

Running-Head: Workplace Stress & Overall Distress

Psychological stress in hydro workers of the 1998 ice storm:
A longitudinal investigation

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Abstract

In the past few decades, it has become acknowledged increasingly that the workplace can be extremely stressful. Occupational stress research should further study the actual stressful transactions that take place between the workers and their workplace, and consider the roles of the subjective changes in the process of psychological stress. This project has been opportunistic because it was carried out following the Great Ice Storm of 1998, the worst to ever hit Eastern-Canada. To document some of the experiences of the hydro workers during and following the storm, the present investigators first identified their stressors, assessed their levels of psychological stress and distress, 5 and 10 months following the storm, and examined differences in psychological stress and distress levels between workers with different levels of exposure to the storm. Second, an assessment of the added contribution of appraised extra-organizational stressors to the prediction of psychological stress was targeted. Third, the added contribution of extra-organizational sources of support to the prediction of psychological stress, as well as its moderating role, were assessed. The main and final goals of the present study were to test an integrative model of workplace stress and overall distress, and further our understanding of the relations between psychological stress and psychological distress levels across time. The study involved 2 phases of data collection. All participants were full-time employees of Hydro-Quebec, the hydroelectric provider for the entire province of Quebec. In phase 1, 844 employees, 551 men and 293 women, filled out an abridged version of a questionnaire about stressors, cognitive appraisals, psychological stress, and symptoms of distress. In Phase 2, 499 participants, 346 men and 153 women, filled out the phase 1 measures, as well as others assessing for perceived social support, and other indicators of overall distress (i.e., job and life dissatisfaction). Even in the absence of pre-post ice storm data, the results shed

light on the different experiences of the recovery effort workers during and following the ice storm. Results not only revealed which variables were most indicative of psychological stress and distress (i.e., involvement in the recovery efforts through the “offices, posts, centers”, being a victim of the storm), but also pointed that the experiences of the various groups of workers varied depending on several factors such as the type/degree of involvement in the recovery efforts from the storm. In addition, findings highlighted the importance of considering appraised organizational stressors when predicting psychological stress. Moreover, results pointed to the significant association between the level of perceived organizational support, particularly from the supervisor, and psychological stress. Whereas the moderating role of perceived social support was not observed, its main effect on psychological stress was significant and substantial. Interesting associations were observed between the variables of interest (cognitive appraisals, perceived social support, psychological stress and distress) and statistical procedures led to a parsimonious and useful model of workplace stress and overall distress. Finally, psychological stress at phase 1 did not add significantly to the prediction of psychological distress at phase 2 (5 months later), once the contribution of psychological distress at phase 1 was accounted for. The implications of these findings, as well as the strengths and shortcomings of the present study, are reviewed in the discussion.

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Psychological stress in workers of the 1998 Ice Storm: A longitudinal investigation.

Work is often thought of as being challenging and satisfying in fulfilling an individual's needs and providing a sense of purpose, however, it has also become increasingly acknowledged that the workplace can be extremely stressful. Stress has indeed been recognized as a serious occupational health hazard (Allen, 2001; Brooker & Eakin, 2001; Cummings, 1990; Hobfoll, 1989; Karasek & Theorell, 1990; Kreps, 1990; Lazarus & Folkman, 1984; MacDonald, Karasek, Punnett & Scharf, 2001; Schabracq & Cooper, 2000; Wallis, 1983; Warr, 1982). Stressful work environments have been associated with a wide range of negative outcomes that impair the effective functioning of both employees and their organizations (Baba, Jamal & Tourigny, 1998; Bliese & Britt, 2001; Bozeman, Perrewé, Hochwarter & Brymer, 2001; Elangovan, 2001; Fielden & Cooper, 2001; Sargent & Terry, 2000; Shupe & McGrath, 1998; Yoon & Thye, 1999).

A wealth of research indicates that occupational stress can adversely affect physical and mental health (Burke, 1993; Cartwright & Cooper, 1993; Cooper, Dewe & O'Driscoll, 2001; Cooper, Cooper & Eaker, 1988; Douglas, Davey, Martin, Steptoe, Brunner & Marmot, 2001; Lee & Ashworth, 1993). Researchers have identified stress as causing somatic problems, including nausea, tension headache, migraine, muscular discomfort, general pain, cardiovascular disease, emotional exhaustion and burnout (Burke, 1993; Douglas et al., 2001; Hoiberg, 1982; Lee & Ashworth, 1993; Leiter & Schaufeli, 1996). Numerous psychological consequences of stress have also been identified. Stress is often associated with mental illness, low self-esteem, psychosomatic illnesses, worry, tension, anxiety, depression, and impaired interpersonal relations (Bussing, 1999; Di Salvo, Lubbers, Rossi & Lewis, 1995; Fielden & Cooper, 2001; Hart, 1999; Vermeulen & Mustard, 2000)

Workplace stress has also been blamed for a decrease in job and overall life satisfaction (Baba, Jamal & Tourigny, 1998; Elangovan, 2001; Fogarthy et al., 1999; Hart, 1999; Judge, Boudreau & Bretz, 1994; Shupe & McGrath, 1998). According to these researchers, work-related stress is considered to have both a direct and indirect influence on job and life satisfaction. The above-mentioned associations have been repeatedly observed across occupational settings and groups (Fogarthy et al, 1999; Hart, 1999; Judge, Boudreau & Bretz, 1994; Lance & Richardson, 1988; Lane & White, 1994; Lee & Ashforth, 1996; Nowack, 1991).

Increased labor turnover (Keita & Sauter, 1992; Perrewé, 1991; Quick, Murphy & Hurrell, 1992) and decreased levels of work performance (Cooper & Roden, 1985; Karasek & Theorell, 1990; Motowidlo, Packard & Manning, 1986; Packard & Motowidlo, 1987) have also been identified as consequences of occupational stress. Occupational stress is also thought to lead to an increase in the number of accidents, incidents involving aggression or violence, and theft in the workplace (Chen & Spector, 1992; Sutherland & Cooper, 1990).

There can be little dispute that occupational stress is indeed responsible for enormous humanistic and financial costs. For example, in terms of absence, retirement due to alcoholism, sickness and premature death, stress costs the United Kingdom more than \$4 billion per year (Cartwright & Cooper, 1994). Similar studies in Quebec (Canada) and the United States revealed that stress-related sickness and absence, reduced productivity, and related health and compensation expenses surpass \$440 million and \$150 billion a year, respectively (Karasek & Theorell, 1990; Vézina, Cousineau, Mergler & Vinet, 1992). It is further believed that over 60% of all work accidents are stress related. Additional indirect stress related costs include an increased level of substance abuse, rising divorce rates, and death from different cancers, particularly those affecting the lungs or skin (Cartwright & Cooper, 1994).

Occupational stress appears to be a growing concern as most organizations find themselves functioning in internal and external environments that are rapidly and constantly changing. Change and its concomitant uncertainty, however, are not thought as the leading sources of stress in the 1990s. More specifically, in order to survive, organizations had to become leaner and much more competitive. To do so, organizations mainly reduced the number of their employees. Not surprisingly, this had the effect of increasing individual workloads, as well as creating serious fears regarding future job security (Ashford, 1988; Cartwright & Cooper, 1994; Karasek & Theorell, 1990).

Whereas occupational research has targeted a better understanding of the detrimental effects of occupational stress on well-being, it has only more recently been attentive to the ways individuals appraise the work-related stressors they face, and the resources they rely on to cope with them (Collings & Murray, 1996; Frone, 1990; Perrewé & Zellars, 1999; Portello & Long, 2001; Schaubroeck, 1999). In fact, a review of occupational stress research reveals that focus has been mainly directed towards the organizational setting of work as stressful, less to person variables, and even less to the actual stress process (Beehr, 1998; Bozeman, Perrewé, Hochwarter & Brymer, 2001; Edwards & Rothbard, 1999; Lazarus, 1994; Perrewé & Zellars, 1999; Schaubroeck, 1999).

Traditionally, such research has treated the environmental and person characteristics as independent and static causes of psychological, physical and behavioral distress, such as illness, burnout, work dissatisfaction, absenteeism, and performance (Bliese & Britt, 2001; Derogatis & Coons, 1993; Elangovan, 2001; Fogarty, Machin, Albion, Sutherland, Lalor & Revitt, 1999; Holt, 1982; Kinichi & McKee, 1996; Monroe, 1989; Summers, DeNisi & DeCoitiis, 1994). Occupational stress research has somewhat neglected to study the actual stressful transactions

that constantly take place between the workers and their workplace, and has not fully considered the roles of the subjective (e.g., stress-enhancing cognitive appraisals, perceived social support) and temporal (e.g., repetitive assessments) changes in stress.

Few of these studies examined the psychosocial impact of occupational stress in the aftermath of a natural catastrophe that accentuates the demands and challenges employees are faced with. This project has been opportunistic because it was carried out in the context of the Great Ice Storm of 1998, the worst to ever hit Eastern-Canada, and which has put extreme demands on many workers. It also went beyond previous research investigating the stress phenomenon as it relates to the stressors from both organizational (i.e., work-related, specific to the ice storm) and extra-organizational (i.e., private-life) sources. The present investigation aimed at the synthesis of a prediction model of occupational stress and distress. More specifically, it attempted to assess the associations between the most important cognitive appraisals specific to the respondents' worst organizational and extra-organizational stressors, perceived social support from work and non-work domains, psychological stress and indicators of overall distress (i.e., psychological distress, job and life dissatisfaction). Considering how the stress process is subject to change, the relation between psychological stress and distress over time was investigated. Findings should further our understanding of the psychological implications of occupational stress and shed light on the "subjective experience" of workers within a large Canadian organization, in the aftermath of a natural disaster event.

CHAPTER I

THEORETICAL CONTEXT

The concept of stress has existed for over 500 years to represent a diversity of difficult circumstances (Cooper, 1998; Lazarus & Folkman, 1984). This thesis will focus on occupational stress. Our understanding of work-related stress, however, is heavily influenced by research done in the area of general stress. As such, the following pages will provide the theoretical foundation on which the thesis builds.

1.1 The Evolution of the Stress Concept

Nowadays, stress is often considered as the most common problem of everyday life. The label of “stress” is so universal that it is used as a verb when events are ‘stressing’ us, as a noun when we talk about being under ‘stress’, and as an adjective when almost everything in today’s life has become ‘stressful’ (Hobfoll, 1989; Holt, 1982; Lazarus & Folkman, 1984; Ross & Altmaier, 1994). Stress also seems to be conceptualized as hardship, adversity and affliction compared to most other ailments such as mental illness and psychosomatic distress (Lazarus & Folkman, 1984). To document the main theoretical and methodological advances in stress research, a brief review of the historical developments will be presented by focusing on three of the main models of stress. First, stress as a response of the individual. Second, stress as the accumulation of difficulties in one’s environment. Finally, stress as the interaction of characteristics of the person and factors in the environment.

1.1.1 Response-Definitions of Stress

The concept of stress is borrowed from the pure physical sciences. It still is believed that humans like most physical objects resist moderate outside forces or demands but eventually, at some point of greater pressure, lose their resiliency (Lazarus & Folkman, 1984). Although this analogy seemed logical, its adaptation to humans was found to be simplistic and inaccurate (Hobfoll, 1989).

Concepts such as strain, stress and load became, nevertheless, widely accepted within the medical field as they were established as the basis of illness during the 19th century (Hobfoll, 1989; Lazarus & Folkman, 1984). Walter Cannon, one of the first modern researchers to apply the concept of stress to humans in these terms, argued that although low to moderate levels of tension can be withstood, prolonged or severe stressors often lead to a significant malfunction of physiological systems (Hobfoll, 1989).

It is in the 1950's that Hans Selye conceptualized stress as a fixed set of physiological reactions that protect the body's processes from noxious physical or psychological stimuli (Selye, 1993). He named the somatic reaction to stress the *general adaptation syndrome* (GAS), then thought to be a universal physiological set of responses to any stressful demand (Selye, 1993). His model held that our body's adaptability is limited because under chronic stress, exhaustion eventually follows.

Although the GAS helped to identify some of the consequences of common work-related stressors such as excessive work, noise, cold, and dirt, it was deemed as inadequate in explaining individual reactions to complex job conditions influenced by factors external to the job as well as internal to the worker (Cassidy & Burnside, 1996; Perrewé & Zellars, 1999; Ross & Altmaier, 1994; Schaubroeck, 1999).

Throughout the first half of the 20th century, many psychologists have conceptualized psychopathology as the product of stress (Cassidy & Burnside, 1996; Derogatis & Coons, 1993; Ilfeld, 1976; Lazarus & Folkman, 1984; Monroe, 1989; Piotrowski & Lubin, 1990). More recently, however, some response-oriented researchers shifted the focus of their research to further their understanding of the “normal” or “adaptive” psychological response to stress. They mostly argue that stress is an adaptive process whose intensity is dependent upon the perception of the event by a particular individual. As such, measurement tools were developed to assess the non-pathological psycho-physiological response to stress within “normal” samples (Cohen, Kamark & Mermelstein, 1983; Lemyre, 1986).

1.1.2 Stimulus-Definitions of Stress

An as well-cited view of stress may be identified in terms of designating stress from the nature of the stimulus, as opposed to the response. In the 1930s, Adolf Meyer applied this concept to the study of stress in humans (Ross & Altmaier, 1994). His objective was to identify stressful events that might have served to cause the individual to be susceptible to diseases. Stimulus-oriented research broadened, as soon, to include minor and major events that sooner or later arise in almost everyone’s life such as death in the family, divorce, loss of a job, late for work, etc. Such events were represented as potential predictors of illness (Holmes & Rahe, 1967; Rahim & Psenicka, 1996; Wright, Bengtson & Frankenberg, 1994).

Modern researchers supporting this definition of stress have mainly focused on pinpointing the potential sources of stress. It was held that events were considered stressful if they normally led to stress outcomes such as psychological distress, emotional setback, physical impairment or decadence, then the stimulus is considered as a stressor (Hobfoll, 1989; Ross & Altmaier, 1994). It was also generally argued that the cumulative adverse effects of most

stressful life events decrease the individual's resistance to disease in a nonspecific fashion, increasing one's susceptibility to illness (Derogatis & Coons, 1993). For instance, Ilfeld (1977) observed that stressful events are significantly related with the presence of depressive disorder and other psychiatric disorders, a finding confirmed by many others (Baba, Jamal & Tourigny, 1998; Barrett 1979; Bliese & Britt, 2001; Lazarus & DeLongis, 1983; Sargent & Terry, 2000; Warheit, 1979).

As such, many researchers developed reviews outlining different life events that are thought to lead to stress (Cartwright & Cooper, 1993; Cooper & Bramwell, 1992; Cooper & Lewis, 1993; Elliot and Eisdorfer, 1982; Holt, 1982; Schwartz & Stone, 1993; Summers, DeNisi and DeCotiis, 1994). For example, Holt (1982) presented a detailed list comprising several occupational stressors including the physical properties of the working environment, time pressures, work overload, loss of job, demotion, promotion, monotony, job complexity, etc.

A number of researchers doubt, however, the strength of the relationship between stressful life events and psychological symptoms arguing that such measures are confounded with symptoms of psychological distress, rendering the correlation between psychiatric disorders and life events an overestimation (Cooper, 1988; Dohrenwend, Dohrenwend, Dodson & Shrout, 1984). Such critics of life events measures have seriously challenged some of the core assumptions of the approach, and have argued against the claim that the desirability of events was impertinent to their potential to evoke stress, and that solely the additive impact of life change related with the events was to be considered.

1.1.3 Interactional-Definitions of Stress

Unlike earlier definitions conceptualizing stress as an external stimulus, a physiological response, or an environmental condition, later definitions have emphasized the active role played

by the individual in the stress process (Cartwright, Cooper & Murphy, 1994). Supporters of the interactional perspective of stress claim that stress is best understood as resulting from the interaction or some imbalance between the individual and aspects of the environment. More specifically, it became acknowledged that the meaning individuals gave to a particular encounter is important in determining whether a situation is experienced as stressful and identified as a threat. This meant that different individuals are likely to perceive different situations as being stressful, and deal with those situations in a variety of ways (Cartwright, Cooper & Murphy, 1994; Perrewé & Zellars, 1999; Schaubroeck, 1999). Not surprisingly, research was rapidly targeted at understanding how people perceive different events, and at identifying which perceptions were more or less related to illness or distress (Edwards & Rothbard, 1999; Lazarus & Folkman, 1984; Portello & Long, 2001; Savoie, 1999; Sweet, 1998).

Researchers emphasized that their approach was a transactional one (Cox & MacKay, 1976; Derogatis & Coons, 1993; Lazarus, 1981; Lazarus & Folkman, 1984). They point to a dynamic model in which interactions take place between one's emotional, cognitive and perceptual functions, on the one hand, and the external environment on the other. The system is comprised of several feedback loops that allow for continuous contact among the constituents of the system and result in a dynamic and balanced state.

Once introduced, however, transactional theories were deemed impractical by some researchers due to the inherent difficulty involved in measuring a system that is thought to be continuously changing (Derogatis & Coons, 1993). In the early 1980's, however, supporters of the transactional approach developed research methodologies that not only considered but also better measured the ongoing interaction between an individual and the environment. Perhaps the most popular among such methodologies was the one proposed by Lazarus and Folkman (1984).

Based on the assumption that one's private beliefs about an event play a crucial role in determining the actual coping strategies that will be used, their model emphasizes the cognitive appraisal process involved when faced with any stressor. In addition, these authors argued that emotions are fused with cognitions and separation of the two may not occur in most situations. For instance, when an individual appraises an event as a threat, an emotional response often follows. The interpretation of this situation can be automatically associated with anger, fear, anxiety, and other emotions (Lazarus & Folkman, 1984). In fact, supporters of this approach have conceptualized stress as a subset of emotions and, in turn, used emotional states as indicators of psychological well-being (Lazarus, 1993a, 1993b).

Over the years, investigators have identified some of the common meanings individuals attribute to situations when appraising them (Dewe, 1993; Lemyre, 1986; Peacock & Wong, 1990; Scherer, Drumheller & Owen, 1993). Among the most accepted of such appraisal dimensions are threat, control, uncertainty, challenge, loss or harm, and gain or benefit. For example, in an interesting model proposed by Lemyre (1986), the Subjective Appraisal Rating Scale, 10 appraisal items representative of one's perceptions of Impact, Mastery, and Uncertainty were outlined. With such tools it became apparent that researchers were becoming more conscious of the complexity of the relationship between stress and well-being, and were now considering individual as well as environmental characteristics in understanding the process of stress.

1.2 Cognitive-Appraisal Models of Stress

As stated in the previous pages, endorsing a transactional approach in studying stress is important in order to better understand the complexity of the existing person-environment interaction. The stress model presented by Lazarus and Folkman (1984), will serve to integrate

the relevant person-environment factors into an exhaustive framework. As such, in the following sections, Lazarus and Folkman's model, and some of its variations will be briefly presented.

1.2.1 Lazarus and Folkman's Cognitive-Appraisal Model

As mentioned earlier, Lazarus and Folkman's (1984) transactional model of stress is probably still one of the most popular in psychology. The model conceptualizes stress as occurring when there is an imbalance between the perceived demands and resources, and emphasizes the ongoing nature of balance or imbalance. Environments are thought to influence people and vice-versa. As such, any person-environment interaction has implications for both the person and the environment.

This model holds that the stress process begins as soon as a person evaluates a particular situation, event, or demand. This evaluation, named primary appraisal, is mostly concerned with whether negative outcomes can result from a specific encounter. An encounter is more likely to be evaluated as stressful if the person-environment interaction involves harm/loss, threat, or challenge (Lazarus & Folkman, 1984; Lazarus, 1991; Folkman & Lazarus, 1988; Schaubroeck, 1999). Secondary appraisals follow primary appraisals, and are conceptualized as one's attempt to define what options are available and effective for dealing with the harm/loss, threat or challenge (Barone, 1995; Brief & George, 1994; Folkman & Lazarus, 1988; Lazarus, 1994; Lazarus & Folkman, 1984).

The flexibility of this model makes it both attractive and complex. With this model, one can view stress as the combination of personal issues and concerns, which continuously vary, and as the resources and responses that an individual can call upon in times of stress, which also change across time. In turn, the actual responses not only affect the initial encounter or stressor, but may also lead to a change in appraisal. Such a process is indeed transactional, where the

perceived balance of resources and demands defines stress. Specifically, stress is more likely to occur if the perceived demands exceed the resources available (Brief & George, 1994; Cassidy & Burnside, 1996; Lazarus, 1994; Ross & Altmaier, 1994; Schaubroeck, 1999).

Despite the widespread acceptance of Lazarus and Folkman's model, some researchers argue nevertheless that it is circular, complex and scientifically not given to rejection (Harris, 1994; Hobfoll, 1989; Trumbull & Appley, 1986). These investigators hold that it is circular because it does not conceptually distinguish between demands from resources, the two sides of the model. Within this perspective, the demand is conceptualized as that which is offset by the coping resources, whereas the coping resources are conceived as these that offset the demand or threat. Solely based on perceptions, this reasoning is thought to be circular in nature, and seems to lose some of the measuring advantages that stimulus-oriented approaches provide. An additional problem with this perspective is that the demand and the coping resources can only be determined following an encounter. In other words, one can only know whether a resource will help coping capacity after it is actually observed to counterbalance the demand in question. As such, with an overemphasis on the dynamic nature of the stress process, there is a definite lack of marker flags and reference points that can assist in organizing a useful taxonomy that will help to predict behavior resulting from interactions of different factors. This perspective is further criticized because it de-emphasizes the contextual environment. Even what is considered the environment is really the individual's perception thereof (Perrewé & Zellars, 1999; Trumbull & Appley, 1986). These researchers, as well as others (Brown and Harris, 1989; Savoie, 1999), have proposed to accompany the commonly used measures of stress with others which are more contextual in nature, that is which rely less on the respondent's limited evaluation of an event.

In summary, although the Lazarus and Folkman's model is criticized by some for being circular and somewhat complex, it is nevertheless deemed conceptually interesting. The model mainly suggests that person and situational factors are extremely intertwined, and their significance for stress derives from the subjective perceptions related to a specific encounter. Most importantly, a person's psycho-physiological well-being is dependent upon his/her most recent appraisals and will, therefore, fluctuate with the changing perceptions.

1.2.2 Stress-Enhancing Cognitive Appraisal Dimensions

Once introduced, Lazarus and Folkman's cognitive appraisal model generated much research. Investigators have focused on identifying the most important of the cognitive dimensions (Cassidy & Burnside, 1996; Fielden & Cooper, 2001; Gall & Evans, 1987; Lemyre, 1986; Peacock & Wong, 1990; Sweet, Savoie & Lemyre, 1999). As a result, numerous appraisal dimensions have been described and studied. These dimensions seem to be well reflected theoretically and empirically by three global cognitive dimensions: Perceived Mastery, Perceived Impact and Perceived Uncertainty.

Lemyre and her associates (1986) have analyzed a multitude of cognitive appraisals in order to develop a more parsimonious but as effective model comprising only three major dimensions. Among the dimensions that were studied were the appraisals of loss, danger, threat, challenge, unknown, importance, and positive as well as negative consequences. By way of factor analyses, Lemyre and her associates have identified three dimensions of appraisals that were shown to explain up to 60% of the variance and to be related to psychological stress (Biron, Truchon & Lemyre, 1992; Fillion, 1993; Lemyre, 1986). The first factor, Perceived Mastery, comprises the control and competence dimensions involved in appraising a situation. The second factor, Perceived Impact, includes the severity, negativity and importance attributed to an event.

The last factor, Perceived Uncertainty consists of dimensions such as the unknown and unpredictability. Based on these findings, Lemyre (1986) developed the Subjective Appraisal Rating Scale that consists of a list of 10 appraisal items representative of one's perceptions of Mastery, Impact and Uncertainty.

Another way of conceptualizing the combined contributions of the three mega-cognitive appraisals dimensions of Perceived Impact, Mastery and Uncertainty is by creating an index that would integrate the different perceptual dimensions specific to a situation into one overall or mega evaluation, and represent their overall relation with psychological stress. Considering them as potential stress-enhancing cognitive appraisals (SECA) emphasizes the notion that when the overall appraisal related to an event is more negative than positive, psychological stress is more likely to be experienced. Based on the theoretical propositions of Lemyre (1986) and Sweet (1998), higher levels of perceived impact and perceived uncertainty combined with lower levels of perceived mastery would lead towards higher levels of SECA, which in turn were expected to lead to higher levels of psychological stress.

Given that an integrative analysis of the cognitive appraisal dimensions has been rarely produced (Cassidy & Burnside, 1996), and that no occupational studies using the SECA grouping dimension were identified, the following sections will present a brief empirical review of the literature examining the relationship between each of the three appraisals (Perceived Mastery, Perceived Impact and Perceived Uncertainty) and stress. The SECA grouping was adopted in the present investigation also to facilitate the readers' understanding of the thesis results.

In the next three sub-sections, we will briefly review the theoretical and empirical support for these three major cognitive dimensions. This review will also examine the relationships between each of these three cognitive appraisals and psychological stress.

1.2.2.1 Perceived Impact and Stress

As mentioned previously, the perceived importance of a situation is postulated to be determinant in the experience of stress. According to Lazarus and Folkman (1984), an individual's commitments and goals determine to a certain extent the perceived importance of an event. Researchers have outlined similar perceptual dimensions such as Goal Significance, Importance, Pleasantness, and Valence; dimensions that play a central role in determining the impact of an event on one's present or future situation (Karasawa, 1995).

In light of previous research, it becomes evident that the perceptions of negative impact influence the relationship between a stressor and its detrimental consequences, particularly psychological stress (Sweet, Savoie & Lemyre, 1999) and distress such as mood disorders (Turk, Okifuji & Scharff, 1995), lack of self-esteem (Ireys, Gross, Werthamer-Larsson & Kolodner, 1994), and bodily illness (Goreczny, Brentley, Buss & Waters, 1988). On the other hand, perceiving the impact of an event as an opportunity or a challenge, instead of as undesirable and threatening, is often tied with lower levels of psycho-physiological distress (Crocker & Bouffard, 1992; Mishel & Sorenson, 1991).

Similarly, occupational stress research has also shown that encounters within the workplace that are perceived as threatening or implying an element of loss are related to increased stress levels, anxiety and other mood disturbances and/or reduced levels of self-esteem (Frone, Russell & Cooper, 1995; Ganster & Schaubroeck, 1995; Hudek-Knezević & Kardum, 2000; Hochwarter, Perrewé & Russell, 1995; Maurier & Northcroft, 2000; Portello & Long, 2001). Therefore, a past, present or anticipated event that is perceived as threatening and consequently as having more impact will most likely be accompanied by increased distress.

1.2.2.2 Perceived Mastery and Stress

The second of the major cognitive dimension, Perceived Mastery, has also received considerable attention. Researchers have used a variety of terms such as Mastery and Control to represent one's persuasion or belief of being able to influence a specific situation (Brosschot, Gebhardt & Godaert, 1994; Reed, Taylor & Kemeny, 1993).

The reviewed general stress literature seems to indicate that perceptions of control or mastery are related to increased psychological adjustment following exposure to daily hassles and more severe stressors (Felsten, 1991; Fielden & Cooper, 2001; Hobfoll & Walfisch, 1986; Jorgensen & Johnson, 1990; Long, 1998; Mischel & Sorenson, 1991; Perrewé & Zellars, 1999; Turk Okifuji & Scharff, 1995). Several of these researchers have investigated the mediating role of perceived control or mastery in the stress experience. They generally seem to agree that elevated perceptions of mastery or control specific to a stressor are less likely to be accompanied by negative psychological outcomes (i.e., symptoms of distress).

Occupational stress research has indicated that perceptions of mastery over aversive outcomes are stress-reducing whereas those of low or no mastery lead to increased stress (Bliese & Castro, 2000; Brooker & Eakin, 2001; Bussing, 1999; Hudek-Knezević & Kardum, 2000; Karasek & Theorell, 1990; Phelan et al., 1991; Vermeulen & Mustard, 2000). Such perceptions of control and mastery have been associated to adjustment in terms of physical and mental health in the context of stressors varying in severity and frequency, from the most common of stressors (Felsten, 1991; Folkman, Lazarus, Gruen & DeLongis, 1986) to the more serious ones (Jacobsen & DuCette, 1993).

1.2.2.3 Perceived Uncertainty and Stress

The third of the major cognitive dimensions, Perceived Uncertainty, has also been the focus of considerable research. It is proposed that perception of uncertainty can result from a lack of information, ambiguous outcomes, and the novelty or unfamiliarity of a situation (Mishel, 1988; Wineman, 1990). A review of the literature reveals a variety of terms that are conceptually closely related, and even interchangeable with the concept of perceived uncertainty. Among those are the notions of expectedness (Kiser et al., 1993), certainty (Anderson & Lyon, 1987), predictability (Katz & Wykes, 1985), and novelty or familiarity (Gardner, Ostrowski, Pino, Morrell & Kochevar, 1992).

It is suggested that as the degree of perceived uncertainty of an event increases so does the level of psychological distress and the experiencing of negative emotions (Hilton, 1988; Lemaire & Lenz, 1995; Tomaka et al., 1993). This is thought to occur because in such cases individuals cannot anticipate the impact of an event nor select an appropriate strategy to respond to it.

Commonly cited examples of perceived uncertainty within occupational stress research point to role ambiguity (Koslowsky, 1998), job insecurity (Maurier & Northcroft, 2000), and ambiguous relationships with work colleagues or supervisors (Beehr, Jex, Stacy & Murray, 2000; Frone, Russell & Cooper, 1995; Schwartz & Stone, 1993), as well as to their negative effects on well-being. These investigations, as well as others, have suggested that work situations that lead to unclear or ambiguous perceptions often generate greater levels of psychological stress. On the other hand, events or situations that are perceived as having greater levels of certainty or predictability are often accompanied by more positive emotions that, in turn, are associated with

decreased psychological stress and increased job satisfaction and performance (Cartwright & Cooper, 1993; Koslowsky, 1998; Vermeulen & Mustard, 2000).

1.3 Social Support

It became widely accepted by the scientific world that while stress is an important and inescapable human condition, how one perceives and copes contributes to how well an individual will adapt. With the increased interest in the relation between stress and illness, researchers have devoted considerable time to identify the detrimental effects of acute and chronic stress, and pin down the different resources that are commonly used to respond to various personal and extra-organizational stressors (Carlson & Perrewé, 1999; Machin, Albion, Sutherland, Lalor & Revitt, 1999).

Throughout the years, numerous researchers have investigated the respective effectiveness of different coping resources across various contexts (Bliese & Britt, 2001; Bliese & Castro, 2000; Sargent & Terry, 2000; Schirmer & Lopez, 2001; Terry, 1989; Yoon & Thye, 1999). Stress literature seems to suggest that social support is indeed one of the most important coping resources (Beehr, Jex, Stacy & Murray, 2000; Carlson & Perrewé, 1999; Cummings, 1990; Fogarty, Machin, Albion, Sutherland, Lalor & Revitt, 1999).

Social support has been broadly defined as “the resources provided by other persons” (Cohen & Syme, 1985). Different types of support have been identified such as instrumental support which refers to the provision of goods and services that help to solve practical problems and emotional support which reinforces an individual’s belief that he/she is cared for, esteemed and loved (Olson & Schultz, 1994).

While social support has been identified as one of the most important response resources to stress, a better understanding of its specific roles in the psychological stress process is still

targeted. In the next sub-section of this paper, a brief review of the major roles of social support (i.e., the main and stress-moderating function) within the occupational stress literature will be presented.

1.3.1 Social Support and Work: Main and Stress-Moderating Roles

It is often held that social support reduces the level of strain regardless of the intensity of the stressors experienced and that it buffers the relationship between stressors and stress outcomes (Beehr, Jex, Stacy & Murray, 2000; Carlson & Perrewé, 1999; Thoits, 1982; Vermeulen & Mustard, 2000). The main and stress-moderating effect models of social support represent such views. Whereas the 'main effect model' stipulates that social support reduces the adverse psychological impacts of exposure to stressful life events and daily hassles, the 'stress-moderating effect model' specifies that as social support increases, the magnitude of the stressor-distress relationship diminishes.

Research has mostly examined the buffering function of social support by using cumulative counts of stressful life events that combine events from different areas of life. For example, many studies report that close relationships such as marriage often are linked with lower rates of morbidity and mortality and increased feelings of well-being (Hannum, Giese-Davis, Hardin & Hatfield, 1991). In addition, some investigators indicate that a lack of confiding relationships may increase one's susceptibility towards depression and other mood disorders (Brown & Harris, 1982).

Fewer studies have focussed, however, on occupational stressors. Of those, a consistent number show nevertheless that the presence of social support at work can reduce occupational stress and lead to better health (Brotheridge, 2001; House, 1981). In fact, the data from a recent meta-analytic review (Carlson & Perrewé, 1999), based on the 65 studies focusing on social

support and occupational stress, supports the coexistence of both main and moderating models of support. Social support appears to act in different ways, the most important of which is to reduce strains ($r = -.21$). Its secondary role seems to alleviate the effects of stressors on strains (cumulated $R^2 = .03$). As important a result is that social support does not seem to function as a mediator or as a suppressor variable in the stressor-stress link.

Main and moderating effects of social support have been reported particularly on depression, anxiety, and irritation (Billings & Moos, 1984; Bourbonnais, Brisson, Moisan & Vézina, 1996; Bourbonnais, Comeau & Vezina, 1999; Brotheridge, 2001; Sarason, Levine, Basham & Sarason, 1983; Schonfeld, 2001; Vermeulen & Mustard, 2000; Winnubst, Marcelissen & Kleber, 1982). For instance, in a study examining the relationships among occupational stress, social support and health in ancillary personnel, findings revealed that those with supportive work-based social networks reported significantly better health than those lacking such networks (Browner, 1987). In other words, staff with supportive social networks reported fewer organic and emotional difficulties, as well as past illnesses than did their colleagues without such support systems. Similarly, research findings emanating from the responses of 1363 nurses suggested that nurses who reported higher levels of perceived organizational support also reported lower levels of distress (i.e., psychosomatic symptoms, psychological burnout) and higher levels of job satisfaction (Burke & Greenglass, 2001). Likewise, Dolan, Ameringen and Arsenault (1992) reported that, in relation to job demands, higher levels of perceived social support from supervisor, colleagues or family were related to lower levels of depression, irritation, and anxiety. Finally, Russell, Altmaier and Velzen (1987) provided additional support for the buffering role of social support in dealing with work-related stress. They observed that social support received from supervisors was found to be a significant

predictor of burnout among the 316 public school teachers who participated in their study. More specifically, teachers with supportive supervisors reported less emotional exhaustion, and more positive feelings of accomplishment.

In a longitudinal study, Carayon (1995) investigated the chronic effects, over a three-year period, of occupational stressors on strain experienced by a group of 76 office workers from a public-service organization. Of particular interest, the role of social support in the stress-strain link was assessed. It was reported that workers with high levels of social support, particularly from their supervisor, during the entire study period reported lower levels of stress than the rest of the participants. In addition, individuals who reported low or medium levels of support also reported the highest levels of stress. These results suggest that supervisor social support is a positive factor that if sustained over time, can buffer the individual from some of the consequences of work-related stressors. Moreover, results support the claim that the lack of social support, particularly from one's supervisor, may act as a chronic occupational stressor.

Other occupational researchers have also investigated the relationship between supervisory support and employees' reported stress and job satisfaction levels. In general, the findings emanating from such studies point to the stress-buffering role of supervisory support (Beehr, King & King, 1990; Bliese & Castro, 2000; House, 1981; Sargent & Terry, 2000; Vermeulen & Mustard, 2000; Yoon & Thye, 1999), and highlight the significant positive correlation between supervisory support and job satisfaction (Allen, 2001; Griffin, Patterson & West, 2001; Sargent & Terry, 2000; Schirmer & Lopez, 2001).

Some investigators have failed to observe, however, the stress-buffering properties attributed to social support (Beehr & McGrath, 1992; Ganster, Fusiler & Mayes, 1986), and still others are reporting 'reverse buffering' effects (Kaufmann & Beehr, 1986). In such studies,

social support seems to strengthen the relationship between job stressors and strain. For example, Kaufmann and Beehr, (1986) investigated the effects of two forms of social support, tangible and emotional, in relation to different occupational stressors. Interestingly, among the 102 nurses tested, it was under high levels of social support that the stressor-strain relationships were stronger. In other words, it seemed that particularly when the nurses experienced increased stress, social support made things even worse. The authors, in turn, suggested that the moderating functions of social support differ across situations and, as such, shouldn't always be considered as buffering the individual from the effects of on and off-the-job stressors.

Although such findings might seem contradictory at first, they point to the idea that social support may take more than one form and that the form it takes might determine whether or not it buffers the individual from the detrimental consequences of the stressors that he/she faces. Besides taking different forms, social support can come from different sources such as supervisors, family, colleagues, and friends, and some of these sources have been identified, at times, as more effective for dealing with certain types of stressors. For example, some researchers have suggested that colleagues and supervisors are particularly important for relieving the effects of occupational stress (Bliese & Castro, 2000; Brotheridge, 2001; Sargent & Terry, 2000; Schonfeld, 2001; Yoon & Thye, 1999).

Of the occupational studies that targeted domain-specific stressors, most have focused solely on occupational stressors. Not surprisingly, very little is known about the stress-buffering function of social support when paired with both intra (e.g., work overload, job insecurity, role ambiguity) and extra-organisational (e.g., divorce, illness, house renovation, loneliness) sources of stress (Edwards & Rothbard, 1999; Phelan et al., 1991; Schonfeld, 2001). With recent socio-economic trends indicating that work and family are becoming increasingly stressful, it is not

surprising that more research investigating the unique and added contributions of social support from both extra-organizational and organizational sources to the stress-strain relationships are needed (Edwards & Rothbard, 1999; Lundberg, 1996). For now, it is important to use extreme caution in interpreting the results of different studies relating to social support. More specifically, it is important to consider not only what type of social support is measured, but also who the provider as well as the receiver of the support is. Finally, the circumstances under which the support is provided should also be considered.

1.4 The Context of Occupational Stress

As mentioned, stressful occupational settings have been repeatedly linked with numerous negative outcomes that impair the effective functioning of both organizations and their employees (Baba, Jamal, & Tourigny, 1998; Beehr, Jex, Stacy & Murray, 2000; Bliese & Britt, 2001; Brooker & Eakin, 2001; Sargent & Terry, 2000). In addition, occupational stress appears to be a growing concern as most organizations find themselves functioning in environments that are rapidly and constantly changing (Ashford, 1988; Cartwright & Cooper, 1994; Karasek & Theorell, 1990; MacDonald, Karasek, Punnett & Scharf, 2001).

A review of occupational stress research suggests that little attention has been given to the study of the actual stressful transactions that take place between the workers and their workplace, and that the roles of the subjective (e.g., stress-enhancing cognitive appraisals, perceived social support) and temporal (e.g., repetitive assessments) changes in stress have not been fully considered (Bozeman, Perrewé, Hochwarter & Brymer, 2001; Edwards & Rothbard, 1999; Lazarus, 1994; Perrewé & Zellars, 1999; Schaubroeck, 1999).

The modern approach to stress research, the transactional approach, that was described in the earlier sections of the document serves as a general framework for the present project. It is

adapted, nevertheless, to the study of occupational stress encountered by Canadian workers within a large organization. Given that the present study is based on employees of a large organization, the next subsection will briefly describe the sources of stress that are common in such work environments.

1.4.1. Sources of Occupational Stress

Although stress may have common manifestation and symptomatology (e.g., irritability, increased blood pressure, insomnia, mood disorders and general psychological distress), the sources of occupational stress are increasingly numerous and diverse in nature, rendering their identification extremely difficult for organizations and their workers. This, in turn makes it even harder to generate effective strategies to deal with such stressors (Cartwright & Cooper, 1993).

Even though stress has been considered by many as resulting from an imbalance between personal resources and situational demands (Theorell & Karasek, 1990), occupational researchers remained determined in their search for general and supposedly more stable sources of occupational stress. As such, throughout the years, a multitude of stressors were identified and categorized according to their nature (Holt, 1982; Parker & DeCotiis, 1983; Vézina et al., 1992; Zandler & Quinn, 1962). For instance, in the early 1960's, investigators already reported an association between psychological distress and workplace sources of stress such as role ambiguity, shift work, lack of autonomy, rapid technological change, and lack of competence feelings (Zander & Quinn, 1962). Two decades later, Holt (1982) presented an elaborate list comprising several occupational stressors in which he differentiated the contextual stressors from the subjective ones. The contextually defined stressors included the physical properties of the working environment, the time variables, the social and organizational properties of work and its setting, and changes in job. In contrast, the subjectively defined ones comprised the role related,

person-environment fit, and miscellaneous stressors. Similarly, Parker and DeCotiis (1983) introduced a theoretical model including both the causes and consequences of stress. Six general categories of occupational stressors were identified: (1) “conditions associated with the organization’s structure, climate, and information flow”, (2) “characteristics and conditions of the job itself”, (3) “relationships at work”, (4) “role-related factors”, (5) “external commitments and responsibilities”, and (6) perceived career development.

In a review of the literature, Cummings (1990) suggested that of all sources of work-related stress identified to date, the most common ones were role conflict and ambiguity, underutilization of skills, work overload, resource inadequacy, and lack of participation. Following a thorough investigation of stress and mental health in Quebec, Vézina et al., (1992) identified the eight most common sources of occupational stress. Their list included the following stressors: (1) repetitive work, (2) communication problems, (3) role ambiguity and role conflict, (4) work overload, (5) work in public relations, (6) alternating work shifts, (7) work in a dangerous environment, and (8) contact with chemical agents. More recently, Cartwright and Cooper (1997) have identified six main work-related stressors including (1) factors intrinsic to the job, (2) roles in the organization, (3) relationships at work (i.e., those with supervisors, colleagues, and subordinates), (4) career development issues, (5) organizational factors (i.e., structure, climate and culture of the organization), and (6) the home-work interface.

