EJMS
European Journal of Management Studies

THE CONTRIBUTION OF PHYSICAL EXERCISE TO ORGANISATIONAL PERFORMANCE

Ivo Marques[1], Andrea Raymundo Balle[2], and Carla Curado[1]

[1]ISEG – Lisbon School of Economics and Management, Universidade de Lisboa, and ADVANCE; [2]Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

The European Journal of Management Studies is a publication of ISEG, Universidade de Lisboa. The mission of EJMS is to significantly influence the domain of management studies by publishing innovative research articles. EJMS aspires to provide a platform for thought leadership and outreach.

ISSN: 2183-4172

DOI: 10.5455/EJMS.

Volume 23, Issue 2

www.european-jms.com

Abstract

Maintaining high levels of employee's performance at work is a major concern among managers. Employees' characteristics and individual performance contribute to the competitiveness of organisations. The current work environment is highly sedentary, which influences employees' performance. This quantitative study investigates the moderating effect of physical exercise on the relationships between job satisfaction, motivation, and organisational performance. Data was collected using an online questionnaire and it was analysed using structural equation modelling and moderation analysis. The results show the existing relationships between job satisfaction, intrinsic motivation and performance regarding both dimensions of organisational performance: creativity and dealing with emergencies. Such relationships are moderated by the level of exercise performed by the employees.

Key words: Physical exercise; motivation; job satisfaction; organisational performance.

Introduction

Human Resources (HR) are of fundamental importance in the development and fulfilment of organisational goals under the present high market pressure, thus retaining HR and accounting for their job satisfaction (JS) and well-being has gained especial relevancy (Coulson, McKenna and Field, 2008 and Ricciardi, 2005). Satisfied and motivated HR strive to meet the organisation's goals, resulting in higher performance levels, and thus top managers should take an interest in the well-being of employees (Osabiya, 2015 and Springer, 2011). Luthans (1992) and Spector (1997) show a positive correlation between JS and good physical fitness. Healthy employees seem happier at work. Those with higher levels of cardiovascular endurance and efficiency tend to feel less tired and concentrate better on their jobs, resulting in higher JS (Wattles and Harry, 2003). Employees' health has a significant positive impact on JS and consequently employees in good health are more positive and proactive at work (Wu, Chen and Chen, 2017). Bernacki and Baun (1984) report a positive correlation between employees who exercise and job performance.

The present work environment comprises plenty of tasks involving a high degree of sedentary behaviour, which develops and increases employees' health problems (Pronk, 2009). The leaders and managers of organisations are increasingly aware and concerned about the costs imposed by certain health conditions and subsequent reflection on performance (Diestel, Wegge and Schmidt, 2014 and Goetzel and Ozminkowski, 2008). Considering that there is a positive relationship between organisational performance (OP) and health care quality (Samadzadeh, 2013), the investment in employees' health is worth making. Enterprises engage in improving and strengthening their employees' health because it increases JS and their contribution to the organisation (Wu *et al.*, 2017).

Physical exercise programmes constitute a means of enhancing the well-being of employees, as well as reducing the incidence of diseases associated with sedentary behaviour (Anderson *et al*., 2009 and Sjøgaard *et al*., 2016). Offering such programmes improves employee JS in the workplace (Der-Karabetian and Gebharbp, 1986; Diestel *et al*., 2014 and Dineen, Noe, Shaw, Duffy and Wiethoff, 2007) and increases employee performance, because JS plays an important role on the success of organisations (Samadzadeh, 2013). The main objective of this study is to test the moderating effect of physical exercise on: a) the relationship between JS and OP, and; b) the relationship between motivation and OP.

Literature review: job satisfaction, motivation, organisational performance, and the role of physical exercise

JS is defined as the work-related attitude which reflects the extent to which individual employees perceive certain aspects of their work, such as colleagues, supervisor, career opportunities, the organisation itself and working conditions, as being beneficial to themselves (Diestel *et al*., 2014). JS is central to organisational behaviour (Weiss and Cropanzano, 1996) and it is mostly studied

(Spector, 1997) in research regarding attitudes at work (Harrison, 2006). JS is one of the key indicators of employee outcomes in HR Management and performance research (Vermeeren, Kuipers and Steijn, 2014). JS refer to the positive or negative attitudes of individuals concerning his employment and work environment (Ouedraogo and Leclerc, 2013) depending on their personality and on the demands of the task (House, Shane and Herold, 1996). JS involves two dimensions: internal and external satisfaction. The internal dimension respects the enjoyment and excitement, the intrinsic interest, autonomy and responsibilities associated to one's job. While the external dimension regards the gratification of enjoying the job environment, involving the salary and benefits, the opportunities for advancement, as well as the operations and organisational decision-making (Wu *et al.*, 2017).

JS, as well as employee motivation, has a large influence on individual behaviour within organisations (Özpehlivan and Acar, 2016). Motivation can be defined as the driving force that leads individuals to achieve a particular goal in order to fulfil a need or expectation (Osabiya, 2015 and Pritchard and Ashwood, 2008). At the organisational level it represents the set of internal and external forces that generate behaviour at work, determine its form, direction, intensity and duration (Rusu and Avasilcai, 2013). We chose to use Gagné *et al.*'s (2015) definition of motivation, based on the Self-Determination Theory (Deci and Ryan 1985), considering three dimensions suggested by the authors: a) amotivation, which relates to the absence of determination to engage in an activity; b) intrinsic motivation, which regards the desire to participate in activities due to the pleasure derived from work, considering it is interesting, enjoyable and pleasant, and; c) extrinsic motivation, which refers to involvement in an activity for instrumental reasons, being moved by compensations (Gagné *et al.*, 2015). This last dimension is further divided into four sub-dimensions (external regulation, introjected regulation, identified regulation and integrated regulation), which varies in the form of internalisation, that is to say, in the way a task is guided by values or objectives that initially was regulated by external factors such as reward or punishment (Ryan and Deci, 2000).

