	-.10	.42	-.80
MBI-E4	.50	-.13	.42	-.79
MBI-E5	.47	-.01	.44	-.92
MBI-C1	.84	-.13	.38	-.52
MBI-C2	.83	-.09	.39	-.53
MBI-C3	.67	-.11	.24	-.30
MBI-C4	.80	-.21	.38	-.50
MBI-C5	.76	-.30	.35	-.44
MBI-PE1	.08	.70	-.25	-.04
MBI-PE2	-.24	.78	-.18	.03
MBI-PE3	-.03	.78	-.20	.00
MBI-PE4	-.28	.74	-.26	.03
MBI-PE5	-.20	.83	-.21	-.03
MBI-PE6	-.20	.81	-.28	.09
HADS-D1	.27	-.18	.69	-.34
HADS-D2	.31	-.17	.80	-.43
HADS-D3	.33	-.22	.74	-.38
HADS-D4	.29	-.27	.54	-.43
HADS-D5	.24	-.23	.57	-.22
HADS-D6	.31	-.23	.79	-.42
HADS-D7	.08	-.14	.58	-.28

3.4. Discriminant analysis using average scores related to sociodemographic variables

We conducted analyses of average differences to determine if respondents differed according to sociodemographic criteria. Table 6 shows the averages and standard deviations of the different subgroups. All scores were calculated on a scale of 0-100. Averages (shown in grey) within the same demographic variable represent the least favorable (with significant differences between subgroups being at least $p < .01$). Post-hoc analyses (Bonferroni Test) which show no statistically significant difference for several averages are depicted here in grey.

As shown here, there were no significant differences in terms of the number of supervised employees (possible responses were: “1 to 4”, “5 to 9”, “10 to 19”, and “20 and over”), or to the business sector (private or public).

Table 6 Mean (M) and standard deviation (SD) between scores on Exhaustion, Cynicism and Professional Efficacy according to gender, age group, occupational status, company size and business sector.

		Exhaustion	Cynicism	Professional Efficacy
Gender				
Male	M	42.40	42.07	71.66
n=665	SD	27.40	26.37	20.84
Female	M	47.00	40.00	72.34
n=648	SD	26.69	27.32	20.73
Age group				
Under 25	M	41.72	37.64	64.36
n=47	SD	22.10	24.05	23.62
25 to 29	M	45.97	42.01	67.47
n=211	SD	25.38	25.92	20.96
30 to 34	M	46.35	42.55	71.87
n=132	SD	25.73	26.93	21.27
35 to 39	M	45.39	40.61	70.52
n=215	SD	26.30	24.45	19.20

40 to 44	M	45.84	44.70	69.94
n=174	SD	27.51	27.44	21.17
45 to 49	M	42.36	38.86	73.34
n=191	SD	27.96	27.96	20.97
50 to 54	M	46.34	41.95	76.41
n=159	SD	29.77	28.99	19.97
55 to 59	M	43.32	38.67	78.03
n=141	SD	29.71	27.85	19.31
60 and over	M	36.35	36.88	76.59
n=42	SD	24.21	26.39	19.80
Occupational status				
Manager	M	43.04	38.23	73.34
n=409	SD	25.65	25.52	20.63
Non-manager	M	45.41	42.33	71.38
n=903	SD	27.77	27.36	20.83
Company/Organization size				
Under 10 employees	M	40.34	36.37	72.21
n=298	SD	26.18	26.08	20.27
10 to 49	M	45.07	39.22	73.15
n=229	SD	25.53	26.61	21.05
50 to 449	M	42.85	41.78	70.32
n=236	SD	26.14	25.88	22.50
500 to 4999	M	49.07	44.80	72.84
n=254	SD	29.19	27.06	20.38
5000 and over	M	46.40	43.36	71.48
n=296	SD	27.66	27.76	
Business sector				
Manufacturing Industry	M	45.19	43.72	72.62
n=201	SD	28.90	27.35	21.03

