

## Chapter 6.

### Discussion

#### Foreword

Work stress and coping research is an area with increasing debate over both how we conceptualize stress, coping and strain, and how we investigate them. Stress, for example, may be conceived as a stimulus (Dohrenwend & Dohrenwend, 1974; Holmes & Rahe, 1967), as a response (Maslach, 1999; Selye, 1976), as the result of an on-going process (Lazarus, 1991b), or as a threat to resources loss (Hobfoll, 2001). A further problem is stress assessment, since stress can be measured as an appraised stimulus (e.g., the Job Stress Survey), or as a response (e.g., the Maslach Burnout Inventory).

In terms of coping, the most predominant debate runs around whether coping should be considered as a context dependent phenomena (e.g., Lazarus, 1991b) or as a trait-oriented one (e.g., Bolger, 1990). A third posture speaks in favor of studying coping as function of the triple influence (e.g., Parkes, 1986) of individual differences (e.g., personality), environmental factors (e.g., work stress), and situational characteristics (e.g., threat, challenge, loss and so forth). As in stress, the unsolved dilemma arises regarding how we should “correctly” measure coping, given the problems of stability, generality, and dimensionality (Schwarzer & Schwarzer, 1996).

With regard to health outcomes, the problem concerns the definition and operationalization of “strain”, as well as the conceptualization of health outcomes and quality of life (QoL). In the field of occupational stress and coping, a great deal of attention has been given to the study of state anxiety, job satisfaction, and psychological “health” by using questionnaire measures of strain and stress (e.g., Goldberg’s General health Questionnaire) that have been criticized due to semantic problems and construct overlapping. Smith, Avis, and Assmann (1999) sustain, on the other hand, that despite the increasing acceptance of quality of life (QoL) as critical endpoint in medical and psychological research, there is still little consensus regarding the definition of this construct and how it differs from the concept of health status. The other debate centers on whether studies should concentrate efforts in studying pathogenic or –alternatively- salutogenic. For instance, positive psychology (Seligman & Csikszentmihalyi, 2000) considers that research should be oriented towards the

“best things in life”, such as positive affect, happiness, well-being, optimal experience, and quality of life.

In the field of work stress and coping research, this study was designed to consider both the pathogenic and the salutogenic viewpoint of human functioning in work settings, by emphasizing on the relationship between personality resources (self-efficacy beliefs vs. proactive attitude), social support (received advice), coping processes (avoidance-oriented vs. proactive-oriented coping), and indicators of health outcomes (depression, somatization, physical illness), emotional experience (negative and positive affect), and quality of life (physical and psychological).

Meta-theoretical principles of the cognitive-transactional theory of stress (Lazarus & Folkman, 1984), the conceptual framework of Holahan et al. (1996), and Lazarus' theory of Emotions (Lazarus, 1991b) were used to analyze the data from both a prospective and a longitudinal viewpoint, and in terms of the dynamics between *antecedent variables* (personal resources, support, work stress), *mediating processes* (principally, coping), and the resulting *outcomes* (short- and long-term effects). These principles were integrated to the self-efficacy theory of Bandura (2001), the self-regulatory-behavioral theory of Carver and Scheier (1998), and the proactive approaches on coping (Aspinwall & Taylor, 1997; Schwarzer, 2000; 2001; Schwarzer & Taubert, 2002), with the aim of offering concrete answers to the questions of how and why employees tend to become sick, and conversely, what is the path through which working people stay well. The present research also makes use of some principles of the conservation of resources theory (Hobfoll, 1998; 2001), specifically, to discuss the role of resources and coping in potential loss vs. gain cycles.

The study presented here used three strategies to assess research hypotheses in a sample of 535 Costa Rican employees at two international manufacturing companies: First, a systematic examination was conducted to corroborate the presence (or absence) of the so called main effects vs. buffer effects, in the context of the prospective influence of personal resources, and social resources on the work stress-health/QoL relation. Second, a set of LISREL models were developed, with the aim of verifying the extent to which coping mediates the long term effects of personal resources and work stress on negative health outcomes, emotional experience, and indicators of quality of life. Third, a set of analyses that made use of Cross Lagged Panel designs (also with LISREL) were conducted, allowing the study of “causal effects” and the reciprocal influence among latent variables over the time.

Taking into account the hypotheses and the theoretical principles discussed in previous chapters, I would like to review and talk about the following issues in the present chapter:

1. The role played by self-efficacy beliefs and proactive attitude in the work stress-health relation.
2. The function of social support (received advice) in the work stress-health relation.
3. The role played by *avoidance coping* as mediator of the effects of work stress, self-efficacy beliefs and proactive attitude on *negative health outcomes*.
4. The role played by *proactive coping* as mediator of the effects of work stress, self-efficacy beliefs and proactive attitude on *positive health outcomes*.
5. The *interplay* between work stress, self-efficacy beliefs, coping, and health outcomes/quality of life over the time.

For each of the previous points, I would like to answer to the following questions:

- What are the most relevant findings, and to what extent the results of this study supported the hypotheses?
- How could the results be interpreted in the context of relevant theoretical frameworks, and how do the results converge and diverge with relevant findings of other investigators?
- What is the concrete contribution of these findings at the level of theory, methodology, and what are the applied implications?

After a critical revision of findings and their discussion, the following issues will be considered:

6. Limitations of the study and issues of internal vs. external validity.
7. Directions for future research.

## 6.1 Hypothesis 1: On the role played by self-efficacy beliefs and proactive attitude in the work stress-health/quality of life relation

Antecedent variables such as personality factors and general beliefs about the environment and one's resources were considered by this study to function as *protective factors* in the work stress-health relation. Hypothesis 1 sustained that self-efficacy beliefs (generalized and work-specific), as well as proactive attitude should protect individuals against the adverse effects of work stress on health and quality of life. The hypothesis dealt with the question of why some employees are more vulnerable than others to develop psychological and physical disorders, and whether personal resources have a "buffering effect" or a "main effect" in the relationship between work stress and psychological and physical health.

In assessing hypotheses 1, a consistent pattern of influence was identified as follows:

First, *general* and *work-specific efficacy beliefs* have shown a systematic pattern of *main effects* on the work stress-health/quality of life relation. The results showed that those who have a strong sense of self-efficacy were less vulnerable to the effects of work stress on health outcomes/quality of life, in comparison with the ones who have a weaker sense of self-efficacy. The protective function of self-efficacy beliefs was observed, not only in the presence of low work stress, but also when work stress was high. Second, *proactive attitude* also exhibited a systematic pattern of *main effects* in the work stress-health/quality of life relation. Similarly, employees who have a strong sense of resourcefulness, responsibility, values, and vision have reported lower depression, somatization and physical illness, and higher physical and psychological quality of life. The protective factor of proactive attitude was observed in both the low and the high work stress scenarios.