In general, such global categories of occupational stress have been repeatedly identified as powerful determinants of distress (Baba, Jamal & Tourigny, 1998; Cartwright & Cooper, 1993; Schwartz & Stone, 1993). The idea that some work conditions generally result in dysfunction is simplistic and only serves as a road map of the typical stressful job encounters. According to Lazarus (1994), excluding the most destructive and tyrannical of work

environments, which tend to be less common and whose negative characteristics are easily identifiable, less than 50% of individuals will respond similarly to the same environment. Psychological stress and its effects seem to vary considerably across individuals. Not only will the sources of stress likely vary between types of occupations and between organizations, but even between departments or workers within the same organization (Cooper & Bramwell, 1992; Duffy & McGoldrick, 1990). In addition, these differences between and within organizations vary across time (Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus, 1994). Consequently, the strategies required by an organization to reduce or eliminate stress will vary according to the sources of stress operating at a particular time.

In addition, many of the investigations focusing on determining the causes or sources of stress have failed to ask workers for their views on what is stressful to them, and have instead asked different employees to respond to a list of causes that the researcher perceived as potentially stressful (DiSalvo, Lubbers, Rossi & Lewis, 1995). Researchers are acknowledging more than ever that it is crucial to assess what workers actually perceive as stressful instead of only relying on the investigator's hunches or inferences of what is stress-inducing, and that this is possible by adopting more open-ended respondent-based research methodologies (Bryman, 1988; Di Salvo, Lubbers, Rossi & Lewis, 1995; Stano, 1983).

In light of previous research, it is suggested that although knowledge of what is generally considered stressful can serve as a road map, it is nevertheless crucial to also consider what the workers perceive as stressful. As such, some of the most influential theoretical models of work-related stress, including Lazarus and Folkman's transactional model of stress, will be presented in order to better describe the role of cognitive appraisals or perceptions in determining the "stressfulness" of occupational and off-job stressors. Some measures that emanated from the

transactional approach will also be reviewed. The next subsection will first discuss, however, why it is also important to consider stressors that are not specific to work when assessing workers' psychological stress.

1.4.2 Stressors Not Specific to Work

Whereas most, if not all, investigators agree that workers are also confronted with a caveat of off-job stressors that can influence their performance at work, many tend to overlook one type at the expense of the other (Dewe & Guest, 1990; Fielden & Cooper, 2001; Latack & Havlovic, 1992; O'Driscoll & Cooper, 1994; Westman, 2001). Neglecting off-job stressors in trying to reduce or eliminate organizational stressors is often counter-productive, and may lead towards an incomplete and unrepresentative portrait of the sources of stress of a particular organization.

In a longitudinal study, Schwartz and Stone (1993) found that for their community sample of working adults ($n = 42$), nearly 80% of all reported daily difficulties originated from the non-work domain. Marital tension and personal injury/illness were the two most frequently cited types of problems. For workers with similar problems, marital or pain-management counseling may be most appropriate before dealing with stressors that are more specific to work. This is in line with previous research investigating the problems presented to occupational counselors in the U.K. Post Office (Cooper & Sadri, 1991).

Given that most adults devote the bulk of their time and energy to their family and work responsibilities, it is not surprising that work and family have both been identified as potent sources of stress (Burke & Greenglass, 1987; Duxbury & Higgins, 1994; Duxbury, Higgins & Lee, 1994; Edwards & Rothbard, 1999; Zedeck, 1992; Westman, 2001). In fact, the recent drastic organizational cost-cutting measures (i.e., downsizing), observed in almost every North-

American industry, have resulted in heightened workloads and reduced job security for many workers (Edwards & Rothbard, 1999). In light of such trends, occupational researchers are pressed, more than ever, to consider both organizational and extra-organizational sources of stress when investigating the stress-strain relationship or in developing stress-management interventions.

Similarly, research targeting the quality-of-life of various working populations has repeatedly pointed to the important role that non-work sources of stress have on one's overall level of psychological well-being (Hart, 1999). In fact, such research findings seem to suggest that non-work sources of stress contribute just as much, if not more, than occupational stressors to people's overall levels of psychological well-being. According to the above-mentioned studies, more research is needed, nevertheless, in order to better understand the unique and added contribution of organizational and extra-organizational stressors in predicting both psychological stress and overall distress

In summary, it is extremely important to obtain a more accurate picture of the different sources of stress workers face. Besides considering the sources of occupational stress, it is also important to consider those that emanate from other life-domain. As mentioned, this can be achieved by simply asking the workers to describe their worst current stressors that are specific to different life domains (e.g., work-related, private-life).

1.4.3 Occupational Stress and Overall Distress

During the past few decades, researchers have tried to further our understanding of the detrimental effects of occupational stress on psychological well-being or overall distress (Brooker & Eakin, 2001; Cartwright & Cooper, 1993; Cooper, Cooper & Eaker, 1988; Edwards & Rothbard, 1999; Lee & Ashworth, 1993; Rahim & Psenicka, 1996; Schirmer & Lopez, 2001;

Westman, 2001). Several psychological consequences of occupational stress have been identified. In fact, stress has often been associated with mental illness, low self-esteem, psychosomatic illnesses, worry, tension, anxiety, depression, impaired interpersonal relations, and physical illness (Bussing, 1999; Collins & Murray, 1996; Di Salvo, Lubbers, Rossi & Lewis, 1995; Fielden & Cooper, 2001; Vermeulen & Mustard, 2000).

A review of the literature suggests that it is generally accepted that overall distress comprises both affective and cognitive components. Negative and/or positive mood has been associated with the affective component, and satisfactions with various life domains have been associated with the cognitive component (Baba, Jamal & Tourigny, 1998; Bliese & Britt, 2001; Edwards, 1992; Edwards & Rothbard, 1999; Elangovan, 2001; Fielden & Cooper, 2001; Fogarty et al., 1999; Hart, 1999; Schonfeld, 2001). Typically, symptoms of psychopathology (i.e., psychological stress, depression, anxiety, worry) have been used as indicators of negative mood, whereas indexes of job and life satisfaction have long been recognized as indicators of the cognitive component of overall distress.

Despite the importance of considering both the affective and cognitive components of overall distress when studying the outcomes of occupational stress, most of the above-mentioned studies have targeted either the affective or the cognitive components of overall distress. In addition, although the above-mentioned studies have heavily relied on indicators of negative mood to measure overall distress, few have distinguished conceptually between the immediate or intermediate outcome of stressors (i.e., state of psychological stress) and the ultimate or longer term ones (i.e., psychological distress, job and life dissatisfaction) (Hudek-Knezević & Kardum, 2000; Israel, House, Schurman, Heany & Mero, 1989; Koslowsky, 1998). According to the Lazarus and Folkman's model of stress, however, a state of psychological stress is mostly likely

to result in increased overall distress (i.e., psychological distress, job and life dissatisfaction) when stress-buffering resources are unavailable (i.e., a solid social support network).

In summary, to achieve a more comprehensive conceptualization of overall distress, it is important to consider both the affective (i.e., psychological distress) and the cognitive indicators (i.e., job and life satisfaction). It is also theoretically important to distinguish between the shorter (i.e., psychological stress) and longer-term outcomes (i.e., psychological distress, job and life satisfaction) of occupational stress in order to better understand the stress transaction. The next section will outline some of the most widely accepted models of work-related stress, and will identify some of their major strengths and shortcomings.

1.4.4 Towards a Transactional Model of Occupational Stress

One of the most widely accepted conceptions of occupational stress is the Person-Environment Fit Theory (French, Caplan & Harrison, 1982). Supporters of this model argue that work-related stress is defined in terms of job characteristics that present a threat to the worker due to a poor match between the his/her abilities and the demands of the job (Edwards, Caplan, Van Harrison, 1998; French, Caplan & Harrison, 1982). The resulting stress is, therefore, thought to arise from an incompatible person-environment fit that can, in turn, lead to psychological as well as physical distress. Research influenced by this model, has reported differences in the sources of work-related stress across organizational settings and occupational groups. For example, Hamer and Tosi (1974) reported that executives and managers tend to experience more role ambiguity whereas employees holding jobs involving less responsibilities experienced more role conflict, a finding that some researchers were not able to replicate (Jackson & Schuler, 1985; Koslowsky, 1998).

Within the same decade, Karasek (1979) developed a slightly different model, the Demand-Control Model. This model is probably the most frequently cited one in the field of stress and psycho-physiological health (Cooper, Dewe & O'Driscoll, 2001). According to Karasek's Model, interactions between job demands and level of decisional latitude (control) are considered as the main determinants of job-related psychological distress. In general terms, job demands refer to the psychological stress involved in managing the workload, and decision latitude refer to the worker's control over his or her work tasks (Theorell & Karasek, 1996). Different combinations of demand and control are thought to have different consequences. More specifically, strain is expected to be the lowest when job demands are low and job latitude is high, and the highest when the values are opposite. For example, high control and low demand seem to contribute to increased productivity and a lower risk of ill health. In contrast to other models, objective stressors or demands, rather than subjectively appraised ones, should be targeted as predictors in the Demand-Control Model.

Although it is true that objective indicators are deemed most important, they are frequently measured, however, through self-report questionnaires that reflect subjective appraisals of the situation. In fact, Karasek has even developed a standard self-report questionnaire, the Job Content Questionnaire, to measure psychological demands and job decisional latitude. Karasek's tool has become quite popular over the years, and has been used as an indicator of psychological stress across various work settings and occupational groups (Bourbonnais, Brisson, Moisan & Vézina, 1996; Brisson et al., 1998; Karasek & Theorell, 1990; Lerner, Levine, Malspeis & D'Agostino, 1995; Vermeulen & Mustard, 2000). Given its theoretical simplicity and widespread applicability, this model has been commonly used as a psychosocial predictor of physical health outcomes such as hypertension, cardiovascular disease

and high blood pressure (Riese, Houtman, Doornen, Lorenz & De Geus, 2000; Theorell, 1998).

In general, researchers seem to agree with the basic assumptions of this model stating that lack of control and autonomy inhibit the worker's motivation and learning, both of which are crucial if the stress that is related to the demanding job is to be successfully dealt with (Karasek & Theorell, 1990; Sauter & Hurrell, 1989; Wall, Jackson, Mullarkey & Parker, 1996).

Inspired by Karasek and Theorell's (1990) Demand-Control Model of stress, Vézina and his colleagues (1992) were also quite successful in introducing their own model of stress. Their model, the Integrative Approach, allows the identification of factors that are thought to mediate and moderate the consequences of occupational stress. Some of these factors (e.g., decisional latitude and social/organizational support) are thought to protect the individual against ill health, whereas others (e.g., repetitive work, role ambiguity, role conflict, work overload, work in public relations, etc.) are believed to make the person more susceptible to the adverse effects of work-related stress. Vézina and his associates acknowledge that other factors (e.g., cognitive appraisals) play a role in determining how an individual will respond to and, in turn, be affected by the stressors. They have not fully integrated them, however, into their model.

The Effort-Reward Model stipulates that the combination of high effort and low reward is likely to cause an imbalance that is experienced as a stressor (Siegrist, 1996; 1998). The formulation considers effort as both extrinsic (i.e., workload) and intrinsic (i.e., a need for control, personality trait). Typically, rewards include worries about salary, job stability, and job promotions. As such, an individual who has attained a high level of achievement but has not been rewarded (i.e., promotion, bonus) is likely to experience stress. Siegrist, the main advocate of this model, has highlighted, several positive associations between effort-reward imbalance and

ill health (i.e., myocardial infarction and cardiovascular disease) across various groups of workers (Siegrist, 1996,1998).

The models reviewed to date (the Person-Environment Fit Theory, the Demand-Control Model, the Integrative Model, and the Effort-Reward Model), are considered as providing very useful perspectives to conceptualize and measure work-related stress. Research within these perspectives have included the assessment of variety of contents such as organizational and job characteristics, competence or control over job demands, job satisfaction, worker skills, personality traits as well as health status. Some of these approaches have been criticized, however, for being somewhat incomplete and not sufficiently focused (Chemers, Hays, Rhodewalt & Wysocki, 1985; Cooper, 1998; Cooper, Dewe & O'Driscoll, 2001; Koslowsky, 1998). With the core assumption that the person-environment fit is static or stable across time, these models, like many others, have focused primarily on identifying the general conditions (e.g., work demands, decision latitude) that produce work-related psychological or physical distress. In other words, they emphasize the stable relationships between the individual and the working environment rather than the process in which stress is thought to change across occupational contexts. A static perspective of stress does not take into account, however, the constantly changing nature of organizational stress (Lazarus, 1994; Spielberger & Reheiser, 1994).

On the other hand, when applied to an occupational context, Lazarus and Folkman's Transactional Process Theory (1994) conceptualizes work-related stress as a process in which a transaction occurs between the worker and the environment. It distinguishes between (a) sources of stress, (b) the way they are perceived by a particular individual, and the (c) resulting emotional reactions; especially when a stressor is appraised as a threat. Such an approach requires a precise

analysis of the work-related elements that workers perceive as stressful, and an understanding of how each worker reacts to these stressors, always considering the worker's coping resources. As such, occupational stress is conceptualized mostly as an individual phenomenon in which a person's perceptions and coping resources mediate the relationship between stress and its consequences, particularly psycho-physiological distress.

In addition, the work environment offers particular advantages for transactional stress research (Barone, 1995). Stressors that are specific to a particular organization can be defined, observed and modified. It is also easier to observe or assess individuals in their workplace than in their home environment. As such, job stress can be related to different conditions between occupational groups, divisions or departments, or changed conditions within the organization and/or its employees (e.g., corporate takeover, reorganization, natural catastrophe, etc.). It is specifically the identification of such situation-specific factors that Lazarus and Folkman's approach proposes to investigate.

1.4.4.1 A Transactional Assessment of Work Stress: Measurement Issues

Only a limited number of occupational stress inventories that are in line with the transactional perspective of stress have been developed. Among the most popular of such measures are the Work Stress Inventory (WSI; Barone, Caddy, Katell, Roselione & Hamilton, 1988), and the Job Stress Survey (JSS; Spielberger & Reheiser, 1994). For example, the JSS was introduced to assess the perceived intensity and frequency of occurrence of working conditions that are likely to adversely affect the psychological well-being of employees who are exposed to them (Spielberger & Reheiser, 1994). It reflects well the psychological rather than the sociological perspective that is endorsed by Lazarus. With such an approach, the JSS, as well as the WSI, identified two main factors that were observed across many jobs. The first involves

appraised stress from organizational policies and supervision, and the second the pressures and risks experienced on the job (Barone, Caddy, Katell, Roselione & Hamilton, 1988; Spielberger & Reheiser, 1994).

Aiming different constructs than the WSI and the JSS, the Psychological Stress Measure (PSM) was developed by Lemyre, Tessier and Fillion (1990) to assess one's subjective experience of feeling stressed in terms of cognitive, affective, behavioral and physiological dimensions. The attractiveness of the PSM, over more specific work-related inventories such as the WSI and the JSS, is that it can be adapted to assess the stress experienced by individuals within and across different settings (e.g., private-life, work, etc.). This measure furthered our understanding of the non-pathological, although distinctive, psycho-physiological responses to stress (Lemyre, Tessier & Fillion, 1990). In addition, the PSM was validated and tested using a normal population consisting of university students, parents, policemen, teachers, and nurses with ages ranging between 18 and 65 years, in turn, rendering it generalizable to various samples and settings, including organizational one.

1.5 Towards a Model of Workplace Stress and Overall Distress

Throughout this document, the utility of the stress-enhancing cognitive appraisals and of perceived social support in predicting psychological stress and overall distress was highlighted. Several very interesting theoretical models of occupational stress and overall distress were described. Similarly, many studies targeting the roles of the different factors (i.e., social support, cognitive appraisals, overall distress) within such models have been reviewed. Most have not fully considered, however, the actual stressful transactions that take place between the workers and their workplace.

A brief review of the main shortcomings of the identified studies will be presented in the

next sub-section. Subsequently, a model of workplace stress and overall distress, the one tested in the present investigation, will be presented.

1.5.1 A Review of Shortcomings

Of the few identified studies that actually investigated the stress-enhancing role of cognitive appraisals specific to the work or/and non-work domains, it seems that none targeted simultaneously the three most important cognitive dimensions identified by Lemyre (1986), namely perceived impact, perceived mastery and perceived uncertainty. In addition, occupational stress research has not fully considered the complementary role of some of the stress-enhancing cognitive appraisals specific to one's worst overall stressors (organizational and/or extra-organizational) and social support from organizational and extra-organizational sources in predicting psychological stress and overall distress. For instance, researchers have neglected to study the added contribution of appraised extra-organizational stressors in predicting workers' psychological stress and overall distress (Fielden & Cooper, 2001; Latack & Havlovic, 1992; Westman, 2001). They have also typically focused on a few predetermined stressors without actually asking the respondents to identify their worst organizational and extra-organizational stressors (Cooper, 1998; Forsythe & Compas, 1987).

Although Lazarus and Folkman's (1984) model of stress suggests that a state of psychological stress may result in increased overall distress only when stress-buffering resources are unavailable, few studies have actually distinguished conceptually between the immediate or intermediate outcomes of stressors (i.e., state of psychological stress) and the ultimate or longer term ones (i.e., psychological distress, job and life dissatisfaction). Additionally, despite the importance of considering both the affective and cognitive components of overall distress when studying the outcomes of occupational stress, most of the above-mentioned studies have targeted

either the affective or the cognitive components of overall distress. Finally, given the scarcity of longitudinal designs in the occupational stress literature, the association between indicators of psychological stress and overall distress over time has long been neglected.

The next sub-section will present the model of workplace stress and overall distress that is proposed and tested in this thesis. By addressing some of the main shortcomings identified in the reviewed literature, the proposed model will hopefully further our understanding of occupational stress and overall distress.

1.5.2 The Proposed Model

Considering the theoretical strengths and shortcomings of the models of occupational stress and overall distress that were reviewed throughout this document, a model of workplace stress and overall distress was proposed and tested in the present investigation. This model represents mostly an integration of the theoretical works of Lazarus and Folkman (1984), Caplan and associates (1980), and Lemyre (1986), as well as an adaptation to an organisational setting. Such a model would explicitly consider the stress-enhancing cognitive appraisal grouping (SECA) specific to the workers' worst reported overall stressors, organizational or extra-organizational, their perceived social support from both organizational and extra-organizational sources, and the psychological stress and overall distress levels related to these evaluations.

The proposed model of workplace stress and overall distress, one that considers all the above-mentioned indicators, is presented in Figure 1. As illustrated, the model suggests different sources of influence on the stress process, of which the most important are the stress-enhancing cognitive appraisals and the perceived social support. Individuals are faced with different events or conditions, be they work-related or not, which are immediately subjectively appraised in function of the context, personal history and characteristics. This results in a mental

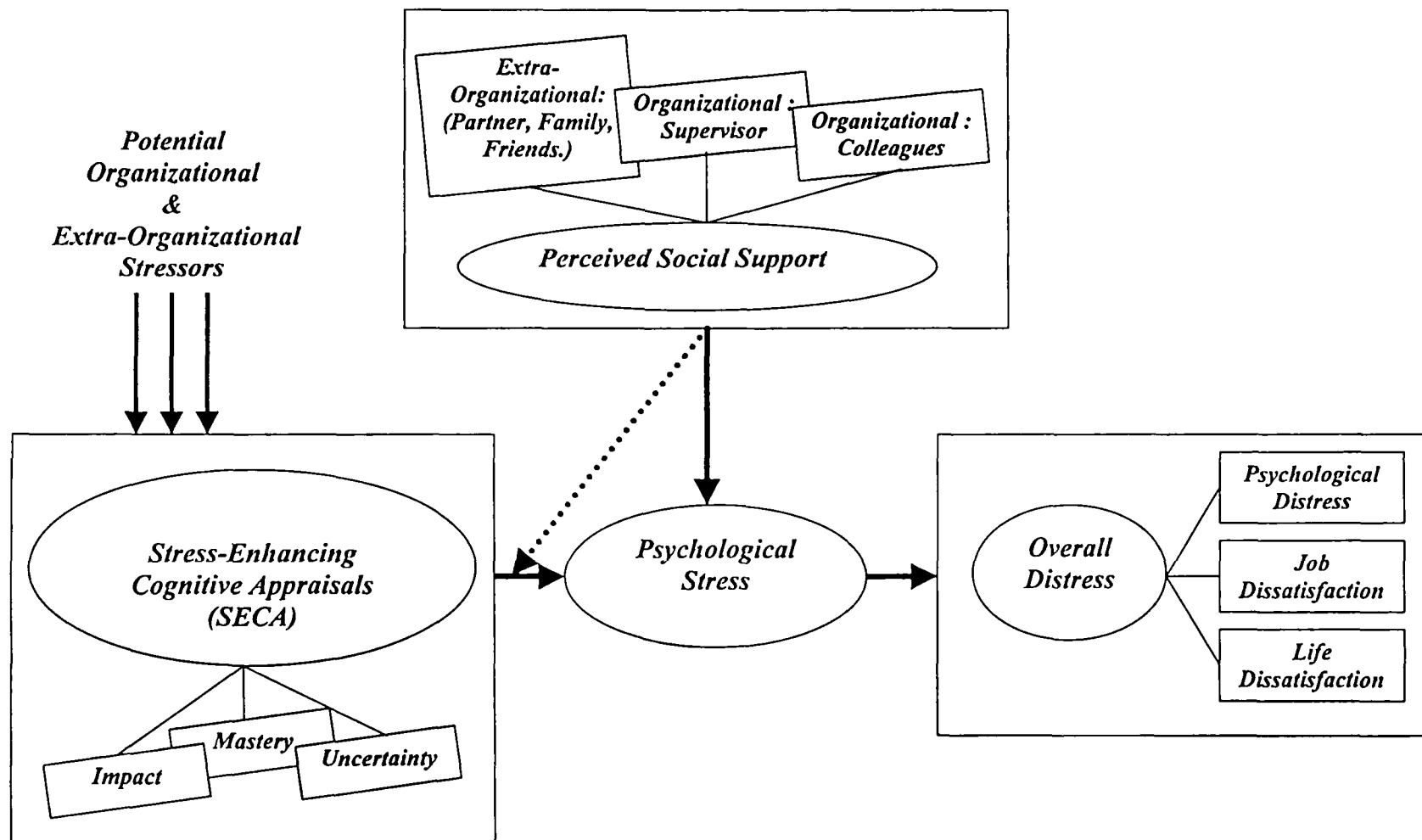


Figure 1. Proposed model of workplace stress and overall distress.

representation of the environmental stressors based on the actual context and on the individuals' perceived Mastery, Impact, and Uncertainty, which lead, in turn, to an increase or decrease of the level of state of psychological stress, manifested by way of affective, behavioural and physiological symptoms. When resources are unavailable (i.e., social support), such a state of stress may result in overall distress (i.e., psychological distress, job and life dissatisfaction).

The proposed model highlights and emphasizes the importance of considering (1) one's worst overall organizational (i.e., work-related) and extra-organizational stressors (i.e., personal) when predicting psychological stress, (2) the main and moderating effects of social support in the stressor-stress relation, and (3) the value of both extra-organizational and organizational sources of support in predicting psychological stress. All of these factors were deemed important to further understand the process of stress, as experienced by workers of a large Canadian organization.

The next sub-section will describe the context in which the proposed model of workplace stress and overall distress was tested. More specifically, the specific circumstances surrounding the present study will be described.

1.5.2.1 The Specific Context of the Aftermath of the Great Ice Storm of 1998

While waiting to test our proposed model of workplace stress and overall distress, a golden opportunity was presented to us, and we elected to use it as the specific setting to the test our model. More specifically, the present study was undertaken within a large Canadian organization and in the aftermath of the Great Ice Storm of 1998. This context was deemed to be well suited to show organizational demands.

On the 5th of January of 1998, the worst natural disaster to hit Eastern-Canada, the Great Ice Storm, brought weeks of darkness, extreme cold, power failures, physical destruction of

numerous power lines, business and transportation paralysis and a few cases of death. Unlike previous natural disasters, this one afflicted one of the most densely populated areas in Canada. Many journalists and reporters referred to the worst hit areas, particularly those in the south shore of the St. Lawrence River, as the Triangle of Darkness. Over 3 million people in areas of Quebec, eastern Ontario and New Brunswick had to cope with the detrimental consequences of the storm. Unfortunately, the death rate reached 25, many of them older adults who succumbed to hypothermia.

This catastrophe certainly affected the daily functioning of many large Canadian organizations. Business losses were huge. For instance, in Quebec the lengthy blackout occurred across an area that includes over 60% of the province's manufacturers. The Quebec Alliance of Manufacturers and Exporters reported that the storm resulted in excess of \$70 million a day in lost production. Some economists have predicted that the storm would slow economic activity throughout the year as organizations struggled to return to their full capacity, and workers made up for lost income by reducing spending. Later reports, however, seemed to contradict such predictions as an increase in economic activity was observed.

Most organizations had to shut down their operations for several weeks. Others, such as hydroelectric organizations, were led to significantly increase the workloads of their employees during and for a longtime after the storm in order to accelerate recovery efforts. In fact, six months after this storm, many hydro workers were still involved in recovery efforts from the storm. The present investigation targeted specifically one of the hydroelectric organizations that was greatly affected by the Great Ice Storm of 1998, and whose employees were significantly involved in the subsequent recovery efforts.

Very little was known about the psychological impact of the storm on Canadian workers involved in such recovery efforts. Psychological distress was a major concern due to the fatigue and stress involved with these extremely demanding recovery efforts. Although it was impossible to assess the direct psychological impact of the storm, it was, nevertheless, possible to screen for psychological stress and overall distress levels among such workers in the aftermath of this disaster, as well as to identify the stressors encountered by these hydro workers during and following the ice storm.

Considering these circumstances, this study was thought to be opportunistic in that it took place following a real-life event. Besides providing greater ecological validity, this context is thought to represent an ideal opportunity involving the unique combination of both threat and challenge. For instance, it is possible that during the early stages of the storm, the threat appraisals of these workers were probably enhanced, and that once climatic uncertainty decreased, the remaining recovery efforts were perceived as a challenge. This context certainly placed high organizational as well as personal demands on these workers and, as such, was deemed to be well suited to investigate the greater phenomenon of workplace stress and overall distress.

Before presenting the objectives and hypotheses of the present study, the literature focusing on work-related stress following natural disasters will be briefly reviewed. Such a review will emphasize the need for occupational stress research targeting personnel involved in non-traumatic recovery efforts from environmental disasters.

1.5.2.1.1 Work-related stress following natural disasters

The majority of the studies focusing on the impact of natural disasters on overall distress targeted the victims of such events (Baum et al., 1992; Knight, Katz, Heller & Bengtson, 2000;

Solomon et al., 1997). Few studies targeted the actual workers involved in the recovery efforts from various natural disasters. In fact, it seems that it is only during traumatic catastrophes involving multiple injuries and death that the overall distress levels of the rescue-workers became the focus of such investigations (Bartone et al., 1989; Nurmi, 1999; Stuhlmiller, 1994). No studies focusing on workers who were involved mainly in the recovery efforts from the environmental sequels of natural disasters were identified (Dixon, 1991; Duckworth, 1991; Hobfoll, 1991).

Researchers investigating stress caused by natural disasters generally agree that such catastrophes have negative effects on the physical and mental health of both victims and workers (Baum, 1991; Baum et al., 1992; Knight, Katz, Heller & Bengtson, 2000; Norris & Uhl, 1993; Nurmi, 1999; Vasquez, 2001). These effects are nevertheless smaller in magnitude and shorter in duration when the losses are less extensive, not traumatic, and the post-disaster period more predictable (Hobfoll, 1991).

Following certain catastrophes, even positive effects on the well-being of rescue-workers were observed. Such positive effects seemed more common, however, when the rescue workers reported higher levels of mastery and personal efficacy, and perceived their contribution as pro-social (Marmar, Weis, Metzler & Delucchi, 1996; Quarentelli, 1985). A review of the literature seems to reveal that the psychological stress of workers that were involved in intensive recovery of material damage in the aftermath of an environmental disaster has yet to be documented.

1.6 Objectives and Hypotheses

Given that this study was carried out following one of the worst ice storms in Canadian history, the overall goal of the study was to document the experiences of hydro workers during and following the storm, in terms of their reported stressors and psychological stress/distress, and in relationship to their exposure to the storm.

With the aim of better understanding the associations between the stress-enhancing cognitive appraisals, perceived social support, psychological stress and overall distress within an occupational setting, the main goals of the present study were to test a model of workplace stress and overall distress, and further our understanding of some of the relations between psychological stress and psychological distress across time. More specifically, the thesis aimed at testing the added contribution of the workers' worst overall appraised extra-organizational stressors to the prediction of psychological stress, as well as the unique and stress-moderating effects of the different sources of social support (family, colleagues and supervisors).

The overall goal of understanding the stress experience of workers dealing with such a crisis can be broken down into five objectives. In the following paragraphs, the objectives and hypotheses will be presented in a sequential order leading towards the main goal of the present investigation: testing the proposed model of workplace stress and overall distress. The rationale for the expected results will also be briefly reiterated.

Objective 1: To determine whether differences in psychological stress and psychological distress levels exist between workers with different levels of exposure to the storm.

Considering the context in which the following study was carried out, the first goal of the study was to document the experiences of hydro workers during and following the storm, and to determine whether differences in psychological stress and psychological distress levels exist between workers with different levels of exposure to the storm.

Based on research suggesting that the psychological effects on victims are shorter in duration when the losses are less extensive (Hobfoll, 1991), it was expected that workers in areas more severely hit by the storm would report significantly more psychological stress and distress than those in areas not hit by the storm. It was also hypothesized that workers who were more involved in the recovery efforts would report significantly more psychological stress and distress than those who were less/not involved. Finally, with time, all workers were expected to report significantly less psychological stress and distress.

Objective 2: To assess the added contribution of appraised extra-organizational stressors to the prediction of psychological stress.

Given that the “stressfulness” of an event is assessed through one’s appraisals of it, and that the reviewed research seems to suggest that stressors from the non-work domains contribute as much, if not more, to one’s overall distress, the second objective of the present study was to assess the added contribution of extra-organizational stressors to the prediction of psychological stress. As such, it was hypothesized that the added value of the stress-enhancing cognitive appraisals specific to the extra-organizational stressors to the prediction of psychological stress would be significant, once the contribution of the stress-enhancing cognitive appraisals specific to the organizational stressors has been accounted for.

Objective 3: To examine the added contribution of extra-organizational sources of support to the prediction of psychological stress, as well as to assess its moderating role.

Given that few studies have investigated the added value of perceived social support (PSS) from extra-organizational sources to the prediction of psychological stress (PSM), and that the moderating role of PSS in the relation between the stress-enhancing cognitive appraisals (SECA) specific to one's worst stressors and PSM remains to be tested, the third objective of the present section was to assess the added role of extra-organizational sources of support, as well as examine its moderating role.

Based on general and more specific research on social support, it was first hypothesized that the added value of PSS from extra-organizational sources (i.e., partner, family and friends) to the prediction of psychological stress, once the contribution of the PSS from organizational sources has been accounted for, would be significant and substantial. Second, the moderating role of PSS in the relation between the SECAs specific to one's worst stressors and psychological stress was expected to be significant and substantial.

Objective 4: To test an integrative model of workplace stress and overall distress.

The main objective of the present investigation is to test an integrative model of workplace stress and overall distress by describing the relations between the stress-enhancing cognitive appraisals of the worst reported stressors (organizational or extra-organizational), perceived social support from various sources (organizational and extra-organizational), psychological stress and overall distress.

Based on the theoretical review presented throughout this chapter, it was first hypothesized that the stress-enhancing cognitive appraisal specific to the worst identified stressors would be associated significantly and positively with psychological stress. Second, the association between perceived social support and psychological stress was hypothesized to be negative and significant. Third, the association between psychological stress and overall distress was hypothesized to be positive and significant. Fourth, the indirect effect of perceived social support on overall distress was expected to be significant and negative, whereas the one of the stress-enhancing cognitive appraisal to the identified stressors on overall distress was hypothesized to be significant and positive. Thus, psychological stress was expected to mediate both the impact of perceived social support on overall distress, and of the stress-enhancing cognitive appraisals on overall distress. Fifth, it was expected that perceived social support would add significantly to the prediction of psychological stress, once the contribution of the stress-enhancing cognitive appraisal specific to the worst reported stressors has been accounted for.

Objective 5: To assess the associations between psychological stress and psychological distress across time.

Considering few studies have targeted the stress-distress association across time, it was deemed interesting to further our understanding of the relations between psychological stress and psychological distress across time. It was expected that psychological stress would predict later distress above and beyond the initial distress level. Thus, the added predictive value of psychological stress at phase 1 was evaluated.

CHAPTER II

METHOD

2.1 Organizational Context

In the aftermath of the ice storm, Hydro-Quebec, the main hydroelectric supplier in the province of Quebec, became increasingly concerned about the psychological well-being of their employees who were reportedly showing signs of fatigue and discouragement. The study had to proceed as early as possible in order to screen for distress among the employees. In such a context of urgency, there was a need for a rapid assessment of different methodologies. Considering that the questionnaire needed to be brief and rapidly delivered, we selected at phase 1, as complete a methodology as possible, by fully considering, nevertheless, the psychometric aspects of the different instruments available within the literature. Consequently, only at phase 2 was it possible to include all of the measures included in the proposed model of workplace stress and overall distress, and to gather more demographic information.

2.2 Participants

Hydro-Quebec employs about 25 000 employees across the province of Quebec. In total, 2500 questionnaires were distributed at both phase 1 and phase 2 of the study. A computer-generated list allowed for a proportional and random selection of 10% of all of the organisation's employees based on their division of work, region of work, and occupational ranks (white collar = managers and professionals; blue collar = specialised workers, crafts and technicians; and pink collar = office personnel). Participants were solicited on a volunteer and confidential basis. They were also made aware that withdrawal from the study was possible at any time without prejudice. To ensure confidentiality, the organisation did not have access to any information that would make it possible to identify the respondents.

A total of 859 and of 536 employees participated in the first and second phase of the study, respectively. Of these employees, 348 participated in both of these phases. Overall participation rates were of 34.4% for phase 1, 21.4% for phase 2, 13.9% for the combined phase1-phase2 (p1-p2) dataset. Following data screening procedures (see preliminary analyses outlined in the Results Section), 16 participants were excluded from the sample of phase 1, 37 from the sample of phase 2, and 17 from the sample that participated in both phases 1 and 2.

For phase 1, the final sample (N=844) comprised 551 men and 293 women, ranging in age from 19 to 62 (M=41.81 years; SD=6.89). For phase 2, the final sample (N=499) comprised 346 men and 153 women, ranging in age from 19 to 63 (M=42.17 years; SD=7.05). As for the merged data set (phase 1 and phase 2 combined), the final sample (N=331) comprised of 223 men and 108 women, ranging in age from 19 to 63 (M=42.1 years; SD=7.06). All participants were full-time employees of Hydro-Quebec. The numbers and percentages (relative and overall) of men and women employees across the different occupational ranks for phase 1, phase 2 and the combined phase1-phase 2 (p1-p2) dataset, are presented in Table 1. The overall participation rates, as well as the ones by groupings (region of work, occupational ranks, and gender), for phase 1, phase 2 and the combined phase1-phase 2 (p1-p2) dataset, are presented in Table 2. Additional demographic information (civil status, parental status, educational level, occupational group, income, and region of work) specific to these samples is presented in Table 3. As can be observed in these tables, the three samples (phase 1, phase 2 and p1-p2 combined) do not differ substantially on any of the demographic information gathered.

2.3 Measures

2.3.1 Demographic Information

To gather general information about the participants, demographics questions covered the

Table 1

Frequency and percentages (relative and overall) of men and women across occupational ranks for the sample of phase 1 (p1), phase 2 (p2) and the phase1/phase2 merged dataset (p1-p2).

Occupational Rank	Participants			Relative Percentage (%)			Overall Percentage (%)		
	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)
White Collar (Managers/Professionals)	121	78	50				14.3	15.6	15.1
Men	106	70	46	87.6	89.7	92.0	12.6	14.0	13.9
Women	15	8	8	12.4	10.3	8.0	1.8	1.6	.9
Blue Collar (Specialized workers /Crafts/Technicians)	413	261	171				48.9	52.3	51.2
Men	335	203	134	81.1	77.8	78.4	39.7	41.0	40.5
Women	78	58	35	18.9	22.2	21.6	8.9	11.3	10.9
Pink Collar (Office Personnel)	301	148	106				35.6	29.7	32.0
Men	106	65	41	35.2	43.9	38.7	12.6	13.0	12.4
Women	195	83	65	64.8	56.1	61.3	23.0	16.7	19.6
Unidentified	9	12	4				1.8	1.0	1.5

Note. Relative Percentage = percentage relative to subgroup; Overall Percentage = percentage relative to total sample.

Table 2

Number and participation rate by groupings (gender, occupational rank, geographic zone) for the sample of phase 1 (p1), phase 2 (p2) and the phase1/phase2 merged dataset (p1-p2).

Occupational Rank		Participants				Participation Rate (%)		
		N targeted (N=2500)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)
Gender								
	Men	1715	551	346	223	32.1	20.2	13.0
	Women	785	293	153	108	37.3	19.5	13.8
Occupational Rank								
	White Collar (Managers/Professionals)	278	121	78	50	43.5	28.1	18.0
	Blue Collar (Specialized workers /Crafts/Technicians)	1233	413	261	171	33.5	21.2	13.9
	Pink Collar (Office Personnel)	913	301	148	106	33.0	16.2	11.6
	Unidentified		9	12	4			
Geographic Zone								
	Heavily hit by storm	1736	592	372	268	34.1	21.4	15.4
	Less/not hit by storm	764	252	140	63	33.0	18.3	8.2

Note. N targeted = total number of solicited workers.

Table 3

Additional demographic statistics for the sample of phase 1 (p1), phase 2 (p2) and for the sample of both phases 1 and 2 (p1p2).

Demographic Variable	Participants			Percentage (%)		
	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)
Civil status						
Married	<i>nc</i>	267	178	<i>nc</i>	53.5	54.6
Common law	<i>nc</i>	117	73	<i>nc</i>	23.4	22.4
Separated/ divorced	<i>nc</i>	62	42	<i>nc</i>	12.4	12.9
Single	<i>nc</i>	38	27	<i>nc</i>	7.6	8.3
Widow	<i>nc</i>	6	6	<i>nc</i>	1.2	1.8
Other	<i>nc</i>	9	/	<i>nc</i>	1.8	/
Parental status (# of children)						
0	<i>nc</i>	85	57	<i>nc</i>	17.0	18.0
1	<i>nc</i>	87	59	<i>nc</i>	17.4	18.6
2	<i>nc</i>	225	150	<i>nc</i>	45.1	47.3
3	<i>nc</i>	68	41	<i>nc</i>	13.6	12.9
>3	<i>nc</i>	13	10	<i>nc</i>	2.7	3.2
Unidentified	<i>nc</i>	21	14	<i>nc</i>	4.2	4.2
Occupation						
Manager	71	47	30	8.5	9.4	9.1
Specialized worker	202	129	85	24.1	25.9	25.7
Office Personnel	299	148	106	35.6	29.7	32.0
Craft	136	87	54	16.2	17.4	16.3
Professional	47	31	19	5.6	6.2	5.7
Technician	70	45	31	8.3	9.0	9.4
Other	15	12	5	1.8	1.0	1.5
Years of education						
< 13	<i>nc</i>	153	108	<i>nc</i>	31.6	33.5
13-15	<i>nc</i>	201	112	<i>nc</i>	40.2	33.8
>15	<i>nc</i>	145	102	<i>nc</i>	26.2	30.8
Unidentified	<i>nc</i>	15	9	<i>nc</i>	3.0	2.7

Note. *nc* = data not collected at phase 1.

Table 3 (continued)

Additional demographic statistics for the sample of phase 1 (p1), phase 2 (p2) and for the sample of both phases 1 and 2 (p1p2).

Demographic Variable	Participants			Percentage (%)		
	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)	p1 (N=844)	p2 (N=499)	p1-p2 (N=331)
Income						
<30000	nc	14	9	nc	2.8	2.7
30000 to 50000	nc	213	145	nc	42.6	43.8
>50000	nc	249	162	nc	49.9	51.27
Unidentified	nc	23	15	nc	4.6	4.5
Region of Work						
Bas St-Laurent	19	13	10	2.3	2.6	3.0
Montreal	390	220	150	46.2	44.1	45.5
Gaspésie	7	6	3	.8	1.2	.9
Saguenay Lac						
St-Jean	18	7	4	2.1	1.4	1.2
Outaouais	29	23	17	3.4	4.6	5.2
Chaudière/						
Apalaches	9	6	2	1.1	1.2	.6
Quebec	49	33	18	5.8	6.6	5.5
Abitibi-						
Témiscamingue	19	7	5	2.3	1.4	1.5
Laval	13	9	4	1.5	1.8	1.2
Mauricie						
Bois-Francis	36	22	15	4.3	4.4	4.6
Côte-Nord	25	12	6	3.0	2.4	1.8
Lanaudière	14	10	8	1.7	2.0	2.4
Estrie	30	15	13	3.6	3.0	3.9
North of						
Quebec	9	1	1	1.1	.2	.3
Laurentides	61	32	20	7.2	6.4	6.1
Montréal	116	63	46	13.7	12.6	13.9
Other	/	20	8	/	4.0	2.4

Note. nc = data not collected at phase 1.

following topics: sex, age, civil and parental status, educational level, income, occupation, and region of work (see Appendix A for Phase 1 questionnaire; and Appendix B for Phase 2 questionnaire).