Construction and public works	M	33.80	31.26	70.98
n=87	SD	25.43	23.00	22.11
Trade and repair	M	48.12	42.28	71.68
n=114	SD	27.57	27.83	19.71
Transportation	M	43.69	40.32	71.07
n=100	SD	26.43	27.25	23.07
Energy	M	39.36	41.91	63.05
n=31	SD	21.65	26.61	23.04
Banking – Insurance – Real Estate	M	47.52	46.72	69.23
n=73	SD	25.74	25.44	21.84
Business services	M	42.23	43.92	72.18
n=168	SD	24.88	26.74	19.33
Retail services	M	47.32	42.19	71.30
n=129	SD	27.70	28.37	22.03
Education – Health – Social Action	M	47.26	36.83	73.49
n=255	SD	26.84	26.12	19.76
Administration	M	44.37	43.14	72.94
n=142	SD	28.16	26.28	20.23
Total population				
	M	44.67	41.05	71.99
	SD	27.14	26.58	20.78

The differences between men and women have been widely published but have not always been consistent with regards to the dimensions of MBI. In this study, average scores among women were higher on exhaustion than they were for men, whereas gender did not influence scores on cynicism and professional efficacy. The result for exhaustion was not entirely unexpected as women very often score higher on questionnaires related to psychological health (NFR, HADS-A, PSS). Bakker, Demerouti and Schaufeli (2002) offered several possible interpretations including, for example, the fact that women more readily express emotional reactions than men, or that women with family responsibilities experience higher levels of fatigue. It is our belief that these differences between men and women are due,

instead, to more relevant explanatory variables such as occupational status or professional activity, versus gender.

With regard to age variable, the results presented in this study are consistent with those previously reported. Notably that younger employees tend, on average, to feel that they are less professionally efficient than older employees, which leaves them feeling exhausted. Employees aged 55 years and older experience less exhaustion and see themselves as being very professionally efficient. We can assume here that older employees have had more time to adapt to and profit from conditions in their work environment as a result of long years of experience in their given profession.

The variable pertaining to occupational status underlined differences among participants and their scores on cynicism: managers experience lower levels of cynicism than non-managers, which can be explained by the factors impacting this dimension (managers have greater autonomy, and tend to receive more recognition than non-managers, etc.).

Results for company or organization size highlight the concept of “healthy worker”: the most favorable scores on both dimensions of exhaustion and cynicism are those of respondents who work for a company or organization with fewer than 10 employees. By contrast, people working in large companies (500 employees and more) are those who produced the highest average scores on exhaustion and cynicism. Company size appeared to have no influence on how respondents scored on professional efficacy.

Employees working in construction and public works scored the lowest on exhaustion and cynicism, whereas respondents working in banking, insurance and real estate scored the highest on these same dimensions. Another interesting point is that people working in education, health and social action sectors produced among the highest average scores on exhaustion, and yet this same group of respondents expressed feeling highly competent at their jobs (high scores on professional efficacy).

The results we have just presented are based on a representative sample of the French working population and will serve as a basis for comparisons in future research. All scores shown are based on averages for the three dimensions of the MBI-GS by the subgroups defined according to the identifying variables. Since these analyses are based on averages, no subgroups simultaneously produced negative scores on the three dimensions. Moreover, and again given that scoring is based on averages, none of the subgroups produced scores extremely different to those from our sample group. We should like to point out, however, if

we refer to what is currently known about burnout development and the models for that process described in our introduction, two subgroups stood out in particular as a possible cause for concern in how they differed and compared highly unfavorably to the other subgroups. These were employees working in larger companies, specifically those working in the sectors of banking, insurance and real estate.

3.5. Hierarchical classification analysis

While the classical approach we adapted, referred to as variable-oriented, proved to be effective for validating the questionnaires (validation being crucial for testing the strength of specific disorders that these questionnaires are designed to measure) a second approach is increasingly becoming more popular and more widely used by researchers to account for interindividual variability: this is the person-oriented statistical approach (Hätinen, Kinnunen, Pekkonen & Aro, 2004; Leiter & Maslach, 2016). This more recent approach interested us for its potential in the context of burnout prevention. We have described the different assumptions about how the signs of approaching or developing burnout can manifest, according to the individual, in different symptoms. Hätinen, Kinnunen, Pekkonen and Aro (2004) described four specific personality profiles they categorized by scores on the three dimensions of MBI by analyzing the responses of employees experiencing health problems associated with their work. Leiter and Maslach (2016) used this same approach with health care workers which allowed them to identify five different profiles. We have conducted this same type of analysis.