Altogether, the hypothesis sustaining that personal resources function as a *buffer* of the effects of work-stress on health outcomes/quality of life was rejected, whereas the hypothesis of the "main-effect" was accepted. As for the findings of self efficacy as a *general* protective factor in the work stress-health/quality of life relation, they were all consistent with theoretical assumptions of Albert Bandura, in the sense that a strong sense of self-efficacy is related with lower *vulnerability* to illness related symptoms such as depression and somatic complaints. In contrast, people who doubt their capabilities fall easy victim to stress and are more *vulnerable* to psychological and physical dysfunctions (Bandura, 1997). In connection with the findings of proactive attitude -as an additional *general* protective factor in the work

stress-health/quality of life relation- the results were coherent with theoretical assumptions and the proactive theory (Schwarzer & Taubert, 2002), given that proactive leadership includes *resourcefulness* and *strength*. Although *proactive attitude* was originally conceptualized as a key ingredient for motivation and action only, the current study provided novel evidence suggesting that its range of influence goes beyond the pre-actional phases and the implementation of goal-oriented behaviors; and may be extended to the outcomes phase, by directly reducing depression, somatization, and somatic disorders irrespective of the level of stress. Two studies were found in the work stress and coping literature, which indirectly converge with research results presented here. The first one was developed by Schmitz and Schwarzer (1999), who reported that *proactive attitude*, was negatively associated with the Burnout syndrome in a sample of German teachers. In a second study, Tang, Au, Schwarzer, and Schmitz (2001), reported that proactive attitude and self-efficacy beliefs had a negative impact on Burnout, and on negative mental health status in a sample of Chinese teachers.

With regard to the role of self-efficacy beliefs, the results presented here are convergent, for instance, with the ones reported by Jex and Bliese (1999), Jimmieson (2000), Tudor (1997), considering that self-efficacy beliefs –in one way or another- do protect working people against the aversive effects of work stressors. Nevertheless, the results presented here extend earlier findings in the sense that, irrespective of the level of *generality* or *specificity* of self-efficacy judgments, the influence of those beliefs in the work stress-health relation is general (i.e., through main effects). The findings are also in line with longitudinal studies of other research fields, in which personality resources have been found to be relevant during crisis as well as in relatively stress free situations (see Hobfoll & Walfisch, 1984). These authors reported that *personal resources* had a *main effect* instead of a *buffer effect* across the several phases of cancer-related episodes.

## 6.2 Hypothesis 1a: On the role played by social support (received advice) in the work stress-health relation

Informational support was considered to be a further “moderator” of the work stress-health relation, and, interestingly, the results were all consistent with the hypothesis that *received advice* does play a different role in the stress-health relation, in comparison with generalized and work-specific self-efficacy.

Several aspects should be remarked in understanding this finding. First, in the context of meta-theoretical principles of the transactional approach of stress (Lazarus, 1991b), social support and social networks are defined as environmental variables that moderate the stress-strain relation across the whole phases of the stress response. The results presented here supported the hypothesis that received advice did *function* as a protective factor by moderating the effects of stress on illness.

Second, as for the *structural aspects of received advice*, an interesting factor to take into account is the source of support. The sample under scrutiny reported that received advice took origin –in order of importance- from the following sources: 1. relatives 2. partner; 3. friends; and 4. groups and organizations. This result is not surprising in the context of Latin American social networks, since the family -in that context- still has a significant function as a relevant source of information and advice.

Third, from the perspective of the Conservation of Resources Theory (COR), received advice might be considered as a finite external resource that helps people to enhance well being. A good marriage, a stable family, intimacy with at least one friend, and involvement with supporting organizations are a good source of counsel that helps working people in buffering the effects of work stress on health outcomes. Conversely, the lack of advice was associated with higher depression, somatization, and more physical illness when confronting higher stress.

In the work stress and social support literature, there is similar recent evidence suggesting that informational support does buffer the effects of stress on health outcomes. For example, Falk, Hanson, Isacson, and Oestergren (1992), VanYperen (1998), and Wong, Cheuk, and Rosen (2000) offered results that are convergent with the one presented here. In terms of new inputs to work stress and social support research, however, the results presented here may extend earlier evidence considering that, informational support (advice) that took origin from the family and the partner (that is, *outside the workplace*), did function as a protective factor by buffering the effects of work stressors on negative health outcomes.

Conversely, informational support (advice) that took origin *from the workplace* played no role in protecting people against the pervasive effects of works stressors on health.

Taking all together, the evidence presented here, about the function of personal resources vs. informational support in the work stress-health relationship, speaks in favor of the *direct-effect model* (see Broadhead, Kaplan, James, Wagner, Schoenbach, Grimson, Heyden, Tiblin, & Gehlbach, 1983), in the case of *personal resources*. This implies that general self-efficacy beliefs, work specific self-efficacy beliefs, and proactive attitude have a beneficial effect on psychological and physical health of working people, regardless of whether work stress is present. On the contrary, the results provided by this study, about the function of informational support in the work stress-health relationship, were all consistent with the *buffering model* (see Cobb, 1976; Cohen & Wills, 1985) which presumes that social support is of benefit mostly when an interaction taxes or exceeds employees' capabilities, that is, *under stress* only.

### **6.3 Hypotheses 2, 2a, 4, and 4a: On the role played by *avoidance coping* as mediator of the long term effects of work stress, self-efficacy beliefs and proactive attitude on negative health outcomes and negative affect**

In the classical literature of stress and coping (e.g., Lazarus, 1966), avoidance was conceived to be a mechanism by which individuals aim at preventing the confrontation with a threat or a potential harm. Avoidance coping has been also considered to be one of the most basic and universal of all action tendencies for coping with threat. More recently, some forms of avoidance coping, such as denial, have been considered to be “facilitators” of human adaptation. Contrary to this statement, this study provides evidence supporting the hypothesis that avoidance coping –in the context of work- is a insidious form of anti-goal oriented action, that conduces to the occurrence and recurrence of illness-related symptoms and negative emotions at a later point in time. When talking about avoidance coping, this study refers to three cognitive-behavioral responses through which “anti-goals” are usually implemented, namely denial, behavioral disengagement, and avoidance as such.

Another relevant aspect under scrutiny is *mediation*. To assess whether *avoidance coping* mediated the effects of work stress, self-efficacy beliefs, and proactive attitude on negative health outcomes and negative affect, a set of structural equation models were

developed in which a *restrictive model* (or fully mediated model) was compared to an *alternative model* (or challenging model). In concrete, two hypotheses (2 and 2a) aimed at evaluating whether *avoidance coping* fully mediated the effects of *self-efficacy beliefs* and *work stress* on *negative health outcomes*, and *negative affect*. Likewise, two additional hypotheses (4 and 4a) were postulated in order to estimate whether *avoidance coping* fully mediated the influence of *proactive attitude* and *work stress* on *negative health outcomes*, on the one hand, and on *negative affect*, on the other.

