



**Work, personality and psychological distress:
direct and moderating effects of the Big Five personality traits**

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Ce mémoire intitulé :
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Résumé

L'objectif de ce mémoire est d'examiner les nombreuses associations qui existent entre les conditions de l'organisation du travail, les traits de personnalité et la détresse psychologique au travail. La question de recherche principale était : est-ce que les cinq grands traits de personnalité (*Big Five personality traits*) ont un effet modérateur sur la relation entre les conditions de l'organisation du travail et la détresse psychologique. De nombreuses autres questions ont aussi été considérées. Pour répondre aux vingt-et-une hypothèses proposées dans cette recherche, nous avons utilisé des données secondaires d'une étude transversale de 395 employés d'un service de police municipal. À la suite d'analyses multivariées, nous avons pu observer quatre associations significatives. Concernant les conditions de l'organisation du travail, nous avons trouvé que les demandes psychologiques en milieu de travail augment la détresse psychologique, tandis que le support d'un superviseur la diminue. En ce qui concerne, les traits de personnalité, nous avons trouvé qu'être névrotique (*neuroticism*) augmente la détresse psychologique. Finalement, nous avons trouvé un effet modérateur du trait de personnalité, être consciencieux (*conscientiousness*), sur la relation entre les demandes psychologiques et la détresse psychologique. Bref, nos résultats nous indiquent que les cinq grands traits de personnalité (*Big Five personality traits*) ont une influence mitigée sur la santé mentale en milieu de travail.

Mots clé : détresse psychologique, traits de personnalité Big Five, condition de l'organisation du travail

Abstract

The current thesis sought to observe the multiple relationships that exist between work organization conditions, personality characteristics and psychological distress in the workplace. The main question of interest was whether the Big Five personality traits have a moderating effect on the relationship between work organization and psychological distress, but numerous other questions of interest were also considered. In order to address the twenty-one hypotheses proposed in this study, secondary data was used from a cross-sectional survey of 395 workers from a municipal police service. Multivariate analyses showed four significant relationships between the three variables of interest. With regards to the work organization conditions, it was found that psychological demands in the workplace increase psychological distress, whereas, support from a supervisor decreases psychological distress. With regards to personality, neuroticism was found to increase psychological distress. Finally, a moderating relationship was found for the conscientiousness trait on the relationship between psychological demands and psychological distress. Globally, the results indicate that the Big Five personality traits have a mitigated impact on mental health problems in the workplace.

Key words: Psychological distress, Big Five personality traits, work organization conditions

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Introduction

The current thesis explores various dimensions of the following research question: *do personality traits have a moderating effect on the relationship between work organization conditions and mental health problems in the workplace?*

Mental health problems in the workplace have taken on a great deal of importance in the research literature over the last two decades. This is due in part to their detrimental effects on individual well-being and the immense costs to organizations due to employee absenteeism and reduced performance (Vearing & Mak, 2007). In Canada, 42.9% of workers report having experienced at least one episode of psychological distress between 1994-1995 and 2000-2001 and 18.7% of them report having had multiple experiences in the same period (Marchand, Demers & Durand 2005a). In Québec, between 17.3% and 25.5% of workers were affected by psychological distress between 1987 and 1998 (Daveluy et al. 2000). A similar pattern can be observed at the international level. A survey conducted by the International Labor Organization showed that 20% of adults have experienced either depression, anxiety or overwork (International Labor Office, 2000).

The costs associated with mental health problems for people over 20 years of age have been estimated at \$51 billion in Canada alone (Lim, Jacobs, Ohinmaa, Schopflocher & Dewa, 2008). The bulk of these costs can be attributed to absenteeism, lost business productivity, income replacement outlays and health service use

(Marchand, Demers, & Durand, 2005b). Such costs not only place a significant burden on organizations, but also on governments and society at large.

Mental health problems are frequently the unintended product of interactions between different variables associated with occupational structure and organization. Certain key work organization conditions have been identified as influential in this relationship such as task design, work demands, social relations and work-related gratification (Marchand et al. 2005b).

Notwithstanding the importance of work factors in causing mental health problems in the workplace, in recent decades, researchers have come to the conclusion that mental distress at work is not solely the direct consequence of a stressor-strain relationship. In their 2006 study, Marchand et al. concluded that only 11% of the variation in distress was associated with work factors alone, while 21% of the variation was associated with personal factors, such as personality, family, social network, etc. We can conclude from these findings that different characteristics may act as a buffer, which makes certain individuals more or less likely to be affected by a stressor in their environment. Of the different potential individual characteristics identified by researchers, personality has been the most pervasively retained as a moderating factor in this stressor-strain relationship (Grant & Langan-Fox, 2006).

Personality assessment has already been shown to detain predictive value in personnel selection, measures of integrity and assessment of management and

leadership qualities (Goodstein & Layon, 1999). It is relevant to propose that it may also prove to be an advantageous tool for organizations by determining which employees may be more at risk of experiencing mental health problems in the workplace according to their personality traits. In this way, workers who are judged as being more at risk of experiencing mental health problems could be monitored and supported more effectively by management. However, the practice of personality assessment in the workplace still remains controversial for two main reasons. First, questions are raised as to the validity of personality measures in predicting employee performance in the workplace (Morgenson, Campion, Dipboye, Hollenbeck, Murphy, Schmitt, 2007). Meta-analysis shows that personality measures only account for roughly 15% of variance in job performance, which researchers say leaves 85% unaccounted for (Barrick & Mount, 1991). Second, researchers are concerned with personality tests being faked by employees, such that the right answers may be obvious and thus be selected in order to please and not because they are true (Morgenson et al. 2007). Additionally, from a more ethical standpoint, questions were raised in the 1960s-1970s regarding personality assessments and their association with equal access to employment as well as the quest for the “good” type of employee which still hold today (Desjardins, 2000). We can also ask whether it is ethical to target or offer preferential treatment to employees based solely on their personality? Regardless of the answer, the jurisprudence on this matter shows that personality assessment in the workplace is considered valid and useful as long as the elaboration, administration, correction, and interpretation of the instrument used is concordant with the regulations set forth by the Standards for Educational and Psychological Testing (1999) (Poirier & Longpre, 2009).

This thesis is organized in five parts. Chapter one presents the research question and provides a review of the literature. Chapter two addresses the problems raised in the literature and presents the analytical model. Chapter three describes the method used to carry out the research. Chapter four presents the results obtained. Finally, chapter 5 provides a discussion of the results and their implications as well as the strengths and weakness of the study and paths for future research.

Chapter 1 – The research question and the review of the literature

1.1 – The pertinence of the research and the research question

The purpose of this thesis is to seek a possible moderating effect of personality in the relationship between work organization conditions and mental health problems in the workplace. This is significant in the field of industrial relations because this line of inquiry seeks to identify one of the potential factors which influences the way workers are exposed to and affected by mental health problems in the workplace. As is the case in any discipline, the road to finding a solution to a problem is first to understand its cause. In this case, mental health problems are considerable tribulations in the workplace. They have a negative impact on both the organization and the worker and not only result in monetary and productivity losses but also in the detriment of employee satisfaction and well-being. Moreover, mental health problems are significant at the international level, affecting between 15 and 20 percent of workers (International Labor Office, 2000). As the care for the health and safety of workers is of fundamental importance in industrial relations, it is imperative to find better methods to detect and act upon mental health problems in the workplace. To this effect, this research poses the question: *do personality traits have a moderating effect on the relationship between work organization conditions and mental health problems in the workplace?*

1.2 - The review of the literature

In the context of the research question proposed above, this review of the literature will focus on four main themes. The first will be a description of mental health problems in the workplace. The second pertains to the theoretical models proposed in the literature concerning work stress. The third examines the work organization conditions in relationship with mental health problems in the workplace. The fourth describes the role of personality in influencing mental health problems in the work environment.

1.2.1 – Mental health at work

As previously stated, mental health problems are often the unintended product of interactions between different variables associated with occupational structure (Marchand et al. 2005b). More specifically, these problems are divided into three concepts: psychological distress, depression and job burnout. First, psychological distress refers to a series of psychophysiological and behavioral symptoms such as anxiety, depressive reactions, irritability, decline in intellectual abilities, sleep disturbances and work absenteeism (Marchand et al. 2005b). It is not specific to a given mental pathology. Second, depression is characterized as experiencing five or more of the following symptoms: depressed mood, diminished interest in daily activities, sleep disturbances, weight loss without dieting, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, diminished ability to think or concentrate,

and recurrent thought of death (American Psychological Association, 2000). Finally, job burnout is composed of three sub-dimensions: emotional exhaustion (or exhaustion), depersonalization (or cynicism) and sense of personal accomplishment (or professional efficacy) (Kim, Shin & Umbereit, 2007). The risk of experiencing burnout increases when emotional exhaustion and depersonalization are high and sense of personal accomplishment is low. Over time untreated mental health problems can lead to health problems such as psychosomatic illness, arterial hypertension, severe depression and alcoholism as well as cardiovascular and neuropsychiatric diseases, permanent disability, premature death and suicide (Marchand et al. 2006).

1.2.2 – The work stress models

Four main theoretical models pertaining to work stress can be detected in the research literature: Karasek's (1979) demand-control model, Karasek & Theorell's (1990) demand-control support model, Siegrist's (1996) effort-reward imbalance model and Marchand et al.'s (2006b) multilevel model of worker mental health determinants. Each will now be examined.