We standardized the data values by converting them into z-scores before then performing hierarchical classification analysis using both Ward's method (to minimize the total within-cluster variance) and squared Euclidian distance (to measure similarity). This produced three categorical variables we then used to classify all 1,312 respondents, which were their scores on exhaustion, cynicism and professional efficacy. We specified further that these variables should be classified into 4, 5, 6 and 7 clusters. When we compared results of our analysis using 4 and 5 clusters, we observed that participants with the highest scores for exhaustion and cynicism had divided into two separate groups, which suggested strong differentiation for professional efficacy and, as such, prompted us to reject using four-cluster analysis. Our analysis of results for five clusters also showed that a group consisting of 501 respondents (almost half of our sample) presented standard deviations which were much higher than for the other groups: analysis using six clusters had divided this group in two. By contrast, analysis performed on seven clusters showed no additional clear distinction between two of

the groups included in the six-cluster analysis. We therefore decided to use a six-cluster solution.

Figure 2 shows average scores (z) of the six clusters according to the three MBI dimensions and Table 7 shows average scores (on a scale of 1-100) for each of the six groups on the three dimensions of MBI, and the PSS, HADS-A, HADS-D and NFR questionnaires. Univariate analysis with each dependent variable (scores on exhaustion, cynicism, professional efficacy, stress, anxiety, depression and need for recovery) showed significant differences (Exhaustion: $F(1306, 5) = 651.92, p = .000, \eta^2 = .71$) Cynicism: $F(1306.5) = 571.79, p = .000, \eta^2 = .69$; Professional Efficacy: $F(1306, 5) = 665.26, p = .000, \eta^2 = .72$; Stress: $F(1306, 5) = 75.63, p = .000, \eta^2 = .25$; Anxiety: $F(1306, 5) = 82.70, p = .000, \eta^2 = .29$; Depression: $F(1306, 5) = 109.70, p = .000, \eta^2 = .30$; Need for recovery: $F(1306, 5) = 142.62, p = .000, \eta^2 = .35$).

The Bonferroni post-hoc tests show no significant difference between average scores on exhaustion for groups 2 and 3, between average scores on cynicism for groups 3 and 5, and between average scores on professional efficacy for groups 3 and 6.

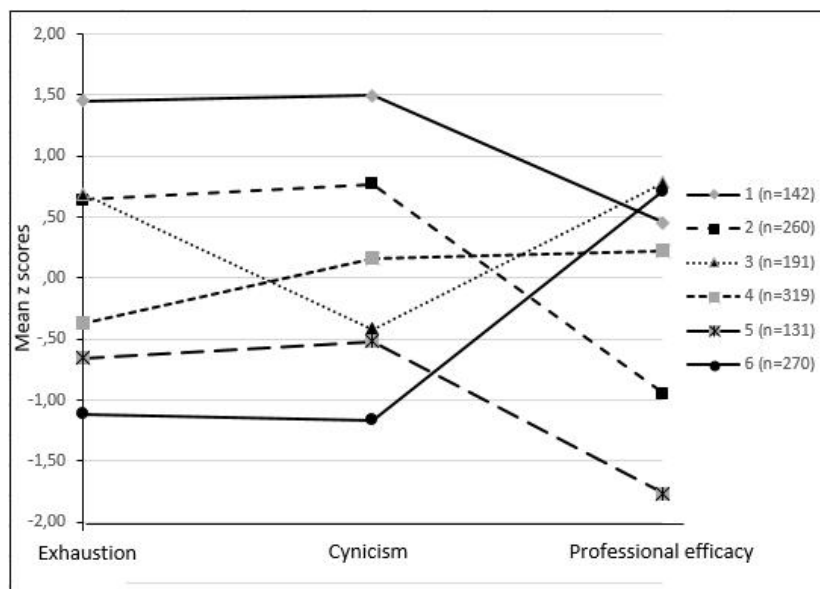


Fig. 2. Plot of means of the 6-profile

The first cluster consisted of employees with the highest scores on exhaustion and cynicism, even if these same employees felt that they were functioning effectively at work. The strongest indicators (and systematically the most unfavorable) correlated to extremely high stress scores, symptoms of anxiety and depression, and the level of need for recovery. Taken together, these results clearly indicate that these employees were experiencing serious psychological difficulties and on the “cusp” of experiencing burnout. We propose that an

individual's elevated cynicism plays an important "protective" role with regards to perceived self-efficacy, or professional efficiency. We classified this group as "very high-risk".

