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# The Big Five Personality Traits and French Firefighter Burnout

## *The Mediating Role of Achievement Goals*

Jérôme Vaulerin, PhD Student, Serge S. Colson, Mélanie Emile, PhD, Stéphanie Scoffier-Mériaux, PhD, and Fabienne d'Arripe-Longueville

**Objectives:** We investigated the associations between the Big Five personality traits and occupational burnout in firefighters and the mediating role of achievement goals in this relationship. **Methods:** Two hundred twenty male firefighters from 20 to 62 years old participated and mediation analyses were performed. **Results:** The results showed that neuroticism was positively related to the three dimensions of burnout, both directly and through mastery avoidance goals. Mastery approach goals mediated the relationships between conscientiousness and physical fatigue and between openness to experience and physical fatigue. **Conclusion:** Three of the Big Five personality traits, neuroticism, conscientiousness and openness to experience, and achievement goals, may be important factors in understanding and preventing firefighter burnout.

Firefighters are among the employees most exposed to traumatic stressors and are likely to experience burnout with relative frequency.<sup>1-3</sup> Between 6% and 22% of firefighters suffer from post-traumatic stress disorders.<sup>4,5</sup> According to Shirom,<sup>6</sup> burnout is an affective reaction to ongoing stress whose core content is the gradual depletion of the individual's intrinsic energetic resources over time. This author explained that burnout has been conceptualized on the basis of "conservation of resources theory" (COR theory<sup>7-9</sup>), which takes into account physical, emotional, and cognitive energetic resources. COR theory assumes that people have a basic motivation to obtain, retain, and protect their resources (ie, free time, feeling that one is accomplishing one's goals and many more<sup>9</sup>). The physiological and environmental demands on professional firefighters and their risks of job-related health consequences have frequently been reported.<sup>10-12</sup> Recent research on firefighters has shown that job demands and job control predict emotional exhaustion and depersonalization.<sup>13</sup>

Although the impact of job demands and control on firefighter burnout has been investigated,<sup>1,13</sup> the role of personal antecedents has been little explored. In this study, we focused on the joint impact of personality traits and achievement goals on firefighter burnout. Personality research has focused on the Big Five model, which presents the five factors of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.<sup>14</sup> Nowadays, the Big Five model is considered to be the best compromise, covering most personality descriptions,<sup>15,16</sup> and several meta-analyses have shown a relationship between personality traits and burnout.<sup>17-19</sup> For example, neurotic persons are described as being hypersensitive, anxious, and with a negative effect, and are at risk for burnout. Individuals who are open to experience have a positive attitude toward learning and are less likely to experience burnout, especially emotional exhaustion

and depersonalization.<sup>18</sup> Conscientiousness is defined as self-discipline, dutifulness, and personal competence, and was found to be negatively related to the dimensions of burnout.<sup>20</sup> Extraversion characterizes an optimistic and active person, and it was found to be related to low burnout scores.<sup>21</sup> Agreeableness is characterized by altruism, empathy, cooperation, and helpfulness and was also negatively associated with burnout.<sup>18</sup> Although several studies have focused on the relationships between personality traits and burnout in different jobs such as emergency medical service,<sup>22</sup> information about this linkage in firefighters has been sparsely documented.

Another important psychosocial antecedent of burnout is the achievement goals. Initially, achievement goals were assumed to be of two types: mastery and performance.<sup>23,24</sup> The fundamental difference in these goal types is how individuals define their competence in a given achievement situation. Mastery goals have task-referenced and self-referenced competence standards, whereas performance goals are grounded in other-referenced competence standards. The theory of achievement goals was further developed to account for goal valence, which emphasizes the tendencies to approach competence and avoid incompetence. The two definitions of competence and the two types of valence converged to the current theoretical approach known as the  $2 \times 2$  achievement goals framework.<sup>25</sup> Consequently, four types of goals are distinguished: mastery approach (MAp), mastery avoidance (MAv), performance approach (PAp), and performance avoidance (PAv).