The primary goal of managers is to increase organisational performance (Tseng and Lee, 2014). Performance is a key issue in management research, which has no simple and unanimous definition and measurement (Maltz, Shenhar and Reilly, 2003). Performance respects the effectiveness of the specified and required actions in the employee function descriptor, to achieve the organisational objectives (Janssen and Van Yperen, 2004 and Menges, Tussing, Wihler and Grant, 2017). In relation to individual performance, adaptive performance regards the skills to adapt to dynamic situations (Hesketh and Neal, 1999). Regarding this concept, Charbonnier-Voirin and Roussel (2012) propose several dimensions based on the work of Pulakos, Arad, Donovan and Plamondon (2000), two of which are closely related to the reaction to uncertainty and ambiguity: the dimension 'solving problems creatively' (the ability of the employee to deal with complex or ill-defined situations) and the dimension 'handling emergencies and crises' (finding solutions to avoid threats and risks). There is a growing recognition that traditional models of performance are static and need to include "responsiveness to changing job

requirements" - the so called adaptive performance (Jundt, Shoss and Huang, 2015). The two dimensions were chosen because they reflect the traces of the adaptability to dynamic situations, uncertain environments and ambiguity contexts.

The relationship between JS and performance has gained increasing prominence among researchers (Diestel *et al*., 2004; Dineen *et al*., 2007; Harrison, 2006 and Springer, 2011). Happy employees who feel fulfilled in their posts achieve higher performance levels, suggesting JS is an antecedent of performance (Uslu, 2016). A satisfied employee pays attention to the quality of the tasks, is committed to the organisation, values the clients, and is more productive (Ferreira, Fernandes, Haase and Santo, 2009). Ouedraogo and Leclerc (2013) and Samadzadeh (2013) results show a clear positive influence of JS on employee performance at work, consistent with other studies supporting that JS has a positive impact on job performance (Judge, Bono, Thoresen and Patton, 2001; Vermeeren *et al*., 2014 and Wu *et al*., 2017). Accordingly, we propose the following hypotheses:

H1a: JS positively influences OP in the dimension 'solving problems creatively'.

H1b: JS positively influences OP in dimension 'handling emergencies and crises'.

Among the various influences affecting performance, previous studies support a positive relationship between motivation and work performance (Grant, 2008; Ryan and Deci, 2000 and Springer, 2011). High intrinsic motivation has been linked to higher achievement, while extrinsic motivation has been associated with lower performance (Deci and Ryan, 2000). Considering three dimensions of motivation suggested by Gagné *et al*., (2015) we suggest the following hypotheses:

H2a: Demotivation negatively influences OP in the dimension 'solving problems creatively'.

H2b: Demotivation negatively influences OP in the dimension 'handling emergencies and crises'.

H3a: Introjected regulation positively influences OP in the dimension 'solving problems creatively'.

H3b: Introjected regulation positively influences the OP in the dimension 'handling emergencies and crises'.

H4a: Intrinsic motivation positively influences OP in the dimension 'solving problems creatively'.

H4b: Intrinsic motivation positively influences OP in the dimension 'handling emergencies and crises'.

In the contemporary work environment, many tasks involve a high level of sedentary behaviour, which consequently exposes employees to musculoskeletal problems, pain, and other health problems (Pronk, 2009). Given such a context, physical exercise gains importance, because it may

lighten illnesses and enhance the therapeutics of a large number of diseases associated with sedentary behaviour, such as depression, cancer, cardiovascular diseases, metabolic, pulmonary and musculoskeletal diseases (Sjøgaard *et al*., 2016), as well as provide benefits related to weight loss (Anderson *et al*., 2009).

The relationship between fitness (the ability to perform the daily tasks without excessive fatigue), or exercise, and productivity is reported in the literature (Sharifzadeh, 2013). In their study, Der-Karabetian and Gebharbp (1986) conclude that employees who participated in an exercise programme had greater JS, better body image, and fewer absences, resulting in increased productivity. Mills, Kessler, Cooper and Sullivan (2007) observed that employees who participated in health promotion programmes had reduced health risks and monthly absenteeism and increased work performance.

Satisfied HR strive to meet the organisation's goals, so it is important for managers to be concerned about the well-being of employees (Osabiya, 2015). Physical exercise stimulates a positive attitude toward peers and work, contributing to building morale (Coulson *et al*., 2008). Programmes that focus on employee well-being produce an increase in JS (Zoller, 2004), which in turn is positively associated with performance at work (Armeli, Eisenberger, Fasolo and Lynch, 1998). Healthy employees increase their outputs, job satisfaction, and overall performance (Wu *et al*., 2017). Thus, we introduce the following hypotheses:

H5a: Physical exercise has a moderating effect on the relationship between JS and OP in the dimension 'solving problems creatively'.

H5b: Physical exercise has a moderating effect on the relationship between JS and OP in the dimension 'handling emergencies and crises'.

Employees' well-being programmes have proven to positively influence employees' motivation, resulting in decreased absenteeism (Parks and Steelman, 2008) and produce a catalyst effect on employees, leading them to improve individual performance in order to provide more value for the organisation (Supriyanto, 2015). Therefore, we elaborated the following hypotheses:

H6a: Physical exercise has a moderating effect on the relationship between demotivation and OP in the dimension 'solving problems creatively'.

H6b: Physical exercise has a moderating effect on the relationship between demotivation and OP in the dimension 'handling emergencies and crises'.

H7a: Physical exercise has a moderating effect on the relationship between introjected regulation and OP in the dimension 'solving problems creatively'.

H7b: Physical exercise has a moderating effect on the relationship between introjected regulation and OP in the dimension 'handling emergencies and crises'.

H8a: Physical exercise has a moderating effect on the relationship between intrinsic motivation and OP in the dimension 'solving problems creatively'.

H8b: Physical exercise has a moderating effect on the relationship between intrinsic motivation and OP in the dimension 'handling emergencies and crises'.

Following these hypotheses, we next present the study's research model (Figure 1).