2.3.2 Identification of the Worst Current Stressors

A self-identification strategy of the worst current stressors was employed in the present investigation. It consisted of asking participants to identify and describe the worst overall stressors (organizational and extra-organizational) they experienced during and following the ice storm (during the ice storm, 5 and 10 months later).

For each phase, all reported stressors were first sorted according to their main type: organizational or extra-organizational. Repeated readings of the complete lists of stressors led the researchers to group the reported stressors into specific organizational (i.e., work overload, job/position uncertainty, interpersonal tension/conflict in the workplace) and extra-organizational (i.e., family-related difficulties, health problems of self/family, financial difficulties) categories. In a few isolated cases of uncertainty, a consensus was sought between three researchers as to the exact category of a particular stressor. Whenever a reported stressor did not fit any of the identified categories, it was placed under the ‘miscellaneous’ category. Given the simplicity of the outlined stressor-categorization process, a consensus method was deemed sufficient.

Unlike the commonly used checklist method for the identification of one’s stressors (i.e., Holmes & Rahe, 1967), the open-ended question method used in the present study is less likely to bias the respondents’ identification process. In addition, this method is in line with Lazarus and Folkman’s methodology. It is an effective and direct method generating an excellent concordance with interview methods assessing stressful life events (Brown & Harris, 1978; Truchon & Lemyre, 1995). This method is particularly useful and efficient when analyses are

based on the worst stressors encountered or on infrequent non-normative specific situations (i.e., ice storm) (Cooper, 1998; Forsythe & Compas, 1987; Koslowsky, 1998).

2.3.3 Stress-Enhancing Cognitive Appraisal (SECA)

The Subjective Appraisal Rating Scale (SARS) was used to measure the participants' cognitive appraisals of specific stressors they face (Lemyre, 1986). For each identified stressor, the respondents evaluated the perceived impact, their feeling of mastery and their perception of uncertainty.

In its original form, the SARS consists of 10 items designed to assess the participant's appraisal of a particular event in terms of Negative Consequences, Positive Consequences, Loss, Danger, Failure, Challenge, Control, Coping Capability, Unknown, and Importance on a 8-point Likert scale (1 = "Not at all"; 8 = "Extremely"). Test-retest reliability of the SARS was repeatedly found to be satisfactory, with correlations ranging from $r = .61$ to $r = .86$ (Biron, Truchon & Lemyre, 1992; Fillion, 1993; Lemyre, 1986). Principal component factor analytic procedures indicated that close to 60% of the variance is explained by three orthogonal factors (Perceived Impact, Perceived Mastery and Perceived Uncertainty) (Lemyre, 1986). Inter-item correlations were low ($< .20$), suggesting the presence of three distinct factors (Fillion, 1993).

For the present study, the shortened version, consisting of the three items assessing one's perceived Impact, perceived Uncertainty, and perceived Mastery of a stressful encounter, was used as an overall indicator of the grouping of dimensions labelled SECA. As mentioned, based on the theoretical propositions of Lemyre (1986) and Sweet (1998), higher levels of perceived impact and perceived uncertainty combined with lower levels of perceived mastery were expected to lead towards higher levels of SECA, which in turn were expected to lead to higher levels of psychological stress. Across the samples of the present investigation, the 3 items

representing the SECA displayed moderately satisfactory levels of internal consistency (Cronbach's $\alpha > .65$), quite acceptable given the 3-factor solution of the SARS reported in previous studies (Lemyre, 1986; Sweet, 1998). Principal component factor analysis, with orthogonal varimax rotation of the 3 items representing the SECA, led to the extraction of one factor explaining close to 59% of the variance (see Appendix C).

2.3.4 Perceived Social Support (PSS)

The perceived social support questionnaire developed by Caplan et al. (1975) was used to measure social support from 3 sources (supervisors, co-workers, and 'spouse, friends and relatives') with 3 subscales assessing the worker's perception regarding the level of social support received. More specifically, these scales measure tangible, as well as emotional support provided by the different intra and extra-organizational sources of support already mentioned. Unlike many other tools that measure social support indirectly (e.g., number of social contacts), these scales were chosen because they directly assess the respondent's perception regarding the level of support received. Example items included: "How much can your (supervisor, colleagues, family) be relied upon when things get tough at work?" Responses were on a 5-point Likert scale (1 = "Not at all"; 4 = "Very much", and 5 = "Don't have such a response"). The responses are then summed across items for each scale. Psychometric properties of the scale have proven satisfactory (Um & Harrison, 1998). For instance, when the 3 dimensions of support served as indicators of the latent variable of social support, these authors reported reliability coefficient alphas that were above .80 for the 3 sources of support. The PSS has been used in several organizational studies (Cummins, 1990; Narayanan, Menon & Spector, 1999). In the present investigation, principal component factor analyses confirmed the presence of a three-factor solution (1. perceived social support from 'spouse, friends, and relatives'; 2. perceived

social support from supervisors; and 3. perceived social support from colleagues) explaining 68% of the variance (see section 3.4.1.1 for factor analyses). The observed internal consistency for the PSS was quite satisfactory (Cronback's $\alpha = .84$).

2.3.5 The Psychological Stress Measure (PSM)

To assess the phenomenological state of feeling stressed, the Psychological Stress Measure (PSM: Lemyre, Tessier & Fillion, 1991) was used. It is a self-report paper and pencil questionnaire designed to measure feelings of stress within normal or "non-pathological" populations in terms of somatic, behavioural, and cognitive-affective indices. The PSM consists of 49 items, each with an 8-point Likert scale (1= "not at all"; 8= "extremely"). Percentile norms were established across adult samples living in the Quebec province, Canada.

Several studies indicated that the PSM with its normal distribution has sound psychometric properties and can be adapted to the study of stress across various settings (Fillion, Tessier, Tawardos & Mouton, 1989; Fortier, Wright & Sabourin, 1992; Levesques & Lavallee, 1992; Lemyre & Tessier, 1988; Savoie, 1999; Sweet, 1998; Tessier, Fillion, Muckle & Gendron, 1990). For instance, across a 2-week, 1-month and 6-month span, its test-retest reliabilities were satisfactory ($r > .55$) (Lemyre, Tessier & Fillion, 1990; Fillion et al., 1989). The internal consistency of the measure was also highly satisfactory ($\alpha = .97$). Studies designed to test the hypothetico-deductive validity of the PSM demonstrated that levels of psychological stress increased as stressful events became temporally closer (Lemyre & Tessier, 1988). Reported findings indicate that the PSM has a convergent validity of $r = .73$ with the Spielberger Anxiety Scale, and of $r = .75$ with the Beck Depression Inventory (Dion, 1988). Such correlations are not surprising as individuals who experience anxiety and depression often also report an overall feeling of psychological distress. Tests assessing the divergent validity of the PSM suggested

that it is, nevertheless, conceptually distinct from anxiety and depression measures (Lemyre, 1986; Dion, 1988). Fillion and her colleagues (1989) also pointed to the concomitant validity between the PSM and salivary immunoglobulin ($r = -.25$) and serum immunoglobulin ($r = -.22$). Finally, the construct validity of the PSM was also found to be satisfactory. In fact, the PSM was sensitive to changes in psychological stress (Fillion et al., 1989).

Given feasibility concerns specific to studies conducted in the workplace, a new abridged 7-item version of the PSM was created following pilot trials. Following the recommendations of Carmines and Zellers (1979), it was based on their factor loadings, their item-total and inter-items correlations that the best 7 items (i.e., “I feel rushed, I do not seem to have enough time”; “I feel stressed”; “I feel preoccupied, tormented or worried”) were selected. Results emanating from prior data (Lemyre, 1986; Savoie, 1999; Sweet, 1998) suggested that this 7-item version correlates highly with the original 49-item scale ($r > .86$). In addition, across the samples of the present investigation, the items of the PSM displayed satisfactory levels of internal consistency (Cronbach’s $\alpha > .87$), inter-item ($r = .30$ to $.72$) and item-total ($r = .52$ to $.84$) correlations. Principal component factor analysis, with orthogonal varimax rotation of the 7 items representing the PSM, led to the extraction of one factor explaining close to 58% of the variance (see Appendix D).

2.3.6 The Overall Distress Index (ODI)

Overall distress was conceptualised as the theoretical and statistical (through the creation of a latent variable via structural equation modeling procedures) combination of three distinct measures: (1) the psychological symptom inventory (PSI), (2) the index of job satisfaction (IJS), and (3) the satisfaction with life scale (SWLS). Several studies defining an “overall distress level or index” as the combination of similar measures/constructs were identified (Baba, Jamal &

Tourigny, 1998; Dolan, Van Ameringen & Arsenault, 1992; Holtzman & Gilbert, 1987; Jamal & Baba, 1997; Long, Kahn & Schultz, 1992; Vézina et al., 1992). None of the identified distress indexes were based, however, on the combination of the exact same indicators used in the present investigation; making it presently impossible to compare the ODI scores of Hydro-Quebec employees with those of others. Considering established norms or values exist for each of the three well-validated measures of the ODI, the individual scores of these three indicators will also be interpreted. Factor analysis for the ODI as well as correlation matrixes for the three indicators of the ODI are presented in the results section (see 3.4.1.1).

2.3.6.1 Psychological Symptom Inventory (PSI)

One of the very few distress instruments that has been standardised for French-Canadians is the Psychological Symptom Inventory (PSI) (Enquête Santé Québec, 1987, 1992, 1998; Ilfeld, 1978; Kovess, 1985), an abridged and adapted version of the Hopkins Symptom Checklist (Derogatis et al., 1974). It was translated into French by Kovess and his colleagues (1985), and validated across Quebec residents. Given its frequent use as an indicator of psychological distress (Billette, Carrier, Bernier & de Seve, 1993; Boisvert et al., 1994; Dompierre, 1993; Dompierre, Lavoie & Perusse, 1994; Gelinas, Lussier & Sabourin, 1995; Lambert, Lussier, Sabourin & Wright, 1995; Rahim & Psenicka, 1996), and that norms were established across adult samples living in the Quebec province (Enquête Santé Québec, 1988, 1992, 1998), the translated version of the PSI served as a screen for psychological distress within the present study.

This version of the PSI is a self-report measure of the presence of common psychiatric symptoms, comprising 14 items (i.e., “During the past week, how often did you “feel lonely”, “have trouble remembering things”; “feel hopeless about the future”, “have to avoid certain

things, places, activities because they frighten you”, “feel easily annoyed or irritated”) on a 4-point answer scale (1 = “Never”; 4 = “Very Frequently”). Participants needed to indicate the answer that best described their health state within the preceding 7 days. Principal component factor analysis, with orthogonal varimax rotation of the items, lead to the extraction of 4 distinct theoretical constructs: depression, anxiety, anger, and cognitive disturbance (Ilfeld, 1978; Kovess, 1985; Maunsell, Brisson & Deschenes, 1989). As a test of internal consistency, the alpha coefficients for the 4 scales range from 0.72 to 0.82, with a global alpha level of 0.89 (Maunsell, Brisson & Deschenes, 1989). The PSI had comparable content validity as other frequently used scales (i.e., Radolff’s Center for Epidemiologic Studies-Depression Scale, Spielberger’s State-trait Anxiety Inventory), and met the majority of the DSM-IV criteria for depression and anxiety supporting its applicability for research purposes (Okun, Stein, Bauman & Silver, 1996). Convergent validity has been assessed by determining that symptoms relate significantly to 3 criteria: having recently used psychoactive drugs, having sought out professional help for emotional problems, and the interviewer’s rating of the respondents degree of tension (Ilfeld, 1976). In yet another test of validity, the PSI has correlated highly with measures of psychopathology (i.e, the Langer scale), and other indicators of health status (Ilfeld, 1977; Prévile, Potvin & Boyer, 1996). The Pearson correlation between scales was 0.82 and did not fall beyond 0.80 in partial correlations controlling for sex, age, and educational level. Discriminant analysis as well as specificity, sensitivity and concordance (kappa) tests have been calculated to be satisfactory (Kovess et al., 1985). In the present study, tests of internal consistency revealed global alpha levels $>.91$, well within the acceptable level. Principal component factor analysis, with orthogonal varimax rotation of the items, confirmed the presence of 3 theoretical constructs (depression, anxiety/anger, and cognitive disturbance)

explaining 64% of the variance.

2.3.6.2 The Index of Job Satisfaction (IJS)

The index of job satisfaction (IJS: Brayfield & Rothe, 1951) was used to measure the overall degree of job satisfaction of the participants. This index provides measures of the level of personal rewards from the work experience and measures of the organizational structure, process and environment. The IJS employs a five-point likert scale (1 = “Strongly Agree”; 2 = “Strongly Disagree”) to assess responses to 18 statements about work-related attitudes (i.e., “Most days I am enthusiastic about my work”). Half of the items are positively keyed. When summed, high total scores reflect higher job satisfaction and low scores lower levels of satisfaction. Used in a variety of contexts, the IJS has shown to have sound psychometric properties (i.e., reliability $\alpha = .87$) (Brayfield & Rothe, 1951; Fogarthy et al., 1999; Leong, 2001). According to these studies, the IJS has satisfactory content, construct and convergent validity as well as good reliability ($\alpha > .87$). In the present study, global internal consistency levels for the sampled participants were satisfactory (Cronback’s $\alpha > .89$). Principal component factor analysis, with orthogonal varimax rotation of the 18 items, led to the extraction of 1 main factor (overall job satisfaction) explaining close to 48% of the variance.

2.3.6.3 The Satisfaction With Life Scale (SWLS)

The satisfaction with life scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985) was used to assess the global level of life satisfaction. The SWLS has sound psychometric properties and is easy to administer (Blais, Vallerand, Pelletier & Brière, 1989). The index employs a 7-point Likert scale to assess responses (1 = “Strongly Disagree”; 7 = “Strongly Agree”) to 5 items measuring overall life satisfaction. Sample items included: “My life conditions are excellent”, and “I am satisfied with my life.” Scores are then summed with high scores related to high life

satisfaction and lower scores to lower life satisfaction levels.

The validated French translation of the scale developed by Blais, Vallerand, Pelletier and Brière (1989) was used. Its psychometric properties were proven to be satisfactory in several studies (Arrindell, Heesink & Feij, 1999; Blais, Vallerand, Pelletier & Brière, 1989; Dube, Lapierre, Bouffard & Labelle, 2000; Lennings, 2001; Pavot, Diener, Colvin & Sandvik, 1992; Vallerand & Bissonnette, 1990). Results from these studies suggested that the SWLS is a valid and reliable measure of life satisfaction, suited for use with wide range of adult populations and applications. The performance of the scale was comparable to other related scales (i.e., Philadelphia Geriatric Center), and it was shown to have high convergence with peer-reported measures of subjective well-being and/or overall distress and/or life satisfaction providing support that subjective well-being is a fairly global and stable phenomenon. In the present investigation, global internal consistency levels across samples were satisfactory (Cronback's $\alpha > .90$). Principal component factor analysis, with orthogonal varimax rotation of the 5 items, led to the extraction of 1 distinct theoretical construct (overall life satisfaction) explaining close to 72% of the variance.

2.4 Procedure

Prior to running this study, ethics approval was sought and obtained from the ethics committee of the university of Ottawa as well as from the internal one of Hydro Quebec. The study involved 2 phases of data-collection: Phase 1 (completed on June 1998), and Phase 2 (completed by November 1998). In Phase 1, 859 employees, categorised according to their occupational groups and regions of work, filled out an abridged version of a questionnaire comprising the SARS, the PSM, the PSI, and a series of questions assessing what their worst current organisational and extra-organisational stressors were (see Appendix A). All

questionnaires (as well as their respective return envelopes) were sent by the *Health and Security Services* section of Hydro-Quebec to the targeted sample of workers via their intra-mail services. In both phases, employees were asked to fill-out their questionnaire during their regular work hours. The present investigators picked up the returned questionnaires. All the questionnaires were stored in the researchers' laboratory at the University of Ottawa. In Phase 2, to further understand the elements that were investigated during the first phase, 499 participants filled out the same questionnaires of phase 1, as well as the IJS, the SWLS, and additional demographic information (see Appendix B). Given that only in phase 2 were all the variables of interest assessed, the data specific to this phase was used in order to test the model of workplace stress and overall distress. Of those who participated in phase 1, a total of 331 also participated in phase 2. The data based on these employees was used to investigate the longitudinal hypotheses stipulated across the different sections of the present study.

CHAPTER III

RESULTS

The present chapter will outline the results of the present study. To facilitate the reader's comprehension of the results, the analyses specific to each of the objectives will be dealt within five sections: 1) the Canadian Ice Storm: Stressors, stress & distress, 2) organizational and extra-organizational stressors as predictors of stress, 3) the added and moderating effects of perceived social support, 4) the model of workplace stress and overall distress, and 5) the prediction of distress from stress: a longitudinal contribution. A separate preliminary analyses and descriptive statistics summary will be presented within most of these sections, as they are based on different datasets.

3.1 The Canadian Ice Storm: Stressors, Stress & Distress

In an effort to document some of the experiences of the hydro workers, the first aim of the present section was to identify the worst stressors encountered by these employees during the long period of recovery efforts (which lasted over 6 months for some employees). The second was to assess, 5 as well as 10 months later, the levels of psychological stress (PSM) and of psychological distress (PSI) of these employees. The main objective was to examine whether, over time, any differences in psychological stress and distress levels existed between workers with different levels of exposure to the storm (as defined by geographical zones, direct contact with victims of the storm, type/degree/length of involvement in the recovery efforts, having been relocated, and having been a victim of the storm).

Based on related research (Baum et al., 1992; Hobfoll, 1991; Solomon et al., 1997), significant differences in PSM and PSI at phase 1 (5 months later) were expected between workers with different type/degree/length of exposure to the storm and involvement in the

recovery efforts. More specifically, it was first hypothesized that workers who were involved, at least to some extent, in the recovery efforts during and following the storm (i.e., direct/indirect involvement in the recovery efforts) would report significantly more psychological stress and distress than those who were less or not involved. Second, it was expected that the workers who were directly assigned to the recovery efforts (i.e., ‘on the fields/outside’ or ‘in the offices/posts/centers’) would report significantly higher levels of psychological stress and distress than those who were indirectly assigned to the efforts (i.e., slight changes in some of their routine work tasks). Third, in comparison to the employees who were directly involved in the recovery efforts ‘on the fields/outside’, those who were directly involved in the recovery efforts ‘in the offices/posts/centers’ were expected to report significantly lower levels of psychological stress and distress. Fourth, it was first hypothesized that workers who were in direct contact with victims of the storm were expected to report significantly higher levels of psychological stress and distress than those who were not. Fifth, employees who lived in the geographical zone that was “heavily hit” by the storm (i.e., Montérégie, Montreal, Outaouais, Laval, Lanaudière, Estrie, and Laurentides) were expected to report significantly higher levels of psychological stress and distress than those in the zone “less/not hit” by the storm (i.e., Bas St.-Laurent, Gaspésie, Côte Nord, Saguenay-Lac St-Jean, Chaudière-Apalaches, Quebec, Mauricie, Abitibi-Témiscamingue, and North of Quebec). Sixth, workers who were relocated from their workplaces due to the recovery efforts were hypothesized to report significantly higher levels of psychological stress and distress than those weren’t relocated. Seventh, employees who were still involved in the recovery efforts at phase 1 were expected to report significantly higher levels of psychological stress and distress in comparison to those who were no longer involved in such efforts. Finally, in comparison to the workers who were also victims of the storm, those who

were not were hypothesized to report significantly lower levels of psychological stress and distress. Given that significant decreases in the levels of PSM and PSI were expected once the bulk of the recovery efforts were completed, none of the hypothesized differences at phase 1 were expected to remain significant at phase 2 (10 months later).

3.1.1 Analyses

For this section, data analysis was based on the merged dataset (phase 1 and phase 2 combined) to investigate whether the hypothesized differences existed in phase 1 (5 months later) and persisted or not into phase 2 (10 months later). The present analysis section was partitioned into three steps. The first, preliminary analyses, addresses issues related to the assumptions specific to multivariate analyses for the phase 1- phase 2 dataset. The second, descriptive analyses, includes a detailed summary statistics on each of the variables under investigation. The last includes the results of the multivariate procedures used to test the present hypotheses.

3.1.1.1 Preliminary Analyses

Prior to running multivariate analysis procedures, all variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis. The following section describes all corrective steps that were taken in order to avoid any violations to the assumptions of multivariate analysis. Given that the exact same steps as those described in Preliminary Analyses I were used in this sub-section, the following paragraphs included a shorter description of the data screening procedures.

Accuracy of input, missing data, univariate and multivariate outliers. Once all observed values seemed reasonable, an examination of missing values was conducted. It revealed that of the original sample of 348 employees who participated in both phases of the

study, 15 cases were deleted because of randomly missing values on several of the variables of interest.

Next, data was screened for univariate and multivariate outliers. Four cases with standardized scores slightly greater than 3.29, with the highest value at 3.86, were identified. Given that with a large sample size a few cases with standardized scores in excess of 3.29 are expected and that these cases were not also multivariate outliers, they were kept in for further analyses (Tabachnick & Fidell, 1996). Multivariate outliers were examined through computations of Mahalanobis' distances. In two cases, the Mahalanobis' distances were significant ($X^2 (df=2) > 32.09, p < .001$). These cases were removed from further analyses, yielding a final sample size of 331 participants.

Distributions. Next, the distributions of all the dependent variables of the data set were examined in order to detect substantial departures from normality. As indicated in Table 4, skewness values ranged from .16 to .91, while kurtosis values ranged from -.64 to .99. Univariate values of kurtosis and skewness were considered acceptable, since all values were within an acceptable range of -1 to 1 (Muthén & Kaplan, 1985). Altogether, the distributions of the variables did not seem to depart significantly from normality, and, from a multivariate perspective, the distribution of the standardized residuals seemed normal.

Linearity, homoscedasticity, multicollinearity. Bivariate scatterplots were inspected to detect potential departures from linearity, and to identify the variance between the pairs of the variables. The observed distributions were generally linear and no evidence of homoscedasticity was found. Finally, correlations between all possible pairs of variables were well below .80, confirming the absence of multicollinearity (Tabachnick & Fidell, 1996).

Table 4

Summary statistics for the psychological stress (PSM.p1p2) and distress (PSI.p1p2) at phase 1 and at phase 2 of the merged dataset (N=331).

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Phase 1 (N=331)				
PSM.p1p2	28.05	9.93	.16	-.64
PSI.p1.p2	22.77	13.11	.43	-.29
Phase 2 (N=331)				
PSM.p1p2	28.28	10.37	.34	-.45
PSI.p1p2	21.96	13.63	.91	.99

Note. The theoretical range for PSM.p1 and PSM.p1p2 is from 7 to 56, and from 0 to 75 for PSI.

3.1.1.2 Descriptive Statistics

Worst reported stressors encountered during and after the ice storm. One of the aims of the present study was to identify the worst stressors (organizational or extra-organizational) encountered by the participants at each of the two phases of the study. Given the simplicity of the stressor-categorization process that was adopted, inter-rater reliability statistics were not calculated. A consensus was always sought nevertheless between the researchers prior to categorizing a stressor that did not directly fit into the main types of categories.

The 9 worst stressors specific to the ice storm at phase 1 were identified in Table 5. The most frequently reported, in descending order of importance, were: (1) the uncertainty related to the development of the ice storm, (2) worries/discomfort related to housing (i.e., no electricity, having to find housing elsewhere), (3) work overload, (4) type of work done (i.e., contact with victims over the phone), (5) interpersonal tension/conflict in the workplace (with colleagues and/or supervisors and/or subordinates), (6) worries related to the well-being of family members, (7) lack of control/decision latitude specific to the recovery efforts, (8) performance and/or competence and/or motivation issues, and (9) increase or decrease of interaction with family members/relatives. Of the identified stressors, approximately 51.4% were specific to workplace operations during the storm, whereas 49.6% were more extra-organizational in nature. The stressors identified clearly suggested that the recovery efforts did not go unnoticed and generated some substantial organizational and extra-organizational stressors. Finally, it was also important to notice that a considerable number of the respondents (12.1%), the majority of which were from areas less/not afflicted by the ice storm (68.5%), indicated not having encountered any stressors specific to the recovery efforts.

Table 5

Frequency, relative and cumulative percentages of the worst reported stressors specific to the recovery efforts from the storm at phase 1 (N=331).

Stressor	Rank Order	Frequency	Relative Percentage (%)	Cumulative Percentage (%)
Uncertainty related to the development of the ice storm	1	54	16.3	16.3
No stressor	2	40	12.1	28.4
Worries/discomfort related to housing (i.e., no electricity, having to relocate)	3	34	10.3	38.7
Work overload	4	33	10.0	48.7
Type of work done (i.e., over-the-phone contact with victims)	5	32	9.7	58.4
Interpersonal tension/conflict in the workplace (with colleagues and/or supervisors and/or subordinates)	6	24	7.3	65.7
Worries related to the well-being of family members	7	21	6.3	72.0
Lack of control/decision latitude specific to the recovery efforts	8	17	5.1	77.1
Performance and/or competence and/or motivation issues	9	15	4.6	81.7
Increase or decrease of interaction with family members/relatives	10	9	2.7	84.4
Miscellaneous (work-related)	/	19	5.7	90.1
Miscellaneous (non-work-related)	/	21	6.3	96.4
Missing data	/	11	3.4	100.0
Total	/	331	100.0	100.0

At phase 2, however, the majority of the participants clearly indicated that the direct impacts of the ice storm were, at most, minimal. In fact, more than 41.4% of the sample reported not having any more stressors related to the recovery efforts. As indicated in Table 6, of the remaining identified stressors, the 5 most frequently reported, in descending order, were: (1) work overload, (2) financial worries, (3) type of work done, (4) ongoing repairs/damage to house, and (5) lack of recognition by the employing organization. Altogether, the majority of these stressors suggested not only some remaining work overload, but also some ongoing minor frustrations on behalf of the workers. The frustrations of some of these employees seemed to be due to the ongoing repairs/damage to their houses, and to the lack of recognition they reported receiving from their organization for the efforts they carried during and after the ice storm. Exploratory analyses targeting the indicators of the stress-enhancing cognitive appraisal of the workers who reported experiencing ice storm stressors at both phases confirmed that, at phase 2, the workers perceived their stressors as having significantly less impact ($t(163) = 4.58, p < .05$) on their lives and as representing significantly less uncertainty ($t(159) = -2.29, p < .05$). Moreover, they reported having significantly more mastery ($t(168) = 7.66, p < .05$) over their stressors. These results seem to confirm that the direct impacts of the ice storm were, in fact, minimal.

Non-Differential Attrition (PSM & PSI; phase 1 & phase 2). It is important to note that an examination of the mean differences of PSM and PSI between the employees who participated at both phases of the study and those who (1) only participated at phase 1 (PSM: $t(842) = 1.67, p > .05$; PSI: $t(842) = 1.52, p > .05$), and (2) those who only participated at phase 2 (PSM: $t(497) = 1.65, p > .05$; PSI: $t(497) = 1.56, p > .05$) were not statistically nor substantially significant. These results suggested that the attrition of participants at each of the phases of the study was non-differential.

Table 6

Frequency, relative and cumulative percentages of the worst reported stressors specific to the recovery efforts from the storm at phase 2 (N=331).

Stressor	Rank Order	Frequency	Relative Percentage (%)	Cumulative Percentage (%)
No stressor	1	120	41.4	41.4
Work overload	2	42	14.5	55.9
Financial worries	3	18	6.2	62.1
Type of work done	4	16	5.5	67.6
Ongoing repairs/damage to house	5	11	3.3	70.7
Lack of recognition from organization	6	10	3.5	74.2
Miscellaneous (work-related)	/	25	7.6	82.0
Miscellaneous (non-work-related)	/	21	5.6	87.6
Missing data	/	41	12.4	100.0
Total	/	331	100.0	100.0

Psychological Stress Measure (PSM; phase 1 & phase 2, N=331). For the employees who participated in both phases of the study, the mean estimated PSM score at phase 1 ($\underline{M}=28.05$, $\underline{SD}=9.93$) was at the 73rd percentile of Quebec-based norms established for that measure, and the one at phase 2 ($\underline{M}=28.28$, $\underline{SD}=10.37$) was at 74th percentile of the same norms. In other words, the “average” employee obtained a stress score higher than or equal to 73% (74%) of the Quebec population in both phases of the study. This result indicated that PSM levels of the sampled employees are above the average of the established norms at both phases of the study. A reduction in the levels of PSM reported by the employees at both phases was not observed. Thus, 10 months following the ice storm, employees seemed to report similar levels of PSM ($t(330) = -.53$, $p > .01$).

Psychological Symptom Index (PSI; phase 1 & phase 2, N=331). Mean score PSI value ($\underline{M}=22.77$, $\underline{SD}=13.11$) at phase 1, as well as that at phase 2 ($\underline{M}=21.96$; $\underline{SD}=13.63$), was approximately at the 63rd percentile of Quebec-based norms established for that measure (Enquête Santé Québec, 1988; 1995; Prévillle, Boyer, Potvin, Perrault & Légaré, 1987). In other words, the “average” employee obtained a PSI score higher than or equal to 63% of the Quebec population at both phases 1 and 2. It is also worth mentioning that whereas close to 19% of the participants of phase 1 scored above the cutoff score used to represent high levels of PSI, approximately 15% of the sample scored above this cutoff at phase 2. Paired-sample t-test revealed a statistically non significant reduction in the mean levels of PSI reported by the employees at both phases ($t(330) = 1.20$, $p > .01$).

Occupational rank differences. A doubly multivariate analysis of variance was performed to assess for occupational rank differences (white collar, blue collar and pink collar)

in psychological stress and distress across time (phase 1 and phase 2). Means and standard deviations for all subgroups are reported in Table 7. Results indicated that the interaction effect between time and occupational rank was not significant (Wilks' = .99, $p > .05$; $\eta_p^2 = .005$), whereas the main effects of occupational rank (Wilks' = .95, $p < .05$; $\eta_p^2 = .028$) and time (Wilks' = .98, $p < .05$; $\eta_p^2 = .021$) were both significant. Tests of the within-subjects and between-subjects contrasts revealed the presence of only one significant effect. More specifically, significant occupational rank differences in psychological distress were observed (PSI: $F(2, 324) = 5.90$, $p < .05$; $\eta_p^2 = .035$). The effect sizes (partial eta squared: η_p^2) observed in the present study were moderately small (largest $\eta_p^2 = .035$). According to Cohen (1988), an effect size (η_p^2) of .01 is considered small, of .06 medium, and of .14 large. Given the moderately small effect sizes observed and the risk of having sample size problems with some of the remaining analyses, a decision was made to pool all occupational groups.

Sex differences. A similar procedure as the one employed to test for occupational rank differences was used to test for sex differences. A doubly multivariate analysis of variance was also performed to assess for sex differences (males and females) in psychological stress and distress across time (phase 1 and phase 2). Means and standard deviations for all subgroups are reported in Table 8. Results indicated that both the interaction effect between time and gender (Wilks' = .99, $p > .05$; $\eta_p^2 = .007$) and the main effect of time (Wilks' = .99, $p < .05$; $\eta_p^2 = .006$) were not significant, whereas the main effect of gender (Wilks' = .96, $p < .05$; $\eta_p^2 = .041$) was significant. Tests of the between-subjects contrasts revealed the presence of two significant effects. More specifically, significant gender differences in psychological stress (PSM: $F(1, 329) = 4.18$, $p < .05$; $\eta_p^2 = .013$) and distress (PSI: $F(1, 329) = 12.55$, $p < .05$; $\eta_p^2 = .037$) were observed. The effect sizes (partial eta squared: η_p^2) observed in the present study were

Table 7

Means and standard deviations (SD) of psychological stress (PSM) and distress (PSI) for white collar, blue collar and pink collar employees at phase 1 and phase 2.

Variable	Mean (SD)		
	White Collar (n=50)	Blue Collar (n=171)	Pink Collar (n=106)
<i>PSM</i>			
Phase 1	28.04 (8.74)	27.14 (9.52)	29.32 (11.05)
Phase 2	27.80 (9.11)	28.04 (10.23)	28.84 (10.92)
<i>PSI</i>			
Phase 1	20.62 (11.49)	21.11 (12.18)	26.22 (14.65)
Phase 2	18.01 (11.45)	21.30 (12.97)	24.30 (14.39)

Note "White collar" employees comprise of managers and professionals, whereas "blue collar" of specialized workers, crafts and technicians, and "pink collar" of office personnel

Table 8

Means and standard deviations (SD) of psychological stress (PSM) and distress (PSI) for men and women at phase 1 and phase 2.

Variable	Mean (SD)	
	Men (n=223)	Women (n=108)
<i>PSM</i>		
Phase 1	27.22 (9.29)	29.75 (11.00)
Phase 2	27.82 (10.12)	29.45 (10.80)
<i>PSI</i>		
Phase 1	21.32 (12.09)	25.78 (14.60)
Phase 2	20.26 (12.08)	25.47 (15.86)

moderately small (largest $\eta_p^2 = .037$). According to Cohen (1988), an effect size (η_p^2) of .01 is considered small, of .06 medium, and of .14 large. Given the moderately small effect sizes observed and the risk of having sample size problems with some of the remaining analyses, a decision was made to pool both males and females.

3.1.1.3 Mean differences: Stress and Distress.

To increase the power of the obtained results, repeated-measures mixed MANOVA analyses were used to test the previously stated hypotheses. PSM and PSI served as the dependent variables and the independent variable (i.e., type/degree of involvement, geographical zone, etc.) varied across the hypotheses. The repeated measure of time had 2 levels with phase 1 and phase 2. Given the nature of the proposed hypotheses, however, the resulting simple effects for each of these analyses, at 5 and 10 months following the ice storm, were of main and sole interest. As such, the following paragraph will focus on these results for each of the hypotheses. Furthermore, considering the proposed hypotheses, follow-up results specific to phase 2 data will only be reported in cases in which significant results were observed at phase 1. Mean PSM and PSI scores, as well as their respective standard deviations, for each of targeted group differences in phase 1 and 2 are outlined in Table 9. Finally, figures illustrating the mean PSM and PSI levels across both phases are presented at the end of the present section as visual aids for each of the tested hypothesis.

Given that the first three hypotheses were based on different levels of the same independent variable (type/degree of involvement in the recovery efforts), three simultaneous planned comparisons were used to test these hypotheses. First, results confirmed that workers who were involved, at least to some extent, in the recovery efforts during and following the storm (direct/indirect involvement in the recovery efforts) did report significantly more

Table 9

Mean scores (*M*), standard deviations (*SD*), significance of group differences (***p***), and partial eta squared (η_p^2) for psychological stress (PSM) and distress (PSI) levels at phase 1 (P1) and phase 2 (P2) between employees with varying levels of involvement in the recovery efforts from the storm (*N*=331).

Variable	n	PSM		PSI	
		P1 M (SD)	P2 M (SD)	P1 M (SD)	P2 M (SD)
Involvement					
“From some to a lot”	245	28.75 (9.82)	28.71 (10.37)	23.72 (12.98)	22.94 (13.99)
“Little/No”	86	26.05 (10.04)	27.07 (10.32)	20.09 (13.19)	19.14 (12.18)
p		.030	.207	.027	.026
η_p²		.014	.005	.015	.015
“Directly Assigned”	209	28.67 (9.72)	28.71 (10.64)	23.70 (12.58)	23.00 (14.12)
“Indirectly Assigned”	36	29.22 (10.48)	28.72 (8.79)	23.82 (15.26)	22.59 (13.41)
p		.754	.994	.957	.868
η_p²		.001	.001	.001	.001
“On the fields/Outside”	93	26.66 (9.39)	26.76 (10.09)	20.74 (11.76)	20.71 (12.35)
“In the offices, posts, centers /Inside”	116	30.28 (9.72)	30.27 (10.86)	26.07 (12.77)	24.85 (15.18)
p		.007	.018	.002	.035
η_p²		.034	.027	.044	.021
Direct Contact with Victims					
Yes	122	27.98 (10.39)	27.85 (11.04)	23.08 (13.24)	22.99 (14.78)
No	209	28.08 (9.68)	28.53 (9.98)	22.60 (13.06)	21.35 (12.91)
p		.931	.564	.749	.293
η_p²		.001	.001	.001	.003

Note. Probability = ***p***, partial eta squared = η_p^2 .

Table 9 (continued)

Mean scores (*M*), standard deviations (*SD*), significance of group differences (*p*), and partial eta squared (η_p^2) for psychological stress (PSM) and distress (PSI) levels at phase 1 (P1) and phase 2 (P2) between employees with varying levels of involvement in the recovery efforts from the storm (*N*=331).

Variable		n	PSM		PSI	
			P1 M (SD)	P2 M (SD)	P1 M (SD)	P2 M (SD)
Zone						
	“Heavily hit”	268	28.73 (9.76)	28.80 (10.56)	23.45 (12.94)	22.35 (13.67)
	Less/Not hit”	63	25.11 (10.19)	26.10 (9.26)	19.89 (13.51)	20.27 (13.42)
	<i>p</i>		.009	.063	.052	.275
	η_p^2		.021	.011	.011	.004
Relocated						
	Yes	111	28.64 (9.72)	29.61 (10.43)	23.96 (12.14)	23.60 (13.40)
	No	217	27.66 (10.05)	27.62 (10.36)	22.05 (13.52)	21.12 (13.79)
	<i>p</i>		.399	.100	.211	.120
	η_p^2		.002	.008	.005	.007
Length of Involvement (>5 months)						
	Yes	72	28.56 (10.23)	26.67 (9.54)	24.67 (13.13)	21.06 (12.92)
	No	259	27.90 (9.86)	28.73 (10.56)	22.25 (13.08)	22.20 (13.83)
	<i>p</i>		.623	.135	.167	.531
	η_p^2		.001	.007	.006	.001
Victim of the Storm						
	Yes	221	28.86 (9.98)	29.10 (10.55)	23.63 (13.02)	22.75 (14.04)
	No	110	26.42 (9.66)	26.65 (9.84)	21.06 (13.18)	20.36 (12.67)
	<i>p</i>		.035	.044	.093	.132
	η_p^2		.013	.012	.009	.007

Note. Probability= *p*, partial eta squared = η_p^2 .

PSM ($t = -8.01, p < .05$) and PSI ($t = -10.36, p < .05$), at phase 1, than those who were less or not involved. Follow-up results indicated that only the observed difference between these two groups in terms of PSI ($t = -10.71, p < .05$) remained significant at phase 2 (See Figure 2).

Second, as illustrated in Figure 3, workers who were directly assigned to the recovery efforts (i.e., 'on the fields/outside' or 'in the offices/posts/centers') did not report significantly higher levels of PSM ($t = 1.51, p > .05$) and PSI ($t = .84, p > .05$) than those who were indirectly assigned to the efforts (i.e., slight changes in some of their routine work tasks). Third, in comparison to the employees who were directly involved in the recovery efforts 'on the fields/outside', those who were directly involved in the recovery efforts 'in the offices/posts/centers' reported significantly higher levels of PSM ($t = 3.62, p < .05$) and PSI ($t = 5.33, p < .05$). Follow-up results indicated that the observed differences in terms of PSM ($t = 3.50, p < .05$) and PSI ($t = 4.15, p < .05$) remained significant at phase 2 (See Figure 4). Results specific to the fourth hypothesis indicated that workers who were in direct contact with victims of the storm did not report higher levels of PSM ($t = -.09, p > .05$) and PSI ($t = .32, p > .05$) than those who were not (See Figure 5). The fifth hypothesis stating that employees who lived in the geographical zone that was "heavily hit" by the storm were expected to report significantly higher levels of psychological stress (PSM) and distress (PSI) than those in the zone "less/not hit" by the storm was confirmed. In fact, employees from the "heavily hit" zone reported significantly more PSM ($t = 2.63, p < .05$) and PSI ($t = 1.95, p < .05$) at phase 1 than those from the "less/not hit" zone. Follow-up analyses suggest that none of these differences were maintained at phase 2 (See Figure 6). The sixth hypothesis was not supported by the obtained results. In fact, workers who were relocated from their workplaces due to the recovery efforts did not report significantly higher levels of PSM ($t = .845, p > .05$) and PSI ($t = 1.25, p > .05$) at phase 1 than those who weren't relocated (See Figure

7). The seventh hypothesis was not supported by the obtained results. Results suggested that employees who were still involved in the recovery efforts at phase 1 did not report significantly higher levels of PSM ($t = .49, p > .05$) and PSI ($t = 1.39, p > .05$) in comparison to those who were no longer involved in such efforts (See Figure 8). Finally, the last hypothesis was partly supported. Although in comparison to the workers who were also victims of the storm, those who were not did report significantly lower levels of PSM ($t = 2.11, p > .05$), they did not differ in terms of their levels of PSI ($t = 1.69, p < .05$). Follow-up results indicated that the observed difference in terms of PSM ($t = 2.03, p < .05$) was maintained at phase 2 (See Figure 9).