In the sports domain, a study<sup>26</sup> showed that individuals oriented toward MAp goals reported fewer burnout symptoms, whereas those who adopted MAv goals were more likely to experience burnout. Moreover, in the education field, a recent study<sup>27</sup> reported that all four dimensions of goal orientation were related to burnout. More specifically, these authors found that avoidance-related dimensions were positively associated with burnout, while approach-related dimensions were negatively related to burnout. In addition, they showed that individuals with avoidance achievement goals were disposed to interpret negative events as threats and were less equipped or disposed to develop slack resources (eg, social support). Although the relationships between achievement goals and burnout have been studied in both sports and educational environments, they have not yet been explored in professional contexts such as firefighting. Yet examining this possibility would be of particular relevance for firefighters, as achievement goals have been found to be related to other psychological health variables such as mental well-being in this population.<sup>2</sup>

Interestingly, a few studies have reported that personality traits are related to achievement goals. In the work context, extraversion was positively related to PAp goal orientation, while neuroticism was positively related to avoidance (ie, MAv and PAv) goal orientation.<sup>28</sup> Moreover, learning goal orientation was positively associated with openness to experience and conscientiousness.<sup>29</sup> Recently, a study<sup>30</sup> demonstrated that (1) conscientiousness was strongly and positively related to MAp goals, (2) agreeableness was positively related to MAp goals and negatively related to PAp goals, and (3) neuroticism was positively related to both PAv, PAp, and MAv goals.

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In sum, although previous studies have shown that personality traits and achievement goals are associated with burnout independently, little is known about their joint influence on burnout, specifically in the firefighting context. Furthermore, the way in which achievement goals might mediate the relationships between personality traits and burnout is unknown. In the current study, we sought to fill this gap in the literature by directly examining (1) the relationships between personality traits, achievement goals, and burnout, and (2) the extent to which the relationships between personality traits and burnout might be mediated by specific achievement goals. Specifically, we tested the following hypotheses. First, given that neuroticism is positively associated with MAV goals<sup>30</sup> and burnout,<sup>17-19</sup> we predicted that neuroticism would be positively related to burnout, both directly and through MAV goals. Second, because openness to experience is negatively related to emotional exhaustion and depersonalization<sup>18</sup> and positively to learning goal orientation,<sup>29</sup> we predicted that openness would be negatively related to burnout, both directly and through MAV goals. Third, conscientiousness was shown to be positively associated with MAP goals<sup>30</sup> and negatively related to burnout.<sup>17,19</sup> Hence, we assumed that conscientiousness would be negatively associated with burnout both directly and via MAP goals. Fourth, extraversion was found to be positively related to MAP goals<sup>30</sup> and negatively to burnout.<sup>17</sup> Thus, we hypothesized that extraversion would be negatively linked to burnout, both directly and through the mediating role of MAP goals. Last, individuals with low scores for agreeableness are more prone to experience job burnout,<sup>18</sup> and McCabe et al<sup>30</sup> revealed a positive relationship between agreeableness and MAP goals. Hence, we hypothesized that agreeableness would be negatively related to burnout, both directly and through MAP goals.

## METHODS

### Participants and Procedures

A total of 220 firefighters from 20 to 62 years old ( $M_{\text{age}} = 36.23$  years;  $SD = 6.94$ ) working in a Fire Department and Rescue Service of the south of France participated in this retrospective study on a voluntary basis and completed a questionnaire. The participants met the following inclusion criteria: (1) to be on duty; (2) in an operational section; and (3) able to complete the questionnaire in one sitting (ie, not called out on a mission). The exclusion criteria were to be operationally unfit or a firefighter officer. Written informed consent was obtained from all participants. The research procedure was approved by the University of Nice Sophia-Antipolis research ethics board. Anonymously structured questionnaires were filled out by the participants. An investigator was present to assist participants and answer any questions. The average time to completion was 30 minutes.

### Measures

#### Personality Traits

The Big Five personality traits were measured using the corresponding Big Five Inventory (BFI) developed by John and Srivastava<sup>31</sup> and validated in French (BFI-Fr) by Plaisant, Courtois, Réveillère, Mendelsohn, and John.<sup>32</sup> This questionnaire consists of 45 items divided into five subscales: (1) eight items measure extraversion (eg, “I am talkative”); (2) 10 items measure agreeableness (eg, “I tend to find fault with others”); (c) nine items measure conscientiousness (eg, “I do a thorough job”); (d) eight items measure neuroticism (eg, “I am depressed, blue”); and (e) 10 items measure openness to experience (eg, “I see myself as someone who is creative, full of original ideas”). Participants responded on a five-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The internal consistency of each subscale was satisfactory

( $\alpha_{\text{extraversion}} = 0.80$ ,  $\alpha_{\text{agreeableness}} = 0.86$ ,  $\alpha_{\text{conscientiousness}} = 0.79$ ,  $\alpha_{\text{neuroticism}} = 0.90$ ,  $\alpha_{\text{openness to experience}} = 0.82$ ).