1.2.2.1 – The demand-control model

Karasek's (1979) demand-control model proposes that a working environment can be defined in terms of two dimensions: psychological demands and job decision latitude. Karasek (1979) identifies two predictions in his model. First that "strain

increases as job demands increase relative to decreasing job decision latitude...and second, that incremental additions to competency are predicted to occur when the challenges of the situation are matched by the individual's skill or control in dealing with a challenge" (pg 288). He goes on to identify four job categories: active, low strain, high strain and passive. When both job demands and job decision latitude are high, a job is classified as "active" and is believed to yield employee development. In the opposite scenario, when job demands and job decision latitude are low, a job is classified as "passive" and is believed to reduce employee problem-solving skills. The other two categories are a combination of the previous two, such that a "low strain" job refers to a low demand, high decision latitude job and a "high strain" job refers to a high demand, low job decision latitude job. Karasek (1979) concluded that jobs classified as "high strain" produced the most mental strain and that simply permitting more decision latitude to workers could ultimately improve their mental health. Therefore, the demand-control model suggests that while high work demands will increase work related stress, high control over work-related issues will buffer this relationship by reducing the amount of stress experienced by the worker.

Recent research has suggested that age may influence the pertinence of the job-control model. Shultz, Wang, Crimmins, & Fisher (2010) hypothesized that due to age-related reductions in cognitive resources, jobs requiring a high mental workload will be appraised differently by older workers than by younger workers, such that old workers will experience these jobs in a much more stressful and threatening way. The results of this study found that in younger workers only one job-control mechanism (time to

complete tasks) buffered stress, whereas in older workers time to complete tasks, autonomy, and schedule flexibility were found to buffer stress. Therefore, Shultz et al. (2010) concluded that older workers need more control over their work to reduce the likelihood of experiencing stress in the workplace.

Despite the importance of the demand-control model in the literature, it is important to note that although there is significant support for the validity of the components of the model (psychological demands and job decision latitude), several authors have not been able to support a significant interaction between these components (Bourbonnais, Comeau & Vézina, 1999; Dragano, He, Moebus, Jöckel, & Erbel, 2008; Elovaino, Kivimäki, Ek, Vahtera, Honkonen, Taanila, et al. 2007; Macklin, Smith, & Dollard, 2006; Vermulen & Mustard, 2000).

1.2.2.2 – The demand-control-support model

Karasek & Theorell's (1990) demand-control-support model stems from Karasek's (1979) demand-control model described above. The demand-control-support model similarly proposes that work stress is caused by an influence of job demands and perception of job control, but adds that the workers perceived support also plays an important role in this interaction. The model describes two types of support: socioemotional and instrumental. Socioemotional support refers to the social and emotional integration and trust experienced by workers and supervisors in the workplace. Instrumental support makes reference to the "extra" resources or assistance

a worker receives from coworkers and supervisors. In this model, social support is believed to act as a buffer to work stress, whereby jobs with high demands, low control and low social support have the highest likelihood of stress for workers (Karasek & Theorell, 1990; Devereux, Hastings & Noon 2009). Nonetheless, it is important to note that several studies have not found empirical evidence to support the interaction between the three components of the demand-control-support model (Bourbonnais, Brisson, Malenfant, & Vézina 2005; Paterniti, Niedhammer, Lang & Consoli 2002; Van der Doef & Maes, 1999).

1.2.2.3 – The effort-reward imbalance model

Siegrist's (1996) effort-reward imbalance model is based on the notion of distributive justice, such that when a lack of reciprocity occurs between the costs and gains an individual experiences in the workplace, a state of emotional distress, characterized by recurrent feeling of threat, anger and depression or demoralization, is produced. More specifically, this occurs when a job requires high effort from an individual but yields low reward. In this model, effort is considered to be either extrinsic (such as work demands and obligations) or intrinsic (employee motivations in demanding situations) and reward is considered as being a combination of monetary reward, esteem (or approval), and status control.

The question arises as to why an individual would remain in a situation of effort-reward imbalance for an extended period of time. Siegrist (1996) explains that

individuals are designed to operate via rational choice, such that they can attain a state of balance between cost and reward in their lives. Therefore, remaining in a state of effort-reward imbalance would in fact be contradictory. However, three circumstances are identified in which an individual would choose to remain in this situation. The first case is due to the labor market. When social constraints are considered, such as low occupational status control in blue-collar jobs, we find that the imbalance is leveled out by the threat of being laid off or demoted. Employees in this scenario are therefore at risk for experiencing the adverse effects of effort-reward imbalance, since they are willing to accept the imbalance for extended periods of time in exchange for job security and stability. The second case is due to strategic reasons, such as the chance of future gains or promotions. In this scenario an individual may take on extra work and extra responsibilities in order to compete for a promotion. If in the end the individual does not receive a promotion after numerous years of hard work they may experience an intensified sense of effort-reward imbalance. The third case is due to an employee trait known as “overcommitment”. Individuals high on this trait would display an excessive striving at work, an intense need for control in dealing with work demands and an intense need for approval from others. They are prone to exaggeration and have difficulty withdrawing from work and relaxing (Siegrist, 1996; Van Vegchel, de Jonge, Bosma, & Schaufeli, 2005). These individuals would also likely remain in a state of effort-reward imbalance.

In their review of 45 empirical studies pertaining to the effort-reward imbalance model, Van Vegchel et al. (2005) found general empirical support for the model in the

literature. However, in the case of overcommitment the results are inconsistent, such that only about half the studies found that high overcommitment resulted in adverse effects.

1.2.2.4 – The multilevel model of worker mental health determinants

A more recent model of work stress is Marchand, Durand & Demers (2006b) multilevel model of worker mental health determinants. The model is rooted in numerous theoretical approaches including: the micro-macro sociological theory (Alexander, 1987; Smelser, 1997), agent structure (Archer, 1995; Giddens, 1987) and social stress theory (Pearlin, 1999; Pearlin & Schooler, 1978; Thoits, 1999; Wheaton, 1999a, 1999b). It proposes that an individual is an agent or actor in a social environment which is subjected to numerous influences from his or her social, political, economic and cultural background. The relationship the individual derives with these influences produces either positive effects, such as happiness and well-being, or negative effects, such as frustration, tension, stress, exclusion, inequality and suffering (Marchand et al. 2006b).

According to this model, “mental health problems are the unintended consequences of the action which results from the constraints and resources engaged simultaneously by agent personality, daily structure and macro social structures” (Marchand et al. 2006b, pg 15, free translation). In this case, agent personality (micro) makes reference to demographics, personality, life habits and childhood experiences.

Daily structure (meso) refers to day to day activities, experiences and environments related to the workplace (work demands, tasks to be accomplished, social relations), family (marital status, children, family tensions), social network (size and support) and community (size, socio-economic condition, available services). Finally, macro social structure includes economic, political and cultural structure. These factors in turn influence social stratification, diversification, and social integration.

In the workplace environment, the multilevel model of worker mental health determinants proposes that the way work is organized will affect workers mental health differently based on individual variations in job hierarchy, family situation, social network and personality. Indeed, several recent studies have empirically supported this model (Marchand et al., 2005a, 2005b, 2006a).

1.2.3 – Work organization conditions

The manner in which work is organized can be classified into four main categories. First, task design, which includes such factors as skill utilization and decision authority; second, work demands, which includes psychological demands, physical demands, and contractual demands; third, social relations at work, which considers social support from colleagues and from supervisors; and fourth, gratification, which includes pay, job security and recognition (Marchand et al. 2005b). Each of these work organization conditions will now be considered independently.

1.2.3.1 – Task Design

The first work organization condition is task design. Task design refers to the content and nature of the tasks an employee must perform and is characterized by two main factors: skill utilization and decision authority.

1.2.3.1.1 – Skill utilization

Skill utilization refers to an employment situation where an employee needs to use skills and competencies to perform his work-related activities, has the possibility to develop new skills in the workplace and has the potential to plan and make decisions relative to his work (Griffin, Greiner, Stansfeld & Marmot, 2007).

Research has demonstrated that high skill utilization has a protective effect on the likelihood of workers experiencing depressive symptoms (Griffin et al. 2007), all three dimensions of burnout (Rafferty, Friend & Landsbergis, 2001), and psychological distress (Albertson, Nielsen, & Borg, 2001; Karasek, 1979; Marchand, Demers, & Durand 2005b, 2006a).

However it is important to consider that some studies limited the significance of these relationships. For example, gender differences were found such that lower skill utilization was associated with depression in women but not in men (Robertson Blackmore, Stansfeld, Weller, Munce, Zagorski & Stewart 2007). Also, the correlation

between skill utilization and psychological distress may be more indirect, such that skill utilization only influences psychological distress when living conditions outside of work are not a significant source of stress (Marchand et al. 2005b). Finally, some studies suggest that this relationship is simply non-existent (Marchand et al. 2005a).

1.2.3.1.2 – Decision authority

Decision authority refers to the power of an employee to participate in and make decisions pertaining to his own work (Vézina, Cousineau, Mergler, & Vinet, 1992).

Research has linked high decisional authority to lower emotional exhaustion (Kowalski et al. 2010; Rafferty et al. 2001), lower occupation stress (Kalleberg, Nesheim & Olsen, 2009), less absenteeism due to depression (Clumeck, Kempnaers, Godin, Dramaix, Kornitzer, Linkowski, & Kittel, 2009) and less psychological distress (Albertsen, Nielsen & Borg, 2001; Bourbonnais Brisson, Moisan, & Vézina, 1996). However, a Canadian study showed significant gender differences such that, low decisional authority was only associated with depression for women and not for men (Robertson Blackmore et al. 2007). Furthermore, some studies did not find any correlation between decisional authority and psychological distress (de Jonge, Janssen & Bakker. 1999; Marchand et al. 2005b).