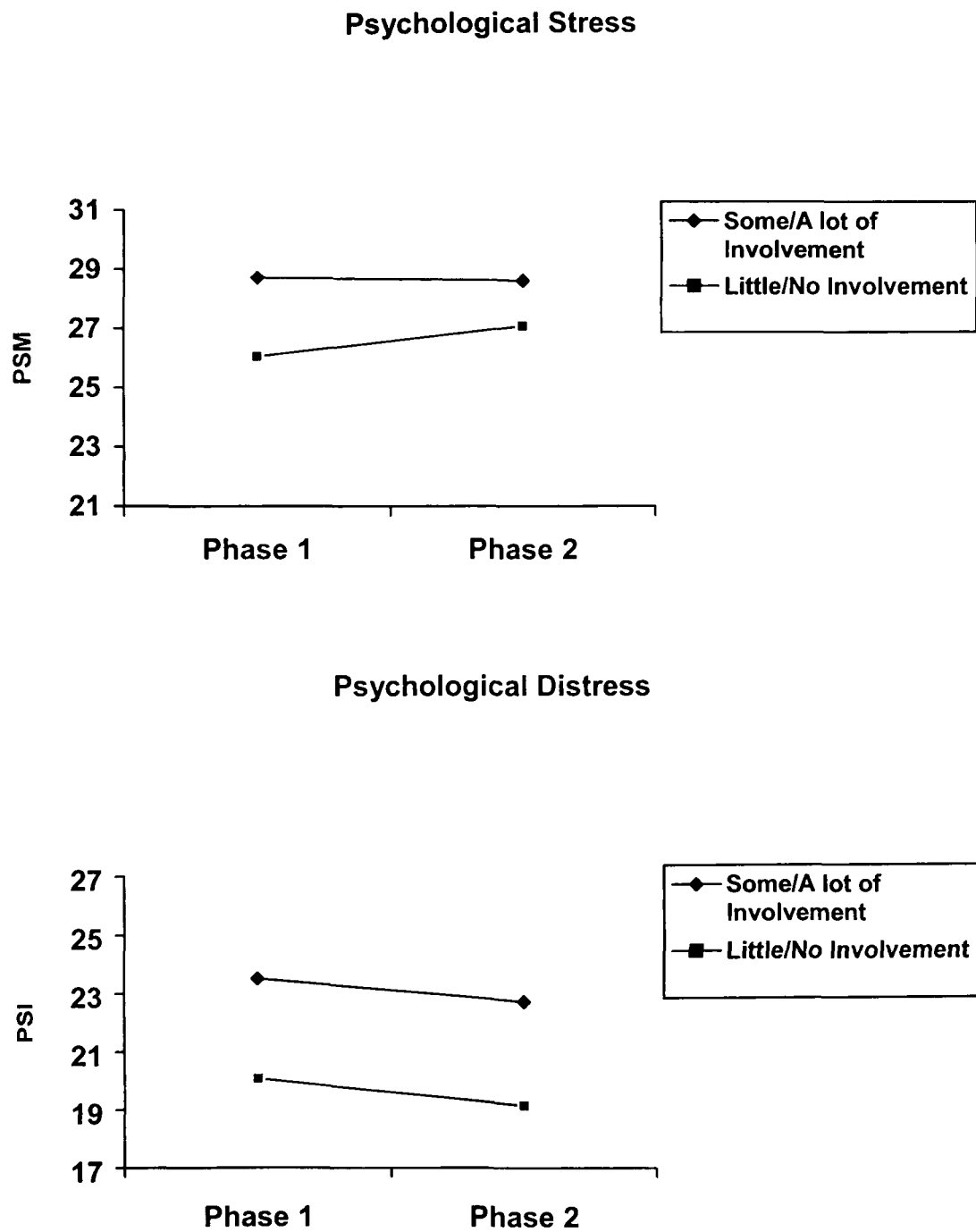


Figure 2. Psychological stress and distress according to the type/degree of involvement across phases (some/a lot or little/no involvement in the recovery efforts).

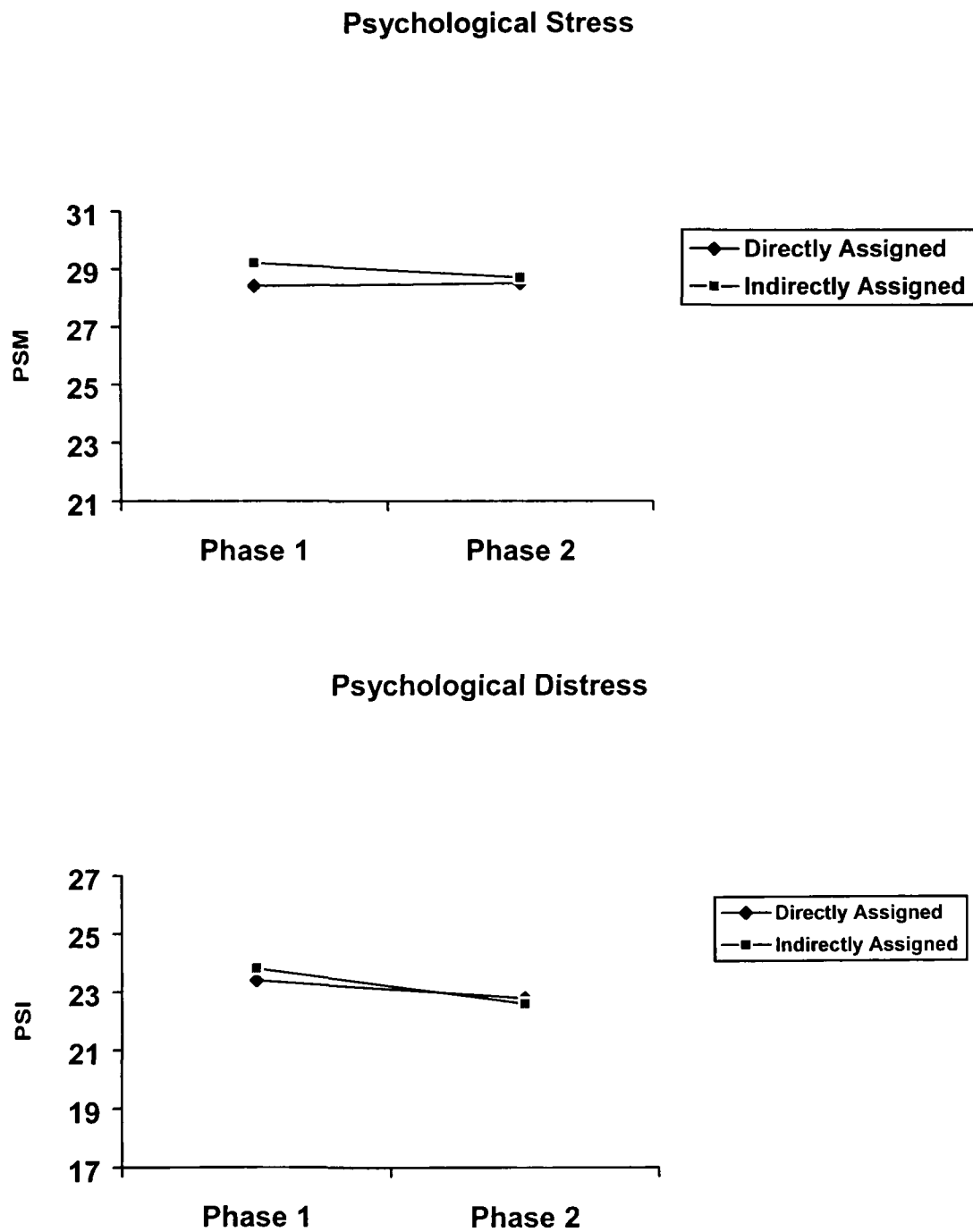


Figure 3. Psychological stress and distress according to the type/degree of involvement across phases (directly or indirectly assigned to the recovery efforts).

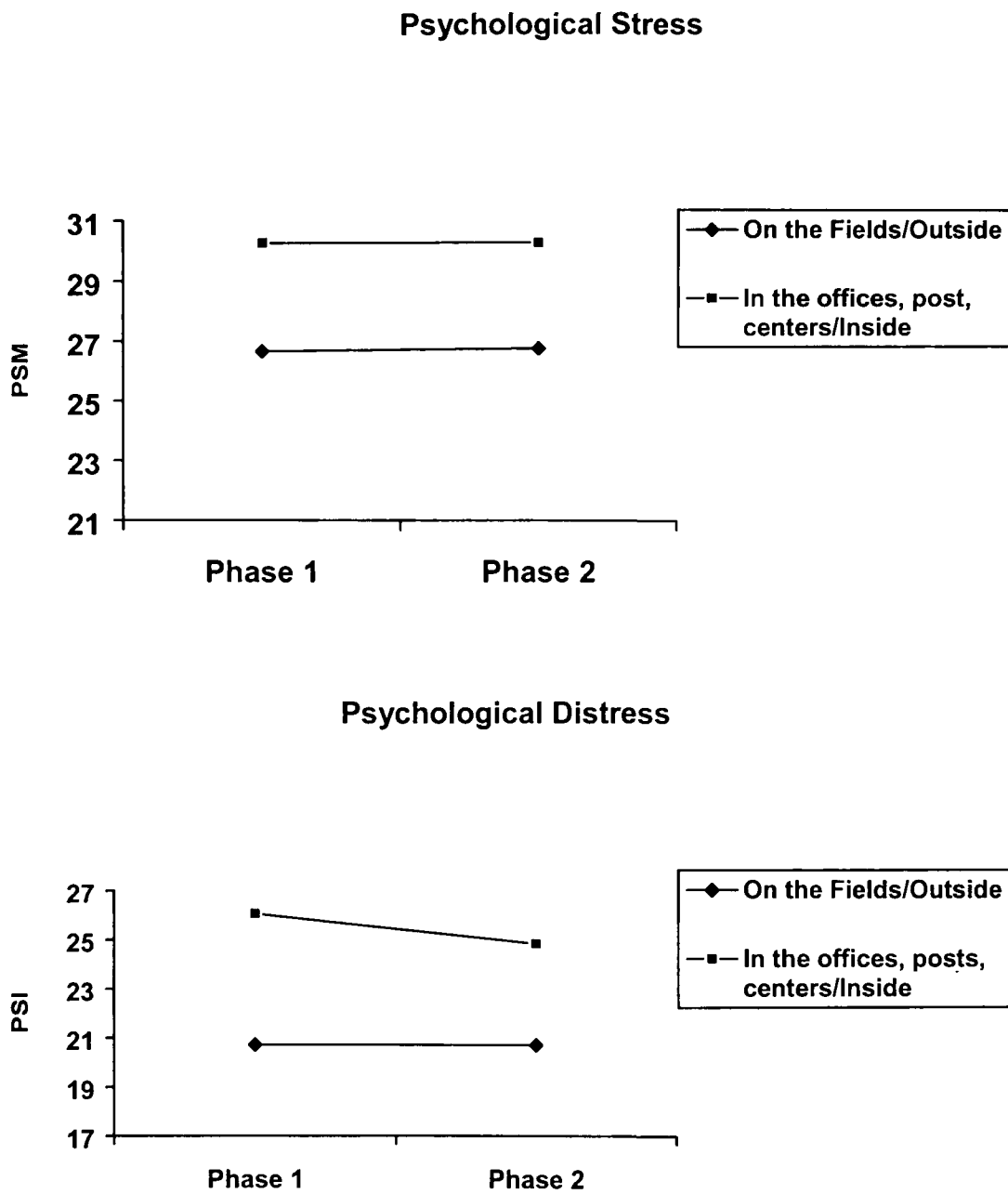


Figure 4. Psychological stress and distress according to the type/degree of involvement across phases (on the fields/outside or in the offices, post, centers/inside).

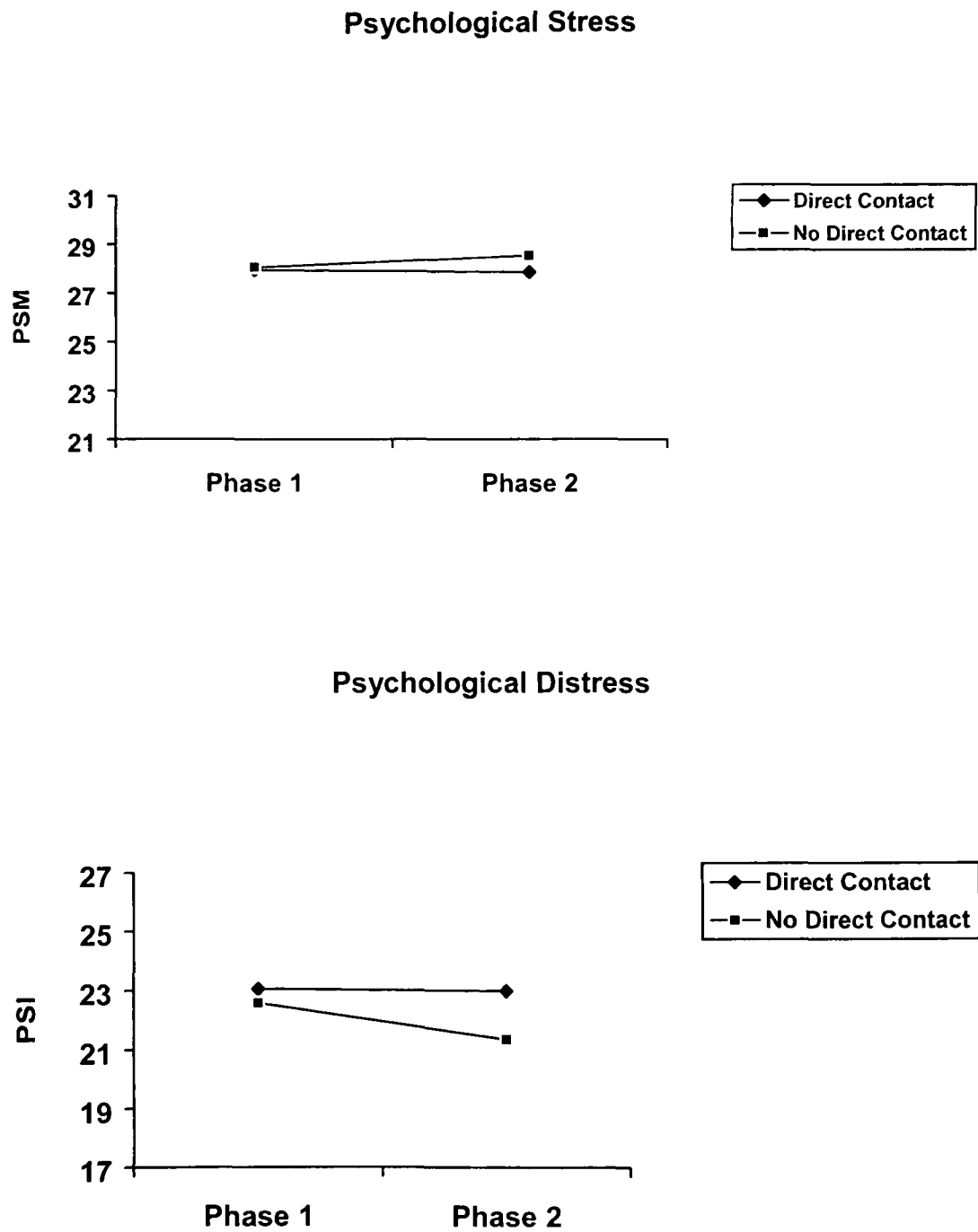


Figure 5. Psychological stress and distress according to the level of contact with the victims of the storm across phases (direct or no direct contact).

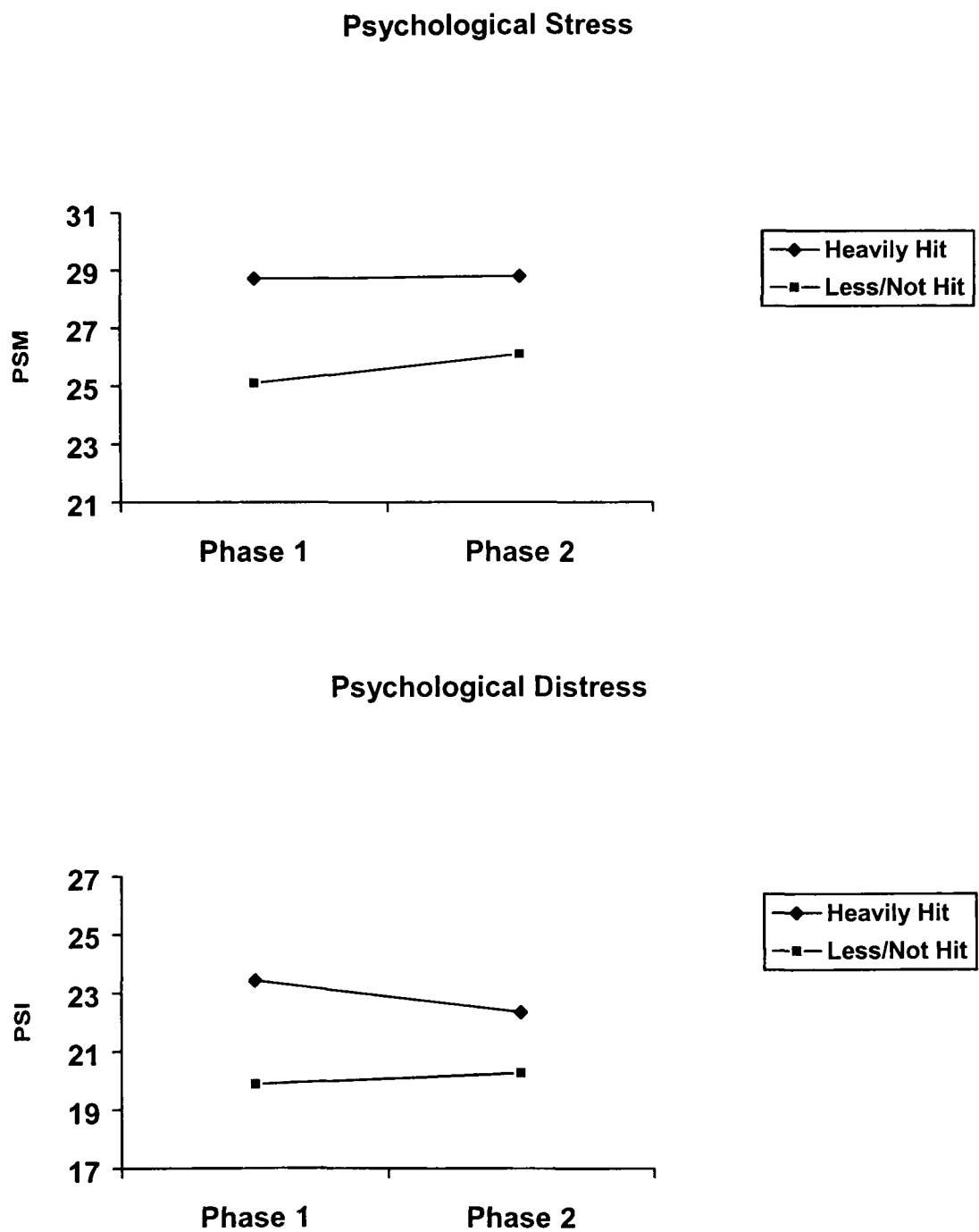


Figure 6. Psychological distress according to the geographic zone across phases (heavily hit or less/not hit by storm).

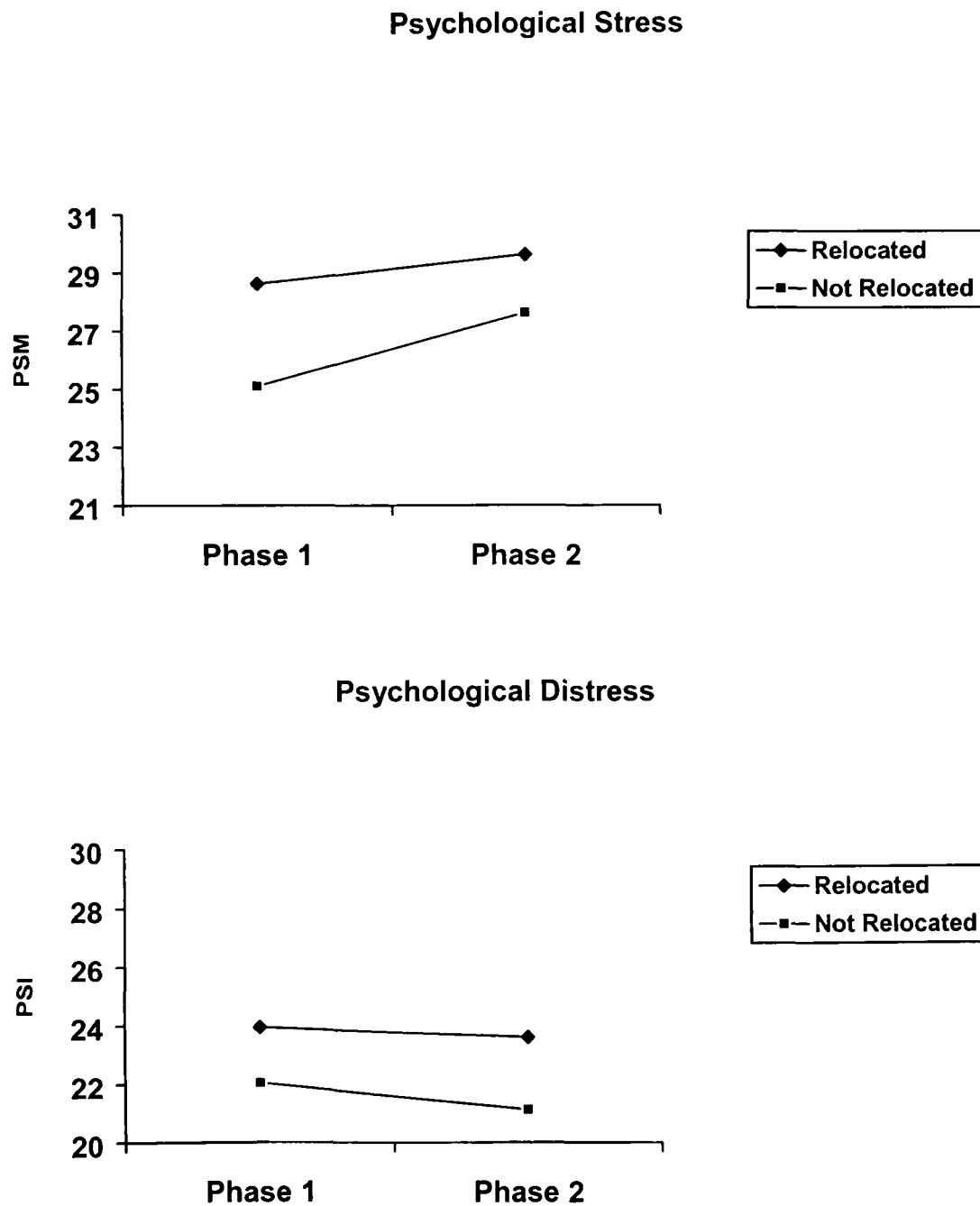


Figure 7. Psychological stress and distress according to relocation due to the recovery efforts across phases (relocated or not for the recovery efforts).

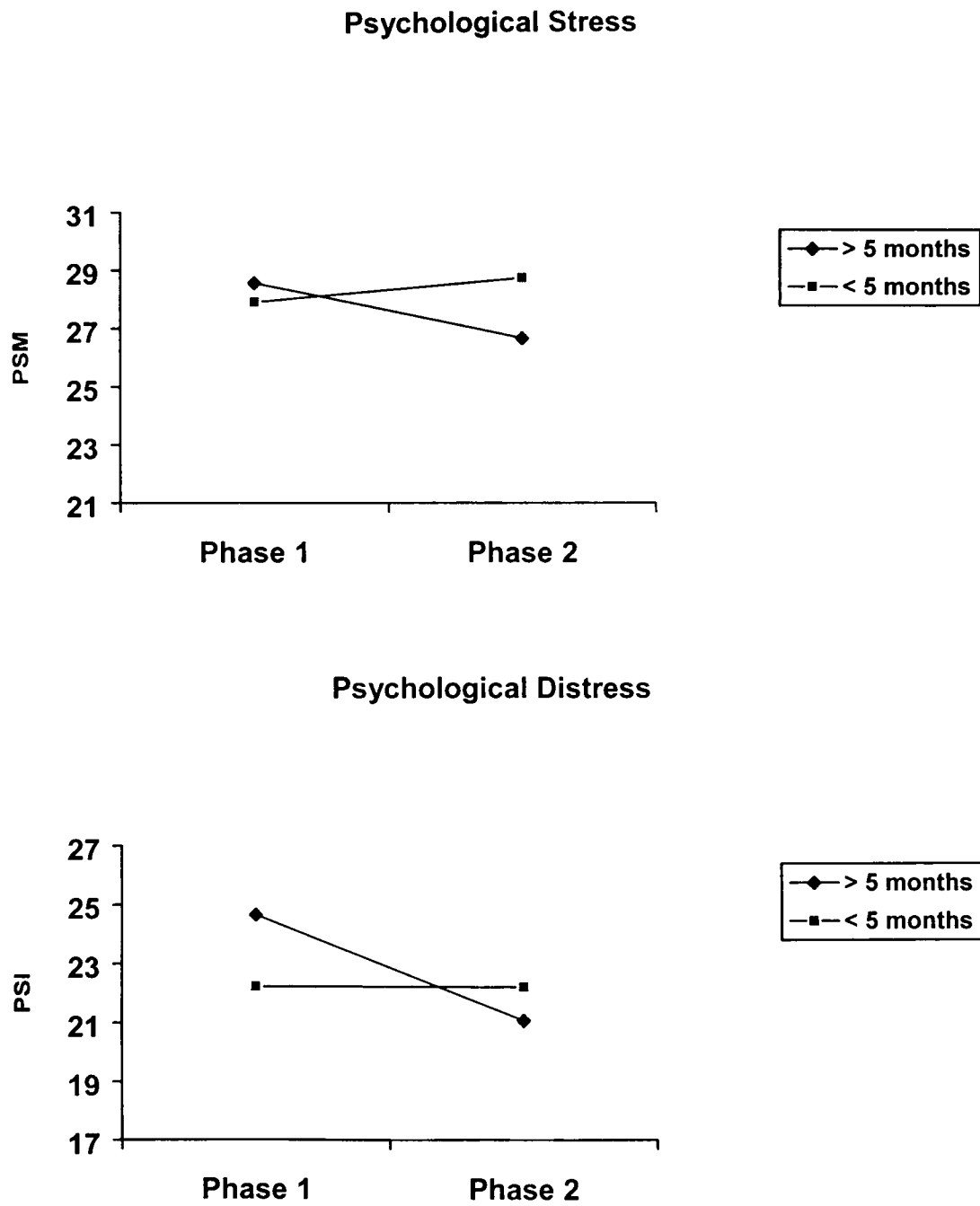


Figure 8. Psychological stress and distress according to the length of involvement in the recovery efforts across phases (over or under 5 months).

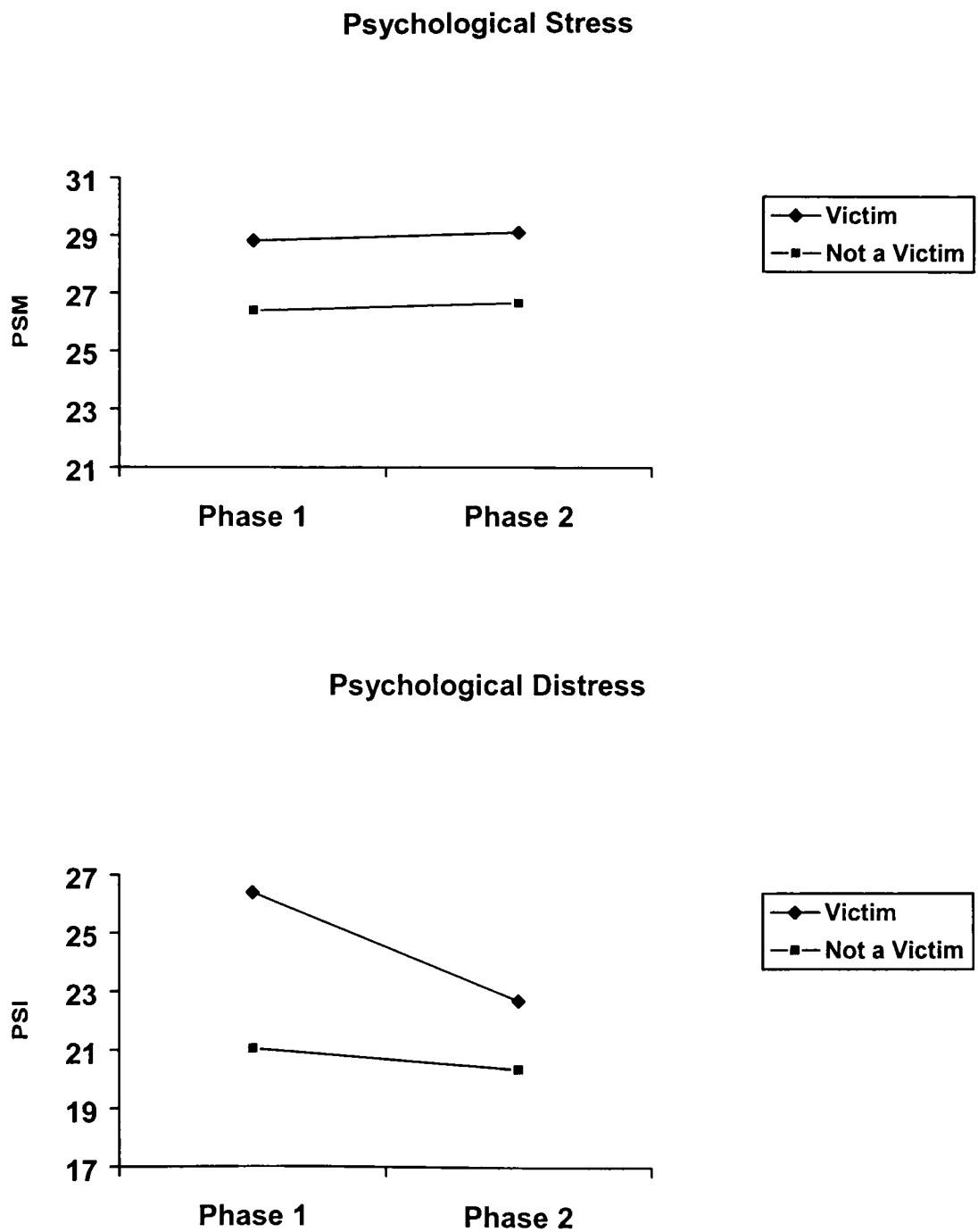


Figure 9. Psychological distress and being a victim of the storm across phases (being a victim or not a victim of the storm).

3.2 Organizational and Extra-Organizational Stressors as Predictors of Stress

The objective of the present section was to assess the added contribution of appraised extra-organizational stressors (SECA-X) to the prediction of psychological stress (PSM). It was hypothesized that the added value of SECA-X to the prediction of PSM will be significant, once the contribution of the stress-enhancing cognitive appraisals specific to the organizational ones (SECA-O) has been accounted for. The next subsection will outline the analyses specific to the objective of the present section.

3.2.1 Analyses

For this section, data analysis was based solely on phase 2 data and was partitioned into three steps. The first, preliminary analyses, addressed issues related to the assumptions specific to multivariate analyses. The second, descriptive analyses, included a detailed summary statistics on each of the variables under investigation. The last, included the results of the hierarchical multiple regression procedures used to test the present hypothesis.

3.2.1.1 Preliminary Analyses

Prior to running multivariate analysis procedures, all variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis. The following section describes all corrective steps that were taken in order to avoid any violations to the assumptions of multivariate analysis.

Accuracy of input, missing data, univariate and multivariate outliers. Of the original sample of 536 employees who participated in second phase of the study, only 172 identified both organizational and extra-organizational stressors. The remaining 364 cases were excluded by default from subsequent analyses. Next, data was screened for univariate and multivariate

outliers. No univariate nor multivariate cases were observed. As such, the final sample size remained at 172.

Distributions. Next, the distributions of all the dependent variables of the data set were examined in order to detect substantial departures from normality. As indicated in Table 10, skewness values ranged from -.66 to .47, while kurtosis values ranged from -1.06 to -1.7. Univariate values of kurtosis and skewness were considered acceptable (Muthén & Kaplan, 1985). Altogether, the distributions of the variables did not seem to depart significantly from normality, and, from a multivariate perspective, the distribution of the standardized residuals seemed normal.

Linearity, homoscedasticity, multicollinearity. Bivariate scatterplots were inspected to detect potential departures from linearity, and to identify the variance between the pairs of the variables. The observed distributions were generally linear and no evidence of homoscedasticity was found. Finally, correlations between all possible pairs of variables were well below .80, confirming the absence of multicollinearity (Tabachnick & Fidell, 1996).

3.2.1.2 Descriptive Statistics

Worst reported organizational and extra-organizational stressors. One of the basic aims of the present study was to identify the reported worst organizational and extra-organizational stressors reported by the participants. Of the 172 organizational stressors reported, about 66.8% were related to a certain organizational instability. As indicated in Table 11, the 6 worst current organizational stressors, in descending order of importance, were: (1) job/position insecurity, (2) work overload, (3) interpersonal tension/conflict in the workplace (with colleagues and/or supervisors and/or subordinates), (4) performance and/or competence and/or motivation issues, (5) stress specific to the type of work, and (6) change to work-related.

Table 10

Summary statistics for the SECA-O and SECA-X indicators of psychological stress (PSM.p2), (N=172).

Variables	Mean	Standard Deviation	Skewness	Kurtosis
(SECA-O)				
IMP	5.61	1.55	-.42	-.65
MAS	3.97	1.95	.08	-1.06
UNC	5.36	1.83	-.47	-.55
(SECA-X)				
IMP	5.62	1.94	-.62	-.41
MAS	3.98	1.88	.24	-.70
UNC	5.37	1.81	-.66	-.17
(PSM.p2)	27.50	9.97	.47	-.56

Note. (SECA-O) = Stress-Enhancing Cognitive Appraisals specific to the organizational stressors; (SECA-X) = Stress-Enhancing Cognitive Appraisals specific to the extra-organizational stressors. The theoretical range is 1 to 8 for SECA sub-items, and from 7 to 56 for PSM.p2.

Table 11

Frequency, relative and cumulative percentages of the worst reported organizational (n=172) and extra-organizational (n=172) stressors in Phase 2 .

Stressor	Rank Order	Frequency	Relative Percentage (%)	Cumulative Percentage (%)
ORGANIZATIONAL				
Job/position insecurity.	1	70	40.7	40.7
Work overload.	2	36	20.9	61.6
Interpersonal tension/conflict in the workplace with colleagues and/or supervisors and/or subordinates.	3	23	13.4	75.0
Performance/competence/motivation issues.	4	16	9.3	84.3
Stress specific to the type of work done.	5	11	6.4	90.7
Change to work-related tasks.	6	9	5.2	95.9
Miscellaneous (work-related).	/	7	4.1	100.0
TOTAL	/	172	/	100.0
EXTRA-ORGANIZATIONAL				
Family-related difficulties.	1	58	33.5	33.5
Financial difficulties.	2	32	18.5	52.0
Health problems (of participant, family member or significant other).	3	27	15.6	67.6
Divorce/separation.	4	9	5.2	72.8
Miscellaneous (non-work-related)	/	46	26.7	100.0
TOTAL	/	172	100.0	100.0

tasks. Altogether, these 6 stressors represent more than 95.9% of all the organizational stressors reported. Of the remaining stressors, 4.1% were categorized as “miscellaneous work-related”. Results reflected that many of the participants seemed preoccupied by a possibility of job change or loss. The importance of anticipated stressors was obvious with job/position insecurity representing more than 40.7% of all organizational stressors. In addition, a substantial number of these employees (20.9%) reported being confronted with work overload, often indirectly related to organizational restructurings. Finally, some of the results suggested an overly tense work climate. In fact, more than 13.3% of the participants reported, as their worst organizational stressor, interpersonal tension/conflict in the workplace (with colleagues and/or supervisors and/or subordinates).

Of the 172 extra-organizational stressors reported, 72.8% of the stressors were related to health, family/couple and financial difficulties/problems. As indicated in Table 11, the 6 worst current extra-organizational stressors, in descending order of importance, were: (1) family-related difficulties, (2) health problems (of participant, family member or significant other), (3) financial difficulties, and (4) divorce/separation. Of the remaining stressors, 27.2% were categorized as “miscellaneous work-related”. The identified stressors pointed to the presence of stressful events in the personal lives of these employees and, as such, would seem further emphasize the importance of considering such events when the prediction of psychological stress is targeted.

Stress-enhancing cognitive appraisals (SECA-O & SECA-X). Three stress-enhancing cognitive appraisals (perceived impact, perceived mastery and perceived uncertainty) were identified for each organizational and extra-organizational stressor. Mean levels of perceived impact ($\underline{M}$ =5.61, $\underline{SD}$ = 1.55), perceived mastery ($\underline{M}$ =3.97, $\underline{SD}$ =1.95), and perceived uncertainty

($\underline{M}$ =5.36, $\underline{SD}$ =1.83) specific to the organizational stressors (SECA-O) are reported in Table 10. The mean levels of perceived impact ($\underline{M}$ =5.62, $\underline{SD}$ = 1.94), perceived mastery ($\underline{M}$ =3.98, $\underline{SD}$ =1.88), and perceived uncertainty ($\underline{M}$ =5.37, $\underline{SD}$ =1.81) specific to the extra-organizational stressors (SECA-X) are also presented in Table 10. The non significant mean differences between each pair of the SECA-O and SECA-X indicators further indicated ($t(171)<-.04$, $p>.05$) that, on average, the participants perceived their organizational stressors as being as ‘stressful’ as their extra-organizational ones.

Psychological Stress Measure (PSM). For this sub-sample, the mean estimated psychological stress score at phase 2 ($\underline{M}$ =27.50, $\underline{SD}$ =9.97) was at the 71th percentile of Quebec-based norms established for that measure. In other words, the “average” employee obtained a stress score higher than or equal to 71% of the Quebec population. This result indicated that psychological stress levels of the sampled employees are above the average of the established norms. It is informative to notice that the final sample of 172 employees who identified both organizational and extra-organizational stressors did not vary significantly ($t(497)=-.41$, $p>.05$) on PSM from those who identified either one or the other type of stressor.

Occupational rank differences. Given that the present analyses were based on a reduced dataset ($n = 172$), and that the number of white collar workers was too small (white collar, $n=10$; blue collar, $n=67$; pink collar, $n=94$). Mean group differences were assessed only for the two remaining groups (blue and pink collar). A comparison of the means, as evaluated by a t-test, indicated that blue collar ($\underline{M}$ =27.42, $\underline{SD}$ =9.24) and pink collar ($\underline{M}$ =28.84, $\underline{SD}$ =10.40) workers did not differ on the dependent variable of interest, namely on psychological stress: (PSM: $t(159) = -.27$, $p>.05$). Consequently, a decision was made to pool the three sub-groups of workers together for the remaining analyses.

Sex differences. A comparison of the means, as evaluated by a t-test, indicated that males ($n=106$; $M=27.05$, $SD=10.17$) and females ($n=66$; $M=28.32$, $SD=9.80$) did not differ on the dependent variable of interest, namely on psychological stress: (PSM: $t(170) = -.81$, $p>.05$). Consequently, a decision was made to pool both men and women for the remaining analyses.

3.2.1.3 Hierarchical Multiple Regression

An hierarchical multiple regression (HMR) was performed between psychological stress as the dependent variable and SECA-O indicators as well as SECA-X indicators as the independent variables. SECA-O indicators were entered first, followed by those of SECA-X. Table 12 displays the results of the HMR. R was significantly different from zero at each step ($\Delta R^2=.04$, $p<.05$). After step 2, with all predictors in the equation, $R = .54$, $F(6, 171) = 11.00$, $p<.05$.

After step 1, with SECA-O in the equation, 25% of the variance in PSM was explained; $R^2=.25$, (adjusted $R^2=.24$), $F_{inc}(3, 168) = 18.65$, $p<.05$. After step 2, with SECA-X added to the prediction of psychological stress, 29% of the variance in PSM was explained; $R^2=.29$ (adjusted $R^2 = .26$) $F_{inc}(3, 165) = 2.77$, $p<.05$. Addition of SECA-X to the equation improved significantly, but not substantially, R^2 . In fact, SECA-X only predicted an additional 2% of the variance in psychological stress.

The unique contribution of SECA-X to the prediction of psychological stress was significant and quite substantial; $R = .35$, $F(3, 171) = 18.65$, $p<.05$. An investigation of the unique contribution of each of the 6 indicators of SECA-O and SECA-X revealed that 5 of them were non significant. In fact, only the unique contribution of the perceived impact specific to the worst organizational stressor was significant ($sr^2=.06$, $p<.05$). Although the unique contribution of most of these indicators was non significant, when treated in blocs to represent the combined

Table 12

Hierarchical multiple regression of the stress-enhancing cognitive appraisals specific to the organizational stressors (SECA-O) and of those specific to the extra-organizational stressors (SECA-X) to psychological stress at phase 2 (PSM.p2) (N=172).

Variables	PSM.p2 (DV)	SECA-O			SECA-X			<i>B</i>	β	ΔR^2 (incremental)
		IMP-O	MAS-O	UNC-O	IMP-X	MAS-X	UNC-X			
BLOC 1: SECA-O										
IMP-O	.45							2.02	.31*	.06*
MAS-O	.30	-.26						-.59	-.11	.01
UNC-O	.39	.58	-.42					.62	.11	.01
										$R^2=.25$
BLOC 2: SECA-X										
IMP-X	.29	.33	-.25	.27				.113	.02	.01
MAS-X	-.23	-.07	.26	.16	.31			-.68	-.13	.01
UNC-X	.28	.25	-.17	.23	.60	.27		.60	.11	.01
										$R^2=.29$
								Intercept	=14.05	
Means	27.53	5.61	3.97	5.36	5.62	3.98	5.37			
SD	10.02	1.55	1.95	1.83	1.94	1.88	1.81			
									R^2	=.29
								Adjusted	R^2	=.26
									<i>R</i>	=.54*

Note. * $p < .05$. IMP1, MAS1 and UNC1 are the perceived impact, mastery and uncertainty specific to the worst reported organizational stressors respectively. IMP2, MAS2 and UNC2 are the perceived impact, mastery and uncertainty specific to the worst reported extra-organizational stressors respectively.

grouping dimension labeled “SECA”, the contribution of SECA-O, as well as of SECA-X, was significant and substantial.