### Achievement Goals

The French Achievement Goals Questionnaire for Sport and Exercise (FAGQSE<sup>33</sup>) was adapted to firefighters and was used to assess the four goals in the  $2 \times 2$  model. Each item was adapted to the firefighting context by replacing, for example, the word “teachers” by “firefighters.” Three items assess each goal: (1) MAP (eg, “I want to improve myself”); (2) PAP (eg, “I want to do better than other firefighters”); (3) MAV (eg, “I’m worried about not being able to progress in my job”); and (4) PAV (eg, “I want to avoid performing worse than other firefighters”). Participants answered on a six-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree). Each subscale presented good reliability ( $\alpha_{\text{MAP}} = 0.89$ ,  $\alpha_{\text{PAP}} = 0.90$ ,  $\alpha_{\text{MAV}} = 0.88$ ,  $\alpha_{\text{PAV}} = 0.89$ ). Confirmatory factor analyses (CFA) were performed with AMOS 21.0 (Arbuckle, 2006) to test the factorial structure of the scale. The model presented a good fit to the data [ $\chi^2(48) = 63.06$ ,  $P = 0.71$ ,  $N = 220$ ,  $\text{NNFI} = 0.951$ ,  $\text{CFI} = 0.988$ ,  $\text{RMSEA} = 0.038$ ,  $\text{CI RMSEA} = 0.00/0.078$ ].

### Occupational Burnout

Burnout was measured with the Shirom Melamed Burnout Measure (SMBM<sup>34</sup>). The questionnaire includes three subscales: (1) three items measure emotional exhaustion (eg, “feeling lacking the energy to display empathy to others at work”); (2) five items measure cognitive weariness (eg, “feelings of reduced mental agility on the job”); and (3) six items measure physical fatigue (eg, “feeling tiredness and low energy at work”). This last dimension could be important in the present investigation given that firefighters may experience more physical fatigue than those in other jobs. Participants answered on a six-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree). Each subscale presented good reliability ( $\alpha_{\text{physical fatigue}} = 0.89$ ,  $\alpha_{\text{emotional exhaustion}} = 0.90$ ,  $\alpha_{\text{cognitive weariness}} = 0.88$ ).

### Control Variable

As age has been found to be related to burnout dimensions in workers,<sup>21</sup> it was considered as a control variable in this study.

### Data Analysis

Mediation analyses were performed to assess the potential mediating role of personality traits on achievement goals and burnout following the bootstrap procedure outlined<sup>35</sup> and through the use of the “INDIRECT” macro in SPSS.<sup>36</sup> In this study, the bootstrap procedure resampled the data 5000 times and calculated the indirect effect for each sample; significance could be seen in that the 95% confidence interval (95% CI) is assumed to indicate significant indirect effects if it does not include zero.<sup>35</sup> Bootstrapping is a nonparametric resampling procedure that involves repeatedly sampling from the data set and estimating the indirect effects in each resampled data set.<sup>37</sup> An empirical approximation of the sampling distribution of indirect effects is generated and used to construct bias-corrected and accelerated 95% CI for the indirect effects.

## RESULTS

### Descriptive Statistics

Means, standard deviations for each dependent variable and correlations between variables are presented in Table 1. Consistent with our predictions, (1) neuroticism was positively correlated with physical activity, emotional exhaustion, and cognitive weariness; (2) openness to experience was positively correlated with MAP goals;