On the whole, all findings supported the premise that *avoidance coping* is a “maladaptive” mechanism through which working people become sick. Additionally, the results presented here supported the hypothesis that avoidance coping *mediated only part* of the effects of personal resources (self-efficacy beliefs, proactive attitude) and work stress on negative health outcomes and negative affect at a later point in time. As a result, the assumption that avoidance coping may “facilitate” adaptation, and that it should *fully mediate* the effects of personal resources and work stress on negative health outcomes and negative affect, was properly rejected. What do these results mean? The results have various implications, which will be analyzed as follows: First, the role played by avoidance coping in work settings. Second, the role played by antecedent variables in avoidance coping. Third, the mediating role of avoidance coping.

First, the manufacturing companies that participated of this study make use of measures of percentage of accomplishment and quality in order to evaluate individual job performance. They have already defined a minimal standard of efficiency and quality on each operation of the process of production, and they are permanently looking for new challenges and better standards of quality. Given that there was a “work philosophy” inspired on the principles of Total Quality Management (TQM) and Total Quality Control (TQC), the hypotheses about avoidance oriented coping suggested that its use would be related to the increment in “negative” outcomes, whereas the use of proactive coping would conduce to “positive” ones. As expected, the study supported the assumption that the use of avoidance-oriented coping, when facing work-related demands, would be systematically related to higher depression, more somatization, and higher occurrence of four types of diseases, namely musculoskeletal pain, skin disorders, gastrointestinal complaints, and viral respiratory infections. Avoidance coping was the mechanism by which employees aimed at preventing the confrontation with a threatening work-related challenge, but by paying the price of becoming sick.



Second, antecedent variables such as self-efficacy beliefs and proactive attitude were expected to diminish the frequency in the use of anti-goal behaviors, whereas work stressors were expected to promote and aggravate the use of avoidance coping, and consequently the occurrence of symptoms. In harmony with this line of assumptions, work stress exhibited a strongly positive effect on avoidance coping, whereas both self-efficacy beliefs and proactive attitude presented a systematic pattern of negative effects on avoidance coping. Avoidance-oriented coping emerged as a *reactive* response to job pressures, which is controlled, nevertheless, by self-regulatory mechanisms such as self-efficacy beliefs and proactive attitude. In consequence, employees with a fragile sense of self-efficacy and a low proactive attitude are guided by several maladaptive needs, for example: The need of sleeping on the problems and put them aside instead of confronting them; refusing to believe that they really exist, instead of trying to understand their nature; repeating for themselves “this isn’t real”, rather than analyzing the pros and the cons of the situation; quickly giving up in dealing with the problems, and rapidly renouncing in the attempt to cope with them.

Third, mediation is a typical function of coping processes, that let us know the extent to which antecedent variables such as personal resources and work stress make unique contributions –let’s say separated from avoidance coping- to negative health outcomes, and negative affect at a later point in time. As already said, the *full mediation* hypothesis was systematically rejected by the analyses, suggesting that, antecedent variables and avoidance coping do not make unique contributions towards the increase (or decrease) in negative indicators of health. Particularly, avoidance coping emerged as good mediator of the indirect effects of work stress on negative health outcomes and negative affect; nevertheless, the effects of self-efficacy beliefs and proactive attitude on negative health outcomes, were only weakly mediated by avoidance coping. From previous arguments, it can be concluded, that the route work stress -> avoidance coping -> health outcomes, is the path through which employees become sick, because the effects of work stressors are exacerbated through the use of avoidance coping. Alternatively, the path self-efficacy beliefs (or proactive attitude) -> avoidance coping -> health outcomes is the route through which the adverse effects of avoidance coping on health are attenuated. Although, this is not the path that conduces to health, it is the route of *preventing* illness, or what is also called the path of not becoming sick.

Similar patterns of results, but not identical, have been found in studies conducted by other investigators both outside the field of work stress and coping research (e.g., Carver et al., 1993; Schroeder, 1997a; Schwarzer, Hahn, & Fuchs, 1993), and inside the work stress and coping research domain (Bishop, Tong, Diong, Enkelmann, Why, Khader, & Ang, 2001; Brown, Mulhern, & Joseph, 2002; Long et al., 1992; Long, 1998; Tyler & Cushway, 1995). Schwarzer, Hahn and Fuchs (1993), in the field of immigration-related stress, rejected the hypothesis of the full mediation, and reported that emotional-oriented coping was related to an increase in the level of negative affect and illness at a later point in time. In addition, they reported that self-efficacy beliefs played a protective role in stress resistance, and that indirect effects of resources on outcomes through avoidance coping were all weaker than the direct effects. Schroeder (1997a), in the field of surgery-related stress, reported that: a. some forms of negative coping (e.g., rumination coping) mediated the effects of personal resources (e.g., volitional and coping competence) on later health-related outcomes such as vigor and depression; b. negative coping styles contributed to higher depression and less vigor at a later point in time; c. the direct effects of personal resources were, on the whole, somewhat stronger than the indirect effects into the alternative models. In addition, she found that positive personal resources promoted the use of active-oriented coping and reduce the use of negative forms of coping, increased vigor, and diminishing depression at a later point in time. Carver et al. (1993), on their side, found that acceptance, denial, and behavioral disengagement mediated the relationship between dispositional optimism and subjective well-being, while the indirect effects of personality factors through coping were somewhat weaker in comparison with the direct influence. In the literature of work stress and coping research, Brown, Mulhern, and Joseph (2002) reported cross-sectional evidence that avoidance coping mediated the relationship between locus of control and psychological distress, and it accounted for most of the explained variance in psychological distress. Tyler and Cushway (1995) reported similar results suggesting that avoidance coping was significantly related with a diminished level of mental well-being. In terms of the antecedents of avoidance coping, Bishop et al. (2001) found that behavioral disengagement, mental disengagement, denial, and focusing on and venting of emotions were positively related to negative personality factors such as Neuroticism. Finally, Long et al., (1992), and Long (1998) found that: a. the use of disengagement coping at T2 increased the occurrence of depression, anxiety, and somatic symptoms at a later point in time (T3); b. personality traits as measured at T1 presented a positive effect in the use of engagement coping at T2. This pattern of results was consistent in both clerical and manager employees.

While the results presented here converge, in part, with findings reported by other investigators regarding the function of avoidance-oriented coping, this research extends earlier findings in the following aspects: First, proactive attitude (or proactive leadership) emerged not only as a personal characteristic that helps people to remain engaged in goal oriented actions, but also as a protective factor that diminish the use of maladaptive coping, and reduces the occurrence of illness related symptoms at a later point in time. Second, systematic evidence was also given suggesting that *general self-efficacy beliefs* and *work-specific* self-efficacy beliefs have a similar function in terms of the reduction in the use of anti-goal oriented actions, and the prevention of illness. Third, the majority of studies in the field of work stress and coping research elaborate conclusions on the basis of cross-sectional evidence. In this sense, the results presented here aimed at making a further step, in order to understand the effects of avoidance-oriented coping from a prospective point of view.