An exploratory hierarchical multiple regression, with the SECA-X entered first in the equation followed by the SECA-O to predict psychological stress, revealed that once the contribution of the stress-enhancing cognitive appraisals specific the worst reported extra-organizational stressor was considered, the added contribution of SECA-O to the prediction of psychological stress was not only significant but quite substantial ($\Delta R^2=.17$, $F_{inc}(3, 165)= 12.80$, $p<.05$).

3.3 The Added and Moderating Effects of PSS

The objectives of the present section were to assess the added role of extra-organizational sources of support to the prediction of psychological stress (PSM), as well as further examine the moderating role of perceived social support (PSS). As mentioned, the main effect of the overall PSS on PSM will be tested in the next section via structural equation modeling procedures.

Based on existing literature, it was first hypothesized that the added value of PSS from extra-organizational sources to the prediction of PSM, once the contribution of the PSS from organizational sources has been accounted for, would be significant and substantial. The moderating role of PSS in the relation between the SECA specific to one's worst stressors and PSM was also expected to be significant and substantial.

The analyses specific to the objectives of the present section, as well as those for the next section of the results chapter, namely the section testing the proposed workplace model of stress and overall distress, were both based on the phase 2 dataset. As such, to avoid repetitions, the preliminary and descriptive statistics sections that follow refer to both sections of the results chapter.

3.3.1 Analyses

Data analysis was partitioned into three steps. The first, preliminary analyses, addresses issues related to the assumptions specific to multivariate analyses, including structural equation modeling procedures. The second, descriptive analyses, includes detailed summary statistics on each of the variables under investigation. The last, included solely the results specific to the hypotheses of the present section of the results. More specifically, the hierarchical multiple regression procedures used to test the present hypotheses are described.

3.3.1.1 Preliminary Analyses

All variables were first examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis. The following section describes all corrective steps that were taken in order to avoid any violations to the assumptions of multivariate analysis.

Accuracy of input, missing data, univariate and multivariate outliers. A check on accuracy of data entry, missing data, skewness, and kurtosis for the data set was done. First, the minimum and maximum values, means, and standard deviations were inspected for plausibility. All observed values were reasonable.

An examination of missing values revealed that of the original sample of 536 participants, 31 cases were missing values on some of the variables of interest. Examination of descriptive data seems to reveal that the data are missing randomly. Given this result and the large sized data set, these cases were deleted from further analyses.

Next, the distributions of the standardized scores for all dependent variables of interest were examined to detect potential univariate outliers. Eight cases with standardized scores slightly greater than 3.29, with the highest value at 3.99, were identified. Given that with a large sample size a few cases with standardized scores in excess of 3.29 are expected and that these cases were not also multivariate outliers, they were kept in for further analyses (Tabachnick & Fidell, 1996). Multivariate outliers were examined through computations of Mahalanobis' distances. In six cases, the Mahalanobis' distances were significant ($X^2 (df=10) > 31.35$, $p < .001$). These cases were removed from further analyses, yielding a final sample size of 499 participants.

Distributions. Next, the distributions of all the dependent variables of the data set were examined in order to detect departures from normality. As indicated in Table 13, skewness values ranged from -1.17 to $.93$, while kurtosis values ranged from $.90$ to 1.2 . Despite a few elevated values, univariate values of kurtosis and skewness were considered acceptable, since all values were within, or very close to, the acceptable range of -1 to 1 (Muthén & Kaplan, 1985). Altogether, the distributions of the variables did not seem to depart significantly from normality, and, from a multivariate perspective, the distribution of the standardized residuals seemed normal.

Linearity, homoscedasticity, multicollinearity. Bivariate scatterplots were inspected to detect potential departures from linearity, and to identify the variance between the pairs of the variables. The observed distributions were generally linear and no evidence of homoscedasticity was found. Finally, correlations between all possible pairs of variables were below $.80$, confirming the absence of multicollinearity (Tabachnick & Fidell, 1996).

Sample size. Most researchers agree that large sample sizes are required in order to run SEM procedures. It is generally recommended that a minimum sample size of 200 is required in order to obtain a stable solution (Byrne, 2001; Kline, 1998). The present sample size ($N=499$) is deemed adequate for the purposes of the present study.

3.3.1.2 Descriptive Statistics

Identified worst reported stressors. One of the aims of the present study was to identify the worst reported stressors reported by the participants. Of all the stressors identified 56.5% were specific to the workplace (i.e., work overload, job/position insecurity, interpersonal tension) and the remaining 43.5% were out-of-work stressors (i.e., family-related difficulties, health problems, financial difficulties). As indicated in Table 14, the 9 identified stressors represented

Table 13

Summary statistics for the indicators of the workplace model of psychological stress and overall distress at phase 2 (N=499).

Variables		Mean	Standard Deviation	Skewness	Kurtosis
Stress-Enhancing Cognitive Appraisal (SECA)					
	IMP	5.94	1.66	-.68	-.21
	MAS	3.82	1.77	.16	-.79
	UNC	5.37	1.79	-.53	-.50
Perceived Social Support (PSS)					
	X-ORG	12.89	3.15	-1.17	1.19
	SUP	9.76	3.71	-.04	-.09
	COL	10.97	3.01	.31	-.19
Stress (PSM.p2)					
		27.79	10.23	.34	-.40
Overall Distress Level (ODI)					
	PSI.p2	21.37	13.35	.93	1.20
	IJS.p2	62.60	11.47	-.69	.58
	SWLS.p2	25.53	5.69	-1.01	.53

Note. The following abbreviations were used for perceived impact (IMP), mastery (MAS) and uncertainty (UNC), extra-organizational sources of perceived social support (X-ORG), organizational perceived social support from supervisor (SUP) and colleagues (COL), psychological distress (PSI.p2), job satisfaction (IJS.p2), and life satisfaction (SWLS.p2). The theoretical range is 1 to 8 for SECA sub-items, from 3 to 24 for the global SECA score, from 0 to 4 for PSS subscales, and from 0 to 48 for the global PSS score. The theoretical range for MSP is from 7 to 56, from 23 to 200 for DIS, from 0 to 75 for PSI, from 18-90 for IJS, and from 5 to 35 for LSS.

Table 14

Frequency, relative and cumulative percentages of the worst reported stressors at Phase 2 (N=499).

Stressor	Rank Order	Frequency stressor		Relative Percentage (%)	Cumulative Percentage (%)
		X-Org	Org		
Work overload.	1	/	91	18.2	18.2
Job/position insecurity.	2	/	83	16.5	34.7
Family-related difficulties.	3	61	/	12.2	46.9
Health problems (of participant, family member or significant other).	4	37	/	7.4	54.3
Financial difficulties.	5	35	/	7.0	61.3
Interpersonal tension/conflict in the workplace with colleagues and/or supervisors and/or subordinates.	6	/	30	6.0	67.3
Divorce/separation.	7	15	/	3.0	70.3
Stress specific to the type of work done	7	/	15	3.0	73.3
Performance/competence/motivation issues.	8	/	14	2.8	76.1
Change to work-related tasks	9	/	11	2.2	78.3
Miscellaneous (Org)	/	/	38	7.6	85.9
Miscellaneous (X-Org)	/	69	/	13.8	99.7
Sub-Totals	/	217	282	100.0	100.0
Total	/	/	/	499	100.0

Note. The following abbreviations were used for organizational (Org) and extra-organizational (X-Org) stressors.

78.3% of all the identified stressors.

Stress-enhancing cognitive appraisal (SECA). SECA's three indicators were examined: perceived impact, perceived mastery and perceived uncertainty. The observed mean levels for these indicators were: perceived impact ($\underline{M}=5.94$, $\underline{SD}=1.66$), perceived mastery ($\underline{M}=3.82$, $\underline{SD}=1.77$), and perceived uncertainty ($\underline{M}=5.37$, $\underline{SD}=1.79$).

Perceived Social Support (PSS). The degree of perceived organizational (from 'colleagues and supervisors') and extra-organizational (from 'partner, family and friends') support was measured. Mean levels of extra-organizational support ($\underline{M}=12.89$, $\underline{SD}=3.15$) suggested that, on average, the participants perceived between "some to a lot" of social support from their "partner, family and friends". Mean levels of organizational support reveal that, on average, the participants perceived between "a bit to some" support from their supervisors ($\underline{M}=9.76$, $\underline{SD}=3.71$) as well as from their colleagues ($\underline{M}=10.97$, $\underline{SD}=3.01$). Analysis of mean differences indicated that reported perceived levels of support from each of the three sources varied significantly ($\underline{F}(1, 498)=249.71$, $p<.05$), with the highest levels of perceived support from extra-organizational sources and the lowest from the supervisor. Mean levels of the overall perceived social support, obtained by summing the PSS from organizational and extra-organizational sources, ($\underline{M}=33.62$, $\underline{SD}=7.20$) revealed that the participants perceived having between "a bit to some" social support from their environment.

Psychological Stress Measure (PSM). The mean estimated psychological stress score ($\underline{M}=27.79$, $\underline{SD}=10.23$) was at the 72th percentile of Quebec-based norms established for that measure. In other words, the "average" employee obtained a stress score higher than or equal to 72% of the Quebec population. This result indicates that psychological stress levels of the sampled employees were above the average of the established norms.

Overall Distress Index (ODI). As indicated, the overall distress index is comprised of three different indicators of general distress: The Psychological Symptom Inventory (PSI), the Index of Job Satisfaction (IJS) and the Satisfaction With Life Scale (SWLS).

The Psychological Symptom Inventory (PSI). Mean score PSI value ($\underline{M}=21.38$, $\underline{SD}=13.35$) was at the 58th percentile of Quebec-based norms established for that measure. In other words, the “average” employee obtained a psychological distress score higher than or equal to 58% of the Quebec population. It is also worth mentioning that close to 14.2% of the participants scored above 33.33, cutoff score generally used to represent high levels of psychological distress (Préville, Boyer, Potvin, Perrault & Légaré, 1987).

The Index of Job Satisfaction (IJS). Mean score IJS value ($\underline{M}=62.60$, $\underline{SD}=11.47$) was just above the “neutral” satisfaction score of 54, and suggested that, in general, the participants reported being somewhat more satisfied than dissatisfied from their work.

The Satisfaction With Life Scale (SWLS). The observed mean score SWLS value ($\underline{M}=25.53$, $\underline{SD}=5.69$) indicated that the employees were “satisfied”, on average, with their lives. The present sample, like most studied groups, fell within the expected range of 23 to 28, or the range of “slightly satisfied to satisfied”, a result which is in line with the frequently reported finding that in North American countries the majority of the respondents report well-being above the neutral point on various measures (Pavot & Diener, 1993; Veenhoven, 1991).

Occupational rank differences. As shown in Table 15, a comparison of the means was evaluated by three one-way MANOVAs and one ANOVA with Bonferroni corrections. The first MANOVA was performed on three dependent variables: perceived impact, perceived mastery and perceived uncertainty. The second MANOVA was performed on three dependent variables: extra-organizational support, supervisory support and colleague support. The third MANOVA

Table 15

Comparison of the means of all the variables of interest for the workplace model of psychological stress and overall distress across occupational groups at phase 2.

Variable	Mean (SD)			df1, df2	F/Wilks'	p (η_p^2)
	White Collar (n=78)	Blue Collar (n=261)	Pink Collar (n=148)			
<i>Stress-enhancing cognitive appraisals (SECA)</i>				6, 964	.97	.02 (.016)
IMP	5.67 (1.67)	5.89 (1.72)	6.21 (1.48)			
MAS	3.84 (1.60)	3.77 (1.82)	3.84 (1.70)			
UNC	5.01 (1.81)	5.26 (1.79)	5.78 (1.69)			
<i>Perceived Social Support (PSS)</i>				6, 964	.99	.90 (.002)
X-ORG	12.92 (3.16)	13.03 (3.04)	12.68 (3.15)			
SUP	10.10 (3.41)	9.75 (3.83)	9.59 (3.67)			
COL	11.22 (2.63)	10.99 (2.99)	10.89 (3.16)			
<i>Stress (PSM.p2)</i>	27.41 (9.38)	27.62 (10.12)	27.97 (10.42)	2, 486	.09	.91 (.001)
<i>Overall Distress Indicator (ODI)</i>				6, 964	.96	.001 (.022)
PSI.p2	17.74 (11.75)	21.10 (12.68)	23.32 (13.74)		4.83	.008 (.020)
IJS.p2	66.15 (9.07)	63.04 (11.27)	59.66 (11.81)		9.34	.001 (.037)
SWLS.p2	27.01 (4.73)	25.62 (5.71)	24.70 (5.88)		4.35	.01 (.018)

Note. 3 one-way MANOVAs and an ANOVA were performed with a Bonferroni correction to control for the number of comparisons ($p=.05/4 = .01$). Partial eta squared = η_p^2 . The following abbreviations were used for perceived impact (IMP), mastery (MAS) and uncertainty (UNC), perceived social support (PSS), extra-organizational sources of PSS (X-ORG), organizational PSS from supervisor (SUP) and colleagues (COL), psychological distress (PSI.p2), job satisfaction (IJS.p2), and life satisfaction (SWLS.p2).

was performed on three dependent variables: psychological distress, job satisfaction and life satisfaction. The ANOVA was performed on the psychological stress as the dependent variable. For all four analyses, the independent variable was occupational rank (white collar, blue collar, and pink collar). Analyses indicated that white collar ($n=78$), blue collar ($n=261$) and pink collar ($n=148$) employees differed solely on the Overall Distress Indicator (ODI: Wilks' = .96, $p<.01$). More specifically, significant differences were observed on job satisfaction (IJS: $F(2, 486) = 9.33$, $p<.01$) and psychological distress (PSI: $F(2, 486) = 4.83$, $p<.01$). However, the effect sizes of the observed differences are not large. In fact, according to Cohen (1988), the effect sizes (partial eta squared: η_p^2) observed in the present study were moderately small ($\eta_p^2 < .037$). Given the fairly large sample size and the moderately small effect sizes observed, a decision was made to pool all occupational groups for the remaining of the analyses.

Sex differences. A similar procedure as the one employed to test for occupational rank differences was used to test for sex differences. As shown in Table 16, a comparison of the means was evaluated by three one-way MANOVAs and one t-test with a Bonferroni correction. The first MANOVA was performed on three dependent variables: perceived impact, perceived mastery and perceived uncertainty. The second MANOVA was performed on three dependent variables: extra-organizational support, supervisory support and colleague support. The third MANOVA was performed on three dependent variables: psychological distress, job satisfaction and life satisfaction. The t-test was performed on the psychological stress as the dependent variable. For all four analyses, the independent variable was sex (males and females). Results indicated that males ($n=346$) and females ($n=153$) differed on the Stress Enhancing Cognitive Appraisal grouping (Wilks' = .97, $p<.01$) and on the Overall Distress Indicator (Wilks' = .97, $p<.01$). More specifically, differences were observed on perceived impact (IMP: $F(1,497) =$

Table 16

Comparison of the means of all the variables of interest for the workplace model of psychological stress and overall distress for men and women at phase 2.

Variable	Mean (SD)		df1, df2	t/Wilks'	p (η_p^2)
	Men (n=346)	Women (n=153)			
<i>Stress-enhancing cognitive appraisals (SECA)</i>			3, 495	.97	.001 (.032)
IMP	5.79 (1.69)	6.28 (1.53)		9.37	.002 (.019)
MAS	3.78 (1.76)	3.90 (1.77)		.41	.52 (.001)
UNC	5.21 (1.79)	5.71 (1.75)		8.64	.003 (.017)
<i>Perceived Social Support (PSS)</i>			3, 495	.98	.02 (.020)
X-ORG	12.71 (3.19)	13.29 (3.03)			
SUP	9.69 (3.58)	9.90 (4.03)			
COL	10.72 (2.85)	11.56 (3.29)			
<i>Stress (PSM.p2)</i>	27.12 (10.15)	29.31 (10.29)	1, 497	-2.22	.03 (.010)
<i>Overall Distress Indicator (ODI)</i>			3, 495	.97	.001 (.031)
PSI.p2	19.98 (12.57)	24.53 (14.53)		12.60	.001 (.025)
IJS.p2	63.45 (11.03)	60.67 (12.24)		6.31	.01 (.013)
SWLS.p2	25.67 (5.63)	25.20 (5.84)		.70	.40 (.001)

Note. Three one-way MANOVAs and a t-test were performed with a Bonferroni correction to control for the number of comparisons ($p=.05/4 = .01$). Partial eta squared = η_p^2 . The following abbreviations were used for perceived impact (IMP), mastery (MAS) and uncertainty (UNC), perceived social support (PSS), extra-organizational sources of PSS (X-ORG), organizational PSS from supervisor (SUP) and colleagues (COL), psychological distress (PSI.p2), job satisfaction (IJS.p2), and life satisfaction (SWLS.p2).

9.37, $p < .01$), perceived uncertainty (UNC: $F(1, 497) = 8.64$, $p < .01$), and psychological distress (PSI: $F(1, 497) = 12.60$, $p < .01$). According to Cohen (1988), the effect sizes observed in the present study were moderately small (largest $\eta_p^2 < .025$). Given the large sample size and the relatively small effect sizes observed, a decision was made to group men and women for the remaining of the analyses.

3.3.1.3 Hierarchical Multiple Regression: Added Contribution

To test for the added value of PSS from extra-organizational sources to the prediction of psychological stress, once the contribution of the PSS from organizational sources has been accounted for, an hierarchical multiple regression (HMR) was performed between psychological stress as the dependent variable and PSS from organizational sources (supervisors and colleagues) as well as PSS from extra-organizational sources ('partner, family and friends) as the independent variables. PSS from organizational sources were entered first, followed by the PSS from extra-organizational ones. Table 17 displays the results of the HMR. R was significantly different from zero at each step. After step 2, with all predictors in the equation, $R = .34$, $F(3, 498) = 21.71$, $p < .05$.

After step 1, with PSS from organizational stressors in the equation, $R^2 = .11$, (adjusted $R^2 = .11$), $F_{inc}(2, 496) = 30.08$, $p < .05$. After step 2, with PSS from extra-organizational sources added to the prediction of psychological stress, $R^2 = .12$ (adjusted $R^2 = .11$), $F_{inc}(1, 495) = 4.53$, $p > .05$. Addition of PSS from extra-organizational sources to the equation did not improve significantly R^2 ($\Delta R^2 = .008$, $p > .05$). In fact, PSS from extra-organizational sources predicted less than an additional 1% of the variance in psychological stress. Moreover, an investigation of the unique contribution of each of the indicators of organizational and extra-organizational

Table 17

Hierarchical multiple regression of PSS from organizational sources (supervisor and colleagues) and PSS from extra-organizational sources ('partner, family and friends') to psychological stress at phase 2 (PSM.p2).

Variable	PSM.p2 (DV)	PSS- supervisor	PSS- colleagues	PSS- 'partner, family, friends'	B	β	sr^2 (incremental)
ORGANIZATIONAL							
PSS-supervisor	-.30				-.64	-.23*	.04*
PSS-colleagues	-.25	.43			-.42	-.12	.01
EXTRA- ORGANIZATIONAL							
PSS-'partner, family, friends'	.17	.18	.29		-.31	-.09	.01
Intercept					= 42.54		
Means	27.79	9.76	10.97	12.89			
SD	10.23	3.72	3.01	3.15			
					R ² =.12		
					Adjusted R ² =.11		
					R=.34*		

Note. * $p < .05$.

sources of PSS revealed that only that of the PSS from the supervisor was significant ($sr^2=.04$, $p<.05$).

Moreover, an exploratory hierarchical multiple regression with the PSS from extra-organizational sources entered first in the equation followed by the PSS from organizational sources to predict psychological stress revealed that once the contribution of the extra-organizational sources of PSS was considered, the added contribution of the organizational PSS to the prediction of psychological stress was significant and somewhat substantial ($\Delta R^2=.09$, $F_{inc}(2, 495)= 24.37$, $p<.05$).

3.3.1.4 Hierarchical Multiple Regression: Moderating Role of PSS

To test the moderating effects, the analytical framework for testing moderator effects using hierarchical multiple regression analyses described by Holmbeck (1997) was employed. According to the same author, moderation implies that a causal association between two variables varies as a function of the moderator variable. As such to test for moderating effects, analyses must test for the presence of a significant differential effect of the predictor variable on the dependent one as a function of the moderator. In regression procedures, this is possible by adding the product/interaction of the predictors and the moderators to the regression equation, and testing for its significance, once the contribution of the two other variables is accounted for.

As such, an HMR was performed to test the moderating effect of PSS in the relation between the stress-enhancing cognitive appraisals specific to one's worst stressors (SECA) and PSM was expected to be significant and substantial. Psychological stress was the dependent variable and the SECA indicators (perceived impact, mastery and uncertainty) relative to the worst reported current stressor as well as PSS from both organizational (supervisors, colleagues) and extra-organizational sources ('partner, relative and friends') as the independent variables.

SECA's indicators specific to the worst reported stressors were entered first, followed by PSS from the three sources, and then by the 9 interaction terms. Table 18 displays the results of the HMR. R was significantly different from zero at each step. After step 3, with all predictors in the equation, $R = .54$, $F(12, 498) = 16.77$, $p < .05$.

After step 1, with SECA in the equation, 23% of the explained variance in PSM was explained; $R^2 = .23$, (adjusted $R^2 = .23$), $F_{inc}(3, 495) = 49.94$, $p < .05$. After step 2, with PSS from organizational and extra-organizational sources added to the prediction of psychological stress, 29% of the variance in PSM was explained; $R^2 = .29$ (adjusted $R^2 = .28$), $F_{inc}(3, 492) = 12.50$, $p < .05$. After step 3, with the 9 interaction terms added to the prediction of psychological stress, the same 29% of the variance was explained in PSM; $R^2 = .29$ (adjusted $R^2 = .28$), $F_{inc}(6, 486) = .70$, $p > .05$. Addition of the 9 interaction terms to the equation did not improve significantly R^2 ($\Delta R^2 = .006$, $p > .05$). In fact, the interaction terms predicted less than an additional 1% of the variance in psychological stress. As such, PSS did not moderate the relation between the stress-enhancing cognitive appraisals specific to one's worst stressors (SECA) and PSM. Altogether, these results suggested that although both the SECA specific to the worst reported stressors and PSS from various sources predicted significantly psychological stress, the moderating role of PSS to the SECA-PSM relation was not supported. In other words, the strength/direction of the SECA-PSM association did not vary according to the reported level of PSS.

Table 18

Hierarchical multiple regression moderating analyses: Predicting psychological stress at phase 2 (PSM.p2), the stress-enhancing cognitive appraisals specific to the worst current stressors (SECA) and PSS from supervisor, colleagues and 'partner, family, and friends' as predictors (N=499)

Variables	PSM.p2	IMP	SECA MAS	UNC	SUP	PSS COL	X-ORG	1 IMP * SUP	2 IMP * COL	3 IMP * X-ORG	4 MAS * SUP	5 MAS * COL	6 MAS * X-ORG	7 UNC * SUP	8 UNC * COL	9 UNC * X-ORG	B	β	sr ² (incremental)
IMP	.43																2.49	.40	.01
MAS	-.29	-.32															1.27	.22	.01
UNC	.37	.51	-.31														.85	.15*	.02*
SUP	-.30	-.17	.18	-.14													.24	.09	.01
COL	-.25	-.10	.17	-.17	.43												.36	-.11	.01
X-ORG	-.17	-.11	.14	-.09	.18	.29											.16	.05	.01
1	.02	.49	-.05	.20	.74	.31	.06										.00	-.16	.01
2	.12	.65	-.10	.24	.19	.67	.14	.60									.00	-.01	.01
3	.22	.70	-.16	.33	-.03	.13	.61	.42	.62								.00	-.01	.01
4	-.38	-.32	.79	-.29	.70	.36	.21	.36	.03	-.12							.00	-.26	.01
5	-.34	-.29	.86	-.31	.35	.60	.25	.11	.23	-.06	.81						.00	-.20	.01
6	-.33	-.32	.90	-.31	.24	.26	.52	-.02	-.03	.10	.77	.84					.00	.05	.01
7	.38	-.32	.79	-.29	.70	.36	.21	.36	.03	-.12	1.00	.82	.77				.00	/	/
8	-.34	-.29	.86	-.31	.35	.60	.25	.11	.23	-.06	.81	1.00	.84	.82			.00	/	/
9	-.33	-.32	.90	-.31	.24	.26	.52	-.02	-.03	.10	.77	.84	1.00	.77			.00	/	/
Means	27.8	5.9	3.8	5.3	9.7	10.9	12.9	56.9	64.7	76.0	38.4	42.8	50.0	38.4	42.8	50.0			
SD	10.2	1.6	1.7	1.7	3.7	3.0	3.1	26.2	25.3	28.3	25.4	24.2	27.8	25.3	24.3	27.7			
Intercept = 14.47																			
Adjusted R ² = .28																			
R ² = .54*																			

Note. *p<.05. IMP, MAS and UNC are the perceived impact, perceived mastery and perceived uncertainty specific to the worst reported overall stressors respectively. PSS is the perceived social support.

3.4 Proposed Model of Workplace Stress and Overall Distress

The main objective of the present study was to test a model of workplace stress and overall distress. The conceptual hypothesized model is depicted in Figure 10. Stress-enhancing subjective appraisals, perceived social support, psychological stress, and overall distress were the main variables included in the model. The present investigation targeted, more specifically, the assessment of a model describing how the stress-enhancing cognitive appraisals specific to the worst reported organizational and/or extra-organizational stressors and perceived social support were related to psychological stress, and how psychological stress, in turn, was related to overall distress, as measured by indicators of psychological distress, job and life satisfaction.

It was first hypothesized that the stress-enhancing cognitive appraisal (SECA) specific to the worst identified current stressors would be associated significantly and positively with psychological stress (PSM). Second, the association between perceived social support (PSS) and PSM was hypothesized to be negative and significant. Third, the association between PSM and overall distress (ODI) was hypothesized to be positive and significant. Fourth, the indirect effect of PSS on the ODI was expected to be significant and negative, whereas the one of the SECA specific to the identified stressors on the ODI was hypothesized to be significant and positive. Thus, PSM was expected to mediate both the impact of PSS on the ODI, and of SECA on the ODI. Fifth, it was expected that PSS will add significantly to the prediction of PSM, once the contribution of the SECA specific to the worst stressors has been accounted for. Finally, it was expected that psychological stress at phase 1 will add significantly to the prediction of psychological distress at phase 2 (5 months later), once the contribution of psychological distress level at phase 1 has been accounted for. Thus, the added predictive value of psychological stress at phase 1 was evaluated.

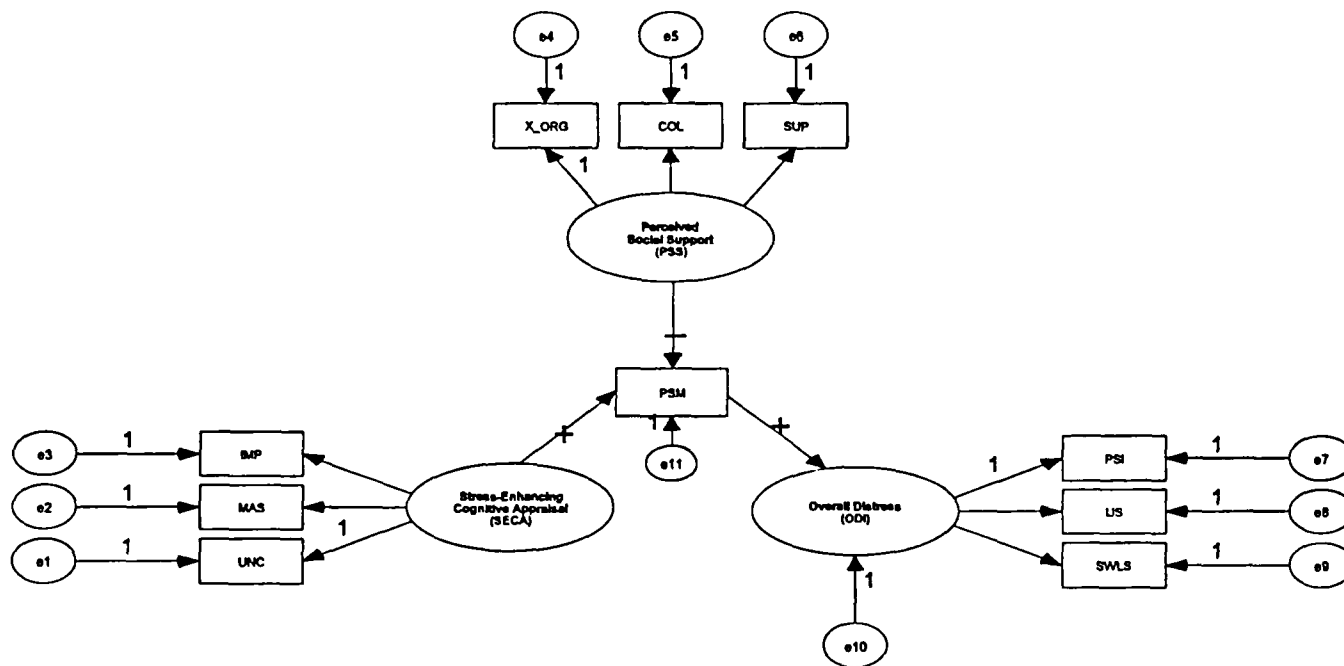


Figure 10. Hypothesized model of workplace stress & overall distress.

Two rounds of analyses were used to test the main objectives of the present section. The first was specific to testing the hypotheses related to the prediction model of workplace stress and overall distress. The second targeted the prediction of psychological distress levels at phase 2 from the psychological stress levels at phase 1. The next subsection will outline all the analyses that are specific to the main objective of this section.

3.4.1 Analyses

For this section, data analysis was based solely on the phase 2 dataset. As such, the reader is encouraged to refer to the previous section (3rd section) of the results chapter for a detailed account of the preliminary analyses and the descriptive statistics relative to the hypotheses of the present section. To test the proposed model of workplace stress and overall distress, data analysis (structural equation modeling) was partitioned into three main steps: (a) estimation of the hypothesized model, (b) principal components analyses, and (c) estimation of an alternative model. Structural equation modeling procedures were performed with the AMOS 4.01 program (Arbuckle, 1994).

Given that a variety of procedures can be used in the selection of the estimation procedure, the analyzed matrix type and the assessment of the overall model fit, the ones selected in the present study are briefly outlined in the paragraphs below.

Estimation procedure. The most widely used estimation option, Maximum Likelihood (ML) estimation, was used in the present study. The ML parameters are unbiased, consistent and asymptotically efficient (Bollen, 1989; Kline, 1998). In addition, the ML function is scale invariant and scale free, and the distribution of the estimated parameters is normal, permitting, as such, to assess their statistical significance. Finally, a statistical test of the fit between the

sample covariance and the estimated covariance of the overidentified model can be done (Bollen, 1989; Byrne, 2001).

Matrix type. A covariance matrix was analyzed in the present study. This type of matrix is frequently analyzed when dealing with continuous or/and likert scale data, and is preferred over correlation matrices that can, at times, generate inaccurate fit indices and standard errors.

Overall assessment of the model fit. There are various different fit indexes in the SEM literature. In line with the recommendations of many not to rely solely on any one of these indexes, some of the most widely reported fit indexes were used in the present study (Byrne, 2001; Kline, 1998). More specifically, the chi-square likelihood ratio (X^2), the comparative fit index (CFI), the parsimony comparative fit index (PCFI), and the root mean square error of approximation (RMSEA) were used.

Perhaps one of the most basic fit indexes is the X^2 . It evaluates whether the sample covariance matrix differs significantly from the estimated covariance matrix (Byrne, 2001). The validity of the X^2 , however, in testing the null hypothesis of overall model fit is questionable partly due to its over-sensitivity to sample size and its tendency to reject the null hypothesis of no differences between the two matrices. As a non-significant X^2 statistic is unlikely with large samples, the X^2/df ratio is often calculated instead in order to reduce the index's sensitivity. When using such an index, values of 3 or less are considered favorable (Kline, 1998).

Other fit indexes are more standardized and less sensitive to sample size. One of these is the CFI. Its values range from 0 (poor fit) to 1 (perfect fit), and values above .90 are considered satisfactory. The CFI indicates the proportion in the improvement of the overall fit of the researcher's model relative to a null model, one in which the observed variables are assumed to be uncorrelated (Byrne, 2001; Kline, 1998). The other of such indexes, the PCFI, is actually

derived from the CFI. The PCFI index takes into account the complexity (i.e., number of estimated parameters) of the hypothesized model in the assessment of the overall model fit. As such, the goodness of fit of the model, as well as its parsimony, are represented by this single index, in turn providing a more realistic evaluation of the hypothesized model. Values for this index also range between 0 and 1, with values above .50 considered acceptable (Byrne, 2001; Kline, 1998). The last of such indexes used in the present study, is the RMSEA. This index focuses on the root mean square error of approximation and evaluates the discrepancy, per degree of freedom, between the model and the population covariance matrix. This index is also sensitive to the number of estimated parameters in the model (i.e., parsimony). Values around .05 indicate a good fit, and values as high as .08 represent reasonable errors of approximation in the population (Byrne, 2001).

Model testing considerations. Considering that SEM procedures could result in sample-specific chance fluctuations in the data (i.e., a satisfactory fit of the revised model), it is suggested to use different samples to test the hypothesized and revised models (Byrne, 2001). With large samples, a commonly used method involves splitting the initial sample in two, testing the proposed model on the first half and the revised one on the second half. However, with a moderate sample size, as the one of the present study, the loss of power and the lower stability of the tested model that results by splitting the sample in half can be considerable. To avoid such a loss of power and model stability, the present investigators chose to test both the proposed and revised model on the same sample (N=499).

3.4.1.1 Structural Equation Modeling

Principle Components Analyses. In order to examine the factor structure of the global scores of the perceived social support scale (PSS) and of the overall distress scale (ODI),

principle components analyses (PCA) were performed prior to testing the hypothesized model through SEM procedures.

Perceived Social Support (PSS). As mentioned, the PSS is comprised of 12-items which assess the perceived social support from three different sources: (1) 'supervisor', (2) 'colleagues', and (3) 'partner, family, and friends'. It is recommended to run a PCA to verify whether three different factors can be detected. In line with the results of previous research (Caplan et al., 1980), a three-factor solution with varimax rotation was deemed very adequate. Three factors (4-items for each of the three different sources of support) were identified, with factor loadings above .65 and elevated communality scores (see Table 19). The final three-factor solution explains 68.1% of the variance. Finally, the observed internal consistency for the PSS scale was quite satisfactory (Cronback's $\alpha=.84$).

Overall Distress Indicator (ODI). The ODI is an index of overall distress that includes three different scales: (1) the psychological distress index (PSI), (2) the index of job satisfaction (IJS), and (3) the satisfaction with life scale (SWLS). PCA, with varimax rotation, revealed that a three-factor solution was quite acceptable. In fact, three distinct factors were identified. The first factor represents the 14 items of the PSI, whereas the second comprised of the 18 items of the IJS, and the third of the 5 items of the SWLS. On average, factors loadings and communality scores were elevated (see Table 20). The final three-factor solution explains 52.4% of the variance. The observed internal consistency for the ODI was quite satisfactory (Cronback's $\alpha=.86$). Observed correlations among the three indicators of the ODI are presented in Appendix E.

Altogether, these results support the factor structure of the global measures used in the present study. To facilitate the reader's comprehension and for the sake of parsimony, SEM

Table 19

Factor loadings and communality scores (h^2) for the three-factor solution (varimax rotation) of perceived social support (PSS).

Item	SUP	COL	X-ORG	h^2
SUP1	.84			.72
SUP2	.82			.70
SUP3	.85			.79
SUP4	.77			.65
COL1		.76		.62
COL2		.65		.52
COL3		.84		.75
COL4		.80		.66
X-ORG1			.78	.62
X-ORG2			.81	.68
X-ORG3			.86	.75
X-ORG4			.84	.74
Explained variance (%)	36.2	19.5	12.4	
Cum. Variance (%)	36.2	55.7	68.1	

Note. SUP1-SUP4 are the sub-items of the PSS from the 'supervisor', whereas COL1-COL4 are the sub-items of the PSS from the 'colleagues', and X-ORG1 X-ORG4 are the sub-items of the PSS from the 'partner, family and friends'

Table 20

Factor loadings and communality scores (h^2) for the three-factor solution (varimax rotation) of the overall distress score (ODI).

Item	PSI	IJS	SWLS	h^2
PSI1	.60			.49
PSI2	.49		<i>-.49</i>	.49
PSI3	.58			.35
PSI4	.70			.55
PSI5	.68			.50
PSI6	.55	<i>.41</i>		.51
PSI7	.61			.46
PSI8	.61			.38
PSI9	.60			.46
PSI10	.71			.63
PSI11	.72			.57
PSI12	.69			.54
PSI13	.76			.61
PSI14	.69			.51
IJS1		.57		.40
IJS2		.75		.61
IJS3		-.22		.06
IJS4		-.66		.46
IJS5		.50		.27
IJS6		.77		.65
IJS7		.75		.61
IJS8	<i>.35</i>	-.66		.59
IJS9		.75		.62
IJS10		-.14		.02
IJS11		.74		.59
IJS12		.62		.44
IJS13		.76		.63
IJS14		-.75		.61
IJS15		.63		.41
IJS16		-.79		.65
IJS17		.78		.67
IJS18		-.68		.53
SWLS1			.79	.71
SWLS2			.79	.70
SWLS3			.85	.81
SWLS4			.81	.70
SWLS5			.70	.59
Explained variance (%)	33.4	11.7	6.1	
Cum. Variance (%)	33.4	45.1	51.2	

Note. IJS1-IJS18 are the sub-items of the IJS, whereas PSI1-PSI14 are the sub-items of the PSI, and SWLS1-SWLS5 are the sub-items of the SWLS. Cross-loadings above .30 are in italics.

procedures, described in the following section, will be based on the total scores of each of the subscales described above. As such, their individual sub-items will not appear in the remaining of the results.

Testing the hypothesized model. As specified, the hypothesized model is depicted in Figure 10. The six main statistical hypotheses specific to the structural portion of the model are described below. First, the regression coefficient of psychological stress on the stress-enhancing cognitive appraisals (SECA) specific to the worst stressors was hypothesized to be positive and significant. As such, it was also indirectly expected that perceived impact and perceived uncertainty will load positively on SECA, whereas perceived mastery will load negatively on SECA. Second, the regression coefficient of psychological stress on perceived social support (PSS) was hypothesized to be negative and significant. It was also indirectly expected that perceived social support from both organizational ('supervisor' and 'colleagues') and extra-organizational ('partner, family and friends') sources will load positively on PSS. Third, the regression coefficient of the overall distress index (ODI) on the psychological stress measure (PSM) was hypothesized to be positive and significant. It was also indirectly expected that the psychological distress index will load positively on ODI, whereas the index of job satisfaction and the satisfaction with life scale will both load positively on ODI. Fourth, the indirect effect of PSS on the ODI was expected to be significant and negative. Fifth, the ΔX^2 between the complete model and the one excluding the total effect of PSS on MSP was expected to be significant. Thus, PSS was expected to add significantly to the prediction of PSM, once the contribution of the SECA specific to the worst stressors has been accounted for. Finally, the indirect effect of the SECA specific to the worst stressors on the ODI was hypothesized to be

significant and positive. Thus, PSM was expected to mediate both the impact of PSS on the ODI, and of SECA on the ODI.

The covariance and the correlation matrices obtained from the observed data are presented in Appendixes F and G respectively. An illustration of the resulting model is presented in Figure 11. All the hypothesized paths between the constructs were not only significant but also in the expected direction. In fact, all direct and indirect hypothesized effects were supported. Altogether, the hypothesized paths explained a substantial and significant portion of the variances of the PSM ($R^2=.36$, $p<.05$) and of the ODI ($R^2=.57$, $p<.05$). Nevertheless, model estimation yielded a poor fit ($X^2(33, N=499)=184.58$, $p<.001$; CFI=.89; PCFI=.65; RMSEA=.09).

A review of the modification indexes generated by the AMOS output highlighted three substantively meaningful links between some of the latent variables that would significantly improve the fit of the model. Although the proposed relations are not as substantial as those already tested, they nevertheless make theoretical sense and have been identified in previous research. The first of these relations is that between the PSS and the ODI. More specifically, besides influencing negatively psychological stress, the overall level of perceived social support is also expected to influence negatively the overall distress level, as measured in the present study. As outlined in the introduction chapter of this document, several researchers have highlighted the link between social support and different indicators of overall distress (Bliese & Britt, 2001; Dolan, Ameringen & Arsenault, 1992; Viswesvaran, Sanchez & Fisher, 2000). In fact, main effects of social support on depression, anxiety and irritation have been frequently reported (Brotheridge, 2001; Browner, 1987; Burke & Greenglass, 2001).