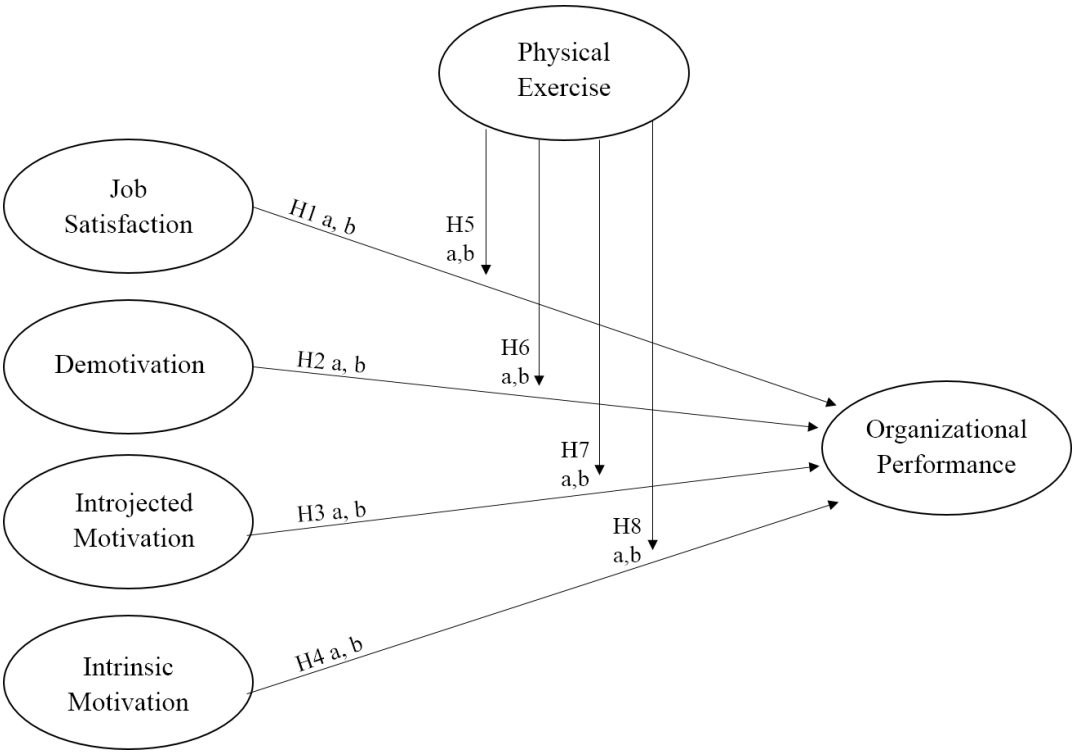

Figure 1: Research Model

Research Methodology

This study is of a quantitative and confirmatory nature that tests the proposed hypotheses. Data were collected by means of an online questionnaire to measure the latent variables using a seven-point Likert scale. The OP scale adopted was by Charbonnier-Voirin and Roussel (2012). JS was assessed using the Minnesota Satisfaction Questionnaire (Weiss, Davis, England and Lofquist, 1967) in its reduced version, consisting of the 20 items (Weiss *et al*., 1967) that best represent

the 100 items of the original version (Ahmadi and Alireza, 2007). Regarding Motivation, the Multidimensional Work Motivation Scale (MWMS) by Gagné *et al.* (2015) was used, specifically the introjected regulation sub-dimension was selected. Introjection represents the regulation of behaviour by self-esteem related to ego involvement and thus leading to demonstrate skills in order to maintain feelings of worth (Ryan and Deci, 2000). (Constructs and items are presented in the Appendix).

A pre-test was performed with seven individuals working in service companies. After making the suggested changes, the questionnaire was distributed on the Qualtrics platform, by sending e-mails. The sample used in the data collection was obtained from an Informa D and B database of the 6,486 largest service companies in the year 2017. The survey was applied to employees of companies in the service industry which, according to the INE study (2012), was the sector presenting the highest growth between 2004 and 2010 and which includes more than 75% of the total number of employees in the non-financial sector. A total of 712 responses were obtained, however, due to database cleaning procedures, 250 questionnaires were removed (Hair, Babin, Money and Samouel, 2005). Data from a total of 462 responses were subjected to the analysis, resulting in a net response rate of 7.12%.

To test the quality of data, the following distribution tests were conducted: Shapiro-Wilk's, according to the procedures described by Razali and Wah (2011) and asymmetry and kurtosis, as suggested by Hair, Hult, Ringle and Sarstedt (2014). For reliability, Cronbach's alpha and corrected item-total correlation (CITC) were used as described by Hair *et al.* (2005). The structure of the analytical variables was checked by performing Exploratory Factor Analysis (EFA), according to the procedures described by Koufteros (1999): Principal Components Analysis, Keizer-Meyer-Olkin (KMO) and Bartlett's sphericity. The data collected were subjected to statistical treatment using the IBM SPSS software version 22.0 (Statistical Package for Social Sciences) and SmartPLS versions 2 and 3.

Data analysis

The sample's demographic data indicate a higher number of female respondents (61.7%), on average being 41 years old and most of them holding a university degree (51.7%). Respondents are mostly married or living in a stable union (64.9%), with a number of children distributed mainly between zero (34.6%), one (23.4%) and two children (32.0%), and tenure (measured by the number of years of activity in the organization) is 11 years on average.

To ascertain if the sample had a normal distribution, the Shapiro-Wilk test was performed and asymmetry and kurtosis were measured (Hair *et al.*, 2014). The values obtained in the Shapiro-Wilk test indicate that no variable presents (for an α value of 5%) a normal distribution. The results obtained for the asymmetry and kurtosis of the sample corroborate normality.

Considering the data do not present a normal distribution, it is recommended to use Partial Least Squares - Structural Equation Modelling (PLS - SEM) methodology to test the models and evaluate the hypotheses (Hair *et al*., 2014). The reliability of the constructs was analysed by internal consistency, evaluating the Cronbach's alpha. Table 1 shows the Cronbach's Alpha values of the constructs in the model used.

Constructs	Number of items	Cronbach's Alpha
Organisational Performance		
Solving problems creatively	5	0.554
Handling emergencies and crises	4	0.727
Job Satisfaction	20	0.954
Motivation		
Demotivation	3	0.812
Introjected Regulation	4	0.634
Intrinsic Motivation	3	0.897

Table 1: Reliability of the research model

Items obtaining less than 0.5 in the corrected total-item correlation that negatively impacted the Cronbach's Alpha were eliminated. This procedure affected items OP3 and OP9, regarding OP, which led to an increase of the scale's Cronbach's Alpha. The exclusion of other items with between-item correlation values below 0.5 would have negatively affected the Cronbach's Alpha, so we decided to retain them.