1.2.3.2 – Work Demands

The second work organization condition is work demands. Work demands have been defined as stressors, whether of cognitive, physical or conflict oriented nature, which can cause an individual to enter into a state of stress (Karasek, 1979). This state of stress can then yield either positive or negative outcomes for the individual. Vézina et al. (1992) explain that high work demands do not automatically produce negative consequences for an individual. On the contrary high demands can help an individual develop new skills if work organization allows for decisional authority and social support. This state is referred to as positive stress and it ideally creates a situation of valorization and actualization for the worker, which allows him to attain new heights. However, on the other side of this fine line, stress caused by high work demands has been consistently linked to negative and/or lasting consequences, as described in section 1.2.1 (Bultmann, Kant, Van den Brandt, & Kasl, 2002; Dragano et al. 2008; Gelsema, Van der Doef,, Maes, Janssen, Akerboom, Verhoeven, 2006; Lopes, Araya, Werneck, Chor, & Faerstein, 2010; Marchand et al. 2005a; Marchand et al. 2006; Vézina et al. 1992).

Regardless of the substantial support for the influence of work demands in causing mental health problems, it is important to consider that numerous studies have cited several moderating variables which buffer this relationship, such as marital or couple strain (Marchand et al. 2005b).

Work demands can be divided into three encompassing categories: psychological demands, physical demands, and contractual demands. Each will now be addressed in turn.

1.2.3.2.1 – Psychological demands

The first type of work demands is psychological demands. Psychological demands include time pressure, working pace, quantity of work, mental effort required, and conflicting demands (Karasek, 1979; Marchand et al. 2005a). Some authors also include emotional demands, such as involvement in life and death situations and dealing with the emotions of patients and relatives, which are particularly relevant in the care industry (de Jonge et al. 1999; Gelsema et al. 2006).

Numerous authors have found a relationship between psychological demands and mental health problems. Albersten et al. (2001), Bourbonnais et al. (1996, 2005), Cole et al. (2002), Paterniti et al. (2002) and Vermulen & Mustard (2000) found a positive relationship between high psychological demands and psychological distress. De Jonge et al. (1999) found a significant relationship between high psychological demands and emotional exhaustion. Similarly, Bultmann et al. (2002) found that high psychological demands increased fatigue in men and that conflict increased psychological distress in both men and women. Furthermore, Lopes et al. (2010) found a positive relationship between high strain jobs and worker distress. Conversely, Marchand et al. (2005a) did not find any relationship between psychological demands

and psychological distress. However, it is important to note that this study (Marchand et al. 2005a) only used a two-item scale to measure psychological demands resulting in low internal consistency and perhaps underestimating the actual effect.

1.2.3.2.2 – Physical demands

The second type of work demands is physical demands. Physical demands refer to the efforts required from an individual to accomplish their work and the demands of the environment in which the work is performed, such as temperature, noise and contaminants (Marchand et al. 2006). Physical demands may also include ergonomic factors such as the way the workplace is designed and the tools and equipment used (Gelsema et al. 2006).

Several authors have found a positive relationship between high physical demands and mental health problems. Gelsema et al. (2006) found a significant relationship between high physical demands and psychological distress and somatic complaints. De Jonge et al. (1999) and Marchand et al. (2005b) also found a relationship between physical demands and psychological distress. In addition, Bultmann et al. (2002) found a relationship between high physical demands and fatigue, but only in men. However, as was the case with psychological demands, some authors found no relationship between physical demands and mental illness (Marchand et al. 2005a). Once again, note that this may have occurred due to low internal consistency produced by the single item scale used to measure physical demands in this study.

1.2.3.2.3 – Contractual demands

The third type of work demand is contractual demands. Contractual demands refer to the number of hours worked per day and per week, the working schedule such as day, evening or night and the presence of an irregular work schedule (Marchand et al. 2006).

With regards to contractual demands there appears to be a lack of consensus in the literature as to their effect. Hilton et al. (2008) and Hayasaka, Nakamura, Yamamoto & Sasaki (2007) agree that an elevated amount of working hours leads to more psychological distress. The former stating that working more than 60 hours per week is associated to high psychological distress and the latter stating that working more than 50 hours per week increased the risk of experiencing psychological distress. Conversely, some authors have found the number of hours worked to be associated to psychological distress only when personality was not considered (Marchand et al. 2005a, 2005b), while others found no such relationship (Marchand 2006).

A similar situation appears with the case of irregular work schedules. Some authors found a significant association between irregular work schedules and psychological distress (Marchand et al. 2005b), while other founds no relationship (Lopes et al. 2010; Marchand et al. 2005a, 2006).

On another note, Lopes et al. (2010) found no association between night shift-work and psychological distress even though previous studies had linked this type of schedule to poor mental functioning (Paterniti, et al. 2002; Sekine, Chandole, Martikainen, Marmot & Kagamimori, 2006).

1.2.3.3 – Social Relations

The third work organization condition is social relations. Social relations in the workplace can be described in terms of support received both from colleagues and from supervisors or management. Social support can be observed in numerous forms, such as, expression of sympathy and affection, technical support, sharing of information and recognition of competencies. It has generally been defined as any form of help, support, or recognition from colleagues or supervisors. In addition, it has been suggested that social support can act on psychological distress in two ways: as a reducer of the occurrence of stressful situations and as a moderator of the negative effects of stress (Vézina et al. 1992).

Research has shown that social support in the workplace is associated with less occurrence of psychological distress (Albertsen et al. 2001; Lopes et al. 2010; Marchand et al. 2005a; Marchand et al. 2006), less fatigue (Bultmann et al. 2002), less work stress (Luszczynksa & Cieslak, 2005) and may indeed act as a moderator of the negative effects of stress (Albertsen et al. 2001; Marchand et al. 2005a, 2006a). In addition, Marchand et al. (2005a) concluded that for each point on the social support at

work scale the likelihood of having a repeated episode of psychological distress decreased by 6%. However, it is important to note that this study, Marchand et al. (2005a) did not find a protective impact regarding the first episode of psychological distress.

There are also important gender differences to be considered. Bultmann et al. (2002) found that co-worker social support lead to less fatigue in female employees only. Alternatively, they found that conflicts with co-workers and supervisors lead to more psychological distress for men only. Similarly, Lopes et al. (2010) found that both men and women experienced psychological distress when faced with low social support, but that this relationship was stronger in men than women. In summary, the impact of social support in the workplace seems to have a different impact in men and women.

1.2.3.4 – Gratification

The final work organization condition is gratification. Gratification is derived both from work and occupation position or prestige and is based on four constructs: pay, job insecurity, recognition and career perspectives.

Little research has focused on the influence of gratification in relation with mental health problems in the workplace. Orpana, Lemyre & Gravel (2009) and McDonough (2000) found that lower professional income is related to psychological distress. Turner, Wheaton, & Lloyd (1995) also found that lower professional income

increases stress, which can in turn lead to mental health problems. However, more recent studies have not found any such relationship when all aspects of daily life are considered (Marchand et al. 2005a, 2005b, 2006a).

Job insecurity has received more significant scientific attention. Bourbonnais et al. 1998, Marchand et al. (2005a, 2006), and McDonough (2000) found a positive relationship between job insecurity and psychological distress. More specifically, Marchand et al. (2005a) found that job insecurity resulted in a 30% increase in the risk of experiencing an episode of psychological distress and a 31% increase in the risk of experiencing a second episode. Researchers have also found that individuals who experienced job insecurity reported more job-induced tension (Naswall, Sverke & Hellgren, 2005), and more fatigue (Bultmann et al. 2002).

To our knowledge, no study has examined the relationship between recognition in the workplace or career perspectives and mental health problems.

1.2.4 – The personality traits

Personality traits have recurrently been a variable of interest in studies pertaining to mental health problems in the workplace. Generally speaking, personality traits refer to the propensity to react in a certain way across various situations (Caprana & Cervone, 2000). To this effect, there are many differing taxonomies and measures that can be employed to categorize an individual in relation to specific personality characteristics.

More specifically, traits can be classified as belonging to one of two categories: general (broad) traits or specific traits. Broad traits explain general behaviors and remain consistent across a variety of different settings and through time. An example of broad traits would be the Big Five personality traits (Barrick & Mount, 1991). Alternatively, specific traits have a narrower scope, are applied to more specific behaviors and may vary depending on the context. For example, need for achievement, risk-taking, innovativeness, autonomy, locus of control, and self-efficacy would be considered specific traits (Rauch & Frese, 2007). Some of these specific traits have been used in past research, for example, self-esteem (Marchand et al. 2005a), center of control (Shimazu, de Jonge & Irimajiri, 2008) and sense of cohesion (Alberston, Nielsen & Borg, 2001). For this research broad traits will be examined, more specifically the Big Five personality traits, also known as the five-factor model of personality, identified by Lewis Goldberg in 1981. This taxonomy is composed of five personality traits which have been dubbed by researchers as encompassing the principal variations in personality. These five traits include: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. This taxonomy has been selected for this research because while no consensual personality taxonomy exists in the literature to date, the Big Five taxonomy is considered to be one of the most influential taxonomies of the past two decades. According to Tokar, Fischer & Mezydlo Subich (1998), this is due to its structural replicability, its robustness, its generalizability and its comprehensiveness. Over recent decades numerous studies have addressed the issue of the role of personality in experience of mental health problems in the workplace. The following section will explore the influence of each trait independently.