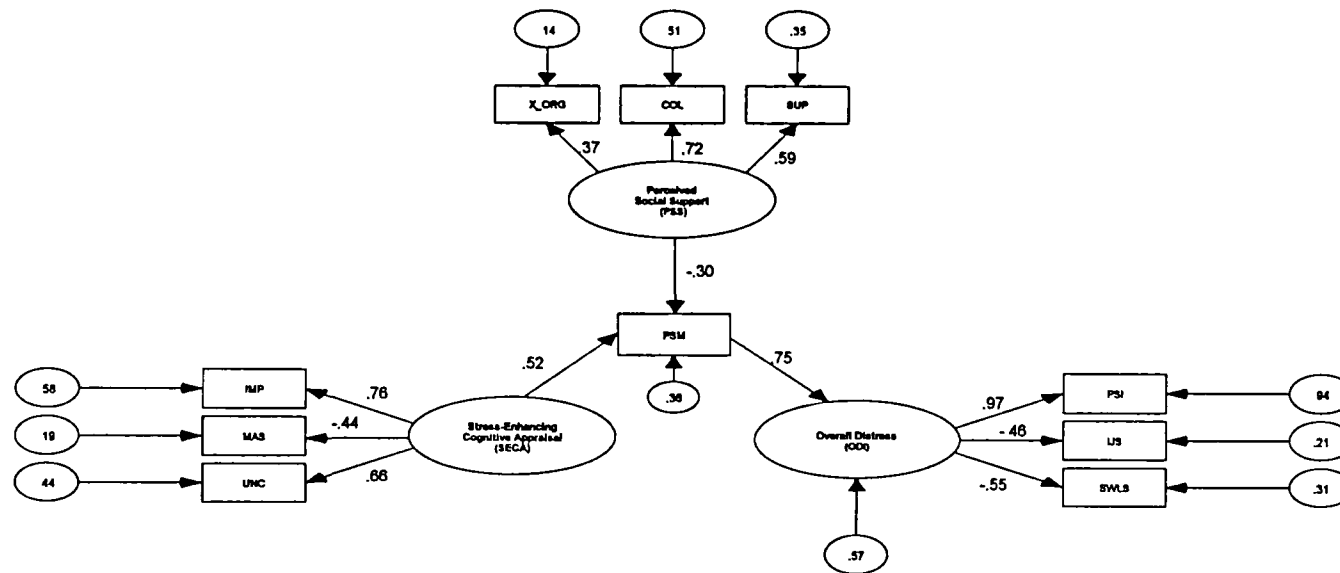


Figure 11. Hypothesized prediction model of workplace psychological stress & overall distress (N=499). All the parameters in the model are standardized and significant at the .01 level.

The second of these relations is that between the SECA and the ODI. It is expected that the stress enhancing cognitive appraisal would influence positively the overall distress level. Positive associations between the different indicators of the SECA grouping (perceived impact, perceived uncertainty, and perceived mastery) and indicators of overall distress have been highlighted by numerous authors (Frone, Russel & Cooper, 1995; Hudek-Knezevic & Kardum, 2000; Perrewé & Zellars, 1999; Sweet, Savoie & Lemyre, 1999; Viswesvaran, Sanchez & Fisher, 2000).

Considering that most authors have not distinguished conceptually between the immediate outcomes of stressors (i.e., state of psychological stress) and the longer term ones (i.e., psychological distress, job and life dissatisfaction), it is not surprising that these first two associations have received considerable support. Combined, these two relations point to the longer term negative outcomes related to a perceived lack of social support and to the endorsement of stress enhancing cognitive appraisals. Given empirical support, as well as the difficulty of capturing the dynamic nature and temporal sequence of the stress transaction through SEM procedures, it was decided to add these two associations to the alternative proposed model of workplace stress and overall distress.

The third of the identified relations is that between PSS and the SECA. More specifically, lower overall levels of perceived social support are more likely to elicit stress-enhancing cognitive appraisals. This relationship has indeed been highlighted by some researchers who suggest that individuals who expect to get little social support from their environment to deal with a stressor are also more likely to endorse stress enhancing cognitive appraisals to a greater extent (Bliese & Castro, 2000; Carayon, 1995; Cassidy & Burnside, 1996; Hudek-Knezević & Kardum, 2000; Jorgensen & Johnson, 1990). Combined, these relations

imply that the higher the level of perceived social support, the lower the likelihood of adopting SECA, and experiencing overall distress. Given the outlined associations, a new stress and distress model was hypothesized a posteriori and tested.

Testing an alternative model. The revised hypothesized model is depicted in Figure 12. The statistical hypotheses corresponding to the structural portion of the model are the same as those described at the beginning of the previous section, with three additional hypotheses. As mentioned above, the first of the added hypotheses is that the regression coefficient of ODI on PSS is expected to be significant and negative. The second is that the regression coefficient of SECA on PSS is also expected to be significant and negative. Finally, the regression coefficient of ODI on SECA is hypothesized to be positive and significant.

Model estimation yielded a satisfactory fit ($X^2(30, N=499)=111.64, p>.001$; CFI=.94; PCFI=.63; RMSEA=.07). The difference between the fit of the initial and final model was significant ($\Delta X^2_{(\Delta df=3, N=499)}=72.92, p>.001$). Although the observed X^2/df ratio of 3.72 is just above the suggested value of 3, the other indexes were more than acceptable. For instance, the CFI revealed that the model explained 94% of the sample covariance matrix. Given such a CFI value, a PCFI of .63 is usually indicative of a model presenting a satisfactory degree of parsimony (Byrne, 2001). Finally, a RMSEA value of .07 represents a reasonable error of approximation in the population. Given these fit indexes, the model presented in Figure 13 was considered the final model for the present study.

All hypothesized paths were not only significant but also in the expected direction. First, SECA predicted PSM significantly, the magnitude of the regression coefficient was large and its valence was positive. Thus, a more frequent use of stress-enhancing cognitive appraisals was

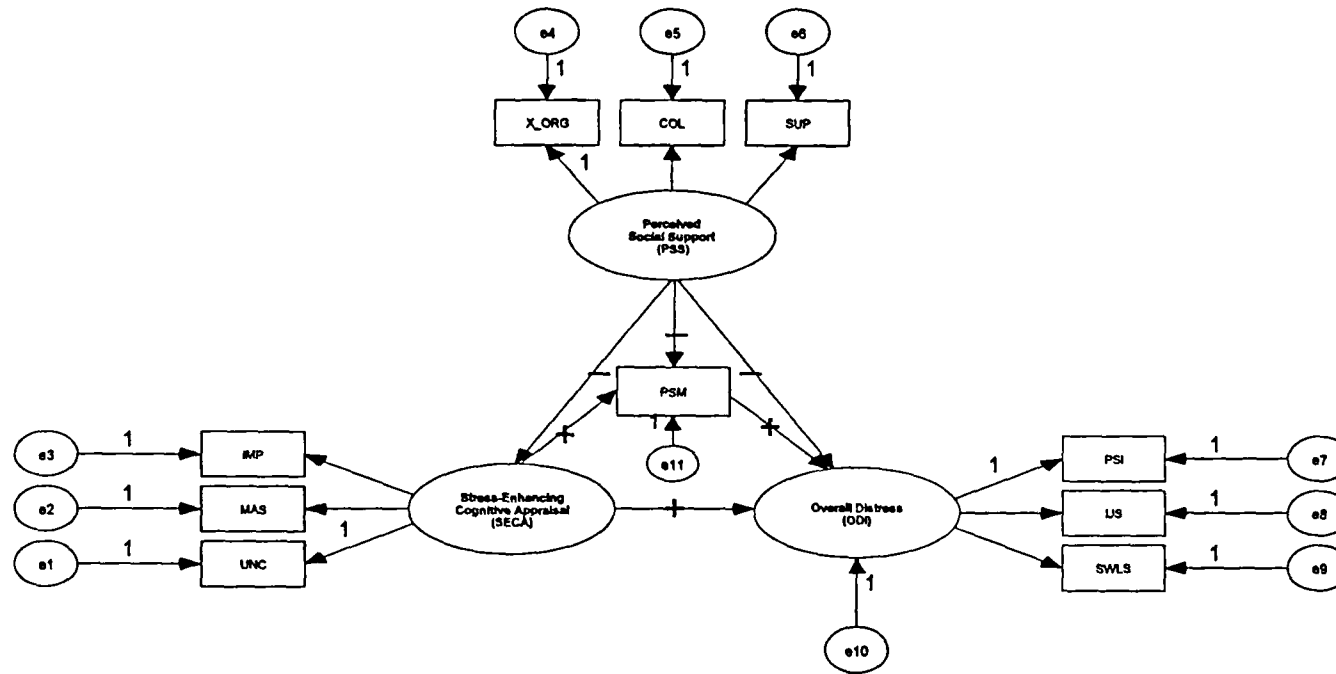


Figure 12. Revised hypothesized model of workplace stress & overall distress.

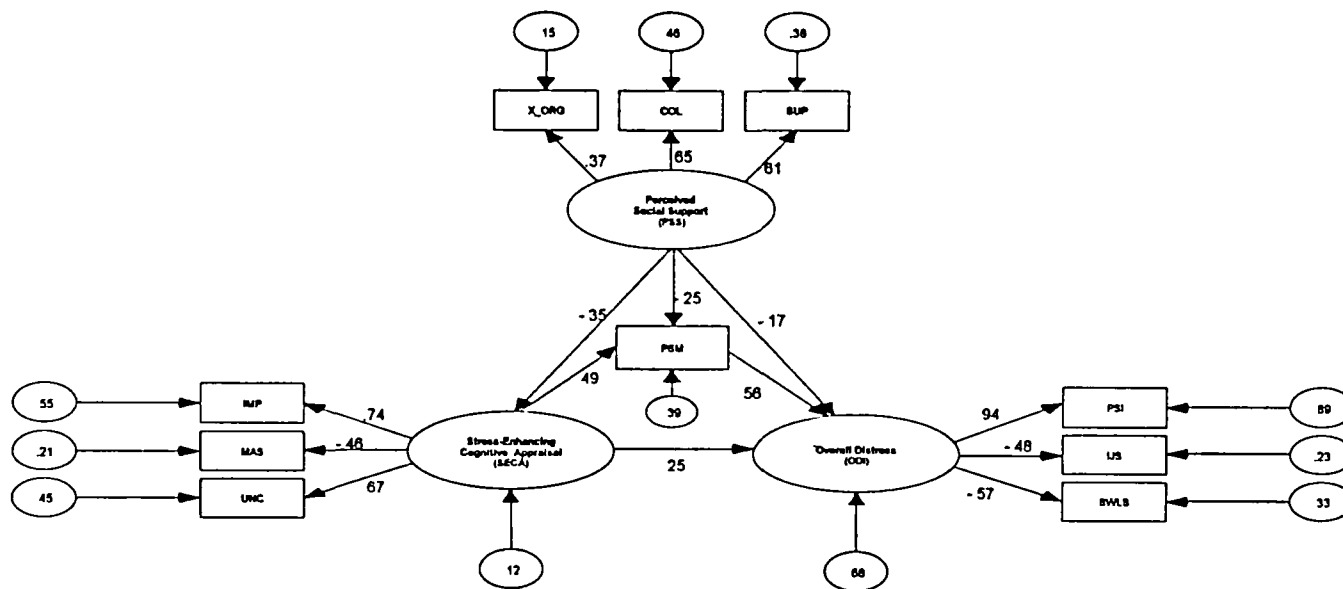


Figure 13. Revised and final model of workplace stress & overall distress (N=499). All the parameters in the model are standardized and significant at the .01 level.

associated with higher levels of psychological stress. Second, SECA also predicted the ODI significantly, the magnitude of the regression coefficient was moderate, and its valence was positive. In other words, as the stress-enhancing cognitive appraisals increased, so did overall distress. Third, PSS predicted PSM significantly, the magnitude of its regression coefficient was moderate and its valence was negative. Thus, higher levels of perceived social support were associated with lower levels of psychological stress. Fourth, the ΔX^2 between the complete model and the one excluding the total effect of PSS on MSP was significant ($\Delta X^2 = 58.2$, $df=2$, $p<.01$). In fact, once the contribution of the SECA specific to the worst stressors has been accounted for, PSS explained an additional 5.8% of the variance of PSM. Fourth, PSS predicted ODI significantly, the magnitude of its regression coefficient was just between small and moderate, and its valence was negative. As such, higher levels of perceived social support were associated with lower levels of overall distress. Fifth, PSS predicted SECA significantly, the magnitude of its regression coefficient was large, and its valence was negative. As such, higher levels of perceived social support were associated with lower levels of stress-enhancing cognitive appraisals. Finally, PSM predicted ODI significantly, the magnitude of its regression coefficient was large, and its valence positive.

Besides the direct effects described above, interesting indirect effects were observed. As indicated by Kline (1998), indirect effects represent the mediating influence of at least one mediating variable. As briefly discussed in the previous section, obtained results supported both of the hypothesized indirect effects. In fact, psychological stress was found to mediate the impact of PSS on the ODI and of SECA on the ODI. The indirect effect of PSS on ODI was significant and negative (Indirect effect = $-.32$, $p<.05$), whereas that of SECA on the ODI was significant and positive (Indirect effect = $.27$, $p<.05$). Both these findings supported the

hypothesis that psychological stress mediated, to a considerable degree, the association between PSS and ODI and that between SECA and ODI.

Altogether, the hypothesized paths explained a significant and quite substantial portion of the variances of the PSM ($R^2=.39$, $p<.05$) and of the ODI ($R^2=.68$, $p<.05$), and a small, yet significant, portion of the variance of SECA ($R^2=.12$, $p<.05$). The next subsection will outline the analyses of the second objective of the present section.

3.5 Prediction of Distress from Stress: A longitudinal Contribution

As mentioned, given the context of urgency in which this study took place, only in phase 2 was it possible to measure all the variables of interest. Of the indicators of ODI, only psychological distress was actually measured at both phases of the study. Consequently, the analyses of the present section targeted solely the prediction of psychological distress (PSI) levels from psychological stress (PSM). It was expected that PSM at phase 1, will add significantly to the prediction of PSI at phase 2 (5 months later), once PSI at phase 1 has been controlled for.

3.5.1 Analyses

For this section, data analysis was partitioned into three steps. The first, preliminary analyses, addressed issues related to the assumptions specific to multivariate analyses. The second, descriptive analyses, included detailed summary statistics on each of the variables under investigation. The last, included the results of the hierarchical multiple regression procedures used to test the present hypothesis.

3.5.1.1 Preliminary Analyses

Prior to running multivariate analysis procedures, all variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis. The following section describes all corrective steps that were taken in order to avoid any violations to the assumptions of multivariate analysis.

Accuracy of input, missing data, univariate and multivariate outliers. Once all observed values seemed reasonable, an examination of missing values was conducted. It revealed that of the original sample of 348 employees who participated in both phases of the

study, 15 cases were deleted because of randomly missing values on several of the variables of interest.

Next, data was screened for univariate and multivariate outliers. Four cases with standardized scores slightly greater than 3.29, with the highest value at 3.86, were identified. Given that with a large sample size a few cases with standardized scores in excess of 3.29 are expected and that these cases were not also multivariate outliers, they were kept in for further analyses (Tabachnick & Fidell, 1996). Multivariate outliers were examined through computations of Mahalanobis' distances. In two cases, the Mahalanobis' distances were significant ($X^2 (df=2) > 32.09, p < .001$). These cases were removed from further analyses, yielding a final sample size of 331 participants.

Distributions. Next, the distributions of all the dependent variables of the data set were examined in order to detect substantial departures from normality. As indicated in Table 21, skewness values ranged from .15 to .91, while kurtosis values ranged from -.64 to .99. Univariate values of kurtosis and skewness were considered acceptable, since all values were within an acceptable range of -1 to 1 (Muthén & Kaplan, 1985). Altogether, the distributions of the variables did not seem to depart significantly from normality, and, from a multivariate perspective, the distribution of the standardized residuals seemed normal.

Linearity, homoscedasticity, multicollinearity. Bivariate scatterplots were inspected to detect potential departures from linearity, and to identify the variance between the pairs of the variables. The observed distributions were generally linear and no evidence of homoscedasticity was found. Although Tabachnick & Fidell (1996) suggest that statistical problems created by multicollinearity tend to occur at correlations above .80, the one observed between psychological

Table 21

Summary statistics for the indicators psychological stress at phase 1 (PSM.p1) and psychological distress at phases 1 (PSI.p1) and 2 (PSI.p2).

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Phase 1				
PSM.p1	28.13	9.93	.15	-.64
PSI.p1	22.77	13.11	.43	.30
Phase2				
PSI.p2	21.96	13.63	.91	.99

Note. The theoretical range for MSP is from 7 to 56, and from 0 to 75 for PSI.

stress and psychological distress at phase 1 ($r = .76$) is quite elevated. Considering such a correlation and the use of multiple regression, it is somewhat unlikely that psychological stress would predict later distress above and beyond the initial distress level. Given the theoretical interest in investigating the longitudinal association between psychological stress and distress, the present investigators decided nevertheless to test the hypothesis and to present the results as exploratory and tentative.

3.5.1.2 Descriptive Statistics

Psychological Stress Measure (PSM at phase1). The mean estimated psychological stress score at phase 1 ($M=28.13$, $SD=9.93$) was at the 74th percentile of Quebec-based norms established for that measure. In other words, the “average” employee obtained a stress score higher than or equal to 74% of the Quebec population. This result indicated that psychological stress levels of the sampled employees are above the average of the established norms.

Psychological Symptom Index (PSI). Mean score PSI value ($M=22.77$, $SD=13.11$) at phase 1, as well as that at phase 2 ($M=21.96$; $SD=13.63$), was at the 63rd percentile of Quebec-based norms established for that measure. In other words, the “average” employee obtained a psychological distress score higher than or equal to 63% of the Quebec population at both phases 1 and 2. It is also worth mentioning that close to 19% of the participants of phase 1 and 17% of those of phase 2 scored above the cutoff score used to represent high levels of psychological distress, a result similar to that reported in other investigations (Enquête Santé Québec, 1987; 1992; Prévile, Boyer, Potvin, Perrault & Légaré, 1987).

3.5.1.3 Hierarchical Multiple Regression

An hierarchical multiple regression (HMR) was performed between psychological distress at phase 2 as the dependent variable and psychological distress at phase 1 as well as

psychological stress at phase 1 as the independent variables. Psychological distress at phase 1 was entered first, followed by psychological stress at phase 1. Table 22 displays the results of the HMR. R was significantly different from zero at each step. After step 2, with all predictors in the equation, $R = .57$, $F(2, 330) = 79.68$, $p < .05$.

After step 1, with psychological distress at phase 1 in the equation, $R^2 = .33$, $F_{inc}(1, 329) = 159.80$, $p < .05$. After step 2, with psychological stress at phase 1 added to the prediction of psychological distress at phase 2, $R^2 = .33$ (adjusted $R^2 = .32$), $F_{inc}(1, 328) = .03$, $p > .05$. Addition of psychological stress at phase 1 to the equation did not reliably improve R^2 .

The presented hypothesis was not supported. It seemed that psychological stress at phase 1 did not add significantly to the prediction of psychological distress at phase 2 (6 months later), once the contribution of psychological distress at phase 1 was accounted for. Knowledge of psychological stress levels at phase 1, however, did predict significantly psychological distress levels 6 months later (at phase 2). When zero-order correlations were assumed, however, psychological stress at phase 1 did predict significantly psychological distress levels 5 months later ($R = .43$).

The next section will present the discussion of the present thesis. In the discussion section, the major findings will be reiterated and further interpreted. Implications of the findings will also be discussed.

Table 22

Hierarchical multiple regression of psychological distress at phase 1 (PSI.p1) and psychological stress at phase 1 (PSM.p1) to psychological distress at phase 2 (PSI.p2).

Variables	PSI.p2 (DV)	PSI.p1	PSM.p1	B	β	sr^2 (incremental)
PSI.p1	.57			.60	.57*	.32*
PSM.p1	.43	.76		-.02	-.01	.01
Intercept = 8.42						
Means	21.96	22.77	28.05			
SD	13.63	13.10	9.93			
					R^2 = .33	
					Adjusted R^2 = .32	
					R = .57*	

Note. * $p < .01$.

CHAPTER IV

DISCUSSION

Given the particular context in which this study took place, the first goal of the study was to (1) document the experiences of hydro workers during and following the storm, in terms of their reported stressors and psychological stress/distress (5 and 10 months following the storm), and in relationship to their exposure to the storm.

Considering the theoretical strengths and shortcomings of the models of workplace stress and overall distress that were identified throughout this document, and the aim of better understanding the associations between the stress-enhancing cognitive appraisals, perceived social support, psychological stress and overall distress within an occupational setting, the theoretical objectives of the present study were to: (2) assess the importance of considering appraised extra-organizational stressors in predicting psychological stress, (3) examine the added contribution of extra-organizational sources of perceived social support to the prediction of psychological stress, as well as assess its the stress-buffering role, (4) test a proposed integrative model of workplace stress and overall distress, and (5) further our understanding of the relations between psychological stress and psychological distress levels across time.

The discussion chapter was partitioned into four steps. First, the results obtained for each of the identified objectives will be reiterated and interpreted. Second, the implications of the findings will be discussed. Third, the strengths and limitations of the study will be identified. Finally, main findings will be summarized and conclusions made.

4.1 The Canadian Ice Storm: Stressors, Stress & Distress

This section of the thesis focused on documenting the experiences of the recovery effort workers of the Canadian Ice Storm. One of the objectives was to determine whether any

differences in psychological stress and psychological distress levels existed between workers with different levels of exposure to the storm [as defined by Geographical Zones (Hit Heavily or Slightly), Degree of implication in the recovery efforts, Having been relocated, Having been a victim of the storm]. Other goals of the present section were to provide a descriptive account of the stressors the employees encountered during and following the recovery efforts from the ice storm as well as to get an estimate of their psychological stress and distress levels 5 as well as 10 months following the storm.

Significant differences in PSM and PSI at phase 1 (5 months later) were expected between workers with different type/degree/length of exposure to the recovery efforts. Given that significant decreases in the levels of PSM and PSI were expected once the bulk of the recovery efforts were completed, none of the hypothesized differences at phase 1 were expected to remain significant at phase 2 (10 months later).

Of the most frequently reported worst stressors related to the ice storm, close to half were specific to workplace operations during the storm (i.e., work overload, type of work done, interpersonal tension/conflict in the workplace, performance and/or competence and/or motivation issues, etc.). The remainder of the stressors were more extra-organizational in nature (i.e., worries/discomfort related to housing, worries related to the well-being of family members, increase or decrease of interaction with family members/relatives, etc.). The stressors identified clearly suggested that for the majority of the participants the recovery efforts did not go unnoticed and generated several organizational as well as extra-organizational stressors.

At phase 2, however, the majority of the participants clearly indicated that the direct impacts of the ice storm were, at most, minimal. In fact, more than 41.4% of the sample reported not having any more stressors related to the recovery efforts at phase 2. Similarly, it seemed that

the workers perceived the ice storm stressors at phase 2 as being less “stressful” (as measured by the SECA indicators) than those identified at phase 1. Nevertheless, the stressors that were identified at phase 2 (i.e., work overload, financial worries, type of work done) suggested not only some remaining work overload, but also the presence of some ongoing minor frustrations, to say the least, on behalf of the workers.

Estimates of psychological stress and distress levels indicated that the employees experienced moderately elevated levels of psychological stress and distress at both phases of the study. First, the mean estimated psychological stress score at both phase 1 and phase 2 was approximately at the 73rd percentile of Quebec-based norms established for that measure. Therefore, 10 months following the ice storm, employees seemed to be experiencing as much stress as they were 5 months following it. Second, phase 1 estimates of psychological distress levels indicated that, on average, employees reported slightly higher levels of psychological distress as compared to the norms established (Enquête Santé Québec, 1988; 1995; Prévile, Boyer, Potvin, Perrault & Légaré, 1987). Given that paired-sample t-test revealed a statistically non significant reduction in the mean levels of PSI reported by the employees at both phases, it therefore appears that 10 months following the ice storm, employees experienced similar levels of psychological distress.

At first glance, the lack of differences between the reported psychological stress and distress levels at both phases of the study were somewhat surprising considering that, 10 months following the storm, the majority of the workers reported few stressors specific to the storm. Given that the present study was larger in scope, the organizational and extra-organizational stressors that were reported by these workers at both phases clearly indicated that, at phase 2, they were confronted with other moderately severe stressors that were not related to the ice

storm. Although without pre-post data a causal relation cannot be drawn, it is likely that the bulk of the consequences of the ice storm were indeed short-lived, and that the moderately elevated levels of psychological stress and distress reported by the workers at phase 2 were more closely related to the impact of other organizational (i.e., work overload, job/position insecurity, interpersonal conflict at work) as well as extra-organizational stressors (i.e., family problems, illness, financial difficulties) that were identified by the workers. Similarly, it is also possible that the impacts of the ice storm had already greatly dissipated at phase 1. Although less likely given the numerous ice storm specific stressors identified by the workers 5 months following the storm, it is nevertheless probable that the workers were already mainly preoccupied by other stressors that were not specific to the ice storm. In such a case, the lack of difference between the psychological stress and distress levels reported at both phases of the study may be partly explained by the presence of non ice storm specific stressors at both phase 1 and 2.

Altogether, these findings point to the shorter-lived consequences of “less traumatic” (i.e., involved less extensive human losses) natural disasters on the well-being of workers (Hobfoll, 1991). Moreover, the observed findings also emphasize the potential negative impacts that day-to-day, non-traumatizing, organizational and extra-organizational stressors have on the psychological well-being of workers (Baba, Jamal & Tourigny, 1998; Bliese & Britt, 2001; Elangovan, 2001; Fielden & Cooper, 2001; Shupe & McGrath, 1998).

Given the absence of pre-post ice storm data no causal associations between the variables of study could be made. The longitudinal design adopted made it possible to investigate nevertheless whether, 5 and 10 months following the storm, any differences in psychological stress and distress levels existed between workers with different levels of exposure to the storm (as defined by geographical zones, direct contact with victims of the storm, type/degree/length of

involvement in the recovery efforts, having been relocated, and having been a victim of the storm). Answers to such questions were thought to be quite informative in better understanding the varying experiences of the employees during and following the ice storm.

As mentioned in the results section, the majority of the speculated hypotheses were not supported. In fact, of the 8 hypotheses detailed in the introduction, only 3 were supported. Obtained results clearly suggested that geographical zone, type and degree of involvement in the recovery efforts, and having been a victim of the storm were the best indicators of high psychological stress and distress levels, whereas having been relocated, having been in direct contact with victims, and prolonged exposure to the recovery efforts were not indicative of elevated psychological stress/distress levels. Before interpreting the significant results, it is important to mention, however, that if a Bonferroni correction was applied to control for the 16 comparisons, none of the hypotheses would have remained significant. Given the exploratory and descriptive goal of this section, the present authors decided, however, to apply a more liberal correction criterion (i.e., 1 omnibus repeated-measure MANOVA for each hypothesis). Nevertheless, until these findings are replicated, it would be prudent to present them as tentative.

Of the observed results, three were thought to be particularly interesting. First, results confirmed that workers who were involved, at least to some extent, in the recovery efforts during and following the storm did report significantly more PSM and PSI, at phase 1, than those who were less or not involved. Second, contrary to expectations, employees who were directly involved in the recovery efforts 'in the offices/posts/centers' reported significantly higher levels of PSM and PSI than those who were involved 'on the fields/outside'. Third, results indicated that in comparison to the workers who were also victims of the storm, those who were not did report significantly lower levels of PSM. These results point to some noteworthy observations

concerning the indicators identified as related to psychological stress and distress, namely the degree and type of involvement in the recovery efforts and the exposure to the actual ice storm.

First, it seems that the mere physical exposure to the actual ice storm is related to increased psychological stress and distress. This is reflected by the fact that geographical zone and having been a victim of the storm are both indicative of elevated psychological stress and distress. This is not surprising given that these workers needed to cope simultaneously with the impacts of the storm on their personal lives (i.e., less contact with family members, damage to property) as well as on their working lives (i.e., increased work hours). This finding may point to the additive effects that numerous stressors can have on one's psychological health, especially following a natural disaster (Barnett & Brennan, 1997; Edwards & Rothbard, 1999; Fielden & Cooper, 2001; Hart, 1999; Knight, Katz, Heller & Bengtson, 2000; Vasquez, 2001; Westman, 2001).

Second, it also seems that the variable representing the degree of involvement in the recovery efforts from the storm is most informative when considered in a dichotomic fashion (i.e., 'direct/indirect' versus a 'little/no'). In other words, having been involved in the recovery efforts to at least some extent, regardless the degree of the extent, generally would also be suggestive of increased levels of psychological stress and distress, as measured in the present study. This may suggest that even workers who were only moderately involved in the recovery efforts from a catastrophe may have suffered negative psychological impacts, and may be in need of additional support. The "mere exposure effect" that was observed seems to be in line with Brown and Harris's (1978) observation that once an event (i.e., ice storm) has involved change to the individual (i.e., change in terms of work-related tasks or other activities, diminished interaction with family members), negative effects are more likely to be experienced

(i.e., psychological stress, distress). Given that no studies in which the recovery effort workers were differentiated based on their degree of involvement were identified, these findings must remain tentative for the present time.

Third, the type of involvement in the recovery efforts is probably the single best indicator of psychological stress and distress. In fact, contrary to expectations, results suggested that employees who were involved in the recovery efforts ‘on the fields/outside’ also reported the lowest levels of psychological stress and distress amongst the other groups of employees who were involved, at least to some extent, in the recovery efforts. On the other hand, employees ‘in the offices/posts/centers’ also reported the highest degree of psychological stress and distress. Both groups of workers, however, were extremely and directly involved in the recovery efforts from the storm. Their type of involvement in the recovery efforts, however, was quite different.

Whereas the workers ‘on the fields/outdoors’ were directly involved in the concrete rebuilding of the power lines those ‘in the offices/posts/centers’ were more in charge of the administrative aspects of the recovery efforts including reassuring clients and informing them about progress of the recovery efforts. These results are in line with informal reports from the workers “on the fields/outdoors” about the positive effects of these efforts. Positive effects on the well-being of rescue workers following natural catastrophes have also been observed by other researchers (Marmar, Weis, Metzler & Delucci, 1996; Quarentelli, 1985). In the present study, these workers indicated that their efforts were highly recognized by the general public, that they had immediate and constant exposure as to how the efforts are progressing, and they also benefited from increased solidarity and teamwork during these times. As much as the workers “on the fields/outside” were exposed to the positive effects of the efforts, those “in the offices/posts/centers” were exposed to the negative effects. More specifically, workers “in the

offices/posts/centers” reported a lack of recognition for their efforts, lack of information concerning the progress of the recovery efforts to convey to the clients, having to deal with frustrated clients, and increased workloads.

Altogether, these results suggest that to better understand the experience of the workers, it is important to consider not only the degree but also the type of involvement in the recovery efforts. The observed findings could be explained with some of the different stress models that were outlined in the introduction chapter of the thesis. For instance, according to Lazarus and Folkman’s model (1984), psychological stress is likely to occur when there is an imbalance between the perceived demands and resources. As such, whereas both workers “on the fields/outside” and “in the offices/posts/centers” reported experiencing high demands (i.e., work overload), mostly those “on the fields/outside” indicated perceiving their resources as adequate (i.e., support, recognition, available information). It therefore seems that the workers “in the offices/posts/centers” experienced greater imbalance between their perceived demands and resources. Similarly, according to Karasek and Theorell’s (1990) model, the elevated psychological stress levels that were reported could be partly explained by the demanding work conditions and the little control the workers “in the offices/posts/centers” had on the completion of the actual recovery efforts. Unlike the workers “in the offices/posts/centers”, however, those “on the fields/outside” seemed to experience greater control over the recovery efforts and, in turn, lower levels of psychological stress.

Most observed differences in terms of psychological stress and distress did not remain significant at phase 2 suggesting that once the majority of the recovery efforts were completed, the accompanying psychological stress and distress also diminished. The exception to this observation was related to the variable representing the type of involvement in the recovery

efforts from the ice storm. It seems that not only was this variable indicative of psychological stress and distress in the shorter term but it was also indicative of stress/distress in the longer term. To some extent, this variable taps into the qualitatively distinct nature of the employees' experience with the recovery efforts from the storm, and emphasizes which workers (i.e., workers in 'the offices/posts/centers') reported experiencing more psychological stress and distress, and, in turn, may need additional organizational support. Without a pre-post ice storm design and considering that by the second phase of the study most of the impacts of the ice storm seemed to diminish significantly, alternative explanations for the presented results exist and must be, at least, considered. For instance, given that most of the workers in 'the offices/posts/centers' are clerical workers who typically have little decisional latitude in their jobs and get little recognition for their work, from the organization and the public, it could be that they were already experiencing increased stress levels before the ice storm. In such a case, the ice storm made a bad working situation even worst by putting these workers in situations in which they had to interact with victims of the storm who were dissatisfied with the situation, and who were asking several questions to which they had no answers (i.e., when will they be getting electricity back in their area?).

In summary, even in the absence of pre-post ice storm data, the results obtained in the present section were quite informative of the different experiences of the recovery effort workers during and following the storm. Results not only revealed which variables were most indicative of psychological stress and distress, in the short and the long run, but also pointed that the experiences of the various groups varied depending on several factors (i.e., type/degree of involvement in the recovery efforts from the storm). To our knowledge, this is one of the first studies that targeted the impacts of a natural catastrophe on workers involved in recovery efforts

from material damage. This said, in investigating such recovery efforts, one should be cautious in generalizing from the experiences of some group of workers to that of others. In addition, to better understand the psychological stress/distress levels of the workers more attention should be directed towards gathering a detailed account of the roles and experiences of the different groups of workers involved. Altogether, it would be important to further replicate the observed findings, and to consider those presented as tentative for the time being.

4.2 Extra-Organizational Stressors as Predictors of Stress

As mentioned, the objective of the present section was to assess the added contribution of appraised extra-organizational stressors (SECA-X) to the prediction of psychological stress (PSM). It was expected that the added value of SECA-X to the prediction of PSM will be significant, once the contribution of the stress-enhancing cognitive appraisals specific to the organizational ones (SECA-O) has been accounted for.

The tested hypothesis was supported. In fact, the added value of SECA-X to the prediction of psychological stress, once SECA-O has been accounted, was significant. However, its added contribution was not substantial. Nevertheless, the unique contributions of both SECA-O and SECA-X to the prediction of psychological stress were significant and substantial. Together, these results first pointed out that both SECA-O and SECA-X are useful predictors of psychological stress. They specifically suggested, however, that although we may rely on either SECA-O or SECA-X when predicting the psychological stress of workers of a large organization, a greater portion of the variance of psychological stress could be explained through SECA-O. These findings were observed even though the participants appraised their organizational stressors as being “as stressful” as their extra-organizational ones.

Second, it seemed that the combined contribution of SECA-O and SECA-X to the prediction of PSM, is not substantially different from their unique ones. In fact, SECA-X only explained an additional 2% of the variance in psychological stress. Thus, once the contribution of the stress-enhancing cognitive appraisals specific to the worst reported organizational stressor was considered, it became almost useless to consider the SECA specific to any extra-organizational stressor. It seemed, however, that the same could not be concluded for the SECA-X. More specifically, an exploratory hierarchical multiple regression with the SECA-X entered first in the equation followed by the SECA-O to predict psychological stress revealed that once the contribution of the SECA-X was considered, the added contribution of SECA-O to the prediction of psychological stress was not only significant but quite substantial ($\Delta R^2 = .17$, $F_{inc}(3, 165) = 12.80$, $p < .05$). Thus, the importance of the SECA-O in predicting psychological stress was unequivocal.

This finding questions the necessity of considering both stressors, particularly extra-organizational ones, in conducting stress research in organizational settings. It also seems somewhat contradictory to those reported by other researchers who seem to suggest that non-work sources of stress contribute just as much, if not more, than occupational stressors to people's levels of psychological stress and distress (Edwards & Rothbard, 1999, Hart, 1999; Westman, 2001). Moreover, considering the observed findings in the exploratory analyses and that most stress research is not conducted in organizational settings, it seems logical to further highlight the importance of considering organizational stressors when conducting stress research (or in developing stress management interventions) with working populations in extra-organizational environments. It is important to emphasize, however, that these results may be

specific to the present sample, and more likely to be replicated with working populations within large organizations.

Finally, the results seemed to indicate that of the three indicators of the stress-enhancing cognitive appraisal, the unique contribution of the perceived impact to the prediction of PSM emerged as the most substantial. This result is in line with that of other researchers who have found that an event that is perceived as threatening and consequently as having more impact will most likely be accompanied by increased stress and/or distress (Hochwarter, Perrewé & Russell, 1995; Lazarus & Folkman, 1984; Maurier & Northcroft, 2000; Portello & Long, 2001). However, the findings also suggested that when relying on the stress-enhancing cognitive appraisals specific to the worst reported stressors in order to predict psychological stress, it is preferable to consider all three indicators of SECA as a group, as their unique predictive power is quite limited. The higher combined predictive power of these three indicators, in comparison to that of any single one of them, was also highlighted in a study examining psychological stress and breast cancer screening (Sweet, Savoie & Lemyre, 1999) on a sample of 506 women.

In summary, although the hypothesis was supported, the significant yet non-substantial added contribution of the SECA-X to the prediction of psychological stress led the present investigator to conclude that the predictive value of the SECA-O seemed superior to that of SECA-X, and that once SECA-O has been considered there was little additional incentive in considering SECA-X. It is important to keep in mind that the participants of the present study only identified one of their worst organizational as well as extra-organizational stressors, and that, on average, the overall perceived severity of the reported stressors were moderate in terms of severity. As such, the previous conclusion would probably have a higher chance to generalize to other working populations reporting only on their worst stressors, particularly stressors of

comparable perceived severity. On the other hand, the same conclusion is less likely to extend to other working populations having to deal with several minor or severe organizational (i.e., eminent job loss) and/or extra-organizational (serious illness, poverty, death, abuse) stressors. Altogether, further research is necessary to support the validity of the findings of the present study. Until then, it would be cautious to consider the presented results as tentative.

4.3 The Added and Moderating Effects of PSS

The third section of the results chapter focused on another theoretical goal of the present study. More specifically, this section targeted the (1) added value of perceived social support (PSS) from extra-organizational sources to the prediction of psychological stress (PSM), and (2) moderating role of PSS in the relation between the stress-enhancing cognitive appraisals (SECA) specific to the reported stressor (organizational or extra-organizational) and PSM. It was first hypothesized that the added value of PSS from extra-organizational sources to the prediction of PSM, once the contribution of the PSS from organizational sources has been accounted for, would be significant. The moderating role of PSS in the relation between the SECA specific to one's stressors and PSM was also expected to be significant.

None of hypotheses tested in the present section was supported. First, the added value of PSS from extra-organizational sources to the prediction of psychological stress, once the contribution of the PSS from organizational sources has been accounted for, was not significant. However, the unique contributions of PSS from organizational and extra-organizational sources to the prediction of PSM were both significant. Second, the moderating role of PSS in the relation between the stress-enhancing cognitive appraisals specific to one's worst stressors (SECA) and PSM was not significant.

The observed results led, nevertheless, to the identification of some interesting associations to consider when stress research is conducted and working populations are targeted. First, of the different sources of PSS considered in the present investigation, those from organizational sources were more predictive of psychological stress than the extra-organizational ones. Of the organizational sources of support, those from the supervisor, best predicted psychological stress. These results are in line with those reported in many other studies (Bliese & Castro, 2000; Browner, 1987; Burke & Greenglass, 2001; Dolan, Ameringen & Arsenault, 1992; Russell, Altmaier & Velzen, 1987). They point to the negative relation between organizational support and psychological stress, and further highlight the stress-buffering role of organizational support, particularly from the supervisor. The important role of supervisory support is not really surprising given the degree and type of influence that supervisors can exert on their staff, as well as their ability to directly alleviate some of the negative impacts of occupational stress (i.e., provide instrumental support, reduce workload, increase job/position security).

Second, exploratory hierarchical multiple regression revealed that the added contribution of the organizational sources of support to the prediction of psychological stress was significant and substantial, even once the contribution of PSS from extra-organizational sources was already accounted for. Thus, the importance of the organizational sources of PSS in predicting psychological stress was unequivocal. This finding questions the necessity of considering extra-organizational sources of PSS, in conducting stress research in organizational settings. It is interesting to note that this result was observed even though the stressors that were identified by the respondents (i.e., family-related difficulties, health problems, divorce/separation) clearly illustrated the presence of stressful events in their personal, non-work, lives. Additionally,

considering the observed findings and that most stress research is not conducted in organizational settings, it may be beneficial to consider organizational sources of support when conducting stress research (or in developing stress management interventions) with working populations in extra-organizational settings. Although this finding, like others (i.e., Browner, 1987; Dolan, Ameringen & Arsenault, 1992), further highlights the superior predictive power of organizational sources of support over extra-organizational ones, it is nevertheless important to exercise caution before generalizing the observed findings to other samples and contexts.

Third, given that close to 56% of the worst reported stressors were work-related, that social support is an important coping resource, and that the participants of the present study reported having fairly low levels of organizational support, it may be that the lack of domain-specific support just makes it more difficult for the workers to cope with their organizational stressors, in comparison to their extra-organizational ones. The lack of organizational support, more than its presence, may be predictive of psychological stress. This result seems to be in line with that of Carayon (1995) and supports the claim that the lack of social support, particularly from one's supervisor, may eventually act as a chronic occupational stressor and lead to increased psychological stress and distress. Similarly, the negative association that was observed between PSS and SECA (see Figure 13) suggests that when individuals perceive their available social support as being fairly low, they are more likely to endorse "stress-enhancing" appraisals, and consequently, experience psychological stress. This is even more likely to be true for organizational sources of PSS, as "interpersonal tension/conflict in the workplace" was the third most frequently reported organizational stressor in the present study. If the lack of social support directly and/or indirectly leads to psychological stress, it is probable that given a sample of participants with fairly low levels of support from extra-organizational sources (i.e., working

single adults with limited social networks) the first hypothesis would have a greater probability of being significant. As such, caution should be used before concluding that the added value of perceived social support from extra-organizational sources is of no interest when the prediction of psychological stress is targeted.