**TABLE 1.** Means, Standard Deviations, and Matrix of Pearson *r* Correlation Coefficients Between the Variables (*N* = 220)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Neuroticism	2.80	0.58	—											
2. Openness to experience	3.18	0.56	0.16 <sup>a</sup>	—										
3. Conscientiousness	3.46	0.39	0.14 <sup>a</sup>	0.23 <sup>b</sup>	—									
4. Extraversion	3.30	0.46	0.14 <sup>a</sup>	0.43 <sup>b</sup>	0.35 <sup>b</sup>	—								
5. Agreeableness	3.00	0.43	0.22 <sup>b</sup>	0.24 <sup>b</sup>	0.25 <sup>b</sup>	0.21 <sup>b</sup>	—							
6. Mastery approach	4.73	1.15	-0.02	0.21 <sup>b</sup>	-0.02	0.21 <sup>b</sup>	0.28 <sup>b</sup>	—						
7. Mastery avoidance	2.04	1.08	0.13	0.03	-0.04	0.08	0.06	0.09	—					
8. Performance approach	3.56	1.50	0.02	0.01	-0.05	0.02	0.10	0.42 <sup>b</sup>	0.27 <sup>b</sup>	—				
9. Performance avoidance	2.72	1.55	-0.02	-0.03	0.04	-0.02	0.13	0.24 <sup>b</sup>	0.36 <sup>b</sup>	0.56 <sup>b</sup>	—			
10. Physical fatigue	1.74	0.85	0.27 <sup>b</sup>	0.00	-0.03	-0.10	0.08	-0.17	0.26 <sup>b</sup>	-0.04	0.04	—		
11. Cognitive weariness	1.48	0.78	0.23 <sup>b</sup>	-0.05	-0.11	-0.08	0.03	-0.18	0.35 <sup>b</sup>	-0.04	0.11	0.66 <sup>b</sup>	—	
12. Emotional exhaustion	1.70	0.85	0.19 <sup>b</sup>	-0.04	-0.10	-0.06	0.01	-0.15	0.20 <sup>b</sup>	0.01	0.04	0.41 <sup>b</sup>	0.57 <sup>b</sup>	—

<sup>a</sup>*P* < 0.05.<sup>b</sup>*P* < 0.01.

(3) conscientiousness was positively correlated with MAv goals; (4) extraversion was positively correlated with MAv goals; and (5) MAV goals were positively correlated with physical activity, emotional exhaustion, and cognitive weariness. However, no significant relationships between agreeableness and achievement goals were observed.

### Mediation Analyses

The bootstrap mediation analyses revealed the mediating role of MAV and MAV goals between personality traits (ie, neuroticism, openness to experience, and conscientiousness) and burnout (see Table 2). Age did not impact personality traits, achievement goals, or burnout variables in this study. Specifically, (1) neuroticism predicted MAV goals (*a*-path); (2) MAV goals predicted the three dimensions of burnout (ie, emotional exhaustion, cognitive weariness, physical fatigue) (*b*-path); and (3) neuroticism directly predicted burnout (*c'* path). Second, (1) openness to experience predicted MAV goals (*a*-path) and (2) MAV goals predicted physical fatigue (*b*-path). Last, (1) conscientiousness predicted MAV goals (*a*-path) and (2) MAV goals predicted physical fatigue (*b*-path). MAV goals explained between 9.8% and 10.1% of the variance in physical fatigue. MAV goals explained 10.4% of the variance in emotional exhaustion, 13.1% of the variance in physical fatigue, and 18.2% of the variance in cognitive weariness. The results of the bootstrap mediation analyses are presented in Table 2.

### DISCUSSION

This study is the first to examine the personality-burnout link directly and through the mediating role of achievement goals in firefighters. We assumed that personality traits would be positively related to burnout, both directly and via achievement goals. More particularly, we expected that (1) neuroticism would be positively associated with burnout, both directly and indirectly through MAV goals; (2) openness to experience would be negatively related to burnout, both directly and via MAV goals; (3) conscientiousness would be negatively linked to burnout, both directly and indirectly through MAV goals; (4) extraversion would be negatively associated with burnout, both directly and indirectly through MAV goals; and (5) agreeableness would be negatively related to burnout, both directly and via MAV goals.

Several findings of this work were consistent with our predictions and establish a number of interesting associations between the Big Five personality traits, the 2 × 2 achievement goals, and firefighter burnout. We also demonstrated that some significant relationships between personality traits and burnout are mediated by achievement goals (ie, MAV and MAV). Specifically, neuroticism was related to the three dimensions of burnout (ie, emotional exhaustion, cognitive weariness, and physical fatigue) both directly and through MAV goals. In addition, openness to experience and conscientiousness were associated with physical fatigue via MAV goals.