1.2.4.1 – Extraversion

Extraversion, the first of the personality traits comprising the Big Five, is concerned with interpersonal interactions, activity, need for stimulation and capacity for joy, so that someone scoring high on this trait would be sociable, active, talkative, person-oriented, optimistic, fun-loving and affectionate (Costa & McCrae, 1992). In addition, individuals high on this trait have been found to reappraise problems positively, use rational problem-solving coping strategies and seek social support (Bakker, Van Der Zee, Lewig & Dollard, 2006).

Extraversion has been observed in several studies examining mental health problems in the workplace. Regardless, no evidence has been found to support a significant relationship between extraversion and psychological distress (van den Berg & Feig, 2003; Miller, Griffin, & Hart, 1999).

Of greatest importance in the literature is extraversion's influence on job burnout. There appears to be a consensus that it is negatively related to burnout. However, there is a lack of consensus on its influence on the dimensions of job burnout.

As noted earlier, job burnout is composed of three sub-dimensions: emotional exhaustion, depersonalization and sense of personal accomplishment (Kim et al. 2007). Thus, in this case the discrepancy lies in the relationship of extraversion with each of these sub-dimensions. In their study of 225 school psychology practitioners, Mills &

Huebner (1998) found that extraversion was positively related to feelings of emotional exhaustion and negatively related to personal accomplishment with no relationship to depersonalization. In a similar study of 80 volunteer counselors, Bakker et al. (2006) found that extraversion was negatively related to depersonalization and positively related to personal accomplishment with no relationship to emotional exhaustion. In a sample of 188 nurses, Zellars, Perrewé & Hochwarter (2000) found that extraversion was negatively related to depersonalization but also negatively related to personal accomplishment with no relationship to emotional exhaustion. Furthermore, in a study of 810 hospitality employees, Kim et al. (2007) only found a negative relationship between extraversion and emotional exhaustion and no relationship with depersonalization or personal accomplishment. However, in their 2009 study of 125 quick-service restaurants, Kim, Shin & Swager did not validate this finding since they found no significant relationship between extraversion and emotional exhaustion. Furthermore, they did not report a significant relationship between extraversion and burnout when all sub-dimensions were considered simultaneously. Finally, contrary to all the studies described above, Buhler & Land (2003) found a positive relationship between extraversion and emotional exhaustion and extraversion and depersonalization.

Taking the results of all these studies into consideration, we can conclude that there is a lack of consensus in the literature on the influence of extraversion which needs to be addressed in future research; nonetheless, most of these studies agree that there is a negative relationship between extraversion and burnout.

To our knowledge, only one study explored the relationship between the Big Five personality characteristics and depressive symptoms in the workplace (Vearing & Mak, 2007). This study did not find a significant relationship between extraversion and depressive symptoms.

1.2.4.2 – Agreeableness

The second of the Big Five personality traits is agreeableness. Agreeableness is concerned with an individual's interpersonal orientation and their quality in thoughts, feelings and actions, so that someone scoring high on agreeableness would be soft-hearted, good natured, trusting, helpful, forgiving, gullible, and straightforward (Costa & McCrae, 1992). Furthermore, there is some evidence that agreeableness is linked to high levels of social support (Bakker et al. 2006).

Although agreeableness does not appear in much of the literature prior to the 1990's, it has been more significantly examined since then. Nonetheless, to our knowledge, no study has addressed the role of agreeableness in predicting psychological distress in workers.

As was the case with extraversion, most researchers agree that there is a negative relationship between agreeableness and burnout, but the relationship between agreeableness and the three sub-dimensions of burnout does not yield a consensus. Piedmont (1993) and Mills & Huebner (1998) agree that agreeableness shows a

negative relationship with emotional exhaustion and depersonalization. Similarly Zellars et al. (2000) state that agreeableness shows a negative relationship with depersonalization but found no such relationship with emotional exhaustion. Alternatively, Kim et al. (2007) found a negative relationship between agreeableness and depersonalization but also a positive relationship between agreeableness and personal accomplishment, which had not been reported in early studies. However, as was the case with extraversion, in Kim et al.'s (2009) follow-up study, no significant relationship was found between agreeableness and burnout when all sub-dimensions were considered simultaneously regardless of the fact that they found a negative relationship between agreeableness and depersonalization and a positive relationship with personal accomplishment. On the other hand, Bakker et al. (2006) found that agreeableness only correlated positively with personal accomplishment when subjects reported a high number of stressful experiences.

In regards to the influence of agreeableness on the development of depressive symptoms no direct relationships were found. However, Vearing & Mak (2007) found that workplace support was negatively related to depressive symptoms. Since a positive correlation between agreeableness and workplace support was found in this study and since agreeableness has often been linked with social support in general (Bakker et al. 2006), it can be deduced that agreeableness does in fact play a role in the development of depressive symptoms although perhaps more indirect.

1.2.4.3 – Conscientiousness

The third of the Big Five traits is conscientiousness. Conscientiousness is concerned with an individual's degree of organization, persistence, and motivation in goal-directed behavior, so that someone scoring high on conscientiousness would be organized, reliable, hard working, self-disciplined, punctual, scrupulous, neat, ambitious and persevering (Costa & McCrae, 1992). Conscientious individuals have also been found to utilize a coping strategy axed on problem solving (Bakker et al. 2006).

The relationship between conscientiousness and psychological distress has received very little attention in the literature. According to Miller et al. (1999), this is due in part to the strong link between conscientiousness and work performance and the limited role that work performance holds in occupation stress models. Consequently, their goal in their 1999 research was to use an organizational health framework to integrate conscientiousness into an occupational stress model. Their study examined 104 Australian public sector employees in regards to organizational climate, personality, well-being and performance. Although conscientiousness did not predict psychological distress it was found to moderate the relationship between role clarity and psychological distress, such that, in more conscientious individuals, role clarity was less negatively related to psychological distress.

The influence of conscientiousness on the likelihood of job burnout is unclear in the literature. Researchers do not agree on whether conscientiousness does or does not

have a relationship with burnout or its influence on the three sub-dimensions of burnout. Kim et al. (2007) and Piedmont (1993) have found a positive relationship between conscientiousness and personal accomplishment. However, neither of these studies found a relationship with the two other sub-dimensions. On the other hand, Mills & Huebner (1998) found a negative relationship between conscientiousness and emotional exhaustion, as well as a negative relationship with personal accomplishment. In contrast, both Bakker et al. (2006) and Zellars et al. (2000) found no relationship between conscientiousness and any of the three sub-dimensions of burnout. It is reasonable to conclude that the relationship is unclear.

Vearing & Mak (2007) explored the impact of conscientiousness on the development of depressive symptoms. Although results were only moderately significant, conscientiousness was found to have a negative relationship with depressive symptoms in their study of 224 Australian employees. In addition, the two personality characteristics which did have a significant relationship with depressive symptoms (neuroticism and conscientiousness) accounted for 32.8% of the variance. The authors identify these traits as being the only two significant predictors of depressive symptoms in the workplace.

1.2.4.4 – Neuroticism

The fourth of the Big Five traits is neuroticism. Neuroticism is concerned with identifying an individual's propensity to psychological distress, unrealistic ideas,

excessive cravings or urges and maladaptive responses, so that someone scoring high on this trait would be worrisome, nervous, emotional, insecure, inadequate and hypochondriacal (Costa & McCrae, 1992). Bakker & et al. (2006) added that individuals high on neuroticism also tend to set unattainable goals for themselves and underestimate their performance, as well as use ineffective coping strategies. Furthermore, Sutin & Costa (2010) put forward that neurotic workers tend to have negative occupational trajectories which start early and persist throughout their working life. More specifically these individuals tend to have fewer opportunities to learn new skills, express creativity in their work and make their own decisions throughout their career. With this description in mind, it is not surprising that in their 1998 review of the literature on personality and vocational behavior between 1993 and 1997, Tokar et al. identified neuroticism as being of substantial focus in the literature. The role of neuroticism will be examined below in relation to psychological distress, burnout, and depressive symptoms.

There is some support for the influence of neuroticism on psychological distress in the literature. Although it was not the main focus of their study, Miller et al. (1999) found that neuroticism was a significant predictor of psychological distress in the workplace in their study of 104 public sector employees. In addition, Van den Berg & Feij (2003) also found a significant relationship between neuroticism and work stress in their study of 181 workers in 11 different job categories. However, it is important to note that the Van den Berg & Feij (2003) study did not measure neuroticism via the five-factor model but rather through the Eysenck Personality Questionnaire.

Regardless, the neuroticism trait refers to the same personality characteristics in both taxonomies, so this finding is significant for the purpose of this review.

In regards to the burnout literature, neuroticism is the trait which has received the most attention of the Big Five due to its important contribution to the development of burnout. In addition to its extensive consideration in the literature, neuroticism is also the Big Five trait which demonstrates the most consistency regarding its effect on the burnout sub-dimensions. Bakker et al. (2006), Mills & Huebner (1998), Piedmont (1993) and Kim et al. (2009) all found that neuroticism had a positive effect on emotional exhaustion and depersonalization, and a negative effect on personal accomplishment. Kim et al. (2007) only found a positive relationship between neuroticism and emotional exhaustion and depersonalization, with no effect on personal exhaustion. On the other hand, Zellar et al. (2000) only found a negative relationship between neuroticism and emotional exhaustion. No significant relationship was found with depersonalization or personal accomplishment in this study. Regardless of these minor differences, all these authors agreed that neuroticism was the most significant predictor of job burnout among the Big Five.