Finally, given that the moderating effect of perceived social support was not significant, results suggested that the strength/direction of the SECA-PSM association did not vary according to the reported level of PSS. Nevertheless, the observed results highlighted that both the SECA specific to the worst reported stressors and the PSS from various sources predicted significantly psychological stress. These results pointed to the significant and substantial main effect of PSS on psychological stress, and as such suggest that social support reduces the adverse psychological impacts (i.e., stress) of exposure to stressful life events. These findings support those observed in the model tested in section 4 of the results chapter (see Figure 13) as well as those reported by several other researchers (i.e., Billings & Moos, 1982; Schonfeld, 2001). At first, these findings seem somewhat contradictory to those of other researchers (i.e., Brotheridge, 2001; House, 1981) who reported a stress-moderating effect of social support. Moderating effects of social support, however, have been tested in different ways, and none of the studies that were identified actually investigated the impact of PSS on the SECA-PSM relationship. Instead, the relationship between stressors and distress (i.e., depression, anxiety, and irritation) was mainly targeted. Not only were the appraisals specific to the stressors often not considered, but also “longer term” (i.e., psychological distress) instead of more “immediate” (i.e., psychological stress) outcomes were used. Given that methodological factors also seem to determine whether a stress-moderating effect is observed, it would be prudent not to prematurely

conclude that social support does not moderate the stressor-distress (or the SECA-PSM) relationship.

In summary, PSS from organizational sources, particularly from the supervisor, were more predictive of psychological stress than the extra-organizational ones. In addition, it seems that the lack of domain-specific support is predictive of psychological stress. Finally, although a stress-moderating effect was not observed, the results pointed, nevertheless, to the significant and substantial main effects of both SECA and PSS on psychological stress, and as such suggested that social support reduces psychological stress.

Before discussing the results of the next section, namely testing the proposed model of workplace stress and overall distress, it was deemed worthwhile to determine whether certain associations among the variables of interest should have been included in the model proposed in Figure 10. As mentioned, given that the sample size observed in the present study was smaller than required to include both SECA-O and SECA-X in the SEM, and the complexity of testing moderation effects through SEM procedures, these two associations were not included in the model tested in Figure 10. Section 2 results led the present investigator to conclude that the unique predictive values of the SECA-O and SECA-X were both significant and substantial, that the predictive value of SECA-O seemed superior to that of SECA-X, and that once SECA-O has been considered there was little additional incentive in considering SECA-X. Section 3 findings indicated that the moderating role of PSS in the relation between the stress-enhancing cognitive appraisals specific to one's worst stressors and PSM was not significant. Altogether, these results seem to justify the use of a single worst reported overall stressor in order to predict the level of psychological stress of working populations, especially if this stressor is work-related. Similarly, given that the moderating effect of PSS was not observed and that its main effect on

PSM was significant and substantial, it seemed adequate not to add, at the present time, an additional association representing the moderating role of PSS in the proposed and tested model. These findings seem to support the associations that were actually tested through SEM procedures in the proposed model of workplace stress and overall distress.

4.4 Testing the Proposed Model of Workplace Stress and Overall Distress

The main theoretical goal of the present study was to test a model of workplace stress and overall distress on the basis of the combined theoretical works of Lazarus and Folkman (1984), Caplan et al. (1980), Vézina et al. (1997), and Lemyre (1986, 1997). More specifically, a model that would describe how the stress-enhancing cognitive appraisals specific to the worst reported organizational or extra-organizational stressors, and perceived social support are related to psychological stress, and, in turn, to overall distress, as measured by indicators of psychological distress, job dissatisfaction, and life dissatisfaction.

The hypothesized model (Figure 10) was tested using structural equation modeling (SEM) procedures. Although all of the hypothesized paths were supported by the results, the overall fit of the model was poor, suggesting the presence of additional relations between the variables that were not tested. Based on logical, theoretical and statistical considerations, a revised model of psychological stress and overall distress was formulated (Figure 11).

Given that all the originally hypothesized paths were significant, the revised model (Figure 12) included all of the same initial hypotheses, as well as three additional ones. Not only was the fit of the final proposed model adequate (Figure 13), all of the hypothesized paths were significant and in the expected direction. Of primary importance are the results that the stress-enhancing cognitive appraisals as well as perceived social support predicted psychological stress significantly, and psychological stress, in turn, predicted overall distress significantly.

Moreover, a more substantial prediction of overall distress was offered when the direct effects of both stress-enhancing cognitive appraisals and perceived social support on it were considered. Finally, the perceived social support predicted significantly and negatively the stress-enhancing cognitive appraisals.

Altogether, it was exciting to note that the resulting model of the present study led to account for a significant and quite substantial portion of the variances of psychological stress and of overall distress (i.e., symptoms of distress, job satisfaction, life satisfaction), and a small, yet significant, portion of the of the variance of the stress-enhancing cognitive appraisals. This result is quite interesting considering the relative simplicity of the final model. In fact, as mentioned, the entire model is comprised of only 11 observed variables, rendering it simpler to apply in organizational contexts. Although the model helped to explain a significant and quite substantial portion of the variances of psychological stress ($R^2=.39$) and overall distress ($R^2=.68$), a significant and substantial amount of the variances in both psychological stress and overall distress were left unexplained. Thus, it is likely that other variables not included in the present model (i.e., considering more than one organizational and extra-organizational stressors, objective indicators of the environment, active coping efforts, self-esteem) may help to further explain the variations in psychological stress and/or overall distress (Cassidi & Elizabeth, 1996; Portello & Long, 2001; Hudek-Knezevie & Kardum, 2000; Frese & Zapf, 1999).

The observed associations pointed to the importance of considering each of the included constructs in the prediction of psychological stress and of overall distress, as measured in the present study. More specifically, the stress-enhancing cognitive appraisals significantly predicted not only psychological stress but also the overall level of distress. In addition, perceived social support significantly predicted all of the variables of interest; namely

psychological stress, overall distress, and the stress-enhancing cognitive appraisals. Moreover, perceived social support added significantly to the prediction of psychological stress, once the contribution of the stress-enhancing cognitive appraisals specific to the worst stressors was accounted for. Finally, psychological stress significantly predicted, through direct and indirect paths, overall distress. The mediating role of psychological stress was also quite considerable, with it mediating the impact of perceived social support on overall distress and that of the stress-enhancing cognitive appraisals on the overall distress.

As expected, the final model supported the general reasoning framework whereby an increase in psychological stress seems to be related, to a great extent, to the adoption of more extreme stress-enhancing cognitive appraisals specific to one's worst stressors, organizational or extra-organizational. As the perceived availability of social support from organizational and extra-organizational sources diminishes, such a state of psychological stress is more likely to result in an increase in one's overall distress level, as measured by an increase in psychological distress and a decrease in overall job and life satisfaction levels. These findings pointed to the theoretical importance of considering both the stress-enhancing cognitive appraisal through which work and 'personal' life generate psychological stress, and the perceived social support from various sources (organizational and extra-organizational).

Not only the stress-enhancing cognitive appraisal proved to be strongly associated to psychological stress, they were also significantly and substantially related to overall distress. Findings from subsequent sections also pointed to the predictive power of the stress-enhancing cognitive appraisals related to the organizational as well as the extra-organizational stressors. Moreover, the findings pointed to the importance and relevance of each one of the cognitive appraisals (i.e., Perceived Impact, Perceived Mastery, Perceived Uncertainty) that were

combined to form the SECA grouping. In their model of stress, Lazarus and Folkman (1984) also identified cognitive appraisals as the key determinants of psychological stress. Appraisals of impact, mastery, and uncertainty have repeatedly been found to influence the relationship between a stressor and its detrimental consequences, particularly psychological stress and overall distress (Brooker & Eakin, 2001; Bussing, 1999; Frone, Russell & Cooper, 1995; Ganster & Schaubroeck, 1995; Hochwarter, Perrewé & Russell, 1995; Maurier & Northcroft, 2000; Turk, Okifuji & Scharff, 1995). However, no study was identified in which the combined contribution, as measured through the SECA grouping, was investigated within an occupational setting.

As for the perceived social support, its main effect role was unequivocal. Not only a significant and substantial main effect of perceived social support on psychological stress was observed, but no evidence was found, in subsequent analyses, to support its moderating role. As such, it seems that social support directly reduces the adverse psychological impacts (i.e., stress) of exposure to stressful events, a finding reported by many other researchers (Schonfeld, 2001; Vermeulen & Mustard, 2000; Winnubst, Marcelissen & Kleber, 1982). This “protective” function of organizational and extra-organizational sources of social support has also been highlighted in the Integrative model proposed by Vézina and his colleagues (1992). As reported in other studies (i.e., Burke & Greenglass, 2001; Dolan, Ameringen & Arsenault, 1992; Russell, Altmaier & Velzen, 1987), the results also suggested that organizational sources of support, particularly those from the supervisor, were more predictive of psychological stress than extra-organizational ones. Considering the reported findings and that most stress research is not conducted in organizational settings, it may be beneficial to consider organizational stressors, as well as organizational sources of support, when conducting stress research with working populations in extra-organizational settings.

The important functions of both the stress-enhancing cognitive appraisals and perceived social support seem unequivocal. However, it is important to remember that three other associations between the variables of interest were also identified as important when the prediction of psychological stress and overall distress are sought. Although smaller in magnitude, these associations improved nevertheless the prediction of psychological stress and overall distress. The additional associations specifically suggested that (1) one's overall distress level is also directly influenced by his/her perceived social support level, (2) the stress-enhancing cognitive appraisals also directly influence one's overall distress levels, and (3) one's stress-enhancing cognitive appraisals are slightly influenced by one's perceived social support. The above-mentioned associations further emphasize the various functions of both the stress-enhancing cognitive appraisals and perceived social support. Although not originally hypothesized, the proposed relations are not as substantial as those already tested. Nevertheless, they make theoretical sense and have been identified in previous research. Given that most occupational stress studies have not conceptually distinguished between the shorter (i.e., "non-pathological") and longer-term (i.e., indicators of "distress and dissatisfaction") consequences of being exposed to organizational and extra-organizational stressors, it is not surprising that the first two of the above mentioned associations have been repeatedly highlighted in the literature (Frone, Russel & Cooper, 1995; Perrewé & Zellars, 1999; Viswesvaran, Sanchez & Fisher, 2000). However, the indirect effects identified in the final model (see Figure 13) specifically pointed to the importance of conceptually distinguishing between such immediate and longer-term outcomes, and supported, as such, the theoretical works of some researchers (i.e., Hudek-Knezević & Kardum, 2000, Israel, House, Schurman, Heany & Mero, 1989; Lazarus & Folkman, 1984; Lemyre, 1986). In fact, observed findings supported the hypothesis that psychological

stress mediated, to a considerable degree, the associations between perceived social support and overall distress and that between the stress-enhancing cognitive appraisals and overall distress. The third association, the one between perceived social support and stress-enhancing cognitive appraisals, suggested that lower overall levels of perceived social support are more likely to elicit stress-enhancing cognitive appraisals. This relationship has indeed been highlighted by some researchers who have suggested that individuals who expect to get little social support from their environment to deal with a stressor are also likely to endorse stress-enhancing, negative cognitive appraisals (Bliese & Castro, 2000; Cassidy & Burnside, 1996; Jorgensen & Johnson, 1990). As mentioned, this association was identified in other studies (i.e., Carayon, 1995), and may suggest that the lack of social support may eventually act as a chronic occupational stressor and lead to increased psychological stress and distress.

Altogether, the identified associations between the variables of interest point to the complexity of the stress process as well as to its dynamic nature, both of which are harder to investigate via cross-sectional SEM designs. First, the final tested model supported the core of the transactional model of Lazarus and Folkman (1984). Second, it further highlighted the importance of Lemyre and her colleagues' works (1986, 1988, 1990) on the development of a "non-pathological" measure of stress, as well as on the identification of mega cognitive appraisal dimensions (i.e., Perceived Impact, Perceived Mastery, Perceived Uncertainty). Last, the final model emphasized the various important functions of organizational and extra-organizational sources of support, as did other researchers (i.e., Caplan et al., 1980; Vézina et al., 1997). Altogether, these findings point towards interesting conceptual associations among the variables of interest, associations that require nevertheless further validation before they could be generalized to other working populations.

In summary, in spite of its relative simplicity, the final model of workplace stress and overall distress that was tested is useful in predicting one's levels of psychological stress and overall distress. Given the fairly diverse sample it was based on (i.e., white collar, blue collar and pink collar employees; men and women), the types of organizational and extra-organizational stressors that were reported, and the levels of organizational and extra-organizational levels of support that were reported, the created prediction model has greater chances of being useful for other organizations. More specifically, in today's volatile economy, organizational instability is unfortunately a threatening reality that impacts, directly and indirectly, the lives of the affected workers. With organizational downsizing as a business survival strategy, it is no longer surprising for workers to report job/position uncertainty and work overload as their worst stressors (Cartwright & Cooper, 1997; Cooper, Dewe & O'Driscoll, 2001; Koslowsky, 1998), as was observed in the present study. Similarly, although the importance of social support is unequivocal, it is still quite common for workers to report relatively low levels of organizational support (Bliese & Castro, 2000; Sargent & Terry, 2000; Vermeulen & Mustard, 2000), a result replicated in the present study.

4.5 Prediction of Distress from Stress: Longitudinal Consideration.

Considering the dynamic nature of the stress process and the limited number of longitudinal studies targeting the associations between psychological stress and distress, a secondary objective of the present study was to assess the associations between psychological stress and distress across time. As mentioned, given the context of urgency in which this study took place, psychological distress was the sole indicator of ODI that was actually measured in both phases of the study. It was hypothesized that psychological stress at phase 1 would add significantly to the prediction of psychological distress at phase 2 (5 months later), once the

contribution of psychological distress level at phase 1 has been accounted for. Thus, the added predictive value of psychological stress at phase 1 was of particular interest.

The hypothesized relation was not supported. Psychological stress at phase 1 did not add significantly to the prediction of psychological distress at phase 2 (5 months later), once the contribution of psychological distress at phase 1 was accounted for. Knowledge of psychological stress levels at phase 1, however, did significantly predict psychological distress levels 5 months later (at phase 2). Similarly, when psychological stress at phase 1 was regressed on psychological distress at phase 2 by itself, it became a significant predictor of distress. Thus, although the added predictive value of psychological stress was non significant, it can, nevertheless, be a useful predictor of psychological distress (even 5 months later) when previous estimates of psychological distress are unavailable.

These results could be partly explained given the substantial correlation observed between the psychological stress and psychological distress scores at phase 1, and the higher stability across time of distress measures that is generally reported (i.e., PSI: the psychological symptom inventory) in comparison to those measuring “non-pathological” conditions (i.e., PSM: the Psychological Stress Measure) (Lemyre & Tessier, 1988; Koslowsky, 1998; Okun, Stein, Bauman & Silver, 1996). In such circumstances, the first variable to enter the equation, psychological distress at phase 1, often ends up explaining most of the variance in the dependent variable, psychological distress at phase 2 (Tabachnick & Fidell, 1996). Considering that psychological stress levels are more subject to change over time than distress levels (Lemyre, Tessier & Fillion, 1990; Fillion et al., 1989), it is likely that if the phase 2 psychological distress estimates were taken only a month or two later, instead of 5 months later, would the added predictive value of the PSM become significant. However, given the general difficulty of

conducting research within a large organization, and the specific context following which this study took place, it would have been extremely difficult to gather estimates of stress and distress that are temporally closer. Designs targeting a better understanding of the associations between psychological stress and distress across time would certainly benefit, nevertheless, from a repeated measure design in which measures are taken closer apart and on several occasions.

4.6 Implications of Findings

The implications of the findings of the present study will be discussed in the next few pages. Organizational and individual implications that are general and domain-specific (i.e., work-related, extra-organizational, specific to the recovery efforts from the storm) will be discussed.

Most of the practical implications emanating from the findings of the present study are quite obvious and direct. The methodology used in the present study led to the identification of the worst stressors (organizational, extra-organizational, specific to the ice storm) experienced by Hydro-Québec employees, 5 as well as 10 months following the storm. At the same time, estimates of the levels of perceived social support from organizational and extra-organizational sources, of psychological stress and overall distress were obtained for the same employees. Together, these results, although descriptive in nature, are quite informative and valuable, at both an organizational and individual level. At the organizational level, it is crucial, as a first step, for the hosting organization to be cognizant that its employees seem to be experiencing high levels of psychological stress. Assuming the organization intends to intervene in order to help its employees reduce their elevated stress levels, there are several steps it could take. At a general level, it could certainly offer stress management workshops and/or promote its employees to make use of individualized assistance programs. Although such broad interventions have proven

to be somewhat effective (Schabracq & Cooper, 2000), their attempt at changing the individual is not the most ethical or profitable strategy of handling the costs (i.e., human, economic, and social costs) of stress in organizations (Schaubroeck, 1999). Furthermore, such interventions unfortunately suggest that the responsibility of learning how to better manage work/life stress lies upon the workers. In all likelihood, such interventions fail to address most of the organization-specific problems (i.e., lack of supervisor support, position insecurity, work overload). To address such issues, organizations need to become more proactive and undertake a more comprehensive stress analysis, one which will help them pinpoint the worst stressors their employees are facing, their coping resources, and their levels of psychological stress and overall distress (Hepburn, Loughlin & Barling, 1997). Through preventative interventions, organizations can help their employees before they start experiencing high levels of overall distress, a state that is indicative of job and life dissatisfaction and that is often linked to several undesirable workplace behaviors (i.e., lower productivity, increased absenteeism, aggression, theft). Workers who are already experiencing high distress levels are less likely to fully benefit from such interventions, and, as such, may require closer individual attention or treatment (i.e., counselling).

In such an effort, the participating organization tried to better understand why its employees are reporting high levels of psychological stress. This was achieved, to some extent, by considering the types of stressors reported by its employees, as well as some of the coping resources their employees rely on. Some of the most commonly identified stressors clearly illustrated the presence of stressful events in the personal lives of these employees and, as such, point to the importance of considering such events when conducting occupational research. The identified work-related stressors mainly pointed towards work overload and organizational

instability, both of which seemed to worry the employees. Findings also revealed that although most workers reported having high levels of extra-organizational support, they also indicated that they were not getting sufficient organizational support, especially from their supervisors. This is troublesome given that organizational social support has frequently been identified as an important coping resource for working populations, and that the findings of the present study suggested that extra-organizational sources of support do not seem to play a sufficient buffering role when workers are dealing with work-related issues.

Organizations need to acknowledge that their employees are confronted with both organizational and extra-organizational stressors, both of which lead towards increased psychological stress, and indirectly towards overall distress. To help their employees, organizations must first become more understanding of the extra-organizational stressors their workers are confronted with and to help their employees as much they can. This can be done by offering to their employees more flexible work schedules, comprehensive health plans (i.e., including coverage for couple/family counseling), manageable workloads that will allow employees to spend more time doing extra-organizational activities (i.e., family activities, physical activity). Second, organizations must attend, more than ever, to the organizational stressors their employees are experiencing, as their impact on psychological stress is unequivocal. For instance, worries specific to organizational stability seem to become increasingly important as large organizations use various strategies (e.g., downsizing, lateral movements of employees) in order to remain competitive in today's economic market. It is nevertheless crucial for organizations to alleviate, to the greater extent possible, the direct and indirect impacts of such instability on its employees. This could be partly achieved by keeping employees informed, on a regular basis, of any anticipated organizational changes, especially

ones that may affect them directly. Similarly, large organizations such as Hydro-Quebec, in which the jobs of the majority of the employees are secured, should become more cognizant that having to change your job position even within the same organization is quite stressful for most employees, even though they may never end up losing their jobs. As such, large organizations should secure, as much as possible, not only the jobs but also the positions their employees hold. Third, it would seem quite logical for organizations to sensitize their supervisors as to the importance of supervisory support as a stress protecting resource, and to train their supervisors to provide social support to their subordinates and colleagues. Similarly, some job redesign strategies (i.e., promoting teamwork as the *modus operandi* of the organization) may be a creative and important way of enhancing social support from organizational sources. Such strategies are becoming more common in today's organizations, and initial findings seem to highlight their effectiveness (Sargent & Terry, 2000).

Findings specific to the recovery efforts from the ice storm, even in the absence of pre-post ice storm data, were quite informative in providing a descriptive account of the different experiences of the recovery effort workers during and following the storm. As mentioned, the worst organizational and extra-organizational stressors encountered during and following these efforts were identified, as were the variables that were most indicative of psychological stress and distress, in the short and the long run. In addition, observed results indicated that the experiences of the various groups varied depending on several factors (i.e., type/degree of involvement in the recovery efforts from the storm). Implications from such findings are direct, but remain speculative considering the absence of pre-post data. First, organizations involved in similar recovery efforts (i.e., mostly from material damage) should be cautious in downplaying the possible negative effects on any of the workers, as high levels of psychological stress and

distress were reported by the sampled workers, even 5 months following the recovery efforts. Second, considering that natural catastrophes tend to affect workers on a personal (i.e., also being a victim of the storm, damage to property) and professional level (i.e., work overload, overtime), organizations need to offer additional support to their employees and their families, especially in such times. Third, organizations need to acknowledge that successful recovery efforts are often the result of various groups of workers, some of which may have lower public exposure than others. It is crucial for the organization to recognize the work of all its employees, especially those who may not get any from the general public (i.e., clerical staff). Similarly, it is important for the organization to assure that all its workers are kept well informed as to the developments of the recovery efforts. This would allow some groups of workers (i.e., clerical staff) to provide accurate information to the organization's clients, as well as to reduce the workers anticipation of prolonged stress, as anticipation itself has been proven to lead to psychological stress (Sweet, 1998). This is one of the first studies that targeted the impacts of a natural catastrophe on workers involved in recovery efforts from material damage. As such, one should be cautious in generalizing from the experiences of the sampled groups of workers. In addition, to better understand the psychological stress/distress levels of the workers more attention should be directed towards gathering a detailed account of the roles and experiences of the different groups of workers involved. It would be important to further replicate the observed findings, and to consider those presented as tentative.

In summary, the implications that were identified were, for the most part, varied and simple. They first highlighted the intertwined dynamics of work/personal factors (i.e., extra-organizational stressors, work-related support) in the stress process. Second, they emphasized the active and preventative role organizations must play in order to reduce the likelihood that its

employees will experience elevated psychological stress and overall distress. Third, some of the implications were specific to the particular situation at the hosting organization. Although targeted interventions are thought to be among the most effective strategies, more general ones (i.e., stress management workshops) are also likely to be useful when used in conjunction with more targeted ones (i.e., training supervisors to be more supportive). Finally, several implications specific to the recovery efforts from the ice storm were outlined. They point to the importance of: (1) not generalizing from the experience of some groups to that of others, (2) recognizing the contributions of all workers, and (3) maintaining ongoing communication during such times.

4.7 Strengths and Shortcomings of the Study

Several strengths of this study are worth mentioning. On a conceptual level the model of workplace stress and overall distress that was tested in the present thesis addresses some of the shortcomings of previous occupational stress models. First, it demonstrated the associations between the stress-enhancing cognitive appraisal, perceived social support, psychological stress and overall distress, and did so by studying the actual stressful transactions that take place between the workers and their workplace. Second, it targeted simultaneously three important indicators (perceived impact, perceived mastery and perceived uncertainty) of the stress-enhancing cognitive appraisals specific to both organizational and extra-organizational stressors, as identified by Lemyre (1986). Third, it also considered the complementary role of social support from organizational and extra-organizational sources in predicting psychological stress and overall distress levels. Fourth, it actually distinguished conceptually between the immediate or intermediate outcomes of stressors (i.e., state of psychological stress) and the ultimate or longer term ones (i.e., psychological distress, job and life dissatisfaction). Fifth, it considered

both the affective and cognitive components of overall distress when studying the outcomes of occupational stress. Altogether, a model of workplace stress and overall distress was tested; one that addressed some of the pitfalls of previous models, explained a significant and substantial portion of the variance in psychological stress and overall distress, and was nevertheless parsimonious.

Another strength of the present study lies within the methodology that was used. First, via the use of open-ended questions, the present investigators were able to get at the worst stressors (organizational, extra-organizational, specific to the ice storm) experienced by the employees, without giving into the researchers' biases or intuitions as to which stressors should be focused on. Second, noting the importance of studying the stress process over time in order to trace some of the observed relationships and to assess the impact of current stressors on later experiences of distress, this study made use of a longitudinal design, two phases five months apart. Given the scarcity of longitudinal designs in the occupational stress literature, the associations between indicators of psychological stress and overall distress over time were targeted in the present investigation. Third, given that this investigation was an actual field study and was carried out in the workers' natural environment, the ecological validity of the study was enhanced. In fact, not only was this study based on actual full-time workers, the sample was considerable in size and comprised both men and women of varying positions, occupational ranks, and geographical zones within the province of Quebec. In addition, the economic reality (i.e., increased worldwide competition, downsizing, work overload) of the late 1990s and early 2000s, also reflected through the participants' responses, and the characteristics of the sampled workers speaks to the increased generalizability of the study's findings. Given that information relating to the ethnic background of the sample was not collected, it is unclear, however, to what

extent these findings may generalize across different ethnic groups. Finally, given the methodology that was adopted, several implications were derived from the findings of the present study; implications that could be applied and have a positive effect on the employees of the hosting organization.

The last major strength of the present investigation lies partly within its originality and/or opportunistic nature. As mentioned, few studies actually examined the psychosocial impacts of occupational stress on workers who were mainly involved in the recovery efforts from environmental sequels of a natural disaster. This project has been particularly opportunistic because it was carried out following the Great Ice Storm of 1998, the worst to ever hit Eastern-Canada, and which has put extreme demands on many workers. By doing so, it went beyond previous research investigating the stress phenomenon as it related to the past and present stressors experienced by these workers from both organizational (i.e., work-related, specific to the ice storm) and extra-organizational (i.e., private-life) sources. Findings helped to shed light as to the stress-related experiences of workers who were involved in the recovery efforts from the storm to varying degrees.

Results must, however, be interpreted in light of several limitations. First, considering that all data was collected from self-reports, it is possible that common method variance biased the observed relationships. Several authors have pointed to the importance of collecting data from other sources (i.e., archival data) to guard against sole reliance on self-reported data (Fogarthy et al., 1999; Frese & Zapf, 1999; Judge, Boudreau & Betz, 1994). Such objective data is often quite informative and useful to the researchers as it can serve to confirm or question the reliability of self-reported data. Other authors have argued, however, that for certain kinds of psychological processes, self-report data may be the only way to obtain certain information

(Lazarus & Folkman, 1984; Perrewe & Zellars, 1999). In addition, high-visibility organizations, given some obvious reasons (i.e., risk of having the negative work habits of their employees exposed) as well as less obvious ones (i.e., potential public awareness), are more likely to be reluctant to provide external researchers with access to their archival data; an obstacle that was unfortunately encountered by the investigators of the present study. A consideration that may mitigate the common method variance concern is that the correlations among the observed constructs exhibited a great deal of variance (ranging from $-.46$ to $.74$), which would not have been expected if response sets were present. Although this argument does not discard the charge of bias due to common method variance, it does suggest that method effects may not be pervasive. Future studies should try to collect data from various sources (i.e., supervisors, colleagues, archival data: absenteeism, performance appraisals, etc.), and direct more attention to the study of the more 'objective' stress situation. This could ultimately help in identifying some of the 'objective' stress-evoking conditions; information that can, in turn, help in the development of work in such a way that it becomes less conducive to overall distress (Frese & Zapf, 1999).

The second limitation of the present study relates to the composition of the sample of respondents. More specifically, even though the main analyses were based on a sample size that was fairly large ($n = 499$), some of the other analyses (i.e., group differences according to involvement level in the recovery efforts from the storm) were based on a smaller group sample size than desired. For instance, given similar sample size problems for the gender (i.e., males and females) and occupational group variables (i.e., white, blue and pink collars), it was not always possible to test for group mean differences on the dependent variables of interest. In other words, it was not always possible to distinguish differences in the dependent variables that

are due to gender from those specific to the variables of interest and then focus on the latter. Given that several authors have reported some gender and occupational rank differences in terms of stress and distress (DiSalvo, Lubbers, Rossi & Lewis, 1995; Martocchio & O'Leary, 1989; Ogus, Greenglas & Burke, 1990; Vermeulen & Mustard, 2000), it would have been preferable to consistently assess for gender and occupational rank differences before pooling them together or/and to conduct separate analyses for each grouping of respondents when group differences were observed. Given the inherent difficulties of conducting field research, such sampling are more likely to occur; especially when working in a context of urgency and assessing for several group differences, as was the case in the present investigation. Post hoc exploratory analyses diminished nevertheless the concerns regarding some of the potential group differences. For instance, all of the reported findings specific to the ice storm sub-section of the results chapter remained the same even once gender was used as a covariate. Similarly, a test of the final proposed model for invariance across gender suggested that all of the observed relations between the variables of interest were similar for both men and women.

The third limitation of the present investigation relates to its methodological shortcomings. First, given the context of urgency in which this study took place, it was unfortunately impossible to measure all of the variables of interest (i.e., life and job satisfaction, perceived social support) at both phases of the study. In addition, even though the present investigators were cognizant of the importance of gathering data as soon as possible following the ice storm to assess its immediate impacts on the workers, several factors (i.e., organizational bureaucracy, obtaining ethical approval) delayed the first data collection phase, which took place 5 months following the storm. Consequently, some of the longitudinal associations that were of particular interest (i.e., relations between psychological stress and overall distress across time)

were not tested. Although other interesting longitudinal associations were assessed (i.e., relation between psychological stress and psychological distress across time), their generalizability remains limited considering the timing of both phases of the study. Second, although via the use of open-ended questions, the present investigators were able to get at the respondents' worst stressors, inter-rater reliability statistics were not gathered nor provided to support the stressor-categorization method that was used in the present investigation. Without such statistics, it is impossible to speculate as to the exact accuracy of the categorization process that was used. However, considering the simplicity of the categorization process that was outlined and the use of consensus between the researchers in cases of uncertainty, the method used is less likely to lead to categorization errors.

The fourth limitation of the present study relates to the use of structural equation modeling (SEM) as a means of testing the prediction model of workplace stress and overall distress. First, the correlational nature of all SEM designs makes it impossible to rule out the eventuality of reverse/reciprocal causation between the variables of interest. Second, considering the correlation ($r = .74$) that was observed between psychological stress and psychological distress, it is possible that the two variables are multicollinear. If the variables were indeed multicollinear, both logical and statistical problems may have occurred. However, according to Tabachnick and Fidell (1996), logical problems are much less likely when structural equation modeling procedures are used, even when two variables with a bivariate correlation above .70 are included. Similarly, the same authors indicate that statistical problems created by multicollinearity tend to occur at correlations of above .90. Third, given that SEM procedures could result in sample-specific chance fluctuations in the data (i.e., a satisfactory fit of the revised model), one should use caution in generalizing the results to others samples (Byrne,

2001; Kline 1998). This is particularly important considering that the fit of the initially proposed model of workplace stress and overall distress was poor and that the alternative model that was proposed was also tested on the same sample. Post hoc exploratory analyses diminished nevertheless the concerns regarding sample-specific chance fluctuations in the data. In fact, by splitting the initial sample in two, the fit of the originally proposed model of workplace stress and overall distress was tested on the first 250 participants whereas that of the alternative model was tested on the remaining 249 participants. The fit of the final model was practically identical to that reported in the results section for the overall sample (N=499).

Finally, although the model of workplace stress and overall distress that was tested in the present model explained a significant and substantial portion of the variances of psychological stress and overall distress, a significant amount of variance in both of these variables was nevertheless left unexplained. As mentioned, this result strongly suggests that other variables, not considered in the present model (i.e., active coping efforts, indicators of the objective environment, self esteem), need to be considered to further explain variations in psychological stress and overall distress.

4.8 Summary and Conclusions

With the aim of testing a model of workplace stress and overall distress, this study examined the associations between the stress-enhancing cognitive appraisals (i.e., perceived impact, mastery, uncertainty) specific to the participants' worst overall organizational and extra-organizational stressors, perceived social support from various sources (i.e., supervisors, colleagues, and 'extra-organizational' ones), psychological stress, and overall distress (i.e., symptoms of distress, job dissatisfaction, life dissatisfaction). The resulting model provided support for the general theoretical framework whereby an increase in psychological stress seems

to be related to a great extent to the adoption of more extreme stress-enhancing cognitive appraisals specific to one's worst stressors, organizational and/or extra-organizational. The perceived unavailability of perceived social support from organizational and extra-organizational sources was associated, in turn, with a state of psychological stress that seems more likely to result in an increase in one's overall distress level, as measured by an increase in psychological distress and a decrease in overall job and life satisfaction levels. Additional unexpected paths, although smaller in magnitude, were identified. Of those, probably the most interesting is the negative association that was observed between perceived social support and the stress-enhancing cognitive appraisals. This association seemed to suggest that individuals tend to endorse stress-enhancing cognitive appraisals to a greater extent, as they perceive lower levels of perceived social support from their environment. Altogether, the identified associations between the variables of interest point to the complexity of the stress process as well as to its dynamic nature.

Of great importance is the finding that the model of workplace stress and overall distress that was created in the present study, besides being parsimonious, is quite useful in understanding the associations between one's levels of psychological stress and overall distress. Further analyses seemed to justify the use of a single worst reported overall stressor in order to predict the level of psychological stress of working populations, particularly if this worst overall stressor is work-related. In addition, these analyses highlighted the importance of considering organizational sources of support, particularly those from the supervisor, in the model of workplace stress and overall distress that was tested. Moreover, these results also suggested, however, that perceived social support from extra-organizational sources did not significantly predict psychological stress, questioning as such the importance of their inclusion in the model.

It is also worth mentioning once more that the moderating effect of perceived social support was not observed and that its main effect on psychological stress was significant and substantial.

Finally, even in the absence of pre-post ice storm data, the results obtained in the present study shed light on the different experiences of the recovery effort workers during and following the ice storm. Results not only revealed which variables were most indicative of psychological stress and distress, in the short and the long run, but also pointed that the experiences of the workers varied depending on several factors (i.e., type/degree of involvement in the recovery efforts from the storm). In investigating such recovery efforts, future researchers should be cautious in generalizing from the experiences of some group of workers to that of others. In addition, to better understand the psychological stress/distress levels of the workers more attention should be directed towards gathering a detailed account of the roles and experiences of the different groups of workers involved. It is extremely important to re-emphasize, nevertheless, that the reported findings must be interpreted in light of the identified limitations.

In conclusion, the findings of the present investigation will hopefully contribute to further our understanding of the stress process in occupational settings. Given the scarcity of studies investigating the psychosocial impacts of natural disasters on workers involved in the recovery efforts from environmental damage, the reported results would be of particular interest to organizations whose employees would be likely to take part in such efforts and/or assist these workers (i.e., Military personnel, Firefighters, Mental health professionals). The outlined implications, should be of particular interest to the hosting organization, as well as to others who's employees can relate to the experiences of the sampled workers. Finally, researchers should consider the study's strengths and limitations in trying to further our current knowledge of occupational stress and overall distress during 'normal' as well as 'extra-ordinary' conditions.

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Appendix A

Phase 1- Questionnaire

Étude : “Après le verglas...”

par :

Laboratoire sur les Aspects Psychosociaux du Stress et de la Santé (L.A.P.S.)

Dr L. Lemyre & Y. Benzimra

Hydro-Québec

En collaboration avec :

*Direction principale des Ressources humaines
Services de santé*

“Après le verglas...”

QUESTIONNAIRE RAPIDE - Phase 1

JUIN 1998

DOCUMENT CONFIDENTIEL UNE FOIS REMPLI

Ce questionnaire sera traité de façon anonyme et confidentielle.

Votre participation est libre et volontaire.

**Remettre ce questionnaire dans l’enveloppe ci-jointe et la sceller
avant de la retourner par courrier interne.**

VOTRE COLLABORATION EST IMPORTANTE.

Étude : “Après le verglas...”

(Phase 1)

- Nous recueillons actuellement des données sur le vécu du personnel d’Hydro-Québec et de l’*Opération Verglas*. Nous apprécierions grandement votre collaboration pour nous permettre d’obtenir une image aussi fidèle que possible de votre vécu actuel.
- Il n’y a pas de bonnes ou mauvaises réponses. Nous cherchons à connaître votre opinion.
- Un rapport de groupe avec des recommandations sera soumis aux Services de santé d’Hydro-Québec.
- **Toutes vos réponses sont CONFIDENTIELLES et ne seront pas divulguées à quiconque à Hydro-Québec. Les enveloppes scellées seront recueillies, dépouillées et gardées par le Dr Lemyre à l’école de psychologie.**
- S.V.P., répondez seul(e) et ne discutez pas de vos réponses avec vos collègues.
- Votre participation est libre et volontaire.
- Vous pouvez vous retirer de l’étude en tout temps.
- Votre collaboration est importante.
- Vous pouvez nous contacter au numéro suivant, au besoin.

Merci pour le temps et le soin que vous y apporterez.

Dr Louise Lemyre, Ph.D.
(613) 562-5800 poste 4309
Fax : (613) 562-5147

Yaniv Benzimra, B.A.
(819) 773-4594

M.S.P.

Après CHAQUE item, ENCERCLEZ le chiffre de 1 à 8 en indiquant jusqu'à quel degré l'item vous décrit bien dernièrement, c'est-à-dire depuis les 4 ou 5 derniers jours

Les chiffres de 1 à 8 signifient :

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Enormement

DERNIEREMENT, C'EST-A-DIRE EN PENSANT AUX 4 OU 5 DERNIERS JOURS (encerclez)

1 Je suis détendu(e)	1	2	3	4	5	6	7	8
2 Je me sens pressé(e) par le temps, coincé(e) par le temps, je manque de temps	1	2	3	4	5	6	7	8
3 J'ai des douleurs physiques mal au dos, mal à la tête, mal dans la nuque, mal au ventre	1	2	3	4	5	6	7	8
4 Je suis préoccupé(e), tourmenté(e) ou tracassé(e)	1	2	3	4	5	6	7	8
5 Je suis confus(e), je n'ai pas les idées claires, je manque d'attention et de concentration.	1	2	3	4	5	6	7	8
6 Je me sens plein(e) d'énergie, en forme	1	2	3	4	5	6	7	8
7 Je sens beaucoup de pression sur mes épaules	1	2	3	4	5	6	7	8
8 Je contrôle mal mes réactions, mes humeurs, mes gestes	1	2	3	4	5	6	7	8
9 Je suis stressé(e)	1	2	3	4	5	6	7	8

Lemyre Tessier & Fillion (1990)

P.S.I.

Les questions qui suivent portent sur divers aspects de votre santé

La façon dont vous vous êtes senti(e) durant la dernière semaine a pu être différente de celle dont vous vous êtes senti(e) l'année passée

Pouvez-vous nous dire avec quelle FRÉQUENCE

AU COURS DE LA DERNIÈRE SEMAINE (encerclez)

ENCERCLEZ VOTRE RÉPONSE

	Jamais	De temps en temps	Assez souvent	Très souvent
10. Vous êtes-vous senti(e) désespéré(e) en pensant à l'avenir?	1	2	3	4
11. Vous êtes-vous senti(e) seul(e)?	1	2	3	4
12. Avez-vous eu des blancs de mémoire?	1	2	3	4
13. Vous êtes-vous senti(e) tendu(e) ou sous pression?	1	2	3	4
14. Vous êtes-vous laissé(e) emporter contre quelqu'un ou quelque chose?	1	2	3	4
15. Vous êtes-vous senti(e) ennuyé(e) ou peu intéressé(e) par les choses?	1	2	3	4
16. Avez-vous ressenti des peurs ou des craintes?	1	2	3	4
17. Avez-vous eu des difficultés à vous souvenir des choses?	1	2	3	4
18. Avez-vous pleuré facilement ou vous êtes-vous senti(e) sur le point de pleurer?	1	2	3	4
19. Vous êtes-vous senti(e) agité(e) ou nerveux(se) intérieurement?	1	2	3	4
20. Vous êtes-vous senti(e) négatif(ve) envers les autres?	1	2	3	4
21. Vous êtes-vous senti(e) facilement contrarié(e) ou irrité(e)?	1	2	3	4
22. Vous êtes-vous fâché(e) pour des choses sans importance?	1	2	3	4

VOTRE PIRE STRESSEUR ACTUEL

La majorité des gens ont quelque chose dans leur vie qui pour eux est une source de stress, que ce soit au travail ou dans d'autres secteurs de votre vie ; on appelle généralement ces sources de stress : «STRESSEURS».

23. QUEL EST, ACTUELLEMENT, VOTRE PIRE STRESSEUR? (dans n'importe quel domaine de votre vie)

24. QUAND CE STRESSEUR A-T-IL DÉBUTÉ? _____

25. PENSEZ-VOUS QUE CE STRESSEUR VA PERSISTER DURANT LES PROCHAINES SEMAINES OU MOIS À VENIR?

OUI ☐

NON ☐

Nous voulons connaître la façon dont vous percevez ce stresser ACTUELLEMENT.

À la suite de chaque question, encerclez le chiffre qui décrit le mieux votre perception :

Sur une échelle de 1 à 8, où :

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT À CE PIRE STRESSEUR ACTUEL (encerclez) :

- | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26. Jusqu'à quel point percevez-vous que ce stresser a un impact sur votre vie actuellement? | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 27. Jusqu'à quel point ressentez-vous un sentiment de maîtrise sur ce stresser, actuellement? | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 28. Jusqu'à quel point percevez-vous de l'incertitude au sujet de ce stresser, actuellement? | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Pensez à CE PIRE STRESSEUR ACTUEL et à comment vous y réagissez.