**TABLE 2.** The Relationships Between Personality Traits and Burnout as Mediated by Achievement Goals

X	M	Y	Indirect Effect			<i>a</i> Path		<i>b</i> Path		<i>c'</i> Path		<i>R</i> <sup>2</sup>
			<i>B</i>	LLCI	ULCI	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	
Neuroticism	MAV	Emotional exhaustion	0.04	0.00	0.10	0.24	1.95 <sup>c</sup>	0.14	2.75 <sup>a</sup>	0.25	2.52 <sup>b</sup>	10.44
Neuroticism	MAV	Physical fatigue	0.05	0.00	0.12	0.24	1.95 <sup>c</sup>	0.18	3.63 <sup>a</sup>	0.35	3.75 <sup>c</sup>	13.10
Neuroticism	MAV	Cognitive weariness	0.06	0.00	0.15	0.24	1.95 <sup>c</sup>	0.23	5.24 <sup>a</sup>	0.25	2.91 <sup>b</sup>	18.23
Openness to experience	MAP	Physical fatigue	-0.06	-0.12	-0.00	0.44	3.25 <sup>b</sup>	-0.13	-2.59 <sup>c</sup>	0.07	0.62	10.12
Conscientiousness	MAP	Physical fatigue	-0.10	-0.26	-0.00	0.81	4.31 <sup>a</sup>	-0.12	-2.40 <sup>c</sup>	0.05	0.31	9.78

*a* path, predictor variable to mediator variable; *b*, unstandardized beta coefficient; *b* path, mediator variable to outcome variable; *c'* path, direct effect; LLCI, lower limit confidence interval; M, mediator; MAP, mastery approach goals; MAV, mastery avoidance goals; ULCI, upper limit confidence interval; X, predictor variable; Y, outcome variable.

<sup>a</sup>*P* < 0.001.<sup>b</sup>*P* < 0.01.<sup>c</sup>*P* < 0.05.

The finding that neuroticism was directly and positively associated with the three dimensions of burnout is consistent with previous studies and provides support for the assumption that it is a strong predictor of burnout.<sup>17–19,38</sup> An original finding of the present study is that neuroticism was also indirectly associated with burnout through MAV goals. These results are partly in accordance with those of McCabe et al.,<sup>30</sup> who also reported a positive relationship between neuroticism and MAV goals in students, but did not measure burnout. Our findings thus suggest that neuroticism is a risk factor for burnout in firefighters both directly and through the mediating role of MAV goals.

Our results further showed that both openness to experience and conscientiousness were indirectly related to physical fatigue through MAP goals. Direct associations between openness to experience and two of the burnout dimensions (ie, emotional exhaustion and depersonalization<sup>18</sup>), and between conscientiousness and the dimensions of burnout in health care employees<sup>20</sup> and students,<sup>39</sup> have been previously reported. Although such direct relationships between these personality traits and burnout were not observed in the present study, we found a significant mediating role of MAP goals. This finding is in line with previous work indicating that openness to experience is positively associated with MAP goals<sup>29</sup> and that MAP goals are associated with less burnout.<sup>27</sup>

Taken together, these findings suggest that both openness to experience and conscientiousness protect firefighters from burnout through the pursuit of MAP goals. Nevertheless, the expected direct or indirect relationships between each personality trait (ie, agreeableness and extraversion) and the three dimensions of burnout were not observed. These results are inconsistent with the literature.<sup>19</sup> The discrepant findings in the literature regarding the direct or indirect associations between the Big Five personality traits and burnout might be due to the type of burnout measure that was used (Malasch Burnout Inventory vs SMBM<sup>34</sup>) and/or the specificity of the professional context.

This study has several methodological limitations regarding the results. First, the self-reported measures used in this study have the disadvantage of leading respondents toward responses (ie, Likert scale) and the findings may thus be biased by social desirability (ie, a tendency to present favorably with regard to social standards). In addition, as the achievement goal scale (ie, the FAGQSE) was adapted to firefighters, its construct validity and temporal stability will need to be confirmed in future studies. Furthermore, the survey was completed on workdays and may have caused additional stress for the firefighters, given that they could have been called out for an emergency rescue at any time. Second, as we used a cross-sectional design, causality could not be deduced from the observed relationships. It would therefore be interesting to conduct a longitudinal study to examine the nature of these relations. Third, the results are specific to the characteristics of our sample, thus limiting the generalization of the present findings to other countries.