The Vearing & Mak (2007) study examined the three-way relationship between the Big Five, the effort-reward imbalanced model (ERI model) and work-related stress, and also took into account the role of overcommitment in this relationship. The study established a positive association between neuroticism and overcommitment and also

found that depressive symptoms were associated with high levels of neuroticism and high ERI ration. Therefore, individuals high on neuroticism are at a greater risk of experiencing depressive symptoms, not only because of the link between depressive symptoms and neuroticism, but also because of the link between overcommitment, which is a consequence of ERI, and neuroticism through the positive relationship between ERI and depressive symptoms.

1.2.4.5 – Openness to experience

The fifth and final Big Five trait is openness to experience. This trait is concerned with assessing proactive seeking, appreciation of experience, toleration and exploration of the unfamiliar so that someone high on openness would be curious, creative, original, imaginative, untraditional and have broad interest (Costa & McCrae, 1992). In addition, individuals open to experience have also been found to use humor as a stress coping mechanism and tend to appraise stressful situations as less threatening (Bakker et al. 2006).

To our knowledge, the role of openness to experience has not been examined in any study relating to psychological distress.

Similarly, most research has found no significant relationship between openness to experience and any of the three burnout sub-dimensions (Bakker et al. 2006; Piedmont, 1993; Mills & Huebner, 1998; Kim et al. 2007; Kim et al. 2009). However,

Zellars et al. (2000) did find a marginally significant relationship between openness to experience and less depersonalization and a significant relationship between openness to experience and greater personal accomplishment. They attribute these findings to the possibility that individuals high on openness to experience may seek deeper meaning from their environments and see new possibilities and outcomes regardless of the negative aspects of their work environment.

Finally, no significant relationship was found between openness to experience and depressive symptoms (Vearing & Mak, 2007).

1.3 – The moderating effect of personality

To our knowledge only one study has examined the moderating effect of the Big Five personality traits in the relationship between work organization conditions and psychological distress in the work place (Miller et al. 1999) and this only with the conscientiousness trait. Nevertheless, researchers have successfully found a moderating effect of other personality dimensions in this relationship. On the other hand, other studies found no such effect (Marchand et al. 2005a, 2006a). The case of locus of control, sense of cohesion and self-esteem and optimism will now be briefly addressed.

1.3.1 – Locus of control

Locus of control refers to how an individual attributes causality in his life. An individual possessing an internal locus of control will naturally attribute events in his life to factors within his control and of his doing. On the other hand, an individual possessing an external locus of control will naturally attribute events in his life to factors outside of his control and not resulting from himself or his actions (Naswall et al. 2005).

Naswall et al. (2005) conducted a study to explore the moderating effect of three personality characteristics (negative affectivity, positive affectivity and external locus of control) on the relationship between job security and strain. The study was conducted on 400 nurses at an acute care hospital in Sweden. Although results did not significantly show a moderating effect of negative or positive affectivity, researchers did find a moderating effect for external locus of control on the relationship between job insecurity and mental health complaints such that individuals with an external locus of control would react more negatively to job insecurity than individuals with an internal locus of control.

With regards to internal locus of control, Parent-Lamarche & Marchand (2010) found that it moderated the relationship between social support at work and psychological distress, such that someone with an internal locus of control would benefit less from the positive effects of social support at work. Similarly, the study also

showed that an individual with an internal locus of control could work more hours without being affected by psychological distress compared to an individual with an external locus of control.

1.3.2 – Sense of coherence

Sense of coherence references to an individual's belief that his life is comprehensible, manageable and meaningful (Albertsen et al. 2001) such that things make sense and are heading in the same direction.

Results from Parent-Lamarche & Marchand (2010) showed a moderating effect of sense of coherence on the relationship between both psychological demands and job insecurity with regards to psychological distress. In this way, the study showed that individuals with a high sense of coherence were less affected by the negative effects of high psychological demands and job insecurity than individuals with a low sense of coherence.

1.3.3 – Self-esteem and optimism

Self-esteem is concerned with an individual's general feeling about himself and his capabilities. Such that an individual with high self-esteem would be satisfied and confident with his person. Optimism on the other hand, is an individual's expectation

that experiences and outcomes in his life will be positive (Makikangas & Kinnunen, 2003).

Makikangas & Kinnunen (2003) conducted a study to determine whether a moderating effect of self-esteem and optimism was present relating to work stress. Their sample included 457 Finnish employees from the private and municipal sector. In the men's sample, results showed a moderating effect of self-esteem in the relationship between both organizational climate and emotional exhaustion, and organizational climate and mental distress. Men with high self-esteem experienced less emotional exhaustion and less mental distress when faced with poor organizational climate compared to men with low self-esteem. A similar relationship was found in the women's sample, such that women with high self-esteem experienced less mental distress when faced with poor organizational climate. Furthermore, women with low optimism were found to experience more mental distress when faced with time pressure at work.

In contrast to the above findings, Parent-Lamarche & Marchand (2010) and Marchand et al. (2005a, 2006a) did not find any moderating effect of self-esteem on the relationship between any of the work organization conditions and psychological distress.

1.4 – Other factors to consider

As we have observed so far, mental health problems in the workplace are not the direct result of the negative influences of work organization conditions; many other factors play a role. Throughout this review, personality has received a great deal of importance as one of these factors. However, numerous other factors must also be addressed. Thus, this section is concerned with exploring the impact of such other variables, including demographic factors, family situation and individual health habits.

1.4.1 – Demographics

The first, and most extensively researched, demographic factor is gender. There is a general consensus in the literature that women experience more mental health problems than men (Galanakis, Stalikas, Kallia, Karagianni, & Karela 2009; Jurado, Gurpegui, Moreno, Fernandez, Luna, & Galvez, 2005; Marchand et al. 2005a, 2006a; McDonough & Walters, 2001). Two explanations for this phenomenon are proposed in the literature. On the one hand, the differential vulnerability hypothesis suggests that women experience more stress because their coping skills are not as effective as men. On the other hand, the differential exposure hypothesis suggests that women experience more stress because they are exposed to more stressful conditions than men. As another explanation, it is also suggested that the social construction of gender and the socialization process of men and women may be at fault, such that women are faced

with higher expectations regarding their multiple roles (wife, mother, housekeeper, employee) and therefore experience more stress (Galanakis et al. 2009).

The second demographic factor is age. A number of authors agree that there is a negative relationship between age and mental health problems (Galanakis et al. 2009; Marchand et al. 2003, 2005a, 2005b, 2006a; McDonough, 2000). On the other hand, others have found that this relationship is non-existent (Bourbonnais et al. 2005; Pomaki, Maes & Doest, 2004; Turner Wheaton & Llyod, 1995). Moreover, as stated earlier, Shultz et al. (2010) found that older workers rely differently on job control variables to buffer the effects of stress than younger workers, perhaps influencing the impacts of age in this relationship.

The third demographic factor to be considered is education. Research has found that there is a negative relationship between level of education and mental health problems (Dompierre Lavoie & Pérusse, 1993; Elovainio et al. 2007; Voydanoff & Donnelly, 1999b). An explanation for this is brought forth by Finkelstein, Kubzansky, Capitman & Goodman (2007) who propose that this may result from the fact that more educated individuals are more optimistic about the future and have more resources available to them to cope with stressful situations. In addition, Drapeau, Rousseau & Boivin (2002) have linked high education with higher employment status and higher revenue which are both also associated with lower psychological distress. However, further studies are required to better understand the direct influence of education in this relationship.

The fourth demographic factor is occupation. The literature suggests that certain occupations may be more at risk for mental health problems. For example, Marchand (2007) identified four groups of occupations that were at an increased risk for mental health problems: health professions, sales and services, transportation and equipment operators and processing, and manufacturing and utilities. These groups were found to be between 1.3 and 2.4 times more at risk than the other six groups of occupations for experiencing mental health problems. However, differences also exist based on hierarchical position and gender. Paterniti et al. (2002) found that workers with a lower position in the hierarchy were at a greater risk of experiencing mental health problems. Vermeulen & Mustard (2000) also found that women occupying professional and semi-professional jobs, as well as qualified and semi-qualified white-collar jobs, experienced more distress than men in similar positions.

1.4.2 – Family situation

The first family situation variable is marital status. A number of studies have shown that individuals living with a partner (not necessarily married) experience less mental health problems than their single counterparts (Cole, Ibrahim, Shannon, Scott & Eyles 2002; Hayasaka, Nakamura, Yamamoto & Sasaki, 2007; Leung Siu, & Spector, 2000; Marchand, 2004; Marchand et al. 2005b; McDonough, 2000; Vermeulen & Mustard, 2000). However, the quality of this relationship appears to play a vital role since numerous studies have also found that conflicts within the couple (or divorce) can

actually increase the risk of experiencing mental health problems (Clays, De Bacquer, Leynen, Kornitzer, Kittel, & De Backer 2007; Hayasaka et al .2007; Marchand et al. 2005b, 2006a).

The second family situation variable is parental status. To our knowledge, only one study has shown that having children in the household increases the risk of mental health problems (Pugliesi, 1999), though it has been shown that being a single parent can have a negative impact on mental health (Vermeulen & Mustard, 2000). Regardless, the quality of the relationship between the parent and the child has been shown to be significant. Strained parental relations have been identified by numerous studies as a risk factor in the development of mental health problems (Almeida & Kesler, 1998; Marchand et al. 2005a, 2005b, 2006a).

The third family situation variable is household income. Numerous studies have found a negative relationship between household income and mental health problems (Drapeau et al. 2002; Marchand et al. 2006a; Paterniti et al. 2002; Vermeulen & Mustard, 2000). However, some studies have found no such relationship (Marchand et al. 2005a, 2005b).