In terms of theoretical implications, several innovative inputs derive from the evidence presented here. First, in the context of the *self-efficacy theory* of Bandura (1997), it can be argued that both *generalized* and *work-specific* self-efficacy beliefs *function together (and cooperate)* as a strong self-regulatory mechanism that reduce the use of maladaptive coping strategies such as behavioral disengagement, denial, and avoidance. This is also in line with the principles of the self-regulatory behavioral theory of Carver and Scheier (1998), specifically, with the assumption that anti-goal oriented behavior does not emerge – exclusively- as reactive responses to environmental stressors; they are also the consequence of the exercise of personal control processes, and self-regulatory mechanisms such as the repertory of optimistic beliefs. Avoidance coping emerged then, as a *giving-up* response that is motivated by threatening work transactions and de-motivated by positive self-regulatory mechanisms and the optimistic perception of being able to accomplish challenging tasks inside and outside the work.

Second, *proactive attitude* emerged as a further important mechanism of the self, which helps people *in not becoming sick and in staying away from the use of anti goal-oriented actions*. This component of the self system, which has also to do with leadership, reduces the use of avoidance-oriented coping and the occurrence of illness-related symptoms and negative affect. The finding offers innovative inputs for the *self-regulatory model of goal-oriented actions* (Schmitz & Schwarzer, 1999) and the *Health Action Process Approach* (1992a), in the sense that proactive attitude (as self-efficacy beliefs do) influences beyond the motivation phases in the adoption and maintenance of health behaviors and goal-oriented actions.

Third, in the context of the transactional approach on stress (Lazarus & Folkman, 1984; Lazarus, 1991b) and the theoretical approach of Moos and Schaefer (1993), evidence was provided supporting the hypothesis that negative health outcomes were the consequence of the combined influence of pervasive environmental factors (work stress), and protective personal characteristics (self-efficacy beliefs and proactive attitude), that influence directly and indirectly through *coping actions*. Nevertheless, there is a divergence between one aspect of Lazarus' approach and the models developed here, considering that the variance in avoidance coping was attributed to the *direct* influence of personal resources and work stressors and not to the mediational role played by cognitive appraisals of threat or harm/loss. Whether the aspects of design of LISREL models make of this study a coping style-oriented research, instead of a context-oriented one, this issue should be considered to be a controversial point for the following reasons: There is an overlapping of concepts among the theory of Bandura and Lazarus' approach, regarding the concept of Beliefs as antecedent for coping. On the one hand, self-efficacy beliefs are conceived to be relatively stable characteristics of the self-system in the Theory of Bandura; on the other hand, self-efficacy beliefs are conceptualized as patterns of secondary appraisal in the terrain of Lazarus (1991b), who sustains that they are also synonymous of coping potential, which is the appraisal of resources that the person makes in order to cope with stressors. A further aspect is work stress, which was measured as the *perception of the frequency and severity of work-related stressors*, attending to Spielberger's approach, who considers that his instrument (the Job Stress Survey) is transactional-oriented and context-oriented. Whether threat and harm appraisals are also implicit in the perception of work stressors is another controversial point. In any case, as already discussed in the theoretical framework, Lazarus offers an extraordinary meta-theoretical approach that cannot be reduced to the role played by threat and harm in avoidance coping. Moreover, and in harmony with the line of thinking of Schwazer (2001, 402): "[...] the meta-theoretical framework cannot be empirically tested and investigated as a whole model. Rather, it represents a heuristic framework that may serve to formulate and test hypotheses in selected subareas of the theoretical system only." This is also the case of the research developed here. Let's turn now to the discussion of results on proactive coping.

#### **6.4 Hypotheses 3, 3a, and 5: On the role played by *proactive coping* as mediator of the long term effects of work stress, self-efficacy beliefs and proactive attitude on quality of life (QoL) and positive affect (PA)**

In accordance with proactive coping frameworks, this study hypothesized that *proactive coping* –as opposed to avoidance coping- would be mainly associated with positive health outcomes, namely a better physical and psychological quality of life and positive affect. The positive facet of coping was then evaluated by defining a set of LISREL models, in which proactive coping was expected to increase the level of well-being. Given that proactive coping is considered to be function of challenging demands and less threatening ones, positive personal resources, and the perception of work stressors were specified as predictors, also in order to explore whether proactive coping would be better explained by positive personality traits. Specifically, hypotheses 3 and 3a assumed that proactive coping should either fully or partially mediate the influence of work stress and self-efficacy beliefs on quality of life and positive affect. Second, hypothesis 5 proposed exactly the same as hypotheses 3 and 3a, but replacing self-efficacy beliefs by proactive attitude into the LISREL models. In this way, several effects were simultaneously assessed, namely: a. the direct effects of antecedent variables (work stress and personal resources) on proactive coping; b. the direct effects of antecedent variables and coping on quality of life and positive affect at a later point in time; and c. the indirect effects of antecedent variables via proactive coping (that is, mediation) on quality of life and positive affect at a later point in time. LISREL models developed to evaluate hypotheses (see section 5.3.3) supported the premise that proactive coping mediates only *part* of the influence of antecedent variables on outcome criteria.

Aspinwall and Taylor (1997), and Schwarzer (2001) assure that proactive coping is not directed to a particular stressor. Rather than being the response to threatening environmental demands, proactive coping is a “virtually always active” strategy that aims at acquiring and maintaining resources over the time. This conception is also compatible with the Conservation of Resources Theory (COR) developed by Hobfoll (2001), in which resources such as self-efficacy beliefs, for instance, may contribute to maintenance of strong resource reservoirs through mechanism such as proactive coping. In accordance with this line of reasoning, the findings reported here revealed that the influence of work stress on proactive coping was consistently weaker, in comparison with the direct effects of two types of personal resources, namely self-efficacy beliefs and proactive attitude.

Interestingly, as Schwarzer (2001) sustains- self-efficacy beliefs played an important role in proactive coping, since they motivated to meet challenges and commit themselves to personal quality standards. The findings provide evidence supporting the hypothesis that self-efficacy beliefs do function as an important determinant of proactive coping. Another unexplored facet in terms of the sources of proactive coping is the function of proactive attitude as coping resource. As expected, the hypothesis that proactive attitude would be a further relevant predictor of proactive coping was supported as well. The findings suggested that the higher the level of proactive attitude, and the stronger the sense of self-efficacy beliefs, the more regularly was the use of proactive coping. Work stress, on its side, presented a quite modest influence on proactive coping, which means that the immediate work-related demands were a poor source for proactive coping. This result should not be confounded and it should be interpreted with care. In other words, proactive coping does protect individuals against the damaging effects of stressors, but proactive coping does not cooperate with work stress in augmenting illness, as avoidance coping does.