The introjected regulation dimension of Motivation presented lower than recommended Cronbach's Alpha values, which indicates that the scale items are inadequately correlated with each other (Hair *et al*., 2005). Eliminating such items from the scales did not improve internal consistency to acceptable values, so they were removed from the model (Hair *et al*., 2005). Thus, hypotheses H3a and H3b are eliminated. Table 3 shows the corrected item-total correlation values of the original constructs, the CITCs of the adjusted constructs, and the Cronbach's Alpha value after elimination.

Constructs	CITC	CITC after elimination	Cronbach's Alpha
Organisational Performance			
Solving problems creatively	(-) 0.155 - 0.605	0.369 - 0.605	0.765
Handling emergencies and crises	0.296 - 0.698	0.601-0.698	0.852
Job Satisfaction	0.223 - 0.791	-	0.954
Motivation			
Demotivation	0.543 - 0.642	-	0.812
Introjected Regulation	0.251 - 0.517	-	-
Intrinsic Motivation	0.683 - 0.781	-	0.897

Table 2: Reliability of the post-elimination research model

Next, EFA was performed using principal components analysis. The score for the Kaiser-Meyer-Olkin test (KMO) was 0.951, above the recommended value (KMO> 0.8) and the Bartlett sphericity test had a significance of 0.000, which shows that data are suitable for the desired analysis. Analysing the values of commonalities and considering the reference value is 0.5, all values below this indicator were eliminated (items JS7, JS8 and JS18, from the JS scale). It was decided to retain item OP5, despite its value of 0.462, since it is close to the reference value and its elimination would make the dimension 'solving problems creatively' in the performance scale more fragile since it would have three items and because their elimination would reduce the Cronbach's Alpha.

In the rotated component matrix (using a Varimax rotation) the independent variables were separated from the dependent variables. Regarding the independent variables, the hypothesis of a fixed number of three factors was tested. The value of the components fell in a dispersed fashion, so it was necessary to eliminate some items. Accordingly, items numbers JS1, JS3, JS9, JS10, JS11 and JS20 (from the JS scale) were eliminated, since they were associated with intrinsic motivation. Once the variables had been purified and corrected, a rotated component matrix with three components was produced. Regarding the dependent variables, two components were identified in the rotating component matrix. The variance explained by the factors corresponds to 68.828% of the variance in the first group and 67.146% in the second. These values are above 60%, reference limit. All components have a factorial load above 1, and are therefore within the limits recommended by Hair *et al*. (2005).

Following the correct analysis of SEM we began with the analysis of the quality and load values of the model's variables. Table 3 shows the values for the Composite Reliability and Cronbach's Alpha, both of which are above the reference value of 0.7 (Hair *et al*., 2014).

	AVE	Square Root	Composite Reliability	Cronbach's Alpha	R^2
Organisational Performance					
Handling emergencies and crises	0,7765	0,8812	0,9124	0,8563	0,1761
Solving problems creatively	0.5883	0.7670	0.8506	0.7665	0.2390
Motivation					
Demotivation	0.7254	0.8517	0.8879	0.8120	-
Intrinsic Motivation	0.8355	0.9141	0.9384	0.9015	-
Job Satisfaction	0.6173	0.7857	0.9465	0.9384	-

Table 3: Quality of the Adjusted Model

The convergent validity was evaluated using the Outer Loadings of the variables (OL) and the AVE (Average Variance Extracted). Both criteria are fulfilled according to the parameters set by Hair *et al*. (2014), verifying the model's convergent validity. The discriminant validity was first assessed using the method that suggests the Outer Loading of an item in the construct should be higher than its Cross Loading (CL) (Hair *et al*., 2014). This criterion is respected. The second criterion for assessing discriminant validity is that of Fornell-Larcker (Hair *et al*., 2014). This criterion is also respected, so the model's discriminating validity is ensured.

Once the reliability and validity of the measures in the constructs had been confirmed, the results of the structural model were evaluated. First the collinearity was assessed by measuring the tolerance and the Variance Inflation Factor (VIF) (Hair *et al*., 2014). Both models were checked and then, the Bootstrapping procedure was used to find the Student *t* value, in order to test the hypotheses and verify if the relations are significant (Hair *et al*., 2014). The model was parameterized with 1,000 samples and 462 cases.

The Bootstrapping algorithm was run with the complete model. Hypothesis H2b presented a *t* value of 0.8161, being rejected. It was removed from the model and the algorithm was run again. All the other hypotheses were accepted. Table 4 shows the relationships supported in the structural model, the coefficients and *t* values.

Hypotheses		Path coefficient	Standard deviation	Default Error	*t* value	Status ($\alpha = 0.05$)
H1a	Job Satisfaction → Solving problems creatively	0.2371	0.0519	0.0519	4.5721	Supported
H1b	Job Satisfaction → Handling emergencies and crises	0.2773	0.0555	0.0555	4.9984	Supported
H2a	Demotivation → Solving problems creatively	-0.1012	0.0483	0.0483	2.0968	Supported
H2b	Demotivation → Handling emergencies and crises	-0,044	0,0539	0,0539	0,8161	Rejected
H4a	Intrinsic Motivation → Solving problems creatively	0.2413	0.0605	0.0605	3.9887	Supported
H4b	Intrinsic Motivation → Handling emergencies and crises	0.1804	0.0566	0.0566	3.1855	Supported

Table 4: Relationships in the structural model

Based on the R^2 value, the results show that the model explains 17.45% of the performance in the 'handling emergencies and crises' dimension and 23.91% of the performance in the 'solving problems creatively' dimension. The Q^2 values are greater than 0, which indicates the predictive relevance of the model according to Hair *et al.* (2014). The resulting relationships from testing the research model are presented in Figure 2.

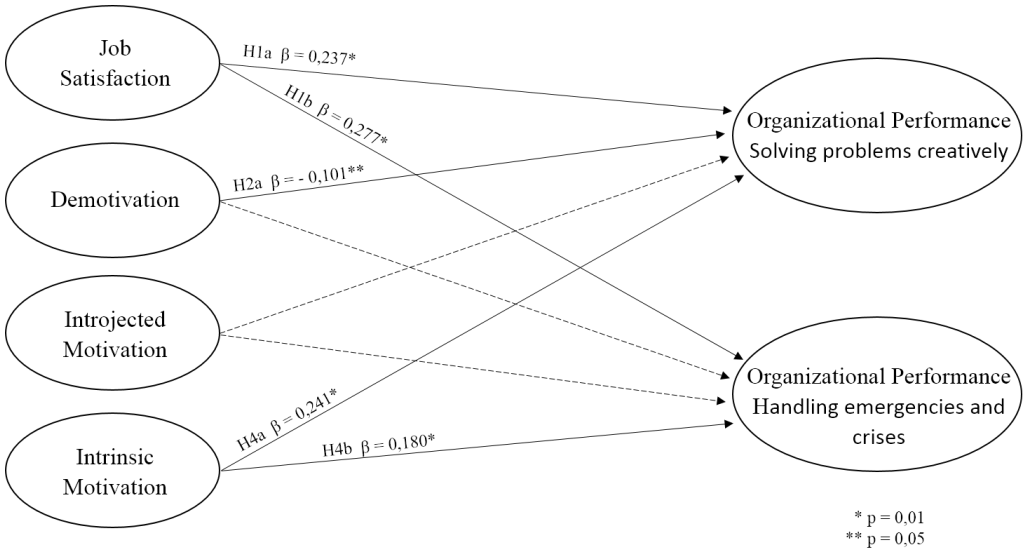

Figure 2: Results of the hypotheses test

The moderation test was conducted to check the influence of different levels of physical exercise performed by the employees on: a) the relationship between JS on performance, and; b) the relationship between motivation and performance. For this, the sample was divided into three subsamples, according to the number of hours of exercise practiced per week: sedentary (no physical exercise), with 126 observations; slightly active (1 or 2 hours of exercise per week), with 159 observations, and; active (at least 3 hours of exercise per week), with 177 observations. Using the resulting relationships from testing the research model, shown in Figure 2, the PLS and Bootstrapping algorithms were again applied, using each of the subsamples, originating results displayed in Figures 3, 4 and 5.

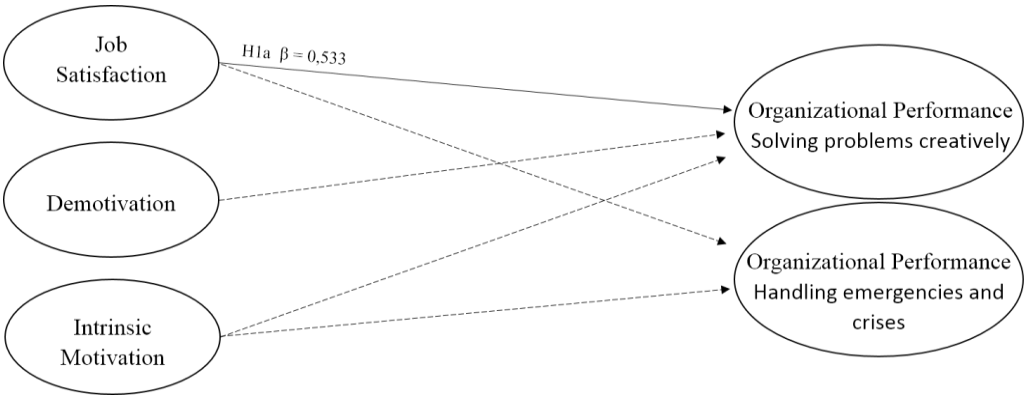

Figure 3: Results of the hypotheses test regarding the sedentary group

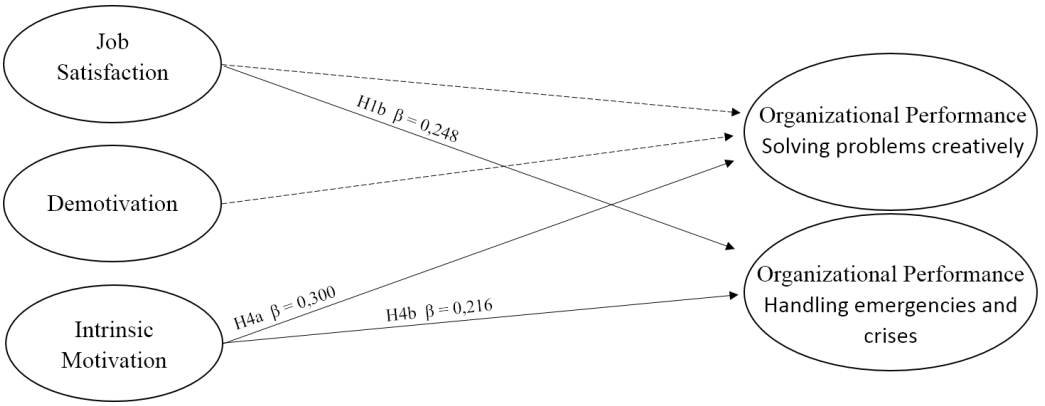

Figure 4: Results of the hypotheses test regarding the slightly active group

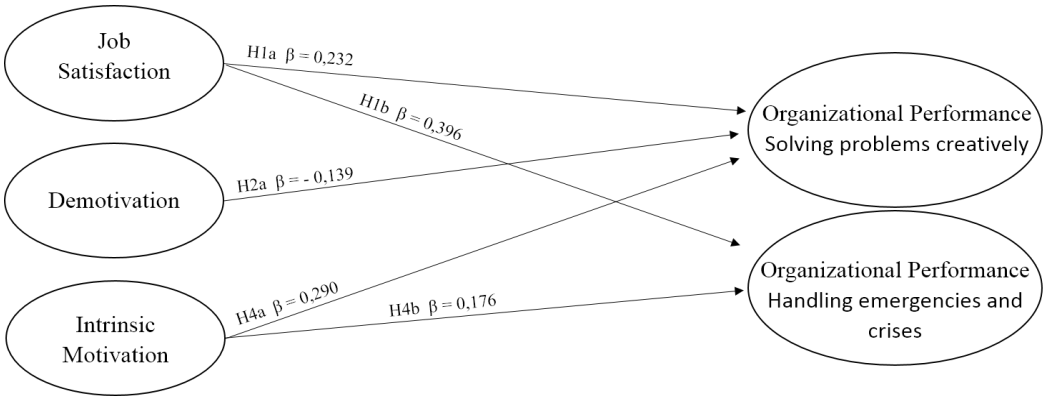

Figure 5: Results Results of the hypotheses test regarding the active group

Regarding the sedentary subsample, only one relationship was supported: JS significantly contributes to 'solving problems creatively'. Considering the slightly active subsample, three relationships were supported: both satisfaction and intrinsic motivation significantly contribute 'handling emergencies and crises', and; intrinsic motivation significantly contributes to 'solving problems creatively'. The relationship between JS and 'solving problems creatively', although supported in the sedentary subsample, was not so in the slightly active subsample. When addressing the active subsample, all relationships in the model were supported. Thus, there is evidence that leads to accepting hypotheses H5a, H5b, H6a, H6b, H8a and H8b, and thus indicating that those relationships are sensitive to the individual's level of physical activity.

The models regarding the subsamples present different significant relationships. In order to check the significance of the differences in the results, we used the long version of Henseler, Ringle and Sinkovics' (2009) Multi Group Analysis – Partial Least Squares (MGA-PLS) test as described by Sarstedt, Henseler and Ringle (2011). In this test, the level of significance should be 5%, so that results below 0.05 or above 0.95 are considered acceptable (Henseler *et al*., 2009 and Sarstedt *et al*., 2011). Table 5 shows the MGA-PLS of the relationship between JS and 'solving problems creatively', present in the sedentary and active subsamples.

	Difference Active x Sedentary	P-value Active x Sedentary
Job Satisfaction → Solving problems creatively	0.151	0.960

Table 5: Sedentary Multigroup Analysis - Partial Least Squares

Regarding the sedentary subsample: $\beta = 0.533$ in the relationship between JS and 'solving problems creatively', while considering the active subsample $\beta = 0.232$. The difference between the sedentary and the active subsamples is significant. Thus, the relationship between JS and 'solving problems creatively' is significantly stronger when employees engage in no type of exercise than when they are active and simply non-existent when employees are slightly active.

The next analysis concerns the relationships between: a) intrinsic motivation and 'solving problems creatively'; b) intrinsic motivation and 'handling emergencies and crises', and; c) JS and 'handling emergencies and crises' which occur in the subsample of slightly active employees. Table 6 shows the results of the MGA-PLS.

	Difference Active x Slightly Active	P-value Active x Slightly Active
Intrinsic Motivation → Solving problems creatively	0.032	0.391
Intrinsic Motivation → Handling emergencies and crises	0.035	0.606
Job Satisfaction → Handling emergencies and crises	0.141	0.103

Table 6: Slightly Active Multigroup Analysis - Partial Least Squares

In none of the relationships is there a significant difference between the slightly active and active subsamples. Hence, practicing exercise, even at low levels, is sufficient for the three addressed relationships occur. Furthermore, the relationships are moderated by exercise, as they do not occur when the employee is sedentary.

Although the moderating role is confirmed the negative relationship between demotivation and creativity is only supported when testing the active subsample. That is to say, when employees who practice exercise are unmotivated, their creativity is negatively impacted, and the same is not true of sedentary or slightly active employees.

Discussion and Conclusions

When analysing the moderating effect of physical exercise on the relationship between JS, motivation and OP, we reached some interesting findings.

The results confirm the relationship of JS with the two dimensions of performance studied: 'solving problems creatively' and 'handling emergencies and crises'. However, this relationship is not uniform - sedentary employees seem to benefit from the effect of JS on 'solving problems creatively', by contrast, employees who practice the most physical exercise seem to benefit from the effect of JS on 'handling emergencies and crises'. Such results puzzled us. Are the sedentary employees more creative? Is physical exercise a support to resisting stress that 'handling emergencies and crises' situations presupposes?

The findings show that the relationship between the two dimensions of motivation and 'solving problems creatively' dimension of OP is confirmed. Similarly, in this case, there is also no uniform pattern - no influence of motivation on 'solving problems creatively' is felt among the sedentary employees, only intrinsic motivation contributes to 'solving problems creatively' in the slightly active employees. Additionally, the two dimensions of motivation were found to impact on the 'solving problems creatively' of active employees. These results are consistent with the previous reports (Grant, 2008; Ryan and Deci, 2000 and Springer, 2011) and support the same questions that crossed our minds regarding the relationship between the employees' amount of physical activity practiced and their creativity.

The relationship between intrinsic motivation and one dimension of performance ('handling emergencies and crises' dimension) was confirmed in similar ways - sedentary employees do not benefit from this relationship, in contrast with those with some level of physical activity. These results raise the same questions regarding the employees' amount of physical activity practiced and their ability to deal with emergencies and crises.

All the relationships confirmed in the model are moderated by the amount of physical exercise practiced by the employee, which demonstrates the relevance of the study and the hypotheses involved - the volume of physical exercise is truly relevant for the addressed phenomena. The

issues raised by the results should be further explored to extend the study of the role of physical exercise in the creativity of employees and their ability to deal with emergencies and crises. As a continuation of this research, it would be useful to conduct a qualitative study to shed light on the reasons why some moderations occur, *e.g.*, in the counterintuitive significant relationship between JS and creativity. Further research could benefit also from longitudinal studies to explore the benefits of exercise in the long term and identify patterns for the evolution of the behaviour attached to exercising. A cluster analysis would be interesting to unveil evolutionary cycles of motivation and satisfaction in relation to job performance and levels of physical exercise.

This study presents some limitations. First, only three motivation dimensions were adopted (and only two were used in the final model). Similarly, only two dimensions of job performance were analysed. Second, the study didn't take into account the sector of the companies within the services industry, it just delimited firm size. Such an analysis could provide a more meaningful answer to some of the results. Finally, the study is limited in that it lost two constructs and several items from the remaining constructs. This limitation is probably linked to the data being collected only from service companies, while the original studies of the scales covered other areas of activity.

Acknowledgements

The authors are grateful for the support provided by CAPES (CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil, scholarship for Andrea Raymundo Balle / Programma de Doutorado-sanduíche no Exterior / Processo número 88881.132892/2016-01), CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico – Brazil) and FCT (Foundation for Science and Technology - Portugal) under the project number - UID / SOC / 04521/2013. They are also grateful to Informa D and B for making company data availability for the launch of the questionnaires and the companies and employees involved in the study, for the time spent and for their collaboration.

References

Ahmadi, K., and Alireza, K. (2007). Stress and Job Satisfaction among Air Force Military Pilots. *Journal of Social Sciences, 3(3)*, 159-163.

Anderson, L., Quinn, T., Glanz, K., Ramirez, G., Kahwati, L., Johnson, D., Katz, D. (2009). The Effectiveness of Worksite Nutrition and Physical Activity Interventions for Controlling Employee Overweight and Obesity. *Journal of Preventive Medicine, 37(4)*, 340-357.

Armeli, S., Eisenberger, R., Fasolo, P., and Lynch, P. (1998). Perceived organizational support and police performance: The Moderating Influence of Socioemotional Needs. *Journal of Applied Psychology, 83(2)*, 288-297.

Bernacki, E.J., and Baun, W. B. (1984). The relationship of job performance to exercise adherence in a corporate fitness program. *Journal of Occupational Medicine*, 26, 529-531.

Charbonnier-Voirin, A., and Roussel, P. (2012). Adaptive Performance: A New Scale to Measure Individual Performance in Organizations. *Canadian Journal of Admin 'istrative Sciences, 29(3)*, 280-293.

Coulson, J., McKenna, J., and Field, M. (2008). Exercising at work and self-reported work performance. *International Journal of Workplace Health Management, 1(3)*, pp. 176-197.

Der-Karabetian, A., and Gebharbp, N. (1986). Effect of Physical Fitness Program in the Workplace. *Journal of Business and Psychology, 1(1)*, 51-58.

Deci, E.L. and Ryan, R.M. (1985). I*ntrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E.L., and Ryan, R.M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

Diestel, S., Wegge, J., and Schmidt, K.-H. (2014). The impact of social context on the relationship between individual job satisfaction and absenteeism: the roles of different foci of job satisfaction and work-unit absenteeism. *Academy of Management Journal, 57(2)*, 353–382.

Dineen, B. R., Noe, R. A., Shaw, J. D., Duffy, M. K., and Wiethoff, C. (2007). Level and dispersion of satisfaction in teams: using foci and social context to explain the satisfaction-absenteeism relationship. *Academy of Management Journal, 50(3)*, 623–643.

Ferreira, J. A., Fernandes, R., Haase, R. F., and Santos, E. R. (2009). Minnesota Satisfaction Questionnaire – Short Form: estudo de adaptação e validação para a população portuguesa. *Psychologica, 51*, 251-281.

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Broeck, A. v., Aspeli, A. K., et al., e. (2015). The Multidimensional Work Motivation Scale: Validation evidence in seven languages and nine countries. *European Journal of Work and Organizational Psychology, 24(2)*, 178–196.

Goetzel, R. Z., and Ozminkowski, R. J. (2008). The Health and Cost Benefits of Work Site Health-Promotion Programs. *Annual Review of Public Health, 29(1)*, 303-323.

Grant, A. M. (2008). Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity. *Journal of Applied Psychology, 93(1)*, 48–58.

Hair, J. F., Babin, B., Money, A. H., and Samouel, P. (2005). *Fundamentos de métodos de pesquisa em administração.* Porto Alegre: Bookman.

Hair, J. F., Hult, G. T., Ringle, C. M., and Sarstedt, M. (2014). *A primer on partial least squares structural equations modeling (PLS-SEM).* Los Angeles: SAGE.

Harrison, D. A. (2006). How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences. *Academy of Management Journal, 49(2)*, 305–325.

Hill, M. M., and Hill, A. (2012). *Investigação por questionário.* Lisboa: Edições Sílabo, Lda.

House R., Shane, S. and Herold, D. (1996). Rumors of the death of dispositional research are vastly exaggerated. *Academy of management review*, 21, 203-224.

INE. (2012). *Evolução do Setor Empresarial em Portugal, 2004-2010.* Instituto Nacional de Estatística, I.P.

Janssen, O., and Van Yperen, N. W. (2004). Employees' goal orientations, the quality of leader-member exchange, and the outcomes of job performance and job satisfaction. *Academy of Management Journal*, 47(3), 368–384.

Judge, T. A., Thoresen, C. J., Bono, J. E., and Patton, G. K. (2001). The job satisfaction job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*. 127, 376-407.

Jundt, D. K., Shoss, M., and Huang, J. L. (2015). Individual adaptive performance in organizations: Review. *Journal of Organizational Behavior*, 36(1), 53–71.

Koufteros, X. A. (1999). Testing a model of pull production: A paradigm for manufacturing research using structural equation modeling. *Journal of Operations Management. 17(4)*, 467-488.

Luthans, F. (1992). *Organizational behavior* (6thed). New York: McGraw-Hill Inc.

Menges, J. I., Tussing, D. V., Wihler, A., and Grant, A. (2017). When job performance is all relative: how family motivation energizes effort and compensates for intrinsic motivation. *Academy of Management Journal*, 60(2), 695–719.

Mills, P. R., Kessler, R. C., Cooper, J., and Sullivan, S. (2007). Impact of a Health Promotion Program on Employee Health Risks and Work Productivity. *American Journal of Health Promotion, 22(1)*, 45-53.

Osabiya, B. J. (2015). The effect of employees' motivation on organizational performance. *Journal of Public Administration and Policy Research, 7(4)*, 62-75.

Ouedraogo, A., and Leclerc, A. (2013). Job Satisfaction and Organizational Performance: Evidence from Canadian Credit Union. *Journal of Organizational Culture, Communications and Conflict*, 17(1), 35-50.

Özpehlivan, M., and Acar, A. Z. (2016). Development and validation of a multidimensional job satisfaction scale in different cultures. *Cogent Social Sciences, 2(1)*, 1-20.

Parks, K. M., and Steelman, L. A. (2008). Organizational wellness programs: A meta-analysis. *Journal of Occupational Health Psychology, 13(1)*, 58–68.

Pritchard, R., and Ashwood, E. (2008). *Managing Motivation: A Manager's Guide to Diagnosing and Improving Motivation.* New York: Routledge Taylor and Francis Group.

Pronk, N. P. (2009). Physical Activity Promotion in Business and Industry: Evidence, Context, and Recommendations for a National Plan. *Journal of physical activity and health, 6(2)*, 220-235.

Razali, N. M., and Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. *Journal of Statistical Modeling and Analytics, (2)1*, 21-33.

Ricciardi, R. (2005). Sedentarism: A Concept Analysis. *Nursing Forum, 40(3)*, 79-87.

Rusu, G., and Avasilcai, S. (2013). Human Resources Motivation: An Organizational Performance Perspective. *Fascicle of Management and Technological Engineering, 22(1)*, 331-334.

Ryan, R. M., and Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55(1)*, 68-78.

Samadzadeh, M. (2013). Investigating the effect of work stress, general health quality, organizational intelligence and job satisfaction on employee performance. *Management Science Letters*, 3, 2989–2994

Sharifzadeh, M. (2013). Does Fitness and Exercises Increase Productivity? Assessing Health, Fitness and Productivity Relationship. *American Journal of Management, 13(1)*, 32-52.

Sjøgaard, G., Christensen, J. R., Justesen, J. B., Murray, M., Dalager, T., Fredslund, G. H., and Søgaard, K. (2016). Exercise is more than medicine: The working age population's well-being and productivity. *Journal of Sport and Health Science 5, 5(2)*, pp. 159-165.

Spector, P. E. (1997). *Job Satisfaction: Application, Assessment, Causes, and Consequences.* Thousand Oaks, California: Sage Publications.

Springer, G. J. (2011). A Study of Job Motivation, Satisfaction, and Performance among Bank Employees. *The Journal of Global Business Issues, 5(1)*, 29-42.

Supriyanto, A. S. (2015). Relationship between Human Resource Management (HRM) Practices and rganizational Performance Moderated by Organizational Commitment. *Australian Journal of Basic and Applied Sciences, 9(7)*, 185-188.

Uslu, O. (2016). The Associations among Emotional Intelligence, Job Satisfaction and Job Performance. *Proceedings of the Fifth European Academic Research Conference on Global Business, Economics, Finance and Banking.* Turquia.

Vermeeren, B., Kuipers, B., and Steijn, B. (2014). Does Leadership Style Make a Difference? Linking HRM, Job Satisfaction, and Organizational Performance. R*eview of Public Personnel Administration,* 34(2), 174-195.

Wattles, M. G. and Harry, C. (2003). The relationship between Fitness Levels and Employee's perceived productivity, Job Satisfaction, and Absenteeism. *Journal of Exercise Physiology*, 6(1), 24-32.

Weiss, D. J., Davis, R. V., England, G. W., and Lofquist, C. H. (1967). *Manual for the Minnesota satisfaction questionnaire.* Minneapolis: University of Minnesota, Industrial Relations Center.

Weiss, H. M., and Cropanzano, R. (1996). Affective Events Theory: A Theoretical Discussion of The Structure, Cause and Consequences of Affective Experiences at Work. *Research in Organizational Behavior, 18(1)*, 1-74.

Wu, C.-H., Chen, I.-S., and Chen, J-C. (2017). A study into the impact of employee wellness and job satisfaction on job performance. The International Journal of Organizational Innovation, 10(2), 252-269.

Zoller, H. M. (2004). Manufacturing health: Employee perspectives on problematic outcomes in a workplace. *Western Journal of Communication, 68(3)*, 278-301.

APPENDIX

Constructs	Questionnaire items	Source
Job Satisfaction	On my present job, this is how I feel about … (JS1) Being able to keep busy all the time. (JS2) The chance to work alone on the job. (JS3) The chance to do different things from time to time. (JS4) The chance to be "somebody" in the community. (JS5) The way my boss handles his/her workers. (JS6) The competence of my supervisor in making decisions. (JS7) Being able to do things that don't go against my conscience. (JS8) The way my job provides for steady employment. (JS9) The chance to do things for other people. (JS10) The chance to tell people what to do. (JS11) The chance to do something that makes use of my abilities. (JS12) The way company policies are put into practice. (JS13) My pay and the amount of work I do. (JS14) The chances for advancement on this job. (JS15) The freedom to use my own judgment. (JS16) The chance to try my own methods of doing the job. (JS17) The working conditions. (JS18) The way my co-workers get along with each other. (JS19) The praise I get for doing a good job. (JS20) The feeling of accomplishment I get from the job.	(Weiss, Davis, England, and Lofquist, 1967)

Motivation	Why do you or would you put efforts into your current job? **Amotivation** (M1) I don't, because I really feel that I'm wasting my time at work. (M2) I do little because I don't think this work is worth putting efforts into. (M3) I don't know why I'm doing this job, it's pointless work. **Introjected regulation** (M4) Because I have to prove to myself that I can. (M5) Because it makes me feel proud of myself. (M6) Because otherwise I will feel ashamed of myself. (M7) Because otherwise I will feel bad about myself. **Intrinsic motivation** (M8) Because I have fun doing my job. (M9) Because what I do in my work is exciting. (M10) Because the work I do is interesting.	(Gagné, *et al*., 2015)
Organisational Performance	**Dimension solving problems creatively** New or ill- defined work situations may arise more or less frequently in your job. How do you respond? (OP1) I do not hesitate to go against established ideas to propose an innovative solution. (OP2) I use a variety of sources/types of information to come up with an innovative solution. (OP3) Whatever the problem to be solved, I never use anything but well-known methods. (OP4) I develop new tools and methods to resolve new problems. (OP5) Within my department, people rely on me to suggest new solutions. **Dimension handling emergencies and crises** At work, you may encounter various emergencies, risks, or even situations of a dangerous nature. How do you respond? (OP6) I am able to achieve total focus on the situation to act quickly. (OP7) I analyze possible solutions and their ramifications quickly to select the most appropriate one. (OP8) I quickly decide on the actions to take to resolve the problem. (OP9) I am not in a position to be able to respond quickly.	Charbonnier-Voirin and Roussel, 2012)