Indiquez jusqu'à quel point les énoncés suivants s'appliquent :

PAR RAPPORT À CE PIRE STRESSEUR ACTUEL (encerclez) :

- | | Je ne fais pas
cela du tout | Je fais cela
un peu | Je fais cela
moyennement | Je fais cela
toujours |
|--|--------------------------------|------------------------|-----------------------------|--------------------------|
| 29. Je discute de mes sentiments avec une autre personne. | 1 | 2 | 3 | 4 |
| 30. Je m'efforce de faire quelque chose au sujet de la situation. | 1 | 2 | 3 | 4 |
| 31. Je fais semblant que cela n'arrive pas vraiment. | 1 | 2 | 3 | 4 |
| 32. Je parle à quelqu'un pour en connaître davantage sur la situation. | 1 | 2 | 3 | 4 |
| 33. Je pense aux étapes à prendre. | 1 | 2 | 3 | 4 |
| 34. Je mets peu d'efforts pour résoudre le problème. | 1 | 2 | 3 | 4 |

VOTRE PIRE STRESSEUR ACTUEL ASSOCIÉ AU TRAVAIL

La majorité des gens ont quelque chose dans leur vie qui est pour eux une source de stress ; on appelle généralement ces sources de stress : «STRESSEUR».

35. QUELLE EST, ACTUELLEMENT, VOTRE PIRE STRESSEUR ASSOCIÉ AU TRAVAIL? _____

36. CE STRESSEUR EST-IL IDENTIQUE A VOTRE PIRE STRESSEUR ACTUEL (mentionné à la page 3)? Oui ☐ Non ☐
 si OUI, passez à la page suivante
 si NON, passez à la question suivante

37. QUAND CE STRESSEUR A-T-IL DÉBUTÉ? _____

38. PENSEZ-VOUS QUE CE STRESSEUR VA PERSISTER DURANT LES PROCHAINES SEMAINES OU MOIS À VENIR?
 Oui ☐ Non ☐

Nous voulons connaître la façon dont vous percevez ce stresser ACTUELLEMENT.

À la suite de chaque question, S.V.P. encerclez le chiffre qui décrit le mieux votre perception :

Sur une échelle de 1 à 8, où :

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT À CE PIRE STRESSEUR ACTUEL ASSOCIÉ AU TRAVAIL (encerclez) :

39. Jusqu'à quel point percevez-vous que ce stresser a un impact sur votre vie actuellement?	1	2	3	4	5	6	7	8
40. Jusqu'à quel point ressentez-vous un sentiment de maîtrise sur ce stresser, actuellement?	1	2	3	4	5	6	7	8
41. Jusqu'à quel point percevez-vous de l'incertitude au sujet de ce stresser, actuellement?	1	2	3	4	5	6	7	8

Pensez à VOTRE PIRE STRESSEUR ACTUEL et à comment vous y réagissez.

Indiquez jusqu'à quel point les énoncés suivants s'appliquent :

PAR RAPPORT À CE PIRE STRESSEUR ACTUEL ASSOCIÉ AU TRAVAIL (encerclez) :

	Je ne fais pas cela du tout	Je fais cela un peu	Je fais cela moyennement	Je fais cela toujours
42. Je discute de mes sentiments avec une autre personne.	1	2	3	4
43. Je m'efforce de faire quelque chose au sujet de la situation.	1	2	3	4
44. Je fais semblant que cela n'arrive pas vraiment.	1	2	3	4
45. Je parle à quelqu'un pour en connaître davantage sur la situation.	1	2	3	4
46. Je pense aux étapes à prendre.	1	2	3	4
47. Je mets peu d'efforts pour résoudre le problème.	1	2	3	4

VOTRE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS

La majorité des gens ont quelque chose dans leur vie qui est pour eux une source de stress ; on appelle généralement ces sources de stress : «STRESSEUR».

48. QUELLE A ETE POUR VOUS LE PIRE STRESSEUR ASSOCIE A L'OPERATION VERGLAS? _____

49. QUAND CE STRESSEUR A-T-IL DEBUTE? _____

50. QUAND CE STRESSEUR A-T-IL ETE LE PIRE POUR VOUS? _____

51. CE STRESSEUR EST-IL ENCORE PRESENT? Oui ☐ Non ☐

52. PENSEZ-VOUS QUE CE STRESSEUR VA PERSISTER DURANT LES PROCHAINES SEMAINES OU MOIS A VENIR?
Oui ☐ Non ☐

À la suite de chaque question, S.V.P. encerclez le chiffre qui décrit le mieux votre perception :

Sur une échelle de 1 à 8, où :

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT A CE PIRE STRESSEUR ASSOCIE A L'OPERATION VERGLAS (encerclez) :

53. Jusqu'à quel point percevez-vous que ce stresser a eu un impact sur votre vie?	1	2	3	4	5	6	7	8
54. Jusqu'à quel point avez-vous ressenti un sentiment de maîtrise sur ce stresser?	1	2	3	4	5	6	7	8
55. Jusqu'à quel point avez-vous perçu de l' incertitude à l'égard de ce stresser?	1	2	3	4	5	6	7	8

Pensez à CE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS et à comment vous avez réagi. Indiquez jusqu'à quel point les énoncés suivants s'appliquent :

PAR RAPPORT A CE PIRE STRESSEUR ASSOCIE A L'OPERATION VERGLAS (encerclez) :

	Je n'ai pas fait cela du tout	J'ai fait cela un peu	J'ai fait cela moyennement	J'ai fait cela toujours
56. J'ai discuté de mes sentiments avec une autre personne.	1	2	3	4
57. Je me suis efforcé(e) de faire quelque chose au sujet de la situation.	1	2	3	4
58. J'ai fait semblant que cela n'arrive pas vraiment.	1	2	3	4
59. J'ai parlé à quelqu'un pour en connaître davantage sur la situation.	1	2	3	4
60. J'ai pensé aux étapes à prendre.	1	2	3	4
61. J'ai mis peu d'efforts pour résoudre le problème.	1	2	3	4

LE VERGLAS

Maintenant, nous allons vous parler du Verglas pour comprendre si vous avez été affecté(e) et de quelle façon.

62. Comme client d'Hydro-Québec (et non comme employé(e)), avez-vous été vous-même sinistré(e) pendant l'*Opération verglas*? Oui ☐ Non ☐
 cochez l'un ou l'autre : ☐ quelques heures ☐ quelques jours ☐ quelques semaines

63. Comme employé(e) d'Hydro-Québec combien d'heures par jour avez-vous travaillé en moyenne lors de l'*Opération verglas*? _____ heures/jours

64. Durant combien de jours consécutifs avez-vous travaillé à l'*Opération verglas*? _____ jours

65. Pendant l'*Opération verglas*, étiez-vous, dans votre travail :

- en contact direct avec la clientèle sinistrée? Oui ☐ Non ☐
 - officiellement affecté(e) à l'*Opération verglas* sur le terrain (à l'extérieur, «dehors»)? Oui ☐ Non ☐
 - officiellement affecté(e) à l'*Opération verglas* en bureau, postes ou centres («en dedans»)? Oui ☐ Non ☐
 - indirectement affecté(e) par un changement à votre tâche dû à l'*Opération verglas*? Oui ☐ Non ☐
 - pas ou peu touché(e) dans votre travail par l'*Opération verglas*? Oui ☐ Non ☐
 - relocalisé(e) temporairement à cause de l'*Opération verglas* (hors de votre lieu de travail habituel)? Oui ☐ Non ☐
- si OUI, cochez l'un ou l'autre : ☐ quelques heures ☐ quelques jours ☐ quelques semaines

66. En date aujourd'hui, travaillez-vous aux suites directes de l'*Opération verglas*? Oui ☐ Non ☐

INFORMATION GENERALE

67. TYPE D'EMPLOI :

- ☐ Cadre ☐ Spécialiste ☐ Personnel de bureau ☐ Métier
☐ Ingénieur ☐ Technicien(ne) ☐ Chercheur(e)
☐ Autre (spécifiez) _____

68. UNITE D'ENTREPRISE :

- ☐ Direction principale Recherches & Développement & IREQ
☐ Projets & Affaires internationales
☐ Distribution
☐ Services à la clientèle
☐ Direction principale Approvisionnement & Services
☐ Direction principale Technologie de l'information

69. RÉGION DU LIEU DE TRAVAIL

- | | | |
|---|--|--|
| ☐ Bas St-Laurent | ☐ Île de Montréal | ☐ Gaspésie - Îles de la Madeleine |
| ☐ Saguenay Lac St-Jean | ☐ Ouataouais | ☐ Chaudière - Apalaches |
| ☐ Québec | ☐ Abitibi - Témiscamingue | ☐ Laval |
| ☐ Mauricie Bois Franc | ☐ Côte-Nord | ☐ Lanaudière |
| ☐ Estrie | ☐ Nord du Québec | ☐ Laurentides |

70. ÂGE : _____ ans

71. SEXE : ☐ M ☐ F

QUESTIONS SUR LE VERGLAS

73. Si une crise comme le Verglas venait à se reproduire, qu'est-ce que l'entreprise pourrait faire de plus pour soutenir son personnel?

74. Parmi les gestes que l'entreprise a posés durant l'*Opération verglas*, quel est celui qui vous a le plus aidé?

75. Qu'aimeriez-vous que l'entreprise fasse maintenant pour vous aider ou aider vos collègues, s'il y a lieu, à récupérer de l'*Opération verglas*?

SUITE DE L'ETUDE «*Après le verglas*»

Ce questionnaire s'inscrit dans une démarche de recherche.
Il y aura une Phase 2.

Étant donné l'importance de cette étude et l'importance de bien comprendre
le vécu du personnel d'Hydro-Québec

Accepteriez-vous d'être contacté(e) pour participer à la Phase 2 de l'Étude «*Après le verglas*»?

Cela impliquera un deuxième questionnaire (15 minutes) et si vous le souhaitez,
une entrevue de 30 minutes avec les chercheurs de l'Université.

(la participation est libre et volontaire, anonyme et confidentielle, avec droit de refus en tous temps)

Oui ☐ Non ☐

Pour être recontacté pour la Phase 2 (à l'usage exclusif des chercheurs - confidentiel)

S.V.P. INDIQUEZ :

Votre code d'identification personnel (C.I.P.) : _____

ou

Votre nom, prénom, adresse au travail : _____

Merci de votre collaboration!

Dr Louise Lemyre, Ph.D.
(613) 562-5800 poste 4309
Fax : (613) 562-5147

Appendix B

Phase 2- Questionnaire

Étude : “Le travail suite au verglas...”

par :

Laboratoire sur les Aspects Psychosociaux du Stress et de la Santé (L.A.P.S.)

Dr L. Lemyre & Y. Benzimra

En collaboration avec :

*Direction principale des Ressources humaines
Services de santé*

“Le travail suite au verglas...”

QUESTIONNAIRE - Phase 2

NOVEMBRE 1998

DOCUMENT CONFIDENTIEL UNE FOIS REMPLI

Ce questionnaire sera traité de façon anonyme et confidentielle.

Votre participation est libre et volontaire.

**Remettre ce questionnaire dans l'enveloppe ci-jointe et la sceller
avant de la retourner par courrier interne.**

VOTRE COLLABORATION EST IMPORTANTE.

Étude : “Le travail suite au verglas...”

(Phase 2)

- Nous poursuivons notre étude du vécu du personnel d’Hydro-Québec et des suites de l’*Opération Verglas*. Nous apprécierions grandement votre collaboration pour nous permettre d’obtenir une image aussi fidèle que possible de votre vécu actuel.
- Il n’y a pas de bonnes ou mauvaises réponses. Nous cherchons à connaître votre opinion.
- Un rapport de groupe avec des recommandations sera soumis aux Services de santé d’Hydro-Québec.
- **Toutes vos réponses sont CONFIDENTIELLES et ne seront pas divulguées à quiconque à Hydro-Québec. Les enveloppes scellées seront recueillies, dépouillées et gardées par le Dr Lemyre à l’école de psychologie.**
- S.V.P., répondez seul(e) et ne discutez pas de vos réponses avec vos collègues.
- Votre participation est libre et volontaire.
- Vous pouvez vous retirer de l’étude en tout temps.
- Votre collaboration est importante.
- Vous pouvez nous contacter au numéro suivant, au besoin.
- **Répondez à toutes les questions (même si vous y avez déjà répondu à la Phase 1) comme vous vous sentez maintenant.**

Merci pour le temps et le soin que vous y apporterez.

E.S.V.

Nous présentons ci-dessous cinq énoncés avec lesquels vous pouvez être en accord ou en désaccord. À l'aide de l'échelle de 1 à 7 ci-dessous, indiquez votre degré d'accord ou de désaccord avec chacun des énoncés en encrant le chiffre approprié à droite des énoncés. Nous vous prions d'être le plus ouvert et honnête possible dans vos réponses.

Les chiffres de 1 à 7 signifient:

Fortement en désaccord	En désaccord	Légèrement en désaccord	Ni en désaccord ni en accord	Légèrement en accord	En accord	Fortement en accord
1	2	3	4	5	6	7

1. En général, ma vie correspond de près à mes idéaux	1	2	3	4	5	6	7
2. Mes conditions de vie sont excellentes	1	2	3	4	5	6	7
3. Je suis satisfait(e) de ma vie	1	2	3	4	5	6	7
4. Jusqu'à maintenant, j'ai obtenu les choses importantes que je voulais de la vie	1	2	3	4	5	6	7
5. Si je pouvais recommencer ma vie, je n'y changerais presque rien	1	2	3	4	5	6	7

I.J.S.

Veuillez indiquer votre degré d'accord avec chacun des énoncés suivants. **Les chiffres de 1 à 5 signifient:**

Fortement en accord	En accord	Ni en accord ni en désaccord	En désaccord	Fortement en désaccord
1	2	3	4	5

6. Il y a certaines conditions par rapport à mon travail qui pourraient être améliorées.	1	2	3	4	5
7. Mon travail est comme un loisir pour moi.	1	2	3	4	5
8. Mon travail est généralement assez intéressant pour que je ne m'y ennue pas.	1	2	3	4	5
9. Il me semble que mes ami(es) sont plus intéressé(es) par leur travail.	1	2	3	4	5
10. Je considère mon travail comme plutôt désagréable.	1	2	3	4	5
11. J'aime mon travail plus que mon temps de loisir.	1	2	3	4	5
12. Mon travail m'ennuie souvent.	1	2	3	4	5
13. Je suis plutôt bien satisfait(e) de mon travail actuel.	1	2	3	4	5
14. La plupart du temps, je dois me forcer pour me rendre au travail.	1	2	3	4	5
15. Je suis satisfait(e) de mon travail pour le moment.	1	2	3	4	5
16. Je pense que mon travail n'est pas plus intéressant que d'autres que je pourrais trouver.	1	2	3	4	5
17. Il est certain que je n'aime pas mon travail.	1	2	3	4	5
18. Je pense que je suis plus heureux à mon travail que la plupart des gens.	1	2	3	4	5
19. La plupart des jours je suis enthousiaste à propos de mon travail.	1	2	3	4	5
20. Chaque journée de travail me semble interminable.	1	2	3	4	5
21. J'aime mon travail plus que l'employé(e) 'moyen' aime le sien.	1	2	3	4	5
22. Mon travail n'est vraiment pas intéressant.	1	2	3	4	5
23. Je prends un plaisir réel à mon travail.	1	2	3	4	5
24. Je suis déçu d'avoir accepté ce travail.	1	2	3	4	5

M.S.P.

Après CHAQUE item, ENCERCLEZ le chiffre de 1 à 8 en indiquant jusqu'à quel degré l'item vous décrit bien dernièrement, c'est-à-dire depuis les 4 ou 5 derniers jours.

Les chiffres de 1 à 8 signifient :

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

DERNIEREMENT, C'EST-A-DIRE EN PENSANT AUX 4 OU 5 DERNIERS JOURS (encerclez) :

25. Je suis détendu(e)	1	2	3	4	5	6	7	8
26. Je me sens pressé(e) par le temps, coincé(e) par le temps, je manque de temps.	1	2	3	4	5	6	7	8
27. J'ai des douleurs physiques: mal au dos, mal à la tête, mal dans la nuque, mal au ventre.	1	2	3	4	5	6	7	8
28. Je suis préoccupé(e), tourmenté(e) ou tracasé(e)	1	2	3	4	5	6	7	8
29. Je suis confus(e), je n'ai pas les idées claires, je manque d'attention et de concentration.	1	2	3	4	5	6	7	8
30. Je me sens plein(e) d'énergie, en forme.	1	2	3	4	5	6	7	8
31. Je sens beaucoup de pression sur mes épaules.	1	2	3	4	5	6	7	8
32. Je contrôle mal mes réactions, mes humeurs, mes gestes.	1	2	3	4	5	6	7	8
33. Je suis stressé(e).	1	2	3	4	5	6	7	8

Lemyre, Tessier & Fillion (1990)

P.S.I.

Les questions qui suivent portent sur divers aspects de votre santé. La façon dont vous vous êtes senti(e) durant la dernière semaine a pu être différente de celle dont vous vous êtes senti(e) l'année passée.

Pouvez-vous nous dire avec quelle FRÉQUENCE

AU COURS DE LA DERNIERE SEMAINE (encerclez) :

ENCERCLEZ VOTRE RÉPONSE

	Jamais	De temps en temps	Assez souvent	Très souvent
34. Vous êtes-vous senti(e) désespéré(e) en pensant à l'avenir?	1	2	3	4
35. Vous êtes-vous senti(e) seul(e)?	1	2	3	4
36. Avez-vous eu des blancs de mémoire?	1	2	3	4
37. Vous êtes-vous senti(e) tendu(e) ou sous pression?	1	2	3	4
38. Vous êtes-vous laissé(e) emporter contre quelqu'un ou quelque chose?	1	2	3	4
39. Vous êtes-vous senti(e) ennuyé(e) ou peu intéressé(e) par les choses?	1	2	3	4
40. Avez-vous ressenti des peurs ou des craintes?	1	2	3	4
41. Avez-vous eu des difficultés à vous souvenir des choses?	1	2	3	4
42. Avez-vous pleuré facilement ou vous êtes-vous senti(e) sur le point de pleurer?	1	2	3	4
43. Vous êtes-vous senti(e) découragé(e) ou avez-vous eu les "bleus"?	1	2	3	4
44. Vous êtes-vous senti(e) agité(e) ou nerveux(se) intérieurement?	1	2	3	4
45. Vous êtes-vous senti(e) négatif(ve) envers les autres?	1	2	3	4
46. Vous êtes-vous senti(e) facilement contrarié(e) ou irrité(e)?	1	2	3	4
47. Vous êtes-vous fâché(e) pour des choses sans importance?	1	2	3	4

lifield (1976), traduction de Santé Québec (1992)

S.S.O.

Après CHAQUE item, ENCERCLEZ le chiffre de 0 à 4 en indiquant jusqu'à quel degré l'item décrit bien votre expérience.

Les chiffres de 0 à 4 signifient :

0	1	2	3	4
Je n'ai aucune personne du genre	Pas du tout	Un peu	Quelque peu	Énormément

48. Jusqu'à quel degré chacune des personnes suivantes s'efforce de faire des choses afin de faciliter votre vie au travail?

A. Votre superviseur immédiat...	0	1	2	3	4
B. D'autres personnes au travail (collègues)...	0	1	2	3	4
C. Votre partenaire, vos amis et famille...	0	1	2	3	4

49. Jusqu'à quel degré vous est-il facile de parler à chacune des personnes suivantes?

A. Votre superviseur immédiat...	0	1	2	3	4
B. D'autres personnes au travail (collègues)...	0	1	2	3	4
C. Votre partenaire, vos amis et famille...	0	1	2	3	4

50. À quel degré pouvez-vous compter sur chacune des ces personnes lorsque les choses deviennent difficiles au travail?

A. Votre superviseur immédiat...	0	1	2	3	4
B. D'autres personnes au travail (collègues)...	0	1	2	3	4
C. Votre partenaire, vos amis et famille...	0	1	2	3	4

51. À quel degré chacune des personnes suivantes est-elle prête à écouter vos problèmes personnels?

A. Votre superviseur immédiat...	0	1	2	3	4
B. D'autres personnes au travail (collègues)...	0	1	2	3	4
C. Votre partenaire, vos amis et famille...	0	1	2	3	4

VOTRE PIRE STRESSEUR ACTUEL ASSOCIÉ AU TRAVAIL

Les choses de la vie qui sont pour nous des sources de stress s'appellent généralement: «STRESSEURS».

52. Quel est, ACTUELLEMENT, votre PIRE STRESSEUR ASSOCIÉ AU TRAVAIL? _____

53. Quand ce stresser a-t-il débuté? _____

54. Pensez-vous que ce stresser va persister durant les prochaines semaines ou mois à venir? OUI ☐ NON ☐

À la suite de chaque question, encerclez le chiffre qui décrit le mieux VOTRE PERCEPTION: Sur une échelle de 1 à 8, où:

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT A CE PIRE STRESSEUR ASSOCIÉ AU TRAVAIL (encerclez):

55. Jusqu'à quel point percevez-vous que ce stresser a un impact sur votre vie, actuellement?	1	2	3	4	5	6	7	8
56. Jusqu'à quel point ressentez-vous un sentiment de maîtrise sur ce stresser, actuellement?	1	2	3	4	5	6	7	8
57. Jusqu'à quel point percevez-vous de l'incertitude au sujet de ce stresser, actuellement?	1	2	3	4	5	6	7	8
58. Jusqu'à quel point ce stresser est-il contrôlable par vous, actuellement?	1	2	3	4	5	6	7	8
59. Jusqu'à quel point vous sentez-vous capable de faire face à ce stresser, actuellement?	1	2	3	4	5	6	7	8
60. Jusqu'à quel point percevez-vous ce stresser comme menaçant, actuellement?	1	2	3	4	5	6	7	8
61. Jusqu'à quel point ce stresser est-il prévisible, actuellement?	1	2	3	4	5	6	7	8

À la suite de chaque question, encerclez le chiffre qui décrit le mieux comment vous réagissez à ce PIRE STRESSEUR actuel.

PAR RAPPORT A CE PIRE STRESSEUR ACTUEL ASSOCIÉ AU TRAVAIL (encerclez):

	Je ne fais pas cela du tout	Je fais cela un peu	Je fais cela moyennement	Je fais cela toujours
62. Je discute de mes sentiments avec une autre personne.	1	2	3	4
63. Je m'efforce de faire quelque chose au sujet de la situation.	1	2	3	4
64. Je fais semblant que cela n'arrive pas vraiment.	1	2	3	4
65. Je parle à quelqu'un pour en connaître davantage sur la situation.	1	2	3	4
66. J'essaie vraiment de répondre aux souhaits des autres car cela devrait améliorer la situation.	1	2	3	4
67. Je pense aux étapes à prendre.	1	2	3	4
68. Je mets peu d'efforts pour résoudre le problème.	1	2	3	4
69. J'essaie d'établir une stratégie pour ce que je dois faire.	1	2	3	4
70. Je me joins à d'autres personnes au travail afin de faire face à la situation ensemble.	1	2	3	4
71. J'abandonne toutes tentatives d'obtenir ce que je veux.	1	2	3	4
72. Je me refuse à croire que cela arrive.	1	2	3	4
73. Je pose une action concrète qui me permet de contourner le problème.	1	2	3	4
74. J'exprime mes sentiments auprès d'une autre personne.	1	2	3	4
75. Je demande à des gens qui ont vécu des expériences similaires ce qu'ils ont fait.	1	2	3	4
76. Je considère attentivement les sentiments des autres avant de décider quoi faire.	1	2	3	4

J.S.Q.

Veuillez indiquer votre degré d'accord avec chacun des énoncés suivants.

Les chiffres de 1 à 7 signifient:

Jamais	Presque Jamais	Un peu	Moyennement	Assez souvent	Souvent	Très souvent
1	2	3	4	5	6	7

À quelle fréquence...

77.votre emploi exige que vous travailliez très vite?	1	2	3	4	5	6	7
78.votre emploi exige que vous travailliez très dur?	1	2	3	4	5	6	7
79.votre emploi vous laisse peu de temps pour accomplir les choses?	1	2	3	4	5	6	7
80.y a-t-il beaucoup à faire?	1	2	3	4	5	6	7
81.ressentez-vous une surcharge de travail?	1	2	3	4	5	6	7

À quelle fréquence...

82.des gens, de rang et autorité équivalents aux vôtres, vous demande de faire des choses qui entrent en conflit entre elles?	1	2	3	4	5	6	7
83.vos superviseurs vous assignent des tâches qui sont conflictuelles avec d'autres que vous avez à accomplir?	1	2	3	4	5	6	7
84.vous n'êtes pas sûr quelles sont vos responsabilités?	1	2	3	4	5	6	7
85.savez-vous ce que les autres s'attendent de vous au travail?	1	2	3	4	5	6	7

À quelle fréquence...

86.les standards de performance sont-ils bien établis?	1	2	3	4	5	6	7
87.votre travail vous permet-il d'utiliser les habiletés et connaissances apprises à l'école ou durant votre formation?	1	2	3	4	5	6	7
88.avez-vous la possibilité de faire les choses que vous faites le mieux?	1	2	3	4	5	6	7
89.avez-vous la possibilité d'utiliser les habiletés apprises de votre expérience ou formation précédente?	1	2	3	4	5	6	7

Voici une liste de 17 stressors reliés au travail. Veuillez indiquer à quel degré vous ressentez chacun de ces stressors au travail en encerclant le chiffre approprié.

LES CHIFFRES DE 1 À 7 SIGNIFIENT:

Jamais	Presque Jamais	Un peu	Moyennement	Assez souvent	Souvent	Tres souvent
1	2	3	4	5	6	7

90 Surcharge de travail	1	2	3	4	5	6	7
91 Conflits de rôles (ex faire des choses qui sont en conflit avec les tâches habituelles)	1	2	3	4	5	6	7
92 Difficultés avec les changements technologiques (ex ordinateurs, internet, etc)	1	2	3	4	5	6	7
93 Travail trop complexe (manque de formation/compétence pour la tâche)	1	2	3	4	5	6	7
94 Conflits entre travail et famille	1	2	3	4	5	6	7
95 Conflits ou tension avec des collègues	1	2	3	4	5	6	7
96 Manque d'opportunités de progrès de carrière	1	2	3	4	5	6	7
97 Ambiguïté de rôles (ex ne pas être sûr quelles sont ses fonctions ou mandats au travail)	1	2	3	4	5	6	7
98 Conflits ou tension avec votre superviseur immédiat	1	2	3	4	5	6	7
99. Travail monotone (être surqualifié pour le travail)	1	2	3	4	5	6	7
100. Manque de pouvoir décisionnel (ex je ne décide presque rien à mon travail)	1	2	3	4	5	6	7
101 Contact fréquents avec les clients (ex par téléphone)	1	2	3	4	5	6	7
102. Insecurité d'emploi	1	2	3	4	5	6	7
103 Salaire insatisfaisant	1	2	3	4	5	6	7
104 Démotion, promotion ou changement d'emploi du même niveau (Indiquer lequel)	1	2	3	4	5	6	7
105 Évaluations négatives de votre performance	1	2	3	4	5	6	7
106 De la discrimination	1	2	3	4	5	6	7
107. Autres (Spécifiez : _____)	1	2	3	4	5	6	7
108. Autres (Spécifiez : _____)	1	2	3	4	5	6	7
109. Autres (Spécifiez : _____)	1	2	3	4	5	6	7

VOTRE PIRE STRESSEUR ACTUEL (*hors-travail ou au travail*)

Les choses de la vie (*au travail ou hors-travail*) qui sont pour nous des sources de stress s'appellent: «STRESSEURS».

110. Quel est, ACTUELLEMENT, VOTRE PIRE STRESSEUR? (*dans n'importe quel domaine de votre vie*) _____

111. Quand ce stresser a-t-il débuté? _____

112. Pensez-vous que ce stresser va persister durant les prochaines semaines ou mois à venir? OUI ☐ NON ☐

À la suite de chaque question, encerclez le chiffre qui décrit le mieux VOTRE PERCEPTION: Sur une échelle de 1 à 8, où:

1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT A CE PIRE STRESSEUR HORS-TRAVAIL OU TRAVAIL (encerclez):

113. Jusqu'à quel point percevez-vous que ce stresser a un impact sur votre vie, actuellement?	1	2	3	4	5	6	7	8
114. Jusqu'à quel point ressentez-vous un sentiment de maîtrise sur ce stresser, actuellement?	1	2	3	4	5	6	7	8
115. Jusqu'à quel point percevez-vous de l'incertitude au sujet de ce stresser, actuellement?	1	2	3	4	5	6	7	8
116. Jusqu'à quel point ce stresser est-il contrôlable par vous, actuellement?	1	2	3	4	5	6	7	8
117. Jusqu'à quel point vous sentez-vous capable de faire face à ce stresser, actuellement?	1	2	3	4	5	6	7	8
118. Jusqu'à quel point percevez-vous ce stresser comme menaçant, actuellement?	1	2	3	4	5	6	7	8
119. Jusqu'à quel point ce stresser est-il prévisible, actuellement?	1	2	3	4	5	6	7	8

À la suite de chaque question, encerclez le chiffre qui décrit le mieux comment vous réagissez à ce PIRE STRESSEUR actuel.

PAR RAPPORT A CE PIRE STRESSEUR HORS-TRAVAIL OU TRAVAIL (encerclez):

	Je ne fais pas cela du tout	Je fais cela un peu	Je fais cela moyennement	Je fais cela toujours
120. Je discute de mes sentiments avec une autre personne.	1	2	3	4
121. Je m'efforce de faire quelque chose au sujet de la situation.	1	2	3	4
122. Je fais semblant que cela n'arrive pas vraiment.	1	2	3	4
123. Je parle à quelqu'un pour en connaître davantage sur la situation.	1	2	3	4
124. J'essaie vraiment de répondre aux souhaits des autres car cela devrait améliorer la situation.	1	2	3	4
125. Je pense aux étapes à prendre.	1	2	3	4
126. Je mets peu d'efforts pour résoudre le problème.	1	2	3	4
127. J'essaie d'établir une stratégie pour ce que je dois faire.	1	2	3	4
128. Je me joins à d'autres personnes au travail afin de faire face à la situation ensemble.	1	2	3	4
129. J'abandonne toutes tentatives d'obtenir ce que je veux.	1	2	3	4
130. Je me refuse à croire que cela arrive.	1	2	3	4
131. Je pose une action concrète qui me permet de contourner le problème.	1	2	3	4
132. J'exprime mes sentiments auprès d'une autre personne.	1	2	3	4
133. Je demande à des gens qui ont vécu des expériences similaires ce qu'ils ont fait.	1	2	3	4
134. Je considère attentivement les sentiments des autres avant de décider quoi faire.	1	2	3	4

VOTRE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS

Les choses de la vie qui sont pour nous des sources de stress s'appellent généralement «STRESSEURS».

134 Quel est, ACTUELLEMENT, VOTRE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS? _____

135 Quand ce stressor a-t-il débuté? _____

136. Quand ce stressor a-t-il été le pire pour vous? _____

137. Pensez-vous que ce stressor va persister durant les prochaines semaines ou mois à venir? OUI ☐ NON ☐

A la suite de chaque question, encerclez le chiffre qui décrit le mieux VOTRE PERCEPTION Sur une échelle de 1 à 8, ou							
1	2	3	4	5	6	7	8
Pas du tout	Pas vraiment	Très peu	Un peu	Plutôt oui	Passablement	Beaucoup	Énormément

PAR RAPPORT À CE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS (encerclez) :

138 Jusqu'à quel point percevez-vous que ce stressor a un impact sur votre vie, actuellement?	1	2	3	4	5	6	7	8
139 Jusqu'à quel point ressentez-vous un sentiment de maîtrise sur ce stressor, actuellement?	1	2	3	4	5	6	7	8
140 Jusqu'à quel point percevez-vous de l'incertitude au sujet de ce stressor, actuellement?	1	2	3	4	5	6	7	8
141 Jusqu'à quel point ce stressor est-il contrôlable par vous, actuellement?	1	2	3	4	5	6	7	8
142 Jusqu'à quel point vous sentez-vous capable de faire face à ce stressor, actuellement?	1	2	3	4	5	6	7	8
143 Jusqu'à quel point percevez-vous ce stressor comme menaçant, actuellement?	1	2	3	4	5	6	7	8
144 Jusqu'à quel point ce stressor est-il prévisible, actuellement?	1	2	3	4	5	6	7	8

A la suite de chaque question, encerclez le chiffre qui décrit le mieux comment vous réagissez à ce PIRE STRESSEUR actuel

PAR RAPPORT À CE PIRE STRESSEUR ASSOCIÉ À L'OPÉRATION VERGLAS (encerclez) :

	Je ne fais pas cela du tout	Je fais cela un peu	Je fais cela moyennement	Je fais cela toujours
145 Je discute de mes sentiments avec une autre personne	1	2	3	4
146 Je m'efforce de faire quelque chose au sujet de la situation	1	2	3	4
147 Je fais semblant que cela n'arrive pas vraiment	1	2	3	4
148 Je parle à quelqu'un pour en connaître davantage sur la situation	1	2	3	4
149 J'essaie vraiment de répondre aux souhaits des autres car cela devrait améliorer la situation	1	2	3	4
150 Je pense aux étapes à prendre	1	2	3	4
151. Je mets peu d'efforts pour résoudre le problème	1	2	3	4
152. J'essaie d'établir une stratégie pour ce que je dois faire	1	2	3	4
153. Je me joins à d'autres personnes au travail afin de faire face à la situation ensemble	1	2	3	4
154 J'abandonne toutes tentatives d'obtenir ce que je veux	1	2	3	4
155 Je me refuse à croire que cela arrive	1	2	3	4
156 Je pose une action concrète qui me permet de contourner le problème	1	2	3	4
157 J'exprime mes sentiments auprès d'une autre personne	1	2	3	4
158 Je demande à des gens qui ont vécu des expériences similaires ce qu'ils ont fait.	1	2	3	4
159 Je considère attentivement les sentiments des autres avant de décider quoi faire	1	2	3	4

INFORMATION GÉNÉRALE

160. a) TYPE D'EMPLOI :

- ☐ Cadre ☐ Spécialiste ☐ Personnel de bureau ☐ Métier
☐ Ingénieur ☐ Technicien(ne) ☐ Chercheur(e)
☐ Autre (spécifiez) _____

b) Depuis combien de temps occupez-vous ce poste (soyez précis S.V.P.) ? _____.

c) Combien de jour travaillez-vous par semaine (en moyenne)? _____ jours.

d) Combien d'heures travaillez-vous par jour (en moyenne) ? _____ heures.

e) Au courant du dernier mois...

...**combien d'heures** supplémentaires avez-vous travaillé? _____ heures.

...**combien d'heures** supplémentaires vouliez-vous travailler? _____ heures.

f) En date aujourd'hui, travaillez-vous **aux suites** directes de l'*Opération verglas*? Oui ☐ Non ☐

161. UNITE D'ENTREPRISE :

- ☐ Projets & Affaires internationales
☐ Distribution
☐ Services à la clientèle
☐ Direction principale Approvisionnement & Services
☐ Direction principale Technologie de l'information

162. RÉGION DU LIEU DE TRAVAIL

- | | | |
|---|---|--|
| ☐ Bas St-Laurent | ☐ Île de Montréal | ☐ Gaspésie - Îles de la Madeleine |
| ☐ Saguenay Lac St-Jean | ☐ Outaouais | ☐ Chaudière - Apalaches |
| ☐ Québec | ☐ Abitibi Témiscamingue | ☐ Laval |
| ☐ Mauricie Bois-Francs | ☐ Côte-Nord | ☐ Lanaudière |
| ☐ Estrie | ☐ Nord du Québec | ☐ Laurentides |
| ☐ Montérégie | ☐ Autre région (spécifiez) : _____ | |

163. ÂGE : _____ ans

164. SEXE : ☐ M ☐ F

165. STATUT CIVIL ACTUEL:

- ☐ Marié(e) ☐ Conjoint(e) de fait ☐ Séparé(e)-Divorcé(e)
☐ Célibataire ☐ Veuve-Veuf ☐ Autre (spécifiez) _____

166. Nombre d'années **DE SCOLARITÉ** complétées: _____ années (à partir de la 1ère année primaire)

167. REVENU ANNUEL PERSONNEL:

- ☐ 0 à \$9,999 ☐ \$10,000 à \$14,999 ☐ \$15,000 à \$19,999 ☐ \$20,000 à \$24,999
☐ \$25,000 à \$29,000 ☐ \$30,000 à \$39,999 ☐ \$40,000 à \$49,999 ☐ \$50,000 et plus

168. REVENU ANNUEL DU CONJOINT:

- ☐ 0 à \$9,999 ☐ \$10,000 à \$14,999 ☐ \$15,000 à \$19,999 ☐ \$20,000 à \$24,999
☐ \$25,000 à \$29,000 ☐ \$30,000 à \$39,999 ☐ \$40,000 à \$49,999 ☐ \$50,000 et plus

169. a) Combien **D'ENFANTS** avez vous? _____ enfants.

b) Combien **DE JOURS PAR SEMAINE** vivent-ils chez-vous? _____ jours.

c) Quel est leur **AGE**? _____

170. a) Comment jugez-vous votre **ETAT DE SANTE PHYSIQUE ACTUEL**?

Sur une échelle de 1 à 5, encerclez le chiffre qui vous décrit le mieux:

Très mauvais	Mauvais	Moyen	Bon	Très Bon
1	2	3	4	5

b) Avez-vous, présentement, des problèmes de santé significatifs? ☐ OUI ☐ NON

. Si OUI spécifiez: _____

171. Aux seules fins de cette recherche, de façon anonyme et confidentielle et à l'usage des chercheurs Lemyre et Benzimra seulement, acceptez-vous que nous obtenions du fichier informatique:

- ♦ le nombre de jours de vacances pris depuis 2 ans.
- ♦ le nombre de jours d'absences depuis 2 ans.
- ♦ le temps supplémentaire effectué depuis 2 ans.

☐ OUI ☐ NON

♦ Si OUI, S.V.P. indiquez votre **CODE D'IDENTIFICATION PERSONNEL (C.I.P.)** : _____

172. Qu'est-ce que l'entreprise pourrait faire de plus pour soutenir son personnel? _____

SUITE DE L'ETUDE «*Le travail suite au verglas*»

Ce questionnaire s'inscrit dans une démarche de recherche.

Étant donné l'importance de cette étude et l'importance de bien comprendre

le vécu du personnel d'Hydro-Québec,

il y aura une Phase 3 pour ceux et celles qui le souhaitent.

Cela impliquera une entrevue (60 minutes) avec les chercheurs de l'Université
pour décrire plus en détail les aspects stressants de votre vie au travail et hors-travail.

La participation est libre et volontaire, anonyme et confidentielle, avec droit de refus en tous temps.

**Accepteriez-vous d'être contacté(e) pour plus d'information sur la
Phase 3 de l'Étude: «*Le travail suite au verglas*»?**

Oui ☐ Non ☐

Pour être recontacté pour la Phase 3 (à l'usage exclusif des chercheurs - confidentiel)

S.V.P. INDIQUEZ :

Votre code d'identification personnel (C.I.P.) : _____
et

Votre nom, prénom, adresse au travail : _____

Merci de votre collaboration!

Dr Louise Lemyre, Ph.D.
(613) 562-5800 poste 4309
Fax : (613) 562-5147

Appendix C

Factor loadings and communality scores (h^2) for the one-factor solution
of the stress-enhancing cognitive appraisals (SECA).

Item	SECA	h^2
IMP	.82	.66
MAS	.67	.44
UNC	.81	.66
Explained variance (%)	58.8	

Note. IMP = perceived impact; MAS = perceived mastery; UNC = perceived uncertainty.

Appendix D

Factor loadings and communality scores (h^2) for the
one-factor solution of the psychological stress measure (PSM).

Item	PSM	h^2
PSM1	.60	.36
PSM2	.70	.49
PSM3	.86	.74
PSM4	.75	.57
PSM5	.79	.63
PSM6	.67	.45
PSM7	.89	.80
Explained variance (%)	57.6	

Note. PSM1-PSM7 are sub-items of PSM.

Appendix E

Correlations between the three indicators of the overall distress index (ODI).

	PSI	IJS	SWLS
PSI		-.45*	-.54*
IJS			-.45*
SWLS			

Note. $p < .05$; PSI = psychological symptom inventory; IJS = index of job satisfaction; SWLS = satisfaction with life scale.

Appendix F

Covariance matrix obtained from the observed data.

	<u>PSM</u>	<u>SWLS</u>	<u>IJS</u>	<u>PSI</u>	<u>SUP</u>	<u>COL</u>	<u>X_ORG</u>	<u>IMP</u>	<u>MAS</u>	<u>UNC</u>
PSM	104.45									
SWLS	-24.56	32.29								
IJS	-36.54	22.91	131.41							
PSI	100.86	-40.86	-68.26	177.97						
SUP	-11.40	4.11	15.03	-14.25	13.80					
COL	-7.67	3.21	8.21	-11.17	4.75	9.07				
X_ORG	-5.50	5.64	3.07	-8.94	2.06	2.77	9.91			
IMP	7.32	-2.56	-4.21	9.92	-1.04	-.50	-.56	2.75		
MAS	-5.14	1.88	4.59	-6.82	1.21	.90	..79	-.93	3.11	
UNC	6.72	-2.13	-5.26	9.15	-.93	-.89	-.53	1.50	-.97	3.21

Appendix G

Correlation matrix obtained from the observed data.

	<u>PSM</u>	<u>SWLS</u>	<u>IJS</u>	<u>PSI</u>	<u>SUP</u>	<u>COL</u>	<u>X_ORG</u>	<u>IMP</u>	<u>MAS</u>	<u>UNC</u>
PSM										
SWLS	-.42									
IJS	.31	.35								
PSI	.74	-.54	-.45							
SUP	-.30	.20	.35	.29						
COL	-.25	.19	.24	-.28	.43					
X_ORG	-.17	.32	.10	-.21	.18	.29				
IMP	.43	-.27	-.22	.45	.17	.10	.11			
MAS	-.29	.19	.22	-.29	.18	.17	.14	-.32		
UNC	.37	-.21	-.26	.38	.14	.17	-.09	.51	-.31	