1.4.3 – Health habits

The manner in which a person leads their life can have a significant impact on their mental health. Daily health habits such as alcohol and tobacco consumption and physical activity have been shown to play a role in this relationship.

Although the bulk of the research has examined mental health problems and their impact on alcohol consumption, very few have examined the opposite, whether alcohol consumption has an impact on mental health problems. Regardless, those who have explored this relationship found that alcohol consumption increased the risk of mental strain (Baldwin, Dodd, & Rennie, 1999; Marchand et al. 2003, 2006; and Parker, Parker, Harford & Farmer 1987). However, one of these studies found that this was only true in women (Baldwin et al. 1999).

Few studies have addressed the relationship between tobacco use and mental health problems. Marchand et al. (2005a, 2006) found a positive relationship between tobacco use and mental health problems. More specifically, Marchand et al. (2005a) found that smoking cigarettes increased the risk of having a repeat episode of psychological distress by 1%. However, there was no impact on the first episode.

Finally, with regards to physical activity, once again few studies have addressed this issue. Nevertheless, Marchand et al. (2005a) found that physical activity had a small

negative relationship (0.4%) with a first episode of psychological distress. However, Marchand et al. (2005b, 2006) did not find any such relationship.

1.5 – A synthesis of the review of the literature

The review of the literature presented above provides an overview of what can be found in the research literature pertaining to several topics relevant to the current thesis. First, we explored four important work stress models which have influenced research on mental health problems in the work place over the last 30 years. Second, we presented the different work organization conditions. We found that skill utilization, decisional authority, and positive social relations have a negative relationship with mental health problems in the workplace. By contrast psychological demands, physical demands, number of hours worked, irregular schedule and job insecurity have a positive relationship with mental health problems in the workplace. Third, we looked at personality as an individual characteristic which could have an impact on mental health problems in the workplace. In this section we paid particular attention to the Big Five taxonomy of personality. The relationship between the five personality traits can be summarized as follows: extraversion is related to job burnout, but in an inconclusive way; agreeableness is related to job burnout in an inconclusive way and may be negatively associated with depressive symptoms; conscientiousness is inconclusively associated to job burnout, is negatively associated with depressive symptoms and plays a role in the development of psychological distress; neuroticism is positively associated to job burnout, depressive symptoms and psychological distress; and openness to

experience is not associated to either burnout nor depressive symptoms. Fourth, since the Big Five personality traits have never been explored, to our knowledge, as a moderating variable in this relationship, we found other personality traits which showed such a moderating effect. Locus of control, sense of coherence, and self-esteem were found to demonstrate a moderating effect on the relationship between work organization conditions and mental health problems. Finally, we observed other individual factors which must be taken into consideration in this relationship such as gender, age, education, profession, marital status, parental status, household income, alcohol consumption, tobacco consumption and physical activity. Table 1 below, presents a synthesis of what was found in the literature.

Table 1 – A Synthesis of the Literature

VARIABLE	AUTHORS	OBSERVATION
Task Design		
Skill utilization	Griffin et al. (2007)	Negative relationship with depressive symptoms
	Rafferty et al. (2001)	Negative relationship with burnout
	Albertsen et al. (2001); Karasek (1979); Marchand et al. (2005b, 2006a)	Negative relationship with psychological distress
Decision authority	Kowalski et al. (2010); Rafferty et al. (2001)	Negative relationship with emotional exhaustion
	Kalleberg et al. (2009)	Negative relationship with occupational stress
	Clumeck et al. (2009)	Negative relationship with absenteeism due to depression
	Albertsen et al. (2001); Bourbonnais et al. (1996)	Negative relationship with psychological distress
Work Demands		
Psychological demands	Albersten et al. (2001); Bourbonnais et al. (1996,	Positive relationship with psychological distress

VARIABLE	AUTHORS	OBSERVATION
	2005); Cole et al. (2002); Paterniti et al. (2002); Vermulen & Mustard (2000)	
	Bultmann et al. (2002)	Positive relationship with fatigue in men
	Lopes et al. (2010)	Positive relationship with distress
	De Jonge et al. (1999)	Positive relationship with emotional exhaustion
Physical demands	De Jogne et al. (1999); Gelsema et al. (2006); Marchand et al. (2005b)	Positive relationship with psychological distress
	Bultmann et al. (2002)	Positive relationship with fatigue
Number of hours worked	Hilton et al. (2008); Hayasaka et al. (2007); Marchand et al. (2005a, 2005b)	Positive relationship with psychological distress
Irregular schedule	Marchand et al. (2005a, 2005b)	Positive association with psychological distress
Social Relations		
Positive social relations	Alberstsen et al. (2001); Bourbonnais et al. (2005); Lopes et al. (2010); Marchand et al. (2005a, 2006); Van der Doef et al. (1999)	Negative association with psychological distress
	Bultmann et al. (2002)	Negative association with fatigue
	Luszczynska & Cieslak (2005)	Negative association with work stress
Gratification		
Pay	Orpana et al. (2009); McDonough (2000); Turner et al. (1995)	Negative association with psychological distress
Job insecurity	Bourbonnais et al. (1998); Marchand et al. (2005a, 2006a); McDonough (2000)	Positive association with psychological distress
	Naswall et al. (2005)	Positive association with job-induced tension

VARIABLE	AUTHORS	OBSERVATION
	Bultmann et al. (2002)	Positive association with fatigue
The Personality Traits		
Extraversion	Bakker et al. (2006); Buhler & Land (2003); Mils & Huebner (1998); Kim et al. (2007, 2009); Zellars et al. (2000)	Inconclusive association with burnout
	Vearing & Mak (2007)	No relationship with depressive symptoms
	Miller et al. (1999); Van den Berg & Feig (2003)	No relationship with psychological distress
Agreeableness	Bakker et al. (2006); Piedmont (1993); Mills & Huebner (1998); Kim et al. (2007, 2009); Zellars et al. (2000)	Inconclusive association with burnout
	Vearing & Mak (2007)	Negative association between social support and depressive symptoms
Conscientiousness	Bakker et al. (2006); Piedmont (1993); Mills & Huebner (1998); Kim et al. (2007); Zellars et al. (2000)	Inconclusive association with burnout
	Vearing & Mak (2007)	Negative relationship with depressive symptoms
	Miller et al. (1999)	Role clarity less negatively related to psychological distress
Neuroticism	Bakker et al. (2006); Piedmont (1993); Mills & Huebner (1998); Kim et al. (2007, 2009); Zellars et al. (2000)	Positive association to burnout
	Vearing & Mak (2007)	Positive association with depressive symptoms
	Miller et al. (1999)	Positive association with psychological distress
	Van den Berg & Feij (2003)	Positive association with work stress
Openness to experience	Bakker et al. (2006); Piedmont (1993); Mills & Huebner (1998); Kim et	No significant relationship to burnout

VARIABLE	AUTHORS	OBSERVATION
	al. (2007, 2009)	
	Vearing & Mak (2007)	No significant relationship to depressive symptoms
The moderating effect of personality		
Locus of control	Naswall et al. (2005)	Moderating effect on the relationship between job insecurity and mental health complaints
	Parent-Lamarche (2008)	Moderating effect on the relationship between social support outside of work and number of hours worked on psychological distress
Sense of coherence	Parent-Lamarche (2008)	Moderating effect on the relationship between psychological demands and job insecurity on psychological distress
Self-esteem	Makikangas & Kinnunen (2003)	Moderating effect on the relationship between organization climate and emotional exhaustion
Other factors to consider		
Gender	Galanakis et al. (2009); Jurado et al. (2005); Marchand et al. (2005a, 2006); McDonough & Walters (2001)	Women experience more mental health problems than men
Age	Galanakis et al. (2009); Marchand et al. (2003, 2005a, 2005b, 2006); McDonough (2000)	Negative relationship between age and mental health problems
Education	Dompierre et al. (1993); Elovainio et al. (2007); Voydanoff & Donnelly, (1999b)	Negative relationship between education and mental health problems
Profession	Marchand et al. (2007); Paterniti et al. (2002); Vermeulen & Mustrard (2000)	Profession has an impact on mental health (groups at increased risk: health professions, sales and services, transportation and equipment operators and processing, and

VARIABLE	AUTHORS	OBSERVATION
		manufacturing and utilities
Marital status	Cole et al. (2002); Hayasaka et al. (2007); Leung et al. (2000); Marchand (2004); Marchand et al. (2005b); McDonough (2000); Vermeulen & Mustard (2000)	Individuals living with a partner experience less mental health problems
Parental tension	Almeida & Kesler (1998); Marchand et al. (2005a, 2005b, 2006a)	Positive relationship between strained parental relations and mental health problems
Household income	Drapeau et al. (20020; Marchand et al. (2006a); Paterniti et al. (2002); Vermeulen & Mustard (2000)	Negative relationship between household income and mental health problems
Alcohol consumption	Baldwin et al. (1999); Marchand et al. (2003, 2006); Parker et al. (1987)	Positive relationship between alcohol consumption and mental health problems
Tobacco consumption	Marchand et al. (2005a, 2006)	Positive relationship between tobacco consumption and mental health problems
Physical activity	Marchand et al. (2005a)	Negative relationship between physical activity and psychological distress

Chapter 2: The research problem and the analytical model

2.1 – The research problem

The literature review contained in the preceding chapter brings to light several issues regarding our three topics of interest: work organization conditions, personality and mental health problems in the workplace.