Another relevant aspect in assessing hypotheses on proactive coping was *mediation*. Schwarzer (2000, p. 344) offers a process model on stress and coping, in which coping (reactive, anticipatory, preventive, proactive) and appraisal (challenge, threat, harm, loss) are fully mediating the relationship between antecedent variables (demands, resources) and the consequences (behavioral, social, psychological and physical). This study used only a section of Schwarzer's schema, with the aim of assessing whether or not the whole influence of demands and resources on consequences would be fully mediated by proactive coping. As in previous analyses, all models allowing for direct and indirect effects (through proactive coping) were found to fit better with data compared to the fully mediated ones, and the indirect effects were found to be weaker than the direct ones. The hypothesis of full mediation was, consequently, rejected.

Particularly, in the models described in sections 5.3.2.3 and 5.3.2.4 self-efficacy beliefs exhibited a direct and positive influence on PA and QoL at a later point in time. Conversely, work stress showed a direct and negative influence on PA and QoL six months later. These results were expected and were all in coherence with the already described protective function of self-efficacy beliefs in the promotion of a better emotional life and more quality of life (Bandura, 1997). The other aspect was the pervasive effects of work stress (see section 5.3.2.1 and 5.3.2.2), which were systematically supported by analyses. Although these findings may be less surprising at this point of the document, the most striking results showed that proactive coping was found to be a good mediator of the effects of self-efficacy

beliefs on PA and QoL, and a bad mediator of the effects of work stress on QoL (see 5.3.2.3) and PA (see 5.3.2.4).

This brings us the question of why avoidance coping is a good mediator of the effects of work stress on negative health outcomes and negative affect? And why proactive coping did not mediate the effects of work stress on quality of life and positive affect? Two aspects can be considered in answering to those questions, namely the nature of coping, and the function of coping. Maladaptive, reactive, anti-goal oriented actions; in concrete, avoidance-oriented coping responses to work stressors are considered to be more impulsive, less “rational” responses, and even more “reactive” responses that serve as a multiplicative factor of the effects of work stressors on the occurrence of negative health outcomes and negative affect. On the contrary, proactive coping strategies are, perhaps, one of the most organized, structured, and rational responses of working people, through which the person guarantees his/her future and accumulates resources for unexpected situations. While avoidance coping might be seen as a reactive “strategy of surveillance”, proactive coping can be conceptualized as an imaginative force taking origin from the most stable components of the structure of the self. In the context of clinical and health psychology, the question whether avoidance-oriented coping might be also related with higher neuroticism, and conversely, whether proactive coping might be more associated to openness or extraversion, is another unexplored topic that offers a fruitful field to conduct further innovative research.

In the context of Carver and Scheier’s (1998) self-regulatory behavioral theory, avoidance coping, as opposed to proactive coping, has a great deal to do with disengagement responses. Avoidance coping can be –consequently- less adaptive than proactive coping in work settings, because disengagement from work-related goals cannot be successfully sustained for long. In consequence, avoidance coping often produces more distress than other forms of coping, including proactive coping. The fact that avoidance coping is a better mediator than proactive coping of the effects of stress on outcomes, is also the result of a functional aspect of behavior. Avoidance coping has the function of mediating the effects of work stressors on *negative health outcomes*, when the person gives up in his/her attempts to deal with work-related demands. The problem is that avoidance coping may not move the person to an adaptive disengagement, because prolonged disengagement from work-related goals may conduce to unemployment, and consequently to social isolation, and the need of social assistance. Proactive coping, on the contrary, does not have the function to mediate the effects of work stress on *positive health outcomes*, but it does mediate the effects of positive personality resources on *positive health outcomes*. This function was even more evident in the

third LISREL model developed in section 5.3.3.3, in which proactive attitude and work stress were specified as antecedent variables of proactive coping (mediator) and positive affect (consequences). Interestingly, proactive coping did not mediate the effects of work stressors on positive affect, but it did fully mediate a strong effect of proactive attitude on positive affectivity at a later point in time. The hypotheses regarding the contrasting pattern of influence of avoidance vs. proactive coping were then supported.

In terms of the convergence and divergence of the findings presented here with the results of other investigators, Greenglass and Burke (2000) conducted a similar study, but not identical, in which control coping (proactive efforts to change the situation) and escape coping (efforts to get the person away from the situation) were analyzed in the context of psychological reactions to hospital downsizing in 1,363 nurses employed in hospitals. These authors found that self-efficacy beliefs and proactive control coping diminished distress and augmented job satisfaction, whereas escape coping resulted in greater psychological distress and less job security. The results presented in this study, about the contrasting pattern between avoidance coping and proactive coping, and the role played by self-efficacy beliefs in distress match the results of Greenglass and Burke (2000). The main difference between the former study and the one developed here is that I used *positive health outcomes* as dependent variables for proactive coping, whereas Greenglass and Burke (2000) used negative ones. By looking at the way in which research is being conducted in the terrain of proactive coping, the question that arises is whether proactive coping research is being coherently conducted with regard to original theoretical assumptions. Should we investigate proactive coping as the path through which employees not become sick? Or alternatively, should we investigate proactive coping (as it was done here) as the route through which employees may stay well? While it is still premature to say whether proactive coping should be attached to *positive outcomes* (e.g., positive affect instead of depression), it is also true that proactive theoretical frameworks conceive proactive coping as the less reactive facet of coping.

In the terrain of the Conservation of Resources Theory (COR), and in harmony with some principles of Positive Psychology, the results discussed in the present section give support to the following issues: First, the work stress process is not circumscribed by the reactive responses to resource loss or threats, as in avoidance coping. Rather, working people can proactively cope by (1) striving to acquire and maintain their resources reservoirs, (2) acting early when first warning signs of some impeding problem are evidenced, and (3) positioning themselves through selection processes in circumstances that fit their resources (Hobfoll, 2001). From the perspective of Positive Psychology, the findings reported here are



consistent with the assumptions of Folkman and Moskowitz (2000), in the sense that coping may also conduce to positive affect.

Another contribution of the current study to theories of positive affectivity (Watson, 2002) and Emotions (Fredrickson, 2002; Lazarus, 1991b), and theory and research on quality of life (Fitzpatrick, 2000; Smith, Avis, & Assmann, 1999) is the finding that *proactive coping* in cooperation with the *self-system*, is another important source of positive affect and physical/psychological quality of life. While Watson (2002) speaks in favor of a disposition to experience pleasurable emotional states, which may be linked in some way to genetic factors, neurobiological aspects, psychopathology, job and marital satisfaction, the results presented by this study speak in favor of self-regulatory determinants (e.g., self-efficacy beliefs and proactive attitude) and behavioral determinants (proactive coping) of positive emotionality.