Future research should replicate this study with women firefighters from different countries to strengthen the generalization of the results. Examining the influence of other mediators such as physiological factors (ie, heart rate) in the relationship between personality traits and burnout might also prove worthwhile. A longitudinal study would provide greater insight into the mediating role of achievement goals in the relationships between personality traits and burnout over time. Last, it would be interesting to investigate the interactions between contextual (eg, perceived working conditions) and personal variables in predicting burnout outcomes.

## CONCLUSION

The results of this study expand our understanding of burnout in firefighters. Indeed, our results enrich the literature by

emphasizing the mediating role of achievement goals between personality traits and burnout in the specific context of firefighting. First, we demonstrate that neuroticism and MAV goals should be considered as risk factors for burnout in firefighters, while openness to experience, conscientiousness, and MAP goals are protective factors. Second, we highlight that only neuroticism is linked to the three dimensions of burnout (ie, emotional exhaustion, cognitive weariness, and physical fatigue) both directly and through MAV goals. Third, we show that openness to experience and conscientiousness are associated with physical fatigue via MAP goals. Taken as a whole, these findings yield a number of insights with potential practical implications on the dynamic interplay between personality and 2 × 2 achievement goals, as well as on their joint influence on burnout.

## REFERENCES

- Alexander DA, Klein S. Ambulance personnel and critical incidents: Impact of accident and emergency work on mental health and emotional well-being. *Br J Psychiatry*. 2001;178:76–81.
- Landen SM, Wang CCDC. Adult attachment, work cohesion, coping, and psychological well-being of firefighters. *Counsel Psychol Quart*. 2010;23:143–162.
- Van Der Ploeg E, Kleber RJ. Acute and chronic job stressors among ambulance personnel: predictors of health symptoms. *Occup Environ Med*. 2003;60:40–46.
- Cornell W, Beaton R, Murphy S, et al. Exposure to traumatic incidents and prevalence of posttraumatic stress symptomatology in urban firefighters in two countries. *J Occup Health Psychol*. 1999;4:131–141.
- Del Ben KS, Scotti JR, Chen YC, Fortson BL. Prevalence of posttraumatic stress disorder symptoms in firefighters. *Work Stress*. 2006;20:37–48.
- Shirom A. Burnout in work organizations. In: Cooper CL, Robertson I, editors. *International Review of Industrial and Organization Psychology*. New York, NY: Wiley; 1989. p. 25–48.
- Hobfoll SE, Shirom A. Stress and burnout in work organizations. In: Golembiewski RT, editor. *Handbook of Organization Behavior*. New York: Dekker; 1993. p. 41–61.
- Hobfoll SE, Shirom A. Conservation of resources theory: Applications to stress and management in the workplace. In: Golembiewski RT, editor. *Handbook of Organization Behavior [2nd Rev. ed.]*. New York: Dekker; 2000. p. 57–81.
- Hobfoll SE. The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Appl Psychol*. 2001;50:337–421.
- Punakallio A, Lusa-Moser S, Louhevaara V. Fire-fighting and rescue work in emergency situations and ergonomics. *Blood*. 2001;37:0–1.
- Wu HC, Wang MJJ. Determining the maximum acceptable work duration for high-intensity work. *Eur J Appl Physiol*. 2001;85:339–344.
- Wu HC, Wang MJJ. Relationship between maximum acceptable work time and physical workload. *Ergonomics*. 2002;45:280–289.
- Lourel M, Abdellaoui S, Chevalyre S, et al. Relationships between psychological job demands, job control and burnout among firefighters. *North Am J Psychol*. 2008;10:489–496.
- McCrae RR, Costa PT. *Personality in Adulthood*. New York: The Guilford Press; 1990.
- Guelfi JD. Troubles de la personnalité. [Personality disorders]. In: Guelfi JD, Rouillon F, editors. *Manuel de Psychiatrie*. Paris: Masson; 2006. p. 323–325.
- Rolland JP. L'évaluation de la personnalité. Le modèle en cinq facteurs. [The Assessment of Personality. The Five-factor Model]. Belgique: Mardaga, Sprimont; 2004.
- Alarcon G, Eschleman KJ, Bowling NA. Relationships between personality variables and burnout: a meta-analysis. *Work Stress*. 2009;23:244–263.
- Swider BW, Zimmerman RD. Born to burnout: a meta-analytic path model of personality, job burnout, and work outcomes. *J Vocat Behav*. 2010;76:487–506.
- You X, Huang J, Wang Y, Bao X. Relationships between individual-level factors and burnout: a meta-analysis of Chinese participants. *Pers Individ Dif*. 2015;74:139–145.
- Azeem SM. Conscientiousness, neuroticism and burnout among healthcare employees. *Int J Acad Res Business Soc Sc*. 2013;3:467–477.
- Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. 2001;52:397–422.