First, to our knowledge, few studies has been conducted to explore the moderating effect of the Big Five personality characteristics on the relationship between work organization conditions and mental health problems in the workplace, and this only pertaining to the conscientiousness trait. This seems to be the case regardless of the fact that other personality traits have been found to be a significant moderator of this relationship and that the Big Five are considered to be one of the most influential personality taxonomies of the last two decades. This warrants an examination of this taxonomy as a moderating factor in this relationship. Moreover, the moderating role of the Big Five personality traits is feasible in the relationship in question. This is due to their predictive role in determining the likelihood of experiencing mental health problems in the workplace - a role which has already been confirmed in the literature.

Second, the majority of the studies regarding the influence of the Big Five personality traits on mental health problems in the workplace have focused primarily on job burnout. There is much less known about the influence of the Big Five, whether

directly or through a moderating effect, on other mental health problems such as depressive symptoms and psychological distress. This represents a large and significant gap in the research.

Finally, on a more methodological note, few studies have examined the entire working population simultaneously. The majority of research regarding any of the three variables (work organization conditions, personality and mental health problems) has focused mainly on a single occupation. Furthermore, for matters of accessibility and convenience the same professions such as nurses, police officers, school psychologists, counselors, and occupational therapists are recurrent in the bulk of the literature. This is problematic since previous research indicates that a link exists between personality traits and occupational group. Indeed, a meta-analysis of this phenomenon found that openness to experience may be more associated to artistic or investigative occupations, extraversion may be more associated to enterprising and social occupations and agreeableness may be associated to more social occupations (Larson, Rottinghaus & Borgen, 2002). When only one occupational group is considered, as is the case in the majority of research, our ability to generalize sector-specific findings to the working population becomes limited.

Thus, taking the above considerations into account, the specific research question retained for this research is: *do the Big Five personality characteristics have a moderating effect on the relationship between work organization conditions and psychological distress.*

Psychological distress has been retained as the mental health problem to be examined due to the fact that it has obtained very little research attention in the context of the five-factor model. Furthermore, as previously noted, psychological distress has an important occurrence in the workplace and is in part responsible for a large economic burden.

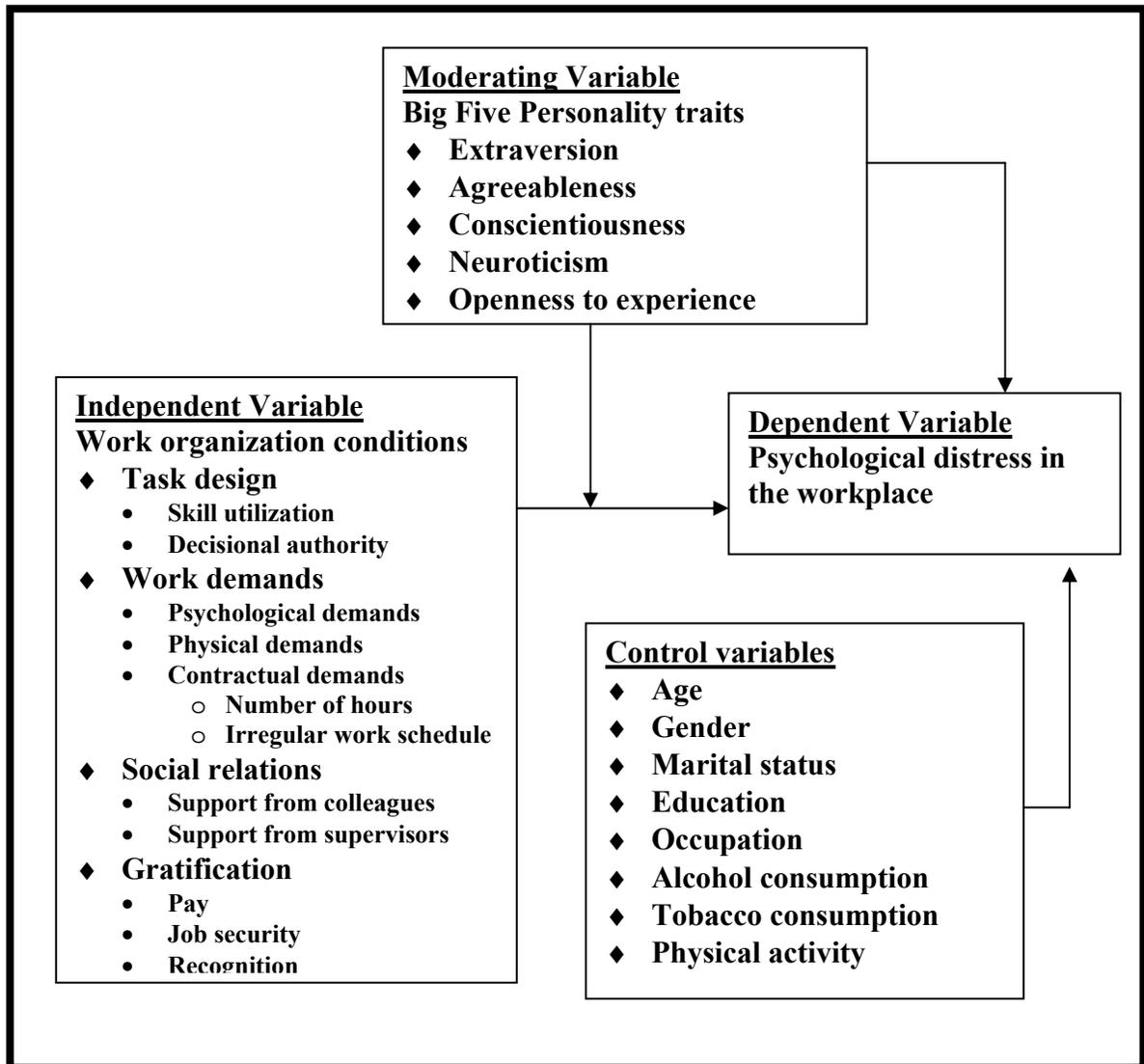
Thus, the goal of the present research is to determine whether the Big Five personality traits (extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences) act as a moderator of the relationship between work organization conditions (task design, work demands, social relations, and gratification) and psychological distress in the workplace. As shown in chapter 1, previous research has already confirmed that there is a significant link between work organization conditions and psychological distress. We propose that personality, more specifically the Big Five personality taxonomy, will moderate this relationship. The premise behind this proposal is that personality is an individual characteristic which serves to guide the way an individual will react to a particular situation. In this way, certain individuals will react in a more positive or more negative way than other individuals to the same incident. This reaction will in turn affect the short and/or long-term consequences of stress on the mental health of the individual. We already know that this may be true for other personality traits such as locus of control, sense of cohesion and self-esteem. It follows that this may also be true for some or all of the Big Five traits.

2.2 – The analytical model

The model proposed for the present research includes: a dependent variable, an independent variable, a moderating variable and eight control variables. The significance of each these variables in addressing the research question proposed above is supported by the research literature presented in Chapter 1. A graphic representation of the model is provided below (Figure 1).

The dependent variable in this model is psychological distress. In the context of this study, psychological distress is defined as a series of psychophysiological and behavioral symptoms such as anxiety, depressive reactions, irritability, decline in intellectual abilities, sleep disturbances and work absenteeism (Marchand et al. 2005b). As can be observed in Figure 1, psychological distress is affected by numerous variables.

The first variable to play a role on psychological distress is the independent variable, work organization conditions. Work organization is defined here as the manner in which work is organized and carried out within the workplace (Marchand et al. 2006a). It is composed of four dimensions and eleven sub-dimensions: task design (skill utilization and decisional authority), work demands (psychological demands, physical demands and contractual demands (number of hours worked and irregular schedule)), social relations (support from colleagues and support from supervisors), and gratification (pay, job security and recognition). We expect a direct effect of these conditions on psychological distress.

FIGURE 1: The analytical model

The second variable to have an impact on psychological distress is the moderating variable, the Big Five personality traits. These traits, also known as the five-factor model of personality, are divided into five dimensions originally identified by Goldberg (1981) namely: extraversion, agreeableness, neuroticism, conscientiousness and openness to experience. We expect both a direct effect of these variables on

psychological distress as well as a moderating effect on the relationship between work organization conditions and psychological distress.

We have also included eight control variables: age, gender, marital status, education, profession, alcohol consumption, tobacco consumption and physical activity. As described in Chapter 1, all of these variables have an impact on mental health; it is therefore important to take them into account to ensure that any effects of the independent or moderating variable are in fact caused by these variables and not by other extraneous variables.

The model proposed here includes components of three of the four work stress models presented in Section 1.2.1. By using work organization conditions as our independent variable we integrate concepts from Karasek & Therorell's (1990) demand-control-support model such as task design, work demands and social relations, as well as concepts from Siegrist's (1990) effort-reward imbalance model such as gratification. Additionally, our moderating variable, personality traits, integrates the agent personality concept from Marchand et al.'s (2006) multilevel model of worker mental health determinants.

As illustrated in Figure 1, our model suggests a series of direct and moderating relationships between the variables. Each of these relationships will now be exposed.

Work organization variables

We first propose that there will be a direct relationship between skill utilization and psychological distress. This relationship is based on the notion that the more skills and competencies an individual requires to perform his work the more he will be protected from experiencing psychological distress (Albertsen et al. 2001; Karasek et al. 1979; Marchand et al. 2005b, 2006a). This may be explained by the notion that an employee who perceives that he is operating at his level of expertise is perhaps more satisfied with his work than an employee operating above or below his level of expertise and thereby less affected by its negative aspects. In this way, employees operating above their level of expertise will be overwhelmed with their work, while employees operating below their level of expertise will become bored and demotivated. For these reasons, we expect a negative relationship between skill utilization and psychological distress [*H1*].