Employees who formed the second cluster produced slightly lower scores for exhaustion and cynicism when compared to those in cluster 1, but had markedly low score for professional efficacy: they showed all of the signs of employees experiencing burnout. Stress scores and symptoms of anxiety and depression for this group were as high as those in cluster 1, while the need for recovery measured slightly lower correlating, as we might expect, with lower levels of exhaustion. One surprising aspect was that these employees produced slightly more favorable scores for exhaustion and cynicism than those in the first cluster, which we can theorize might be explained by the possibility that these individuals may have been undergoing medical treatment, which could have a mitigating effect on exhaustion and cynicism. Alternatively, it is possible that differences in scores on exhaustion and cynicism among employees in clusters 1 and 2, which may be statistically significant, are not that different in a clinical context. Both possibilities merit more in-depth investigation in future studies.

Cluster 3 was made up of employees characterized by high scores on exhaustion and need for recovery. The other scores were more or less favorable: they produced low scores on cynicism, the lowest recorded scores on professional efficacy, and average scores related to both stress, and symptoms of anxiety and depression. Leiter and Maslach (2016) qualified employees with this specific profile as "overextended", which we have also applied to our analysis. These are employees who should be monitored very carefully, given that according to several burnout development models, a high exhaustion score may be a sign of the first stage of burnout.

Cluster 4 was composed of employees who all produced average scores. Häätinen, Kinnunen, Pekkonen and Aro (2004) reported the same profile which they named "not in burnout", as we have done. These employees produced scores on stress, symptoms of anxiety, symptoms of depression and need for recovery more favorable than the averages of our sample.

The employees in cluster 5 produced low scores for three dimensions of the MBI. Specifically, these were individuals who were neither exhausted nor cynical, but who were not more effective in their work environment. These employees produced the least favorable average scores for the third dimension, professional efficacy. Even if these characteristics are not identical to those presented in the literature, the profile of these employees appeared to us very similar to what Leiter and Maslach (2016) described as "ineffective", and what Häätinen, Kinnunen, Pekkonen and Aro (2004) called "low professional efficacy". Average scores of

participants responding to the other questionnaires in our study allowed us to describe this profile in more precise terms: this employee with average scores for stress, symptoms of depression and need for recovery, or even slightly more favorable than the average for the total sample, produced a relatively high score for anxiety (the third highest among those in clusters 1 and 2). While the most widely accepted burnout development model does not identify professional efficacy as the first symptom to signal approaching burnout, we believe that individuals exhibiting these characteristics should be kept under observation, certainly in the case of employees who score very high for symptoms of anxiety.

The final cluster 6 brought together employees who produced the most favorable average scores for all indicators. These individuals were neither exhausted nor cynical and were highly effective in their work environment. They produced average scores for stress, symptoms of anxiety, symptoms of depression and extremely low scores for need for recovery. All of these indicators are characteristic of employees in excellent psychological health. We refer to this profile, like Leiter and Maslach (2016), as “commitment”.

Table 7 Average and standard deviation of the six groups formed by hierarchical classification analysis of scores on Exhaustion (Ex), Cynicism (C), Professional Efficacy (PI), Stress (S), Anxiety symptoms (A), Depression symptoms (D), and Need for Recovery (NfR).

	Group		Ex	C	PI	S	A	D	NfR
1	Risk of burnout	M	84.14	80.86	81.47	30.07	9.83	9.20	77.83
	n=142 (10.8%)	SD	10.49	12.86	9.91	6.23	4.27	3.50	24.89
2	Burnout	M	62.17	61.63	52.25	29.19	9.68	8.92	62.50
	n=260 (19.8%)	SD	14.65	17.45	11.55	5.95	3.89	3.58	29.62
3	Overextended	M	63.45	29.84	88.20	26.85	7.26	6.10	65.34
	n=191 (14.6%)	SD	15.18	17.47	6.97	5.92	3.86	3.50	23.16
4	Not in burnout	M	34.66	45.33	76.61	24.49	6.02	5.29	38.62
	n=319 (24.3%)	SD	14.16	17.78	12.20	5.58	3.34	3.43	21.61