In the context of the Emotion theory of Lazarus (1991b), the results presented here confirmed his theoretical premise that positive emotions may take origin from secondary appraisal, and coping may lead to positive emotions. This assumption was supported as follows. First, one of the three components of secondary appraisal mentioned in Lazarus' theory of emotions is the appraisal of *coping potential*. This concept refers to the perception of whether and how the person can manage the demands of the encounter, and it overlaps the concept of perceived *self-efficacy beliefs* of Bandura (see Lazarus, 1991b, p. 225).

In the language of Lazarus, consequently, the current study found that the higher the *perceived coping potential*, the more positive emotions, and the higher the quality of life at a later point in time. Coping potential refers to an appraisal rather than actual coping; however, secondary appraisal also conduces to the selection of the preferred coping strategy. Proactive coping may be considered to be a function of secondary appraisal and also as an important source of well-being. Thus, positive emotions are also the function of secondary appraisal patterns (e.g., self-efficacy beliefs) as well as the result of specific action tendencies (e.g., proactive coping). One aspect that should be considered, however, is that Lazarus gives more relevance to coping potential in the development of incongruent emotions (negative emotions); nevertheless, the findings reported in this study suggested that *coping potential* also plays an important role in the prediction of the experience of positive affect.

As for the sources of quality of life, I have insisted in the need of separating emotional experience from health status, and quality of life, based on both meta-analytic research results reported by Smith et al. (1999) and theoretical assumptions. Rather than considering QoL as function of the severity of symptoms, it was explored the role played by work stress, the self-system, and proactive coping as potential sources of QoL. Hypotheses were all consistent with

findings in the sense that work stress was a negative predictor, whereas self-efficacy beliefs and proactive coping were positive predictors of QoL.

Another aspect to take into account is that QoL was investigated in relatively healthy people, and in the context of coping with one of the most common stressors of human life: work stressors. This demarks a fundamental difference between this study and the majority of studies on QoL over the last decade. QoL is usually analyzed in samples of individuals undergoing surgery (e.g., Schroeder & Schwarzer, 2001), or in subjects taking some kind of physical or psychological therapeutic intervention (e.g., Malmgren & Braenholm, 2002; Tsay & Healstead, 2002).

In the work stress and coping research domain, the study of QoL has been another seldom task, which also presents the problem of indistinctively using the constructs of QoL and those referring to Burnout Syndrome (e.g., Bennett, Kelaheer, & Ross, 1994). Among the very few studies linking personal resources, coping, and QoL in work settings, Hart et al. (1995) found with structural equation modeling that extraversion and neuroticism were the strongest predictors of perceived quality in a sample of 527 police officers, whereas Yager and Borus (1990) reported that “coping strategies” such as prioritizing, bridge building, triaging, delegating, careful scheduling, and time management were relevant in the increase in QoL among psychiatric residency training directors. The results reported in this document are consistent with the former findings, since personality factors as well as coping strategies were relevant predictors of QoL in working people. Nevertheless, the lack of attention given to *proactive coping* as potential mediator of the effects of antecedent variables on QoL is still too widely extended. The cross-sectional approach in the conduction of studies is an additional difficulty already discussed in sections 6.1 and 6.3. As for the discussion of concrete implications of findings, I would like to expose this topic after I have commented the “reciprocal effects” (next section), in order to offer a more complete panorama about the rich possibilities and practical applications that this study may have in the context of manufacturing industries.

### **6.5 Hypotheses 6 to 9: The *interplay* between work stress, self-efficacy beliefs, coping, and health outcomes/quality of life over the time**

Although the discussion realized in section 6.4 has strongly emphasized on models depicting some variables as independent and others as dependents with the main flow of influence from the independent to the dependent; here, the discussion will be centered on four further models that allow the understanding of the *reciprocal links*, *multiple* and *bidirectional* “causal paths” among work stress, self-efficacy beliefs, coping, and health outcomes/quality of life over the time. This turns the approach of analyses to a system of elements that are in mutual interaction, attending to the premise of Lazarus (1991b, p. 206) that “a system analysis does not accept traditional causality, though it is multicausal, process-centered, and flexible in what is an antecedent or a consequence.”

In the first CLP model (see section 5.4.1) the hypothesis about the bi-directionality between work stress, negative affect, and physical illness was assessed. The CLP-effects confirmed the hypothesis that work stress –effectively- conduces to an increase in negative affect and four types of somatic disorders (viral respiratory infections, musculoskeletal pain, gastrointestinal disorders, and skin disorders). In addition, the findings supported Lazarus’ premise (1991b), and holistic medicine hypothesis (Cousins, 1976), that stressful emotional states and negative emotions are destructive and promote illness. In fact, we may now say, with more property, that negative emotions (e.g., distressed, upset, guilty, afraid, hostile, irritable, ashamed, nervous, jittery, and scared) did contribute with the *change* (the augment) in four types of somatic disorders (viral respiratory infections, musculoskeletal pain, gastrointestinal disorders, and skin disorders). The findings add new evidence to the little theory and research about the consequences of different patterns of emotions on illness (Lazarus, 1991b). With respect to reversed causation, in the model of illness developed in section 5.4.1, a reversed significant link was found from negative emotions to work stress, suggesting that work stress and negative emotions are engaged in a relation of reciprocal influence. It was already suggested, nevertheless, that more investigation is required on this topic, for the reason that the reversed influence of negative affect on work stress was marginally significant and rather weak. The other hypothesized reversed causation that CLP analyses did not sustain, were two links that go from physical illness to negative affectivity, and to work stress. Explicitly, physical illness was found to be a function of the pervasive

influence of work stress and negative affect, but not vice versa. However, these results supported the premise that work stress predicts the *change* in illness at a later point in time.

In the second CLP model (see section 5.4.2), the hypothesis about the reciprocal effects between self-efficacy beliefs, negative affect, and physical illness was assessed. In principle, the model aimed at evaluating central assumptions of the Self efficacy Theory of Bandura (1997) regarding the “negative” sources of self-efficacy beliefs, and the influence of self-efficacy beliefs on negative health outcomes. In this sense, Albert Bandura sustains that mood and affective states impact on self-efficacy judgments as follows: Induced positive moods enhance perceived efficacy, whereas induced despondent moods diminish self-efficacy beliefs (Bandura, 1997, p.112). According to Bandura, self-efficacy beliefs influence a number of biological processes that, in turn, influence health and disease. That is, the lack of perceived control over environmental demands can increase susceptibility to infections and hasten the progression of disease. Interestingly, as Bandura suggests, a relation of reciprocal influence was supported between self-efficacy beliefs and negative affectivity. In concrete, self-efficacy beliefs predicted the *change* (the reduction) in negative affect, and negative affect explained the *change* (the decline) in self-efficacy beliefs. Moreover, while the hypothesis of bidirectional influence between illness and self-efficacy beliefs was not supported, the findings did provide evidence that self-efficacy beliefs influence in the *change* (the reduction) in four types of somatic disorders, namely, musculoskeletal pain, skin disorders, gastrointestinal complaints, and viral respiratory infections. As in the previous model, an additional fascinating aspect was that negative emotions explained the *change* (the increase) in physical illness at a later point in time. This finding replicates –once again- the already discussed results regarding central theoretical assumption of Lazarus (1991b) and holistic medicine, in the sense that unhealthy emotions conduce to illness.

While previous CLP models were designed considering a *pathogenic* approach, that is, with the aim of explaining why employees may or may not become sick (including the reversed consequences of negative health outcomes on antecedents), the third and the fourth CLP models (see section 5.4.3 and 5.4.4) were considered to be *salutogenic-oriented* and *positive-oriented*, since they concentrate on the positive aspects of health. Following this premise, the third model was specified to comprehend the interplay between self-efficacy beliefs, positive affect (PA) and quality of life (physical and psychological). Hypotheses concerning bidirectional causal paths among PA and self-efficacy beliefs were rejected. However, self-efficacy beliefs did work as an important source of PA; the stronger the sense of self-efficacy, the higher the positive affect six months later. More precisely, the *change*

(the augment) in PA was explained by the influence of the former level of self-efficacy beliefs. The relationship between PA and QoL was a further aspect contemplated into the model. Unexpectedly, the evidence suggested that QoL and PA were unrelated. A possible explanation for this result is that PA may depend more on the influence of personality factors than on the subjective perception of one's QoL. In fact, a relation of reciprocal influence was identified between self-efficacy beliefs and QoL, suggesting that self-efficacy beliefs predicted the *change* in QoL and vice versa. The findings add new evidence to the little theory and research about the consequences of *positive aspects* of personality on the perception of QoL. On the norm, QoL has been conceived to be function of negative indicators of health such as biological and physiological status and symptoms severity (see Smith et al., 1999).

In the last CLP model (see section 5.4.4), the idea was to provide new inputs to proactive coping theories regarding the positive sources and consequences of proactive coping. The evidence supported the hypothesis that proactive coping should conduct to higher PA as well as to higher QoL at a later point in time. In other words, those who engage in sustained efforts oriented to accomplish challenging goals, invest resources for further resources enhancement, and place themselves in positions that allow for risk minimization, will have a more pleasurable emotional life, and will get benefits of having a higher physical and psychological quality of life. This evidence supports, partially, the theoretical concept of *gain spirals* (Hobfoll, 2001), in the sense that those who engage in behaviors oriented to gain resources (namely, proactive coping) will also gain from the benefits derived from those behaviors. In concrete, proactive coping may generate *gain spirals* because it conduces to *gain* a better QoL, and this consequence, is also the "cause" of further use of proactive coping behaviors oriented to gain and so on. The question that remains, however, is why PA does not take part of the reciprocal influence, and why it was unrelated to QoL. In any case, a successful adaptation and gain spiral seems to be motivated by the use of *proactive coping*. The findings also speak in favor of the assumptions of Schwarzer (2000), suggesting that *goal management* (through proactive coping) initiates a constructive path of action and creates opportunities for growth, in order to assure progress and *quality of functioning*. Proactive coping, as demonstrated, conduces to productive arousal (positive affect), vital energy, and higher personal quality standards (including physical and psychological quality of life). This is also consistent with Schwarzer's assumptions about proactive coping.

Altogether, the *pathogenic*-oriented CLP models provided evidence supporting the hypothesis that work stress and negative affect are highly virulent mechanisms of human functioning, which conduce to the augment in the occurrence and recurrence of physical

diseases in people who work for manufacturing industries. Both, work stress and negative affect can be, consequently, considered a direct path through which employees will become sick. On the contrary, the *positive*-oriented CLP model suggested that self-efficacy beliefs and proactive coping are powerful components of human functioning, which lead to a more pleasurable emotional experience as well as to better standards in physical and psychological quality of life. Both, a strong sense of self-efficacy beliefs and a frequent use of proactive coping can be considered to be a route by which working people can stay and remain well.

### **6.6 Limitations of the study and issues of internal and external validity**

With regard to limitations, I would like to discuss three potential problems, which are also common to the field of applied health psychology.

First, the study developed here was based on self reports of work stress, personality traits, coping process, and health outcomes and quality of life across two measurement points in time, except for sociodemographic variables, and data of employee's rates in production (that were not analyzed here). In addition, the strategy of assessing psychological dimensions through scales measuring antecedent variables, mediating processes, and outcome criteria are further topics to be discussed. While a deep discussion on this topic is beyond the scope of this work, it is important to consider what Lazarus (1991b, p. 437-450), and Schwarzer and Schwarzer (1996) have already portrayed with property with regard unsolved dilemmas in measuring stress, coping and outcomes. With regard to antecedent variables such as beliefs, the problem is to decide which belief among the many should be considered most relevant in terms of adaptive functioning. This study emphasized on self-efficacy beliefs. In terms of coping, the question is whether proactive coping should be assessed by using a context-free format or a situation oriented one. This study has preferred the context oriented format in the questionnaires, but also giving to personality factors a leading role in the prediction of coping behavior. In spite of the use of self-reports measures, there are several attributes that make of this modality an attractive strategy when investigating samples greater than 500 individuals at two measurement point in time, namely the *economy of professional effort*, the *cost-benefit* of the strategy, they are also *highly transportable* and require few technology, and probably the most compelling feature is that the self-report arise from the individual experiencing the phenomena in question (Derogatis, 1982).

Second, this study has a quasi-experimental design, and it used neither a random assignment of subjects to groups nor the “manipulation” of the independent/dependent variables. For this reason, the concept of “causality” between predictors and dependent variables can not be fully addressed. Another issue to consider here is the design of mediational models (see section 5.3) that not controlled for Time 1 outcomes when trying to predict Time 2 outcomes. Once again, the reader should consider that the analyses presented in section 5.3 were conducted with the aim of assessing *predictive relations* and not the change in dependent measures as function of the level of predictors. Moreover, even after having used cross-lagged panel designs (which control for Time 1 outcomes), I am aware of the fact that my conclusions might be challenged due to the problem of unmeasured third variables. Nevertheless, given that negative affect has been considered to be one of the most important confounding variables in the work stress research domain (see Dormann, 1999), this study developed several models in which negative affect was included as a predictor into the CLP designs. In principle, this may give more consistency to results in the sense that the predicted *change* can not be attributed to spurious relations (see section 5.4.1 and 5.4.2). On the other hand, in work settings, true experiments are not very common, since there is a wide range of organizational and individual variables that cannot be just simply “manipulated” by the scientist. Thus, when compared to experimental studies, quasi-experimental studies are more likely to cover aspects that are relevant in every work life, and for this reason they have the reputation of having a higher “ecological validity”. With respect to external validity, that is, the extent to which my findings can be generalized, confirmatory research would be necessary, nevertheless, to further support the claim that psychological factors such as self-efficacy beliefs, proactive attitude, avoidance coping, and proactive coping do account for the occurrence and recurrence of health outcomes, positive and negative affect, and the increase (or decrease) and physical and psychological quality of life in other samples of working people. A pro of the current study, however, is that all data were collected from two different manufacturing companies, whereby the results may gain in generalizability, at least in Costa Rica.

## 6.7 Directions for future research

In analyzing possible research questions that remain, and potential tasks for future research, two general aspects, that can be considered a priority, were identified: First, how to close the gap between research results and concrete applications at the level of individuals and organizations. Second, the need to conduct further research to identify what is the role played by psychosocial factors *in the process of production*, namely the percentage of quality, and the percentage of accomplishment.

### 6.7.1 How to close the gap between research results and concrete applications?

In terms of applications of the findings discussed in sections 6.1 to 6.5, the question is whether the results reported by this study gave necessary and sufficient empirical evidence to design and implement intervention programs aimed at increasing positive affect, quality of life, and decreasing the occurrence and recurrence of stress-related complaints in working people. The second question is whether the solutions may be implemented through stress management strategies, and how these strategies should be implemented.

The following empirical evidence may be considered to be *necessary* to design and implement an intervention program aimed at enhancing well-being in workers of manufacturing industries: First, the evidence provided about the *general effect* of personal resources in the work stress-health outcomes interaction; second, the confirmation of the *buffer effect* of informational support (received advice) when crisis arises; third, the demonstrated damaging effect of work stress and avoidance oriented coping on health outcomes and quality of life; and fourth, the protective role played by self-efficacy beliefs, proactive attitude, and proactive coping in the promotion of health and quality of life.

As for the question of whether the evidence presented by this study is considered to be *sufficient* to design and implement intervention programs, my answer would be positive. However, there are still a couple of details that should be explored to make the results more consistent in terms of primary and secondary prevention. Freedy and Hobfoll (1994) found, for example, that nurses, who received training aimed only at enhancing their sense of mastery, got little positive influence on their ability to stave off burnout. However, when the intervention included both mastery and social support, there was a remarkable positive enhancement in their capacity to deal with chronic environmental stress. Based on the



evidence presented in former chapters, it can be sustained that the enhancement of self-efficacy beliefs through intervention programs would conduce to lower negative affect and less somatic disorders, irrespective of the level of stress that the employees may face at work. In addition, the results suggest that the increase in informational support would buffer the effects of work stress when the things get worse only. Therefore, as Freedy and Hobfoll (1994) propose, it would be ideal to investigate whether a combined intervention aimed at enhancing both self-efficacy beliefs and the mobilization of advice would conduce to a more positive influence on health, in comparison with an intervention designed only to enhance the sense of generalized and work-specific self-efficacy beliefs. In addition, the ideal strategy to implement such interventions is another topic for further research.

Another interesting facet is the virulent effect of work stress and avoidance coping vs. the benign influence of personal resources and proactive coping on health outcomes and quality of life. Multi-component prevention programs involving education, training of coping skills, cognitive restructuring have shown some initial promise in reducing the effects of work stressors. However, there is still very few evidence on whether the modification of coping behaviors conduces to an effective reduction in physiological variables and the perception of stress (Kaluza, 1997). Based on Bunce (1997) proposal, it would be of great relevance to focus on the moderators of change enabling greater understanding of the circumstances in which a particular stress management intervention is appropriate; and to examine the mediators of change thereby increasing our understanding of the psychological mechanism underpinning outcome change. This is consistent with the arguments of Freedy and Hobfoll (1994).

Theoretically, stress management research should be centered both on organization-focused strategies as well as on individual-focused strategies. Nevertheless, in the real world, a difficult task for health psychologists consists of convincing the organizational establishment of the urgent need to invest financial resources in modifying job and physical demands, or modifying the role and interpersonal demands (relationships) at work. In coping with these limitations, the most common strategy used by health psychologists has been to design and implement individual-focused strategies, if and only if, these interventions do not interfere with the production plans and production exigencies of the companies.

This problem brings us the need to conduct additional research to first demonstrate that human factors such as perceived stress, personality, coping, and social support, are also determinants of the percentage of quality and efficiency of an employee that operates a machine on a daily basis. By doing this, we may then proceed to design and implement

primary prevention programs aiming at training positive coping skills (proactive coping), modifying the negative responses (avoidance coping) to inevitable demands, and even attending the occurrence of already developed symptoms through therapeutic treatments. Consequently, the efforts oriented to the prevention of illness and the promotion of health should be also followed by stress management intervention research demonstrating that they are really effective in combating the pervasive effects of work stress on health and indicators of production. The problem requires realistic solutions to cope with the challenge of closing the gap between theoretical approaches, methods, research results, and the real world of manufacturing companies.

### ***6.7.2 What is the role played by psychosocial factors in the process of production?***

While there is a number of research questions that cannot be answered by the present study and remain a task for future research, two further concrete questions should be considered relevant tasks in forthcoming studies. The first one is whether avoidance-oriented coping conduces directly or indirectly (via diseases) to lower productivity (percentage of quality and percentage of accomplishment) over the time. The second one is whether proactive coping conduces directly or indirectly (via well-being) to higher productivity (percentage of quality and percentage of accomplishment) over the time.

A first direction for research will be to examine the path avoidance coping->illness->percentage of accomplishment, on the one hand, and the route avoidance coping->illness->percentage of quality, on the other. Several research questions take origin from previous routes. For instance, does illness influence the percentage of accomplishment and product quality? If so, are there significant differences between healthy employees and those who have experienced illness? To what extent illness *mediates* the effects of proactive coping on the percentage of accomplishment and product quality? Does avoidance coping make individual contributions? A second direction for research will be to examine the path proactive coping->well-being->percentage of accomplishment, on the one hand, and the route proactive coping->well-being->percentage of quality, on the other. Here, several research questions remain. For example, do positive emotions and perceived quality of life conduce to higher productivity? Does proactive coping influence directly or indirectly (through well-being) the level of productivity? If so, what is the role played by personal and social resources in this process?

In sum, although the central hypotheses about the benign role of personal resources and proactive coping, and the pervasive function of avoidance coping in work settings have received direct support through the analyses presented here, many questions remain unanswered. In my view, two important questions are –perhaps- the most challenging to conduct future research. The first one is whether this work provides necessary and sufficient evidence to help in closing the gap between research results and concrete intervention research. The second is whether psychosocial factors, such as personality, work stress, and coping have to do in the prediction of concrete indicators of production, namely the percentage of quality and the percentage of accomplishment. Both aspects open a critical direction for future research.

Finally, and thinking always on the best things in life, it might be important to remind a proverb, which offers a simple explanation on how people can deal with the inevitable worries of modern working life:

***“You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your head.”***