22. Pajonk FG, Cransac P, Müller V, et al. Trauma and stress-related disorders in German emergency physicians: the predictive role of personality factors. *Int J Emerg Ment Health*. 2011;14:257–268.
23. Dweck CS. Motivational processes affecting learning. *Am Psychol*. 1986;41:1040–1048.
24. Nicholls JG. Achievement motivation: conceptions of ability, subjective experience, task choice, and performance. *Psychol Rev*. 1984;91:328–346.
25. Elliot AJ, McGregor HA. A 2 × 2 achievement goal framework. *J Pers and Soc Psychol*. 2001;80:501–519.
26. Isoard-Gautheur S, Guillet-Descas E, Duda JL. How to achieve in elite training centers without burning out? An achievement goal theory perspective. *Psychol Sport Exerc*. 2013;14:72–83.
27. Naidoo LJ, DeCriscio A, Bily H, et al. The 2 × 2 model of goal orientation and burnout: the role of approach–avoidance dimensions in predicting burnout. *J Appl Soc Psychol*. 2012;42:2541–2563.
28. Wang M, Erdheim J. Does the five-factor model of personality relate to goal orientation? *Pers Individ Dif*. 2007;43:1493–1505.
29. Payne SC, Youngcourt SS, Beaubien JM. A meta-analytic examination of the goal orientation nomological net. *J Appl Psychol*. 2007;92:128–150.
30. McCabe KO, Van Yperen NW, Elliot AJ, Verbraak M. Big Five personality profiles of context-specific achievement goals. *J Res Pers*. 2013;47:698–707.
31. John OP, Srivastava S. The Big Five Trait Taxonomy: History, Measurement, and Theoretical Perspectives. In: Pervin LA, John OP, editors. *Handbook of Personality Theory and Research*. New York: Guilford Press; 1999; 2:102–138.
32. Plaisant O, Courtois R, Réveillère C, et al. Validation par analyse factorielle du Big Five Inventory français (BFI-Fr) Analyse convergente avec le NEO-PI-R. [Factor structure and internal reliability of the French Big Five Inventory (BFI-Fr). Convergent and discriminant validation with the NEO-PI-R]. *Annal Médico-Psychol Rev Psychiatr*. 2010;168:97–106.
33. Riou F, Boiché J, Doron J, et al. Development and Validation of the French Achievement Goals Questionnaire for Sport and Exercise (FAGQSE). *Eur J Psychol Assess*. 2012;28:313–320.
34. Shirom A, Melamed SA. Comparison of the construct validity of two burnout measures in two groups of professionals. *Int J Stress Manage*. 2006;13:176–200.
35. Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behav Res Methods Instrum Comput*. 2004;36:717–731.
36. Hayes AF. PROCESS: A Versatile Computational Tool for Observed Variable Mediation, Moderation, and Conditional Process Modeling [White paper] Columbus, OH: The Ohio State University; 2012. Available at: <http://www.afhayes.com/public/process2012.pdf>. Accessed January 18, 2013.
37. MacKinnon DP, Lockwood CM, Williams J. Confidence limits for the indirect effect: distribution of the product and resampling methods. *Multivariate Behav Res*. 2004;39:99–128.
38. Schaufeli WB, Enzmann D. *The Burnout Companion to Study and Practice. A Critical Analysis*. Washington, DC: Taylor & Francis; 1998.
39. David AP. Examining the relationship of personality and burnout in college students: the role of academic motivation. *Educ Measure Eval Rev*. 2010;1:90–104.