We similarly propose that a direct relationship exists between decision authority and psychological distress. The research literature supports the notion that when an employee is allowed to participate in and make decisions pertaining to his own work he will experience less psychological distress (Albersten et al. 2001; Bourbonnais et al. 1996). This is perhaps due to the feeling of control the employee perceives over his work, which in turn provides a sense of empowerment in the face of stressful situations. Therefore, we expect a negative relationship between decision authority and psychological distress [*H2*].

We put forward the existence of a direct relationship between psychological demands and psychological distress. When psychological demands (time pressure, working pace, quantity of work and mental effort) are high, an individual will experience more psychological distress (Bultmann et al. 2002; Lopes et al. 2010). This may occur because a worker who must deal with numerous psychological demands is left with little mental energy to dedicate to coping with stress, therefore rendering them more at risk of experiencing its negative effects. Consequently, we expect to find a positive relationship between psychological demands and psychological distress [*H3*].

There is a direct relationship between physical demands and psychological distress. When physical demands such as high physical effort and difficult work environment are present, workers will be at a greater risk for psychological distress (de Jonge et al. 1999; Gelsema et al. 2006; Marchand et al. 2005b). This relationship may hail from the fact that physical demands, similarly to psychological demands, increase strain on the individual and therefore make it more difficult for him to cope with stressful situations. If a worker is exposed to these conditions over a long period of time, negative consequences, such as psychological distress may occur. As a result, we expect a positive relationship between physical demands and psychological distress [*H4*].

A direct relationship can also be observed between both contractual demands and psychological distress. The literature suggests that an elevated number of working

hours (Marchand et al. 2005a, 2005b) and an irregular working schedule (Marchand et al. 2005a, 2005b) lead to an increased risk of psychological distress. We propose that this may be caused by the lack of conciliation between the work and family interface brought about by extended working hours and irregular schedules. Such an arrangement may not give the worker enough time to detach himself from the stresses experienced in the workplace and thus increasing the risk of psychological distress. As a result, we expect a positive relationship between both the number of working hours and an irregular working schedule with psychological distress [*H5 and H6*].

We postulate that a direct relationship exists between social support and psychological distress. There is strong support for the notion that positive social support in the workplace reduce the risk of experiencing psychological distress (Albertsen et al. 2001; Lopes et al. 2010; Marchand et al. 2005a, 2006). As noted in chapter 1, this may be the case because social support not only reduces the occurrence of stressful situations, but also acts as a moderator of their negative effects thereby protecting the individual (Vézina et al. 1992). Due to this dual protective effect, we expect a negative relationship between positive social support (from colleagues and supervisors) and psychological distress [*H7 and H8*].

Our model puts forth that we can observe a direct relationship between pay and psychological distress. Only one study has found a relationship between lower pay and psychological distress (Turner et al. 1995). However, based on Siegrist's (1996) effort-reward imbalance model, it is logical to deduct that when the salary received by a

worker is not equivalent to his perceived effort, he will experience a state of imbalance. Remaining in such a state for an extended period of time may increase the risk of experiencing psychological distress. Hence, we expect a negative relationship between pay and psychological distress [*H9*].

It is suggested that job security has a direct relationship with psychological distress. Marchand et al. (2005a) found that job insecurity significantly increases the risk of experiencing psychological distress. We can hypothesize that this may be due to the increased pressure or tension these individuals must face due to the insecurity for their future, especially if they are the sole income provider. Therefore, we expect a positive relationship between job insecurity and psychological distress [*H10*].

We also propose that there is a direct relationship between recognition and psychological distress. To our knowledge, no study has explored this relationship. Nonetheless, we can hypothesize that there exists a negative relationship between recognition and psychological distress because recognition can be linked to social support both from colleagues and supervisors. If recognition is experienced as an additional form of social support it should also act as a protective factor on psychological distress. For these reasons, we expect a negative relationship between recognition and psychological distress [*H11*].

Personality variables

Moving to the personality traits, our model suggests that a direct relationship exists between extraversion and psychological distress. Although prior research covered in the literature did not find a significant relationship between these two (van den Berg & Feig, 2003; Miller et al. 1999), we propose that such a link may in fact be found. An individual high on the extraversion trait is characterized as being optimistic (Costa & McCrae, 1992) and has been found to reappraise problems positively (Bakker et al. 2006). For these reasons, they should be better equipped to deal with stressful situations and present a positive attitude. We hypothesize that such a positive outlook would produce a protective effect on the risk of experiencing psychological distress in extraverted individuals. Furthermore, when observing the burnout literature, several authors have found extraversion to be negatively related to job burnout (Bakker et al. 2006; Kim et al. 2007; Zellars et al. 2000). Since it is logical to deduct that mental health problems may be positively correlated, these findings may indicate a negative link between extraversion and psychological distress. Therefore, we expect to find a negative relationship between extraversion and psychological distress [*H12*].

We equally put forward the occurrence of a direct relationship between agreeableness and psychological distress. To our knowledge, no study has addressed this relationship. In any case, we propose that there may be a negative relationship between agreeableness and psychological distress. A negative relationship may yield from the fact that agreeable workers are good-natured and forgiving (Costa & McCrae,

1992). In this way, they may yield positive relationships with others in their environment and be willing to forgive small issues. With regards to the literature on other mental health problems, agreeableness has been found to have a negative relationship with burnout (Kim et al. 2007; Piedmont, 1993; Mills & Huebner, 1998) and may have a protective impact on the development of depressive symptoms due to its association with social support (Vearing & Mak, 2007). Consequently, we expect the relationship between agreeableness and psychological distress to be negative [*H13*].

A direct relationship can also be found between conscientiousness and psychological distress. To our knowledge, past research has not addressed this issue. However, we hypothesize that there will be a negative relationship between conscientiousness and psychological distress. We attribute this to the characteristics associated with conscientiousness such as being goal-direct, ambitious and perseverant (Costa & McCrae, 1992), as well as using coping strategies axed on problem-solving (Bakker et al. 2006). These traits suggest that these workers would be willing to resolve the negative aspects of their work to achieve their future goals, exposing them less to the negative effects of stress. Furthermore, Vearing & Mak (2007) found that conscientiousness was negatively associated with depressive symptoms. Therefore, we predict a negative relationship between conscientiousness and psychological distress [*H14*].

It is proposed that there is a direct relationship between neuroticism and psychological distress. Miller et al. (1999) found neuroticism to be a significant

predictor of psychological distress. Furthermore, the definition of neuroticism itself predicts that an individual high on this trait would have a propensity to psychological distress (Costa & McCrae, 1992). This may be partly due to the fact that these individuals tend to set unrealistic goals, underestimate themselves and use ineffective coping strategies. Moreover, when considering the literature on other mental health problems, neuroticism has been significantly associated with a higher risk of both burnout (Bakker et al 2006; Mills & Huebner, 1998; Piedmont, 1993; Kim et al. 2009) and depressive symptoms (Vearing & Mak, 2007). For these reasons, we predict a positive relationship between neuroticism and psychological distress [*H15*].

We posit that openness to experience has a direct effect on psychological distress. To our knowledge no study has addressed this relationship. Nonetheless, we hypothesize that there will be a negative relationship between openness to experience and psychological distress. Individuals who are open to new experiences have been found to use humor as a stress coping mechanism and have been found to appraise stressful situations in a less threatening way (Bakker et al. 2006). This leads us to believe that they will be less affected by the negative effects of stress and hence less at risk for experiencing psychological distress. Additionally, Zellars et al. (2000) found a marginally significant negative relationship between openness to experience and burnout. Therefore, we predict a negative relationship between openness to experience and psychological distress [*H16*].

Moderating effects

With regards to moderating relationships, our model puts forward the notion that extraversion has a moderating effect on the relationship between work organization conditions and psychological distress. To our knowledge, this has not been shown in the literature to date, however, we propose that this effect will be largely related to the social relations dimension. Since an extraverted worker is believed to be sociable, talkative and person-oriented (Costa & McCrae, 1992), they are more likely to go out of their way to interact with others. In the majority of cases this allows them to form positive relationships with colleagues and supervisors, which in turn provides them with more social support than a less extraverted worker. Finally, the increased social support will act as a protective factor for experiencing psychological distress. Therefore, we predict that extraversion will have a moderating effect on the relationship between work organization condition and psychological distress by increasing social support [H17].

We postulate that agreeableness produces a moderating effect on the relationship between work organization conditions and psychological distress. To our knowledge, no research has addressed this issue. Regardless, we propose that this will occur in the social relations dimension. Bakker et al. (2006) have linked agreeable individuals to higher levels of social support than non-agreeable individuals. This is likely due to their soft-heartedness and good nature. As previously mentioned, increased social support acts as a protective factor over psychological distress. We can assume that agreeable workers will not only be more attuned to the social support provided by others but they

will also be more likely to receive it. Consequently, we predict that agreeableness will have a moderating effect on the relationship between work organization condition and psychological distress by increasing social support [H18].

It is suggested that conscientiousness brings about a moderating effect on the relationship between work organization conditions and psychological distress. To our knowledge, this has not been addressed in the research literature. Nonetheless, we propose that this effect will be most significant in the work demands category, such that conscientious workers will be less affected by high psychological demands, the number of hours worked and an irregular schedule than non-conscientious workers. We propