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Simões, C., & Gomes, A. R. (2019). The Interactive Process of Adaptation to Stress and Implications for Intervention. In N. Mucci, G. Giorgi, F. Sderci, & G. Arcangeli (Eds.), *Occupational Stress: Risk Factors, Prevention and Management Strategies* (pp. 1-42). USA: Nova Science Publishers, Inc.

### **Título do capítulo**

The Interactive Process of Adaptation to Stress and Implications for Intervention.

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### **Funding**

Psychology Research Centre (UID/PSI/01662/2013), University of Minho. COMPETE2020. PT2020 Partnership Agreement (POCI-01-0145-FEDER-007653). Project UID/MAT/00013/2013

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*Chapter***THE INTERACTIVE PROCESS OF  
ADAPTATION TO STRESS AND  
IMPLICATIONS FOR INTERVENTION**

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**ABSTRACT**

Human adaptation to stress involves the understanding of contextual and personal variables, and also the specific stress event. This complexity is a challenging topic not only for researchers interested in the topic of stress but also for delivering public policies dedicated to control the negative effects of stressful work conditions to individuals, families, and organizations. In this chapter, we will debate occupational stress in a dual perspective. First, we propose the Interactive Model of Human Adaptation to Stress (Gomes, 2014) that gives particular relevance to processes of cognitive appraisal on the relation between the stressful event and the individual responses to stress. Second, we will analyze implications of the interactive model for intervention, emphasizing techniques that can be useful to prevent the negative effects of stress and that can indeed promote positive adaptation to work demands.

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## **INTRODUCTION**

Worldwide in every-day living contexts, specifically those related to work performance are becoming further more demanding and stressful. Work related sources of stress are also becoming wider, incessant and intense, pushing the individuals to be constantly more efficient in their ways of coping, in order to achieve a positive adaptation to work. Although that, the relationship between stress and human adaptation is far from being linear, and requires to take into consideration the contextual and personal factors involved in the ways individuals perceive and respond to their work context. Therefore, to promote human adaptation to work stress is both necessary to understand the conceptual models that can help to recognize the complexity of the adaptation process to stress, and analyze the implications of those models for the intervention. Specifically, how individuals can achieve their best performance in their work contexts and how they can use those same contexts to be fulfill as human beings.

Stress is a word widely used in day-to-day living (e.g., common sense talks, media and scientific world), being object of several theoretical conceptualizations, conditioned by the continuous and obsessive nature of men, in the task of discovering and explaining the mechanisms that regulate human reactions and behaviors of adaptation to their performance contexts (Tavares, Soares-Fortunato, & Leite-Moreira, 2000; Vaz Serra, 2007). The stress has been subject of several research domains, in the last few years, constituting a particular area of interest in the field of health psychology, allowing to establish the border between the normal and the pathological, emphasizing the influence that psychosocial factors have on the health-illness process (Aldwin & Gilmer, 2004; McIntyre, 1994). The field of research in the health domain is large, embracing different points of view that vary from ethology, human and social sciences, physiology, physiopathology, up to the causal factors for physical and mental morbidity (Vaz Serra, 2007).

Stress related to work has been considered the “plague of the century” (McIntyre et al., 2007, p. 5), and theme of the debate in the contemporary scientific field of research, due its impact on several domains of the person’s

life (e.g., family, marital and societal domains) (Ashforth, Kreiner, & Fugate, 2000; Carter & McGoldrick, 1995; Coupland & Júdice, 2002; Davila, Karney, Hall, & Bradbury, 2003; McIntyre, 1994; Rodell & Judge, 2009; Rosenstock, 1997; Vaz Serra, 2007). The relevance of occupational stress raises from the increasing interest on the conditions that determine the person's productivity, satisfaction and well-being in the work place, for its negative effects on health quality of life and work performance (e.g., Burke & Greenglass, 1999; Hasselhorn, Müller, & Tackenberg, 2005; Simon, Kummerling, & Hasselhorn, 2004; Simon et al., 2008). A great number of studies emerge from fundamental questions and perennial doubts that stress researchers have talk over. That is, will be individuals who are more vulnerable to stress than others are? Are there professions inherently more stressful than others are? What are the causes of stress related to day-to-day work? In addition, what is the relationship between work-related stress and the person's health? How and when should we intervene? (Barling, Kelloway, & Frone, 2005; Kopp, Skrabski, Szekely, Stauder, & Williams, 2007; Rosenstock, 1997; Vaz Serra, 2007).

Occupational health constitutes a primordial and pioneer area for the investigation of these problematics. Moreover, the *National Institute for Occupational Safety and Health* (NIOSH), identified psychological disorders as one of the ten main categories of pathological conditions related to work, specifically to occupational stress (Quick, 1999; Rosenstock, 1997). Occupational stress has been identified worldwide, as being associated to cardiovascular and musculoskeletal diseases (Johnson, 1996; Kopp et al., 2007; Quick, 1999; Schneiderman, Ironson, & Siegel, 2005) (Huang, Feuerstein, & Sauter, 2002; Simon et al., 2008); physical and psychological distress (Blustein, 2008; Klainin, 2009; Rosenstock, 1997); absenteeism, *turnover* and *burnout* (Gomes, Cruz, & Cabanelas, 2009). Affecting, interpersonal relationships and performance at work (McIntyre et al., 2007; Queirós, 2005), as well as, general satisfaction with life (Netemeyer, Boles, & McMurrian, 1996; Rodell & Judge, 2009; Simon et al., 2004; Yildirim & Aycan, 2008).

In this domain, aid professions (e.g., psychologists, teachers, health professionals) had been identified as being in particular risk of experience

the negative effects of occupational stress, demanding the implementation of primary prevention policies, by organizations (McIntyre et al., 2007). However, most of studies have a general character in his nature, showing some gaps with respect to the process of adaptation to stress, demanding intervention guidelines (McIntyre et al., 2007).

The aim of this chapter is to discuss the factors that are involved in human adaptation to stress and its implications for the intervention, being proposed specific strategies to prevent occupational stress negative effects and to promote a positive adjustment to work demands. The chapter moves from the theoretical analysis of the interactive process of stress, proposed by the Interactive Model of Human Adaptation to Stress (Gomes, 2014), to discuss intervention possibilities to promote a positive adaptation to stress, according the main dimensions included in the model (e.g., characteristics of the stressful events, personal antecedent factors, cognitive appraisal, responses, and event outcomes). There will be proposed approaches in order to turn the stress situation a positive context for excellence, the individual adaptable to stress conditions, and human resources adequate to multiple stress conditions.

## **STRESS AS AN INTERACTIVE PROCESS**

The Interactive Model of Human Adaptation to Stress, proposed by Gomes (2014), relies mainly on the cognitive-motivational-relational theory of stress and emotions of Lazarus (1991, 1999) and the succeeding adaptations proposed by Fletcher, Hanton, and Mellalieu (2006) and Folkman (2008). Furthermore, the model counts with the contributions of concepts related to the sources of stress (Occupational Stress Model; Cooper & Marshall, 1976), the fit between the person and the environment (Person–Environment Fit; Edwards, Caplan, & Van Harrison, 1998), and the importance of personal control over work (Job Demands-Control model; Karasek, 1979; Karasek & Theorell, 1990).

For a better understanding of the Interactive Model of Human Adaptation to Stress (Gomes, 2014) according to the author, some

assumptions should be taken into consideration. Human adaptation to stress is best understood and accomplished through a process-oriented approach, which adopts the dynamic nature of the relationship between the individual and the environment. The apprehension of this dynamic process implies the analysis of the temporal sequence of the demands, the antecedent factors at the situational and personal levels, the cognitive appraisal at the first and second levels, the responses, and the event outcomes of human adaptation. The most influential model that theorizes stress as a process is the transactional (or relational) model, proposed by Lazarus (1991), which assumes that stress is not a property of the individual nor of the environment, as separate entities, but resides in the transaction between the two. Numerous aspects can characterize both the individual and the environment, but the dynamic experience of stress can only be achieved when both factors are analyzed in conjunction.

The model is interactive, since it considers that human adaptation is an ongoing process, with advances and setbacks in the coping process with stress, assuming interactive influences between the first level of cognitive appraisal, the responses, and the second level of cognitive appraisal in a bidirectional way, as such: first level of cognitive appraisal ↔ responses ↔ second level of cognitive appraisal. Stress is an ongoing transaction between environmental demands and personal vulnerabilities and resources. Strain (*negative human functioning*) is a consequence of an imbalance between these demands and resources (Cox, 1985; Lazarus, 1999; McGrath, 1970) and well-being (*positive human functioning*) is a consequence of a balance between these demands and resources.

For the interactive model, the process of adaptation involves the processes of cognitive appraisal, the responses (at the emotional, cognitive and behavioral levels), and the adjustment to the appraised conditions. Cognitive appraisal is a central component to understand human responses during stressful events. Cognitive appraisal is involved in the onset of psychological, physiological, and behavioral responses, and in how these responses will be interpreted and managed. The process of human adaptation does not need to go through all the steps proposed in the model, it can end when the individual does not give importance to the stressful event or when

he has achieved an event outcome of positive or negative human functioning. There is no reason to believe that human adaptation to stress finishes after primary and secondary cognitive appraisals, and that, tertiary and quaternary cognitive appraisal are only mobilized if a positive adjustment is not achieved. Further, even if a positive adjustment to stressful events is achieved, after primary and secondary cognitive appraisals, additional efforts can be developed to improve personal adjustment to the situation.

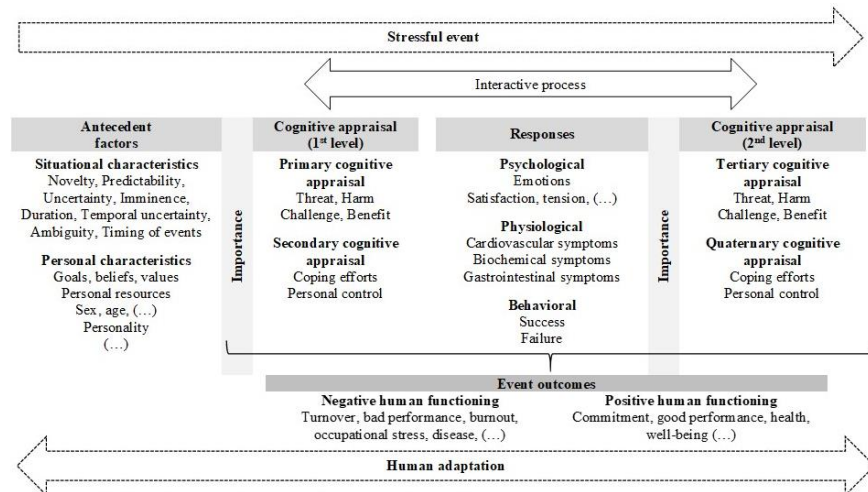


Figure 1. Interactive model of human adaptation to stress (Gomes, 2014).

The model takes into consideration that the relationship between stressful events and the events outcomes, can be mediated by cognitive appraisal and moderated by antecedent factors. Stressful events can be a source of influence along the all process of human adaptation, and not only at the beginning, strengthening the dynamic nature of the person-environment relationship.

After these core considerations, we will explore in more detail the theoretical dimensions that define the Interactive Model of Human Adaptation to Stress (Gomes, 2014), which is presented in Figure 1.

**Stressful Event**

Research on stress has been developed essentially along three axes, which define three conceptual perspectives: the biological, environmental and the psychological (Mason, 1975; Paúl & Fonseca, 2001; Soares & Pereira, 2006; Vaz Serra, 2007). The biological perspective focuses on the study of the mechanisms by which specific physiological systems are activated, and on their modulation by certain physical and psychological conditions. The environmental perspective is interested in the study of specific environmental factors, and to what extent its assessment by the individual determines feeling the environment as a stressing agent, affecting health and well-being. Finally, the psychological perspective, highlighting the cognitive evaluation factors, is centered on the subjective interpretation of the meaning around environment events, or specific experiences, and on the subjective evaluation of the available resources, so that the individual can deal with the demands perceived (Aldwin & Gilmer, 2004; Paúl & Fonseca, 2001; Soares & Pereira, 2006).

Accordingly, stress has been analyzed in one of three ways: as a stimulus (factors that can induce distress), as a response of the individual to stressful events (psychological, physiological, and behavioral), and as an interaction between the person and the stressful situation (for a review, see Cooper & Dewe, 2004). The Interactive Model of Human Adaptation to Stress reflects more the last approach to stress (as an interaction), without underestimate the other two (as a stimulus and as a response). The conception of the stress as a stimulus and as a response, have the merit of highlighting the factors that can disrupt human functioning in performance contexts (e.g., work) and the consequences that stressors can have on human functioning. Actually, it is fundamental to comprehend if the nature of stressors is changing across time, leading to “new” or “more intense” responses to stress, in order to promote an appropriate intervention. The interactive model proposes that stressful events play a major role in human adaptation to stress. This means that stressful events are not a static entity prior to processes of cognitive appraisal or coping efforts that are assumed by the individual in order to deal with stress. In contrast, it assumes an interactive and dynamic nature



established between the individual and the situation. This means that the stressful event plays a major role during all processes of human adaptation to stress; changing its nature according to the continuous efforts made by the person to cope with stress along this adaptation process, (this is why there is a dashed line to signalize the stressful event in Figure 1).

Considering research on stress related to work, Lazarus (1995) proposed that sources of stress at work are, to somewhat, an individual phenomenon, as well as the ways people cope with stress. In addition to describing the sources of stress that can promote negative human functioning, it is important to perceive the way the individual appraises and manages the stress situation. Yet, the author recognizes the importance of describing the conditions of work, since some types of stressors (e.g., time pressures, work overload, lack of decisional control) can be stressful enough for a great number of workers. The interactive model considers Lazarus's perspective, giving relevance to the individual process of human adaptation to stress, but also recognizing the importance of the effects of some occupational stressors. The interactive model assumes that a deep understanding of the process of human adaptation to stress will be achieved if the nature of the stressful situations and the following process of human adaptation are considered (appraisal and coping). This interactive perspective of stress gives attention to the ongoing process that is involved in the relationship between the environment and the individual, considering the dynamics between these two factors and the subjective meaning the individual builds when facing a stressful event. Stress is conceived as a transaction between the set of demands associated to each stress event and the individual personal resources. Therefore, strain arises from an imbalance between these two aspects (Cox, 1985; Lazarus, 1991; McGrath, 1970). This dynamic perspective can be best understood by analyzing the relational meaning that the individual attributes to the stress situation; that is, the meaning a person gives to the relationship he or she has with the environment (Lazarus, 1991).

### **Antecedent Factors**

Stressful events include two of the most important factors involved in human adaptation to stress; that is, situational characteristics (e.g., type of organization, culture) and personal characteristics (e.g., personality traits). Both represent antecedent factors that can influence the process of human adaptation to stress events and for that, they are considered in the Interactive Model of Human Adaptation to Stress (see Figure 1).

Regarding situational characteristics, the transactional perspective of Lazarus (1991; Lazarus & Folkman, 1984) considers that, besides describing the stressful event, it is important to identify the reasons why an individual appraises events as stressful. So, situational characteristics in the model, involve not only aspects related to the organizational culture and the type of work to perform, but also the underlying properties that can turn the situation into a stressful event, as proposed by Lazarus and Folkman (1984). Those properties are: (a) the novelty of the situation for the individual; (b) the predictability of the situation for the individual; (c) the uncertainty of the event's occurrence; (d) the imminence of the event in terms of time available to anticipate before its occurrence; (e) the duration of the event; (f) the temporal uncertainty of the event, which is related to the individual ability to know the precise time when the stressful situation will occur; (g) the ambiguity of the information needed for the appraisal of the event; and, (h) the timing of the event occurrence, in relation to the life cycle, which analyzes whether more events are happening in the person's life when the stressful situation occurred. There are scarce studies on this topic, but some existing findings do support the importance of these properties to the stress response (Dugdale, Eklund, & Gordon, 2002; Kirschbaum, 1999; Marchant, Andersen, & Morris, 1997; Perrez & Reicherts, 1992; Thatcher & Day, 2008).

Concerning the personal characteristics, Lazarus (1999) describes the importance of analyzing goal commitment, values, beliefs about the self and the environment, and situational intentions. Goal commitment is considered a central factor because "it implies that a person will strive hard to attain the goal" and that "if there is no goal commitment, there is nothing of

adaptational importance at stake in an encounter to arouse a stress reaction’ (Lazarus, 1999, p. 76). These aspects are included in the interactive model as antecedent factors that can determine the ongoing process of stress confrontation (see Figure 1). The advantage is to split the personal meaning of the event (included in the concept of importance for the interactive model) from the factors involved in human adaptation to stress (e.g., appraisal, coping, and event outcomes). For example, if the stressful event affects valuable personal goals (antecedent factor), the chance of being attributed importance to the event increases, giving start to the process of adaptation to the stressful event. For the interactive model if no personal significance is given to the situation, then it cannot be appraised as stressful because it has no importance.

The interactive model considers other aspects related to personal resources (e.g., educational level, economic resources, social skills, life experiences, social support, health status, physical abilities) that can influence what an individual will be able or unable to do (Lazarus, 1999; Lundberg & Cooper, 2011; Payne, 1988). Personality factors are also included as antecedent factors in the interactive model. Certain types of persons (e.g., rigid personalities, addicted to drugs, neurotic, depressive tendencies) are likely to react with stress more often or more intensely than others (Lazarus, 1995). Research has partially confirmed this idea, namely, the tendency to be more vulnerable to stress and to perceive job situations as more stressful in individuals who are high in negative affectivity (Cassar & Tattersall, 1998; Spector & O’Connell, 1994), who have an external locus of control (Newton & Keenan, 1990; Ress & Cooper, 1992), and who have a Type A behavior pattern (Newton & Keenan, 1990; Payne, 1988). Other dispositional variables have been suggested to buffer the impact of stressors on an individual’s experience of strain, for example, hardiness, self-esteem and self-efficacy, and optimism (for a review, see Cooper, Dewe, & O’Driscoll, 2001). Finally, demographic variables (e.g., sex, age) also constitute personal antecedent variables in the interactive model, because they can affect vulnerability to stress, as demonstrated by research (e.g., Jenkins, 1991; Nelson & Quick, 1985; Shirom, Gilboa, Fried, & Cooper, 2008).

It is important to note that situational and personal characteristics should be conceived together (Lazarus, 2000a), meaning that personal factors make sense when they are analyzed in the context of the situation, and the situation makes sense in the scenario faced by each individual. The situation can be meaningful to the individual, but it will not be appraised as stressful if it does not assume one or more of the described underlying properties; further, the situation can assume at least one underlying property, but it will not be appraised as stressful if no personal significance is given by the individual (Thatcher & Day, 2008).

Considering these aspects, the Interactive Model of Human Adaptation to Stress suggests the concept of “importance” as the *gate* that opens the process of human adaptation to stress, resulting from the conjunction of situational and personal characteristics (see Figure 1). This personal meaning attributed to the stressful event will determine if the situation will be faced by the individual; if no importance is attributed to the stressful event, then this event can become, for example, a frustrating or sad situation, but it does not represent an event that requires efforts of human adaptation to stress. The concept of “importance” or personal meaning of the Interactive Model of Human Adaptation to Stress also results from the relation between a particular individual and a specific situation, indicating if the process of human adaptation to stress will begin or end at this first moment of confrontation with the stress event.

### **Cognitive Appraisal: 1<sup>st</sup> Level Processes**

Appraisals are evaluations that affect people’s beliefs, values and/or goals (Arnold, 1960; Lazarus & Folkman, 1984), having an adaptive function because they indicate whether an event may be good or bad for the individual, generating subsequent action tendencies (Arnold, 1960). Therefore, cognitive appraisal represents reactions to stressful situations that vary according to the way the individual perceive the stressful events. This turns cognitive appraisal a central concept for human adaptation to stressful events.

The Interactive Model of Human Adaptation to Stress defines two processes of cognitive appraisal that arise directly from the transactional proposal of Lazarus (1991): primary and secondary cognitive appraisals (see Figure 1). Primary cognitive appraisal refers to whether what is happening is personally relevant to one's values, goal commitments, and beliefs about the self and the world, and situational intentions, thereby meaning if there is any personal stake in the stressful encounter. Secondary cognitive appraisal refers to coping options and prospects, evaluating if there are available personal resources for dealing with harm, threat, or challenge appraisals.

Specifically, regarding the Interactive Model of Human Adaptation to Stress, it is worth remembering that the concept of "importance" already analyzed whether the stress event is *personally relevant*. In this way, when primary cognitive appraisal happens, the event already has a significant personal meaning that requires to be coped by the individual. In this way, for the interactive model, primary cognitive appraisal refers to the first impact of the stressful event in the individual. The results from the primary cognitive appraisal, for the interactive model, are described as by Lazarus (1991, 2000b, 2001) (see Figure 1): (a) threat perception (i.e., harm or potential loss that has not yet happened); (b) harm perception (i.e., damage that has already occurred); (c) challenge perception (i.e., difficult-to-attain, yet anticipated gain); and, (d) benefit perception (i.e., gain that already occurred). The result of the interaction between the individual and the stressful encounter generates a *relational meaning* (Lazarus, 2000b) that can be organized according to a loss or a gain attributed to anticipated results (i.e., threat and challenge) or to results that are already occurring (i.e., harm and benefit). Additionally, it can coexist in the same situation the threat and challenge perceptions because the same stressful encounter may exhibit aspects that implicate a potential loss while others implicate a potential gain; however, as assumed by Lazarus (1999), one or the other usually dominates.

Secondary cognitive appraisal includes coping efforts made by the individual to deal with the situation and personal control over the situation (see Figure 1). As discussed by Lazarus and Folkman (1984), coping involves cognitive and behavioral efforts that an individual makes to manage demands that exceed the personal resources. These efforts can be organized

into problem-focused coping, when the person tries to alter the actual relationship between the person and the environment for the better (and if the efforts are successful, then the threat and harm can be reduced or even eliminated); it can also be organized into emotion-focused coping, when the individual tries to regulate emotional distress caused by threat or harm by using, for example, avoidance of thinking about the sources of stress. Some authors also include a third type of coping related to meaning-focused coping that is used to manage the meaning of a situation (Folkman & Moskowitz, 2004). Regardless of the dimensions that can characterize the concept of coping, this factor is central to explain the stress process and its adaptational outcomes. In fact, psychological stress only occurs if the person evaluates the internal or external demands as taxing or exceeding the individual's resources (Lazarus, 1999). In addition to coping efforts, the interactive model includes personal control in the secondary cognitive appraisal. Personal control can make a difference in the selection of coping strategies used by the individual to deal with the stress situation (see Figure 1). If the person feels that the stressful encounter can be subject to control by his or her actions, then problem-focused strategies predominate; in contrast, if the person feels that nothing can be done to change the situation, then emotion-focused strategies predominate (Lazarus, 1991). The model assumes that more important than the set of job demands that can exert pressure to the individual and create strain, it is crucial to consider if he or she has some control over the set of demands to be deal. This assumes an interactive effect between the demands and the control on stress levels, meaning that control will buffer (moderate) the impact of demands (pressures) on strain (Dewe, O'Driscoll, & Cooper, 2013). Thus, primary and secondary cognitive appraisals represent central dimensions for the interactive model.

### **Cognitive Appraisal: 2<sup>nd</sup> Level Processes**

The interactive model proposes a second level of cognitive appraisal that comprehends tertiary and quaternary cognitive appraisals. Tertiary and

quaternary cognitive appraisals are targeted to deal with the entire set of responses at the psychological, physiological, and behavioral levels (as will be described in the next section). This level is particularly important, if after the first level of cognitive appraisal the situation is not resolved, although, the interactive model considers that favorable (or not so good) situations can also trigger the need for the second level of cognitive appraisal. For example, quaternary cognitive appraisal maintains its relevance when the individual feels that he can achieve an even better situation, or when he feels that, despite the positive effects, there are personal or situational aspects that can be improved.

More specifically, for the interactive model, tertiary cognitive appraisal reflects the personal significance of the *same* stressful event that can result in threat/harm or challenge/benefit appraisals. Tertiary appraisal assumes that the situation maintains the significant personal meaning that requires coping by the individual (importance). Quaternary appraisal includes the *new* coping strategies and personal control, which are involved in the efforts to manage the impact of the responses to the stressful events (see Figure 1). The final goal of using the second level of cognitive appraisal is achieving a better personal situation, compared to the one that resulted from the first level of cognitive appraisal. Thus, all subsequent evaluations and efforts of resolution after the first level of cognitive appraisal should be included in the second level of cognitive appraisal. This is important to say, because long and complex processes of human adaptation to stress can trigger more than one process of the second level of cognitive appraisal. That is the case when one has to deal with sources of stress that change their nature along the process. For example, health professionals have to deal with chronic or fatal diseases, and the process of being ill can start with a problem that was benign and only after a period it becomes malignant and terminal. Therefore, the second level of cognitive appraisal can assume different forms and results along the process of human adaptation to stress.

### **Psychological, Physiological, and Behavioral Responses**

For the interactive model, the main aspect related to the three levels of responses to a stressful situation (e.g., psychological, physiological, and behavioral) is cognitive appraisal. Cognitive appraisal not only explains the type of responses obtained in a stressful event (e.g., anxiety, threat, increased heart rate, decrease of motivation toward the task) but also explains how the individual interprets the responses and the way he will respond. The cognitive appraisal at the first level will determine the responses to the stressful event, whereas the cognitive appraisal at the second level will determine how these responses will be interpreted (e.g., positive or negative; facilitative or debilitating). After this interpretation, adaptation to stress can terminate (turning to event outcomes) or can be assumed the need of additional efforts in order to deal with the situation (e.g., quaternary cognitive appraisal).

Considering the set of responses that follows the first level of cognitive appraisal, the interactive model proposes responses at the psychological, physiological, and behavioral levels (see Figure 1). Nevertheless, the model makes a distinction between *immediate and proximal* outcomes that occur *during* the process of human adaptation, and *stable and prolonged* outcomes that occur *after* the same process of human adaptation. For example, it is accepted that the individual can feel fatigue and lack of energy due to a very demanding situation (outcomes). Yet, it is not likely that same person experiences immediately the process of burnout (event outcomes), because this process results from a prolonged exposure to chronic stress (Maslach, Schaufeli, & Leiter, 2001). This distinction, assumed in the interactive model, can reflect better the ongoing process between the first level of cognitive appraisal, the responses, and the second level of cognitive appraisal. This will result in an interactive relationship between the first level of cognitive appraisal ↔ the responses ↔ the second level of cognitive appraisal (that correspond to immediate and proximal outcomes) and the final process of human adaptation reflected in the event outcomes (that correspond to stable and prolonged outcomes).



Regarding the psychological level, the interactive model highlights the emotional responses involved in human adaptation to stress. As emotions are triggered by cognitive appraisal, they play a central role in the comprehension of adaptation to stress. This means that stress and distress are not independent of the environmental conditions or of the individual characteristics, but instead are the “functional juxtaposition of both” (Lazarus & Cohen-Charash, 2001, p. 46). Furthermore, it is assumed that processes of cognitive appraisal related to threat and harm tend to be associated with negative emotions (but not always) and that processes of cognitive appraisal related to challenge and benefit tend to be associated with positive emotions (but not always). Regarding the physiological responses, the model considers the three main types of physiological symptoms focused in general research (Fried, Rowland, & Ferris, 1984; Jex & Beehr, 1991): cardiovascular (e.g., blood pressure, cardiac activity, and cholesterol), biochemical (e.g., catecholamines, cortisol, and uric acid), and gastrointestinal (e.g., peptic ulcers). Regarding the behavioral responses, the interactive model proposes the analysis of the success or failure obtained by the individual by using his coping efforts in order to deal with the stressful event. These behavioral responses correspond to immediate and proximal results achieved by the individual when trying to resolve or mitigate the effects of the stressful event. From this point of view, they are somewhat different from the results achieved in the event outcomes as these effects tend to be more prolonged in time and often occur after a long exposure to the stress situation.

For the interactive model, using the example of occupational stress, all three types of responses (psychological, physiological, and behavioral) deserve equal importance, and they should be integrated in the understanding of human adaptation to stress, where cognitive appraisal plays a major role. This need is based on research that supports the influence of cognitive appraisal in psychological, physiological, and behavioral responses to stress (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001; Tomaka, Blascovich, Kibler, & Ernst, 1997).

### **The Interactive Process**

The interactive model proposes a sequence of steps that occur since the stressful event activates cognitive appraisal, the three types of responses, and the occurrence of event outcomes in human adaptation. Although that, it also considers the process is quite complex.

First, human adaptation to stress adaptation can be completed after the first level of cognitive appraisal or even before when the individual evaluates the personal meaning – importance – of the situation to his well-being. The process will be finished when the individual assumes that: (a) the stress situation is not so important to challenge/threat his well-being or to mobilize coping efforts, in order to deal with the source of stress; (b) coping efforts (both at first and second levels) succeeded in dealing with the situation (e.g., positive human functioning); (c) coping efforts (both at first and second levels) did not succeed in dealing with the situation, and the individual feels harm in the event outcomes (e.g., negative human functioning); and, (d) coping efforts (both at first and second levels) did not succeed in dealing with the situation, and the individual feels that there is nothing that can be done to solve the problem, thereby accepting the situation. The split between situations (c) (where there is negative human functioning) and (d) (where there is not necessarily negative human functioning) is important, because the way the individual copes with the failure of dealing with the stressful event can determine the event outcomes of human adaptation to stress. In fact, there is evidence that avoidant emotional coping (e.g., denial or self-distraction to avoid the source of distress) leads to mental health problems when compared to other forms of emotional coping (Coyne & Racioppo, 2000).

Second, the relation between first and second levels of cognitive appraisals is interactive, meaning that they can influence each other along the process of human adaptation to stress (and both can produce psychological, physiological, and behavior responses). For example, the harm resulting from having a bad job performance (second level of cognitive appraisal), resulting from a threat perception of having too much work to do (first level of cognitive appraisal), can be followed by negative emotions,

physical disturbances, and a tendency to avoid the situation. That scenario can become even more difficult (e.g., threatening) for the individual, not only to face the same situation in the future (e.g., too much work to do) but also similar situations that can happen to the individual (e.g., having a difficult task to do). Thus, the interactive model assumes that processes of cognitive appraisal can interact in such a way that can cause negative cycles of human functioning (resulting in the incapacity to deal with stressful events), or can promote positive cycles of human functioning (resulting in the capacity to deal with stressful events). Along the interactive process between the first and second levels of cognitive appraisals, people can feel advances and setbacks, and progress and regress, through a point where the individual positively or negatively adjusts to the situation.

Third, the need to not consider coping and emotion as separate entities (Lazarus, 1999) is accepted because separating the elements involved in the adaptation to stress can only provide a partial vision of the phenomenon. For the interactive model, cognitive appraisal (which includes the evaluation of the effects of the stressful event and the coping efforts) and the event outcomes (including psychological, physiological and behavior outcomes) interact in a continuous way, influencing each other until event outcomes of human adaptation to stress are reached.

### **Event Outcomes: Human Adaptation**

The interactive process means that human adaptation results from the combination of a certain individual and a specific situation, that interact with each other along the occurrence of the stressful event, being highlighted the dynamic characteristics of this process (because of that there is a dashed line to describe the process of human adaptation to stress; see Figure 1). The dynamics of this process can turn difficult to study human adaptation to stress, not only because the person or the situation can change along this process, but also because it can change the relation between the individual and the situation.

The model proposes two main effects of adaptation to stress, positive human functioning and negative human functioning. From an historical point of view, there has been a great interest in studying the maladaptive reactions to stress (e.g., decreases in productivity, turnover, burnout, depression, anxiety), but more recently, psychological science has paid more attention to the adaptive reactions to stress (e.g., increases in productivity, will to stay in the organization, commitment, happiness, satisfaction) (for a review of these topics, see Beehr, 1995; Cooper et al., 2001; Folkman, 2011; Payne & Cooper, 2004). In effect, if cognitive appraisal can result not only in threatening and harmful appraisals but also in challenging and beneficial appraisals, then not only can negative reactions occur in stressful situations, but positive reactions can also be observed when studying human adaptation to stress.

For the interactive model, cognitive appraisal will mediate the relationship between stressful events and event outcomes, meaning that it can change or alter the relationship between both sets of variables. It is assumed that positive human functioning will derive from an ability of the individual to use effective coping strategies, in order to deal with the existing demands. Therefore, when a correspondence between existing demands and individual resources has been achieved, the conditions for positive human functioning are increased. For the interactive model, the role of cognitive appraisal is crucial to explain the final result of human adaptation to stress.

### **PROMOTING POSITIVE ADAPTATION TO STRESS: SOME POSSIBILITIES**

The Interactive Model of Human Adaptation to Stress besides contributing for the theoretical understanding of the stress process, it allows to propose some possibilities for the intervention. Then, considering the ongoing process of human adaptation to stress, and the dynamic nature of the relationship between the individual and the environment, we propose two focus for the intervention: antecedent factors and cognitive appraisal. With

respect to antecedent factors, the model highlights the role of the situational and the personal characteristics, in the process of human adaptation to stress. Therefore, our proposal for the intervention aims to turn the situation a positive context for excellence, and to turn the individual adaptable to stress conditions. With respect to cognitive appraisal, the model emphasizes the role of threat perception and challenge perception (primary and tertiary cognitive appraisal), and the role of coping potential and control perception (secondary and quaternary cognitive appraisal) on the process of human adaptation to stress. Consequently, concerning cognitive appraisal processes, our aim for the intervention is to turn human resources adequate to multiple stress conditions.

Research on occupational stress interventions are unanimous in considering the primary and secondary health prevention levels, as the most desirable and efficient in reducing the adverse effects of stress related to work. Centering the intervention either on the sources of occupational stress, reducing job stressors by eliminating their causal factors, and by capacitating the individuals with appropriate skills to deal with the inevitable stress conditions, thus altering the way the individual respond to them (Campos et al., 2010; Grant & Langan-Fox, 2007; Lamontagne, Keegel, Louie, Ostry, & Landsbergis, 2007; Quick & Quick, 2004). Additionally, interventions can address three different entities: (1) the organization, by changing work situation through organizational-based interventions; (2) the individual-organization interface, by increasing the individual resistance to specific sources of stress; and, (3) the individual, by turning the individual more capable of coping with stress, thus preventing stress negative effects (Le Blanc, de Jonge, & Schaufeli, 2008). Joining all those perspectives, we analyze the implications of the interactive model for the intervention, considering both the antecedent factors and cognitive appraisal.

### **Antecedent Factors: Turning the Situation a Positive Context for Excellence**

Turning the situation a positive context, implies an organization of the job context, in such a way that it can be able to promote a well-being of excellence to the employee. To do so, we must consider in the intervention plan the situational characteristics (antecedent factors) proposed by the interactive model. Specifically, it is important to implement strategies to reduce the novelty and the uncertainty of the situation for the individual, as well as, to increase its predictability and imminence, in terms of the time available to anticipate its occurrence and duration. It is also necessary to implement strategies to decrease the ambiguity of the information needed for the appraisal of the event, and to recognize the timing of the event occurrence in relation to the life cycle. To turn the situation a positive context for excellence, we consider that the main target of intervention will be the organization.

With respect to organizational-based interventions, strategies should be focused in implementing a positive organizational climate and a collaborative organizational culture, in order to reduce job sources of stress and to promote a better organizational functioning. As proposed by Le Blanc, de Jonge, and Schaufeli (2000; Le Blanc et al., 2008) in an overview of job stress interventions, first it is important to identify the stressful working conditions, that is, to analyze the situational characteristics that turn the job context into a source of stress. This implies a diagnosis of the employees' working conditions, which can be achieved through a stress audit. The next step for the intervention, aims to remove or reduce the diagnosed job stressors and/or turn the inevitable stress events more predictable for the individual. This task can be accomplished by improving workload, job content and work environment (e.g., work enlargement, job enrichment and job rotation); better time scheduling and role clarification, improving communication among different hierarchies, decision making and conflict management; optimize the use of equipment and technologies; improve healthier and safer physical work conditions; implement corporate wellness programs and improve organizational development. Additionally,

it becomes necessary to change the ways employees respond to job stress by improving the fit between the individual and the organization. This can be enhanced by improving career management and career development plans, anticipatory socialization, and management development. Furthermore, when occupational stress is identified and the consequences are significant, it becomes fundamental to improve the institutionalization of occupational health and safety services, and employees' assistance programs.

### **Antecedent Factors: Turning the Individual Adaptable to Stress Conditions**

Turning the individual adaptable to stress, implies to consider the personal characteristics (antecedent factors) proposed in the interactive model, as contributing for the ongoing process of human adaptation to stress. It is not our intention to explore in detail personal characteristics, since most of the individual level of interventions are well established in clinical and health psychology. However, some aspects should be addressed, when we talk about implications for intervention. As proposed by Le Blanc, de Jonge, and Schaufeli (2000; Le Blanc et al., 2008) individual-based interventions in occupational stress should address the following purposes: i) increase the individual's consciousness (e.g., self-monitoring and didactic stress management); and/or, ii) reduce negative arousal (e.g., implementing healthy life styles, cognitive-behavioral techniques, biofeedback and relaxation, physical fitness programs). To do so, we must consider the way individuals see their work environment, and what personal goals they expect to achieve professionally and in their job. We must consider among several characteristics, personal values, beliefs, personality traits, personal resources, age, gender, and to what extent they feel and believe that their work environment allows them to accomplish their personal goals. Therefore, intervention can focus on dysfunctional beliefs or in redefining realistic personal goals, and increase personal emotional and instrumental resources to turn the individual more prone to deal with inevitable job stressors.

Considering the dynamic and interactive nature of human adaptation to stress, we can not conceptualize intervention without acknowledge the role of cognitive appraisal in this process.

### **Cognitive Appraisal: Turning Human Resources Adequate to Multiple Stress Conditions**

Turning human resources adequate to several work stress conditions, implies the implementation of strategies that can address primary cognitive appraisal processes (i.e., that can reduce threat perception and increase challenge perception), and secondary cognitive appraisal processes (i.e., improving control perception and coping potential).

With respect to primary cognitive appraisal, challenge perception constitutes, a priori, the stress-inducing interpretation that is less harmful for the individual. Although of being a demanding or complex situation, it is perceived as capable of being overcome, and as resulting in personal benefits, a sense of gain, control perception and self-efficacy, being associated with a sense of mastery and positive emotions (Rodell & Judge, 2009; Schwarzer, 2001). On the contrary, the perception of threat, damage or loss, imply less positive consequences for the individual. Specifically, the perception of damage or loss, implies the conclusion that some form of damage or harm has already occurred (e.g., low self-esteem, salary reduction) in a given situation (e.g., a negative evaluation at work). However, an event can also be evaluated as a threat, when the subject anticipates that it may result in damage or loss, in the short or medium term future, being associated to more negative emotions (e.g., anxiety, pressure, anger, sadness) (Folkman & Greer, 2000; Lazarus, 1993; Rodell & Judge, 2009; Straub, 2005).

Therefore, if the individual was not indifferent to the situation, having appraised it as a threat, damage or challenge to his personal goals and well-being, a process of secondary cognitive appraisal begins. The purpose of the secondary cognitive appraisal is to evaluate the adequacy of the personal and social resources available for the individual, to confront the demands placed



to him, to solve the problem and to eliminate the negative emotions experienced, which usually are covered with high intensity. That is, the secondary evaluation concerns the evaluation of individual *coping* resources (Lazarus, 1993; Lazarus & Folkman, 1987; Straub, 2005). Specifically, in this level of cognitive appraisal the individual makes judgments regarding the abilities and resources that he owns, the options he can have and the limitations of each option. Those judgments are influenced by several factors, such as the novelty, the predictability, controllability, clarity or ambiguity of the occurrence, but also by the state of mind, physical and mental health, and the expectations of personal self-efficacy (Rodell & Judge, 2009; Schwarzer, 2001; Vaz Serra, 2007).

The expectancies of self-efficacy, as proposed by the social learning theory, concern personal beliefs about the individual abilities to take the necessary attitude in order to achieve the desired result. Those beliefs are related to the individual's personal confidence, sense of coherence, locus of control, sense of personal competency and mastery, influencing his response or action, including the direction of the individual's interpretation of the situation and emotional reactions (Folkman & Greer, 2000; Folkman & Moskowitz, 2004; Lazarus & Folkman, 1987). Consequently, there will be a higher probability for the individual to appraise the situation as a challenge, and not so much as a threat, if he has positive expectations of self-efficacy and personal sense of competency, allowing the individual to feel more confident about himself, and more able to respond to the demands (Folkman & Moskowitz, 2004; Lazarus, 2006).

Together primary and secondary cognitive appraisal determines to what extent the situation is assessed as damage or loss, threat or challenge, or a combination of all, as well as the intensity and types of emotional, neurophysiological, autonomic, endocrine, cognitive and behavioral responses, which are associated to these appraisals (Folkman & Greer, 2000; Folkman & Moskowitz, 2004; Ganzel, Morris, & Wethington, 2010; Lovallo, 1997). Thus, if the available coping resources are perceived as weak and/or ineffective, in such a way, that the imposed demands exceed the individual's ability to cope, generating negative emotions, then there is a high probability of initiating and maintaining a stress process, especially

by perceived lack of control (Straub, 2005). As a result, we consider that a threat perception to stressful work conditions can be reduced and turned into a more challenging situation, if the individual appraises some personal control over the situation, and the availability of some personal coping resources to mobilize and face the demands.

Lazarus and Folkman (1984) conceptualized *coping* “as constantly changing cognitive and behavioral efforts to manage specific external /or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). This concept, besides considering coping response as a process, it underestimates coping behaviors and coping thoughts, which seem apparently disconnected from the personal situational meaning. This meaning is fundamental, because it gives vitality to all individuals’ lives, embracing the personal goals, beliefs and situational intentions (Lazarus, 2006). Therefore, we consider a more detailed definition of coping, as proposed by Folkman and Greer (2000), conceptualizing *coping* as “thoughts and behaviors a person uses to regulate distress (*emotion-focused coping*), manage the problem causing distress (*problem-focused coping*), and maintain positive well-being (*meaning-based coping*), (p. 12). In this perspective, we highlight the usual dichotomous distinction between two forms of coping: (a) problem-focused coping, characterized by the mobilization of cognitive and behavioral strategies to change the situational characteristics or the problem that is causing distress (e.g., construction of an action plan, concentration at work, seek for social support and for information); and, (b) emotion-focused coping, when the individual mobilizes strategies in order to improve the experienced negative emotions that are associated with the problem (e.g., involvement in distractive activities, smoking, consumption of alcohol or other substances, denial, detachment, avoidance, emotional expression). However, although these forms of coping constitute the most used nomenclature in the literature and research, a third type, the meaning-focused coping, is also highlighted. The latter is characterized by the mobilization of cognitive strategies in order to change or assign a meaning to the situation that the subject is experiencing (e.g., give a new meaning to the fact of having lost a job promotion) (Folkman & Moskowitz, 2004).

Despite the distinction, both types of coping are provided with adaptive and maladaptive strategies and, what may be adaptive in one relational context may not be for the same person in a different context or moment (Schwarzer, 2001). Because of this, the coping process is complex, highly contextual and dynamic over time, influencing the outcome of the situation and the cognitive evaluation that the individual does of the same (Folkman & Greer, 2000). At the same time, both different types of coping should be interpreted theoretically as coping functions, since they are often mobilized in a joint and complementary way, influencing the situations and the attributions that the individuals construct from them (e.g., in a chronic illness situation). A process that should not be dissected when it comes to the arduous task of understanding the individual's behavior. That is, just as a tree only makes sense in a landscape context, the coping process must also be contextualized and meaningful (Lazarus, 2006). Yet, the coping strategies adopted are largely determined by the intensity of the individual's emotional response and the ability to regulate these responses, along with the situational opportunities to solve the problem, the changes and characteristics of the established relational substrate between a given individual and a particular situation (Folkman & Greer, 2000). A series of classical stress studies developed by Lazarus and colleagues, emphasize the relevance of cognitive appraisal as a cognitive filter in the conceptualization and subjective experience of stress (e.g., Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986), constituting as a fundamental legacy in the study and understanding of this phenomenon.

Therefore, to increase coping human resources, the intervention must go further the organization and the individual, and take place at the individual/organization interface level. According to Le Blanc, de Jonge, and Schaufeli (2008), the intervention at the individual/organization interface must pursue the following purposes: (a) improve consciousness (e.g., personal screening); (b) increase personal coping skills (e.g., time management, interpersonal skills training, improve a realistic image of the job, balancing work and family life); (c) provide emotional and instrumental support at work (e.g., peer-support groups, co-worker support, supervisor

support, coaching and consultation, and career planning); (d) cure target complains by intensive treatment (e.g., specialized counselling and psychotherapy); and, (e) rehabilitate employees (e.g., individual guidance and assistance).

Let us consider the example of occupational stress in health professionals. One of the first areas of intervention should be at the basic training level of health professionals (Gillespie & McFetridge, 2006; McIntyre et al., 2007; Vaz Serra, 2007). In particular, there are studies that reveal a relevant incidence of stress in students from health professions (e.g., Khademian & Vizesfar, 2008; Loureiro, 2006; Loureiro, McIntyre, Mota-Cardoso, & Ferreira, 2008). Consequently, the teaching of appropriate communication strategies, as the active listening, assertiveness and the understanding of clients' reactions to illness, permits to capacitate the upcoming health professionals in strategies that will enable them to deal and solve conflicts and problems in the future, in an assertive way, reducing the levels of experienced stress. In this context, we highlight the importance of learning in laboratorial context, with resort to simulated practice and Role Play (Arnold & Boggs, 2003; Grilo & Pedro, 2005; Phaneuf, 2004; Riley, 2000), as well as the workshops of professional continuous training, promoted by the organizations so that employees can have the chance of developing and updating their competences (Akerboom & Maes, 2006).

In addition, it is important to educate health professionals about the reality of their work and the roles they have to play. That is, provide knowledge about what the organizations expect from employees and about what they can obtain, in order to avoid creating high expectations, which subsequently can be translated into a “sea of frustrations,” leading to a bad performance, illness, and the abandonment of the profession (Arnold & Boggs, 2003; Glazer, 2005; Khademian & Vizesfar, 2008; Phaneuf, 2004; Vaz Serra, 2007). Likewise, being able to get help when needed, knowing how to plan and stablish priorities about both professional and private life, constitute fundamental skills health professionals should develop, especially those that experience high levels of stress (McIntyre, McIntyre, Araújo-Soares, Figueiredo, & Johnston, 2000; Seixas & Pereira, 2005; Vaz Serra, 2007).

In order to reduce emotional tension, in result of occupational stress, there have been suggested the practices of relaxation according the cognitive-behavioral model (McIntyre et al., 2000). Besides, a meta-analysis conducted by Richardson and Rothstein (2008) reveals that cognitive-behavioral programs are the most efficient in terms of intervention. In this field, it is also important to know how to laugh and how to have a sense of humor, as essential competences health professionals should develop, because they have a direct action on health and well-being, by improving the function of the immune system (José, 2002; Vaz Serra, 2007).