5	Low professional Efficacy n=131 (10%)	M	26.86	27.20	35.30	25.03	8.01	6.44	41.38
		SD	12.64	13.17	12.42	5.46	3.81	3.51	33.63
6	Engagement n=270 (20.5%)	M	14.35	10.05	86.83	20.41	4.12	2.85	19.64
		SD	11.02	7.64	11.37	6.31	2.84	2.81	17.02
	TOTAL	M	44.67	41.05	71.99	25.58	7.13	6.14	47.83
	n=1312	SD	27.14	26.85	20.78	6.75	4.02	4.04	32.50

4. Conclusion

The analyses presented in this work have identified the psychometric properties of the French version of the MBI-GS. The factorial structure shares strong similarities with those found in the literature for versions of the MBI which have been translated into different languages, analyses showed excellent internal consistency in the three dimensions and the convergent validity has been demonstrated.

The high positive correlation between the dimensions of exhaustion and cynicism, the significant and negative correlation between the dimensions of cynicism and professional efficacy, and importantly, the absence of a link between the dimensions of exhaustion and professional efficacy support a model of burnout development corresponding to that described by Leiter and Maslach (1988), and by Taris, LeBlanc, Schaufeli and Schreurs (2005).

Given that the data collected for this work are from a representative sample of the French working population, the results presented here may be considered as French “standards”, as defined by sociodemographic variables (gender, age, business sector, etc.).

In addition to these results obtained by descriptive variables, we have presented our profile analysis which produced highly relevant results with regard to burnout prevention. Applying cross-correlation to scores for the three dimensions of burnout with scores on other instruments for assessing psychological disorders, allowed us to identify “at risk” profiles. Several previous works have taken a differential approach to studying developmental trajectories of burnout and recovery of people with different personality profiles (Hätinen, Kinnunen, Pekkonen & Aro, 2004; Hätinen, Kinnunen, Mäkikangas, Kalimo, Tolvanen &

Pekkonen, 2009; Mäkikangas & Kinnunen, 2016). This approach has proven to be entirely justified: one treatment will not be appropriate for all profiles, and similarly, will have different outcomes in the medium-to-long term

Finally, given that burnout is result of chronic stress in the work environment, it is equally necessary, in addition to being able to identify individuals with elevated scores on one or several dimensions of the MBI, to evaluate organizational factors in the work context that may cause the occurrence of burnout symptoms (Leiter & Maslach, 2016). If risk factors in the work environment persist, a person at risk of developing burnout or who is suffering from burnout will never fully experience fulfillment in their work. Maslach (2011) and Maslach, Leiter and Jackson (2012) advocate taking more comprehensive preventive actions in the workplace. As such, they recommend shifting the focus to using a positive based approach by giving preference to the notions of engagement, respect and recognition in addition to thorough assessment of the other psychosocial risk factors.

Abbreviations

AGFI: Adjusted Goodness of Fit Index

CFA: Confirmatory Factor Analysis

COR: theory: COnservation of Resources theory

EFA: Exploratory Factor Analysis

NFR: Need For recovery

GFI: Goodness of Fit Index

HADS: Hospital Anxiety and Depression scale

MBI-SG: Maslach Burnout Inventory - General Survey

MBI-HSS: Maslach Burnout Inventory - Human Services Survey

MBI-ES: Maslach Burnout Inventory - Educators Survey

NFI: Normed Fit Index

NNFI: Non-Normed Fit Index

PSS: Perceived Stress Scale

RMSEA: Mean Square Error of Approximation

Declarations

Ethics approval and consent to participate

Data were collected by OpinionWay (an independent market research firm specialized in survey data collection and analytics). Respondents were instructed to fill out a questionnaire made available on a dedicated website. Participants included in the OpinionWay panel responded on condition of anonymity and after completing a consent form. OpinionWay works in accordance with the requirements of European regulation no° 2016/679/EU (*cf.* “OpinionWay attestation”).

Availability of supporting data

The authors approve on making available the dataset used in this study when requested to the corresponding author upon reasonable request.

For the French validation study of the MBI-GS, we contacted Mrs. Maslach via Mind Garden website to have her authorization. We paid the fees to present questionnaire to our participants and we sent Mrs. Maslach French version of the MBI-GS. French version is now also available via Mrs. Maslach.

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