However, dealing with stress goes far beyond a simple relaxation strategy, or a good laugh. As valuable as they are, the process is much more complex, while based on the development of a realistic conception of the situations and the assumption that each individual acts in the most competent way that he can, according to its theoretical-practical knowledge, personal resources, context and moment. That is, "dealing with stress is knowing how to deal with time ... it is having your own way of gathering information, solving problems, planning enjoyable activities, taking advantage of people and their environment, as well as generating ideas, thoughts and emotions. Caring for patients should also include caring for oneself" (Vaz Serra, 2007, p. 606).

Globally, review studies indicate that occupational stress interventions with an organizational focus and a systemic approach, involving a high number of professional groups, in comparison to the individual interventions, constitute the ones with higher impact on both the individual and the organization, in terms of job stress reduction (Lamontagne et al., 2007). In this area, it is highlighted the role of chiefs and supervisors, and the leadership style adopted by them, as a determining factor of the organizational climate (Stone et al., 2007). So, an intervention on those hierarchical groups, considering an transformational leadership style, focused on the competencies, virtues, abilities and personal integrity of employees, has shown to be effective in reducing the occupational stress levels experienced by the team, resulting in a more positive and productive environment (Jennings, 2008; Quick & Quick, 2004; Stone et al., 2007; Stordeur & D'Hoore, 2007).

Recent studies showed that the perception of discriminatory work environments have a negative impact on employees' health, which can be buffered by high levels of job satisfaction (Donatella Di et al., 2016). So, intervention with human resources managers, in order to recognize and reduce work discrimination and, turn work environments more inclusive and equitable, are suggested. Additionally, managers should focus on the promotion of employees' job satisfaction (e.g., by allowing the participation of employees in decision-making processes) (for further detail see, Donatella Di et al., 2016).

Workplace bullying is also a topic that deserve our consideration, since it constitutes a relevant source of occupational stress, with significant impact on physical and psychological health (Giorgi et al., 2016). Being considered a form of dysfunctional and toxic relationship, workplace bullying influences the employee's emotional intelligence and the ability to self-management. This relationship is mediated by psychological distress (for further detail see, Giorgi et al., 2016). Thus, intervention with human resources managers should focus on the promotion of positive and inclusive work relationships, reducing the levels of psychological distress, and the improvement of self-management ability. In addition, an individual intervention with managers might be important. To this respect, Li and colleagues (2017) showed the effectiveness of a psychotherapeutic stress management intervention at work based on the ERI model, observed over a 9-year period (for further detail see, Li et al., 2017).

More, Campos and colleagues (2010) proposed that to achieve an efficient management of the occupational stress experience, we must consider group-oriented interventions, which should embrace the following elements: encouraging group cohesion; stimulation of assertive communication within the multidisciplinary team; promoting the training of stress management skills, such as communicational skills in the face of difficult patients or in the transmission of bad news, through simulation and role play; encouraging active listening and interprofessional decision-making, by creating critical reflection groups and a constructive supervision. Underlying this strategy is Winnicott's concept of "holding," characterized by affectionate, empathic and caring relationships, which promote bonding,

support and cohesion among group members (Campos et al., 2010). In this field, is inscribed the concept of “group field,” as a promoter of a “lap” that gives support to the organization and the standardization of procedures, through stimulating interpersonal relationships and experiences, by facilitating brainstorming and ideological disclosure, fundamental to problem solving, critical spirit, initiative and innovation, especially in moments of crisis and vulnerability (Campos et al., 2010). Additionally, the regular practice of physical exercise, has been shown a significant strategy to reduce the negative effects of the occupational stress experience (Cory, Moreira, & Dias, 2009), namely in health professionals, resulting in increased levels of professional satisfaction and mastery (Ribeiro, Gomes, & Silva, 2010).

## CONCLUSION

Along this chapter, we analyzed the Interactive Model of Human Adaptation to Stress, conceptually and its implications for the intervention in order to promote a positive human functioning. Considering the discussion so far, some topics deserve a final comment.

Regardless of considering the process of human adaptation to stress in its individual nature, intervention to promote a positive human functioning related to workplace must above all, provide “friendly places to employee’s performance.” Therefore, designing predictable and fair workplaces can be a way of turning the situation a positive context for excellence, constituting a preventive strategy to reduce the stress experience, and probably more effective than the individual training to prepare employees to face “unfriendly workplaces.” However, since some personal characteristics are hard to change (e.g., personal traits), there are advantages in helping individuals to be aware of their personal strengths and weaknesses, so they can make changes in order to become more adaptable to face stress conditions. Additionally, the importance given to a certain situation is many times considered a sign of commitment and motivation toward the job or task, but excess importance can turn the situation much more significant than

it really is. Therefore, we believe there are advantages in educate individuals to include all different sides of their lives in a meaningful living perspective, consequently being more likely to appraise job stressful events as “just” one part of their everyday life.

The definition of specific and realistic personal goals by individuals, along with an appraisal of their job performance in terms of personal standards, instead of external indicators, constitute an effective strategy in order to promote a challenge perception. The majority of workplaces are sensitive to programs of goal setting, in the view to promote the individuals’ feelings of mastery. Having individuals that are more confident about their abilities to face stress and focused in their own job performance, reduce the probability of making threat and harm evaluations. In addition, more relevant than the number of coping abilities the individuals have, it is important to train them to use their coping skills in an effective way. This training should include strategies that individuals ought to use when something can be done to change the situation (problem-focused), as well as, when nothing can be done to change the situation, but adapt in the individual best way (emotion-focused). To this respect, is important to allude that human adaptation to stressful situations is a process highly dependent of personal control. Therefore, individuals must have at least some control over their work and roles in the job performance situation. Supervisors should give control to individuals, including some degree of participation in decision-making and autonomy, in order to do their work. Some control is better than no control.

Responses to stressful events are spontaneous. Nevertheless, individuals can be trained to change their responses or, to control their reactions to those situations. The majority of individuals are not even aware of the relationship between a stressful event and a specific personal reaction, so when they do that association, they start to gain control over the situation. Training this kind of awareness in advance, increase individuals’ probability of controlling stress negative effects. More, coping with stressful events is an ongoing and often unfinished process. This implies that individuals should be educated regarding the cycles of stress and most important, people should be trained in how to use their coping skills in their lives.



Lastly, society and all human beings should expect no less than a positive human functioning, besides the recognition that a negative human functioning is a part of becoming a better person. However, what seems intolerable is having individuals in performance situations where what they can expect is to not make the situation worse than it is. Human beings should expect to be happy most of the time, even when they are in very demanding work performance situations.

## REFERENCES

- Akerboom, S. and Maes, S. (2006). Beyond demand and control: the contribution of organizational risk factors in assessing the psychological well-being of health care employees. *Work & Stress*, 20 (I): 21-36.
- Aldwin, C. M. and Gilmer, D. F. (2004). *Health, illness, and optimal aging: biological and psychosocial perspectives*. London: SAGE Publications, Inc.
- Arnold, E. and Boggs, K. U. (2003). *Interpersonal relationships: professional communication skills for nurses* (4<sup>th</sup> ed.). USA: SAUDERS, Elsevier Science.
- Arnold, M. B. (1960). *Emotion and personality* (Vol. 1: Psychological aspects). New York: Columbia University Press.
- Ashforth, B. E., Kreiner, G. E. and Fugate, M. (2000). All in a day's work: boundaries and micro role transactions. *Academy of Management Review*, 25 (III): 472-491.
- Barling, J., Kelloway, E. K. and Frone, M. R. (2005). *Handbook of work stress*. Thousand Oaks, CA: SAGE.
- Beehr, T. A. (1995). *Psychological stress in the workplace*. London: Routledge.
- Blascovich, J., Mendes, W. B., Hunter, S. B., Lickel, B. and Kowai-Bell, N. (2001). Perceiver threat in social interactions with stigmatized others. *Journal of Personality and Social Psychology*, 80 (I): 253-267.

- Blustein, D. L. (2008). The role of work in psychological health and well-being: a conceptual, historical, and public policy perspective. *American Psychologist*, 63 (IV): 228-240.
- Burke, R. J. and Greenglass, E. R. (1999). Work-family conflict, spouse support, and nursing staff well-being during organizational restructuring. *Journal of Occupational Health Psychology*, 4 (IV): 327-336.
- Campos, E., Chaves, A., Pereira, C., Fontaine, J., Santos, L., Cardoso, L., . . . Silva, V. (2010). Equipes do programa saúde da família: estresse profissional e dinamica de trabalho. *Revista APS, Juiz de Fora*, 13 (I): 46-54. [Family health program teams: professional stress and work dynamic. *Journal of Primary Health Attention*, 13 (I): 46-54].
- Carter, B. and McGoldrick, M. (1995). Changes in the family life cycle: a framework for family therapy. In B. Carter and M. McGoldrick (Eds.), *Changes in the family life cycle - a framework for family therapy* (pp. 7-29). Porto Alegre: Medical Arts.
- Cassar, V. and Tattersall, A. (1998). Occupational stress and negative affectivity in Maltese nurses: Testing moderating influences. *Work & Stress*, 12 (I): 85-94.
- Cooper, C. L. and Dewe, P. J. (2004). *Stress: a brief history*. Oxford: Blackwell.
- Cooper, C. L., Dewe, P. J. and O'Driscoll, M. O. (2001). *Organizational stress: a review and critique of theory, research, and applications*. London: Sage.
- Cooper, C. L. and Marshall, J. (1976). Occupational sources of stress: a review of the literature relating to coronary heart disease and mental ill health. *Journal of Occupational Psychology*, 49 (I): 11-28.
- Coupland, D. and Júdice, M. A. (2002). *Todas as famílias são psicóticas*. Lisboa: Teorema. [All families are psychotic. Lisbon: Theorem].
- Coury, H. J., Moreira, R. F. and Dias, N. B. (2009). Evaluation of the effectiveness of workplace exercise in controlling neck, shoulder and low back pain: a systematic review. *Brazilian Journal of Physiotherapy*, 13 (VI): 461-479.
- Cox, T. (1985). *Stress* (2<sup>nd</sup> ed.). New York: Macmillan.

- Coyne, J. C. and Racioppo, M. W. (2000). Never the twain shall meet? Closing the gap between coping research and clinical intervention research. *American Psychologist*, 55 (I): 655-664.
- Davila, J., Karney, B. R., Hall, T. W. and Bradbury, T. N. (2003). Depressive symptoms and marital satisfaction: within-subject associations and the moderating effects of gender and neuroticism. *Journal of Family Psychology*, 17 (IV): 557-570.
- Dewe, P. J., O'Driscoll, M. P. and Cooper, C. L. (2013). Theories of psychological stress at work. In R. J. Gatchel and I. J. Schultz (Eds.), *Handbook of occupational health and wellness* (pp. 23-38). New York: Springer.
- Donatella Di, M., Rocío, L. C., Alicia, A., Gabriele, G., Giulio, A. and Nicola, M. (2016). Approaching the discriminatory work environment as stressor: the protective role of job satisfaction on health. *Frontiers In Psychology*, 7: 1313. doi:10.3389/fpsyg.2016.01313/full.
- Dugdale, J. R., Eklund, R. C. and Gordon, S. (2002). Expected and unexpected stressors in major international competition: Appraisal, coping, and performance. *The Sport Psychologist*, 16: 20-33.
- Edwards, J. R., Caplan, R. D. and Van Harrison, R. (1998). Person-Environment fit theory: conceptual foundations, empirical evidence, and directions for future research. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 28-68). New York: Oxford University Press.
- Fletcher, D., Hanton, S. and Mellalieu, S. D. (2006). An organizational stress review: conceptual and theoretical issues in competitive sport. In I. S. Hanton and S. D. Mellalieu (Eds.), *Literature reviews in sport psychology* (pp. 321-374). Hauppauge NY: Nova Science.
- Folkman, S. (2008). The case for positive emotions in the stress process. *Anxiety, Stress, & Coping*, 21 (I): 3-14.
- Folkman, S. (2011). Stress, health, and coping: synthesis, commentary, and future directions. In S. Folkman (Ed.), *The Oxford handbook of stress, health, and coping* (pp. 453-462). Oxford: Oxford University Press.
- Folkman, S. and Greer, S. (2000). Promoting psychological well-being in the face of serious illness: when theory, research and practice inform each other. *Psycho-Oncology*, 9 (I): 11-19.

- Folkman, S. and Lazarus, R. S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48 (I): 150-170.
- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A. and Gruen, R. J. (1986). Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, 50 (V): 992-1003.
- Folkman, S. and Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology*, 55: 745-774.
- Fried, Y., Rowland, K. M. and Ferris, G. R. (1984). The physiological measurement of work stress: a critique. *Personnel Psychology*, 37: 583-615.
- Ganzel, B. L., Morris, P. A. and Wethington, E. (2010). Allostasis and the human brain: integrating models of stress from the social and life sciences. *Psychological Review*, 117 (I): 134-174.
- Gillespie, M. and McFetridge, B. (2006). Nurse education - the role of the nurse teacher. *Journal of Clinical Nursing*, 15 (V): 639-644.
- Giorgi, G., Perminienè, M., Montani, F., Fiz-Perez, J., Mucci, N. and Arcangeli, G. (2016). Detrimental effects of workplace bullying: impediment of self-management competence via psychological distress. *Frontiers In Psychology*, 7: 60-60. doi:10.3389/fpsyg.2016.00060.
- Glazer, S. (2005). Six of one, half a dozen of the other: problems with working fixed and rotating shifts. *International Journal of Stress Management*, 12 (II): 142-163.
- Gomes, A. R. (2014). Positive human functioning in stress situations: an interactive proposal. In A. R. Gomes, R. Resende and A. Albuquerque (Eds.), *Positive human functioning from a multidimensional perspective: promoting stress adaptation* (Vol. 1, pp. 165-194). New York, NY: Nova Science.
- Gomes, A. R., Cruz, J. F. and Cabanelas, S. (2009). Estresse ocupacional em profissionais de saúde: um estudo com enfermeiros Portugueses. *Psicologia: Teoria e Pesquisa*, 25 (III): 307-318. [Occupational stress

- in health professionals: a study with Portuguese nurses. *Psychology: Theory and Research*, 25 (III): 307-318].
- Grant, S. and Langan-Fox, J. (2007). Personality and the occupational stressor-strain relationship: the role of the big five. *Journal of Occupational Health Psychology*, 12 (I): 20-33.
- Grilo, A. and Pedro, H. (2005). Contributos da psicologia para as profissões da saúde. *Psicologia, Saúde & Doenças*, 6 (I): 69-89. [Contributes from Psychology for the Healthcare Professions. *Psychology, Health and Diseases*, 6 (I): 69-89].
- Hasselhorn, H., Müller, B. and Tackenberg, P. (Eds.). (2005). *NEXT scientific report*. Wuppertal: University of Wuppertal, NEXT-Study Coordination.
- Huang, G. D., Feuerstein, M. and Sauter, S. L. (2002). Occupational stress and work-related upper extremity disorders: concepts and models. *American Journal of Industrial Medicine*, 41 (V): 298-314.
- Jenkins, R. (1991). Demographic aspects of stress. In C. L. Cooper and R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 107-132). New York: Wiley.
- Jennings, B. (2008). Work stress and burnout among nurses: role of the work environment and working conditions. In R. G. Hughes (Ed.), *Patient safety and quality: an evidence-based handbook for nurses* (pp. 1-12; Chapter 26). Rockville, MD: Agency for Healthcare Research and Quality.
- Jex, S. M. and Beehr, T. A. (1991). Emerging theoretical and methodological issues in the study of workrelated stress. *Research in Personnel and Human Resources Management*, 9: 311-365.
- Johnson, J. V. (1996). Conceptual and methodological developments in occupational stress research: an introduction to state-of-the-art reviews I. *Journal of Occupational Health Psychology*, 1 (I): 6-8.
- José, H. (2002). *Humor nos cuidados de enfermagem: vivências de doentes e enfermeiros* (1<sup>th</sup> ed.). Loures: Lusociência. [*Humor in nursing care: experiences of patients and nurses* (1st ed.). Loures: Lusoscience].

- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: implications for job redesign. *Administrative Science Quarterly*, 24 (II): 285-308.
- Karasek, R. A. and Theorell, T. (1990). *Healthy work: stress, productivity, and the reconstruction of working life*. New York: Basic Books.
- Khademian, Z. and Vizeshfir, F. (2008). Nursing students' perceptions of the importance of caring behaviors. *Journal of Advanced Nursing*, 61(IV): 456-462.
- Kirschbaum, C. (1999). Mental stress follows mental rules. *Journal of Clinical Endocrinology and Metabolism*, 84 (XI): 4292.
- Klainin, P. (2009). Stress and health outcomes: the mediating role of negative affectivity in female health care workers. *International Journal of Stress Management*, 16 (I): 45-64.
- Kopp, M. S., Skrabski, A., Szekely, A., Stauder, A. and Williams, R. (2007). Chronic stress and social changes: socioeconomic determination of chronic stress. *Annals of the New York Academy of Sciences*, 1113: 325-338.
- Lamontagne, A. D., Keegel, T., Louie, A. M., Ostry, A. and Landsbergis, P. A. (2007). A systematic review of the job-stress intervention evaluation literature, 1990-2005. *International Journal of Occupational and Environmental Health*, 13 (III): 268-280.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Lazarus, R. S. (1993). From psychological stress to the emotions: a history of changing outlooks. *Annual Review of Psychology*, 44: 1-21.
- Lazarus, R. S. (1995). Psychological stress in the workplace. In R. Crandall and P. L. Perrewé (Eds.), *Occupational stress: a handbook* (pp. 3-14). Washington, DC: Taylor & Francis.
- Lazarus, R. S. (1999). *Stress and emotion: a new synthesis*. London: Springer.
- Lazarus, R. S. (2000a). Toward better research on stress and coping. *American Psychologist*, 55 (VI): 665-673.
- Lazarus, R. S. (2000b). How emotions influence performance in competitive sports. *The Sport Psychologist*, 14 (III): 229-252.

- Lazarus, R. S. (2001). Relational meaning and discrete emotions. In K. R. Scherer, A. Schorr and T. Johnstone (Eds.), *Appraisal processes in emotion* (pp. 37-67). Oxford: Oxford University Press.
- Lazarus, R. S. (2006). Emotions and interpersonal relationships: toward a person-centered conceptualization of emotions and coping. *Journal of Personality*, 74 (1): 9-46.
- Lazarus, R. S. and Cohen-Charash, Y. (2001). Discrete emotions in organizational life. In R. L. Payne and C. L. Cooper (Eds.), *Emotions at work: theory, research and applications for management* (pp. 45-81). Chichester: John Wiley & Sons, Ltd.
- Lazarus, R. S. and Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lazarus, R. S. and Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1 (III): 141-169.
- Le Blanc, P. M., de Jonge, J. and Schaufeli, W. B. (2000). Job stress and health. In N. Chmiel (Ed.), *An introduction to work and organizational psychology: a European perspective* (pp. 148-177). Oxford: Blackwell.
- Le Blanc, P. M., de Jonge, J. and Schaufeli, W. B. (2008). Job stress and occupational health. In N. Chmiel (Ed.), *An introduction to work and organizational psychology: a European perspective* (2<sup>nd</sup> ed., pp. 148-177). Oxford: Wiley-Blackwell.
- Li, J., Riedel, N., Barrech, A., Herr, R. M., Aust, B., Mörtl, K., . . . Angerer, P. (2017). Long-term effectiveness of a stress management intervention at work: a 9-year follow-up study based on a randomized wait-list controlled trial in male managers. *BioMed Research International*, 1-11. doi:10.1155/2017/2853813.
- Loureiro, E. (2006). *Study of the relationship between stress and lifestyles in medical students*. (MasterThesis), University of Minho, Braga.
- Loureiro, E., McIntyre, T., Mota-Cardoso, R. and Ferreira, M. (2008). A Relação entre o stress e os estilos de vida nos estudantes de medicina da faculdade de medicina do Porto. *Acta Médica Portuguesa*, 21 (III): 209-214. [The relationship between stress and life-style of students at the Faculty of Medicine of Oporto. *Portuguese Medical Acta*, 21 (III): 209-214].

- Lovallo, W. R. (1997). *Stress and health: biological and psychological interactions*. USA: Sage Publications.
- Lundberg, U. and Cooper, C. L. (2011). *The science of occupational health: Stress, psychobiology, and the new world of work*. Chichester Wiley.
- Marchant, D. B., Andersen, M. B. and Morris, T. (1997). Perceived uncertainty of outcome as a contributing factor in competitive state anxiety. *Australian Journal of Science and Medicine in Sport*, 29: 41-46.
- Maslach, C., Schaufeli, W. B. and Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52: 397-422.
- Mason, J. W. (1975). A historical view of the stress field. *Journal of Human Stress*, 1 (I): 6-12.
- McGrath, J. E. (1970). *Social and psychological factors in stress*. New York: Holt, Rinehart and Winston.
- McIntyre, S., McIntyre, T., Salgado, J., Pereira, P., Dantas, J., Johnston, D. and Jones, M. (2007). *Serving two masters: job characteristics as predictors of psychosocial and psychophysiological responses to stress in physicians and nurses in managerial positions*. Maia: Bial Foundation.
- McIntyre, T. (1994). Stress e os profissionais de saúde: os que tratam também sofrem. *Análise Psicológica*, 12 (II-III): 193-200. [Stress in health professionals: those who care also suffer. *Psychological Analysis*, 12 (II-III): 193-200].
- McIntyre, T., McIntyre, S., Araújo-Soares, V., Figueiredo, M. and Johnston, D. (2000). Psychophysiological and psychosocial indicators of efficacy of a stress management program for health professionals: phase 1. In T. Cox, P. Dewe, K. Nielsen and R. Cox (Eds.), *Occupational health psychology: Europe 2000* (pp. 112-116). Nottingham: European Academy of Occupational Health Psychology Conference Proceedings Series.
- Nelson, D. L. and Quick, J. C. (1985). Professional women: are distress and disease inevitable? *Academy of Management Review*, 10: 206-213.



- Netemeyer, R. G., Boles, J. S. and McMurrian, R. (1996). Development and validation of work-family conflict and family-work conflict scales. *Journal of Applied Psychology*, 81 (IV): 400-410.
- Newton, T. J. and Keenan, A. (1990). The moderating effect of the Type A behavior pattern and locus of control upon the relationship between change in job demands and change in psychological strain. *Human Relations*, 43: 1229-1255.
- Paúl, C. and Fonseca, A. M. (2001). *Psicossociologia da saúde* (1ª ed.). Lisboa: Climepsi Editores. [*Psychosociology of health* (1st ed.). Lisbon: Climepsi Publishers].
- Payne, R. L. (1988). Individual differences in the study of occupational stress. In C. L. Cooper and R. L. Payne (Eds.), *Causes, coping and consequences of stress at work* (pp. 209-232). New York: John Wiley.
- Payne, R. L. and Cooper, C. L. (2004). *Emotions at work: Theory, research and applications for management*. Chichester, UK: Wiley.
- Perrez, M. and Reicherts, M. (1992). *Stress, coping and health. a situation-behavior approach theory, methods, applications*. Seattle: Hogrefe & Huber.
- Phaneuf, M. (2004). *Comunicação, entrevista, relação de ajuda e validação*. Loures: Lusociencia. [*Communication, interview, helping relationship and validation*. Loures: Lusoscience].
- Queirós, P. J. (2005). *Burnout no trabalho e conjugal em enfermeiros Portugueses*. Coimbra: Edições Sinais Vitais. [*Burnout in work and conjugal in Portuguese nurses*. Coimbra: Vital Signs Editions].
- Quick, J. C. (1999). Occupational health psychology: historical roots and future directions. *Health Psychology*, 18 (I): 82-88.
- Quick, J. C. and Quick, J. D. (2004). Healthy, happy, productive work: a leadership challenge. *Organizational Dynamics*, 33 (IV): 329-337.
- Ress, D. W. and Cooper, C. L. (1992). The occupational stress indicator locus of control scale: should this be regarded as a state rather than trait measure? *Work & Stress*, 6 (I): 45-48.
- Ribeiro, L., Gomes, A. R. and Silva, M. (2010). Occupational stress in health professionals: a comparative study between physicians and nurses working in hospital context. In C. Nogueira [et al.] (Ed.), *Proceedings*

- of the VII National Symposium on Psychology Research (pp. 1494-1508). Lisbon: Portuguese Association of Psychology.
- Richardson, K. M. and Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: a meta-analysis. *Journal of Occupational Health Psychology*, 13 (I): 69-93.
- Riley, J. B. (2000). *Comunicação em enfermagem*. Loures: Lusociência. [Communication in Nursing. Loures: Lusoscience].
- Rodell, J. B. and Judge, T. A. (2009). Can "good" stressors spark "bad" behaviors? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviors. *The Journal of Applied Psychology*, 94 (VI): 1438-1451.
- Rosenstock, L. (1997). Work organization research at the National Institute for occupational safety and health. *Journal of Occupational Health Psychology*, 2 (I): 7-10.
- Schneiderman, N., Ironson, G. and Siegel, S. D. (2005). Stress and health: psychological, behavioral, and biological determinants. *Annual Review of Clinical Psychology*, 1: 607-628.
- Schwarzer, R. (2001). Stress, resources, and proactive coping. *Applied Psychology: An International Review*, 50 (III): 400-407.
- Seixas, P. C. and Pereira, P. (2005). *Relações e situações críticas na enfermagem*. Porto: Universidade Fernando Pessoa. [Critical relations and situations in nursing. Porto: Fernando Pessoa University].
- Shirom, A., Gilboa, S., Fried, Y. and Cooper, C. L. (2008). Gender, age and tenure as moderators of work-related stressors' relationships with job performance: A meta-analysis. *Human Relations* 61 (X): 1371-1398.
- Simon, M., Kummerling, A. and Hasselhorn, H. M. (2004). Work-home conflict in the European nursing profession. *International Journal of Occupational and Environmental Health*, 10 (IV): 384-391.
- Simon, M., Tackenberg, P., Nienhaus, A., Estryng-Behar, M., Maurice Conway, P. and Hasselhorn, H. M. (2008). Back or neck-pain-related disability of nursing staff in hospitals, nursing homes and home care in seven countries: results from the European NEXT-Study. *International Journal of Nursing Studies*, 45 (I): 24-34.

- Soares, A. J. and Pereira, M. G. (2006). Cortisol como uma variável em psicologia da saúde. *Psicologia, Saúde & Doenças*, 7 (II): 165-177. [Cortisol as a Variable in Health Psychology. *Psychology, Health & Diseases*, 7 (II): 165-177].
- Spector, P. A. and O'Connell, B. J. (1994). The contribution of personality traits, negative affectivity, locus of control and Type A to the subsequent reports of job stressors and job strains. *Journal of Occupational & Organizational Psychology*, 67 (I): 1-12.
- Stone, P. W., Mooney-Kane, C., Larson, E. L., Pastor, D. K., Zwanziger, J. and Dick, A. W. (2007). Nurse working conditions, organizational climate, and intent to leave in ICUs: an instrumental variable approach. *Health Services Research*, 42 (III): 1085-1104.
- Stordeur, S. and D'Hoore, W. (2007). Organizational configuration of hospitals succeeding in attracting and retaining nurses. *Journal of Advanced Nursing*, 57 (I): 45-58.
- Straub, R. O. (2005). *Psicologia da saúde*. Porto Alegre: Artmed. [Health Psychology. Porto Alegre: Artmed].
- Tavares, M. L., Soares-Fortunato, J. M. and Leite-Moreira, A. F. (2000). Stress: respostas fisiológicas e fisiopatológicas. *Revista Portuguesa de Psicossomática*, 2 (II): 51-65. [Stress: physiological and pathophysiological responses. *Portuguese Journal of Psychosomatic*, 2 (II): 51-65].
- Thatcher, J. and Day, M. C. (2008). Re-appraising stress appraisals: The underlying properties of stress in sport. *Psychology of Sport and Exercise*, 9: 318-335.
- Tomaka, J., Blascovich, J., Kibler, J. and Ernst, J. M. (1997). Cognitive and physiological antecedents of threat and challenge appraisal. *Journal of personality and social psychology*, 73: 63-72.
- Vaz Serra, A. (2007). *O stress na vida de todos os dias* (3ª ed.). Coimbra: Autor. [Stress in everyday life (3rd ed.). Coimbra: Author].
- Yildirim, D. and Aycan, Z. (2008). Nurses' work demands and work-family conflict: a questionnaire survey. *International Journal of Nursing Studies*, 45 (IX): 1366-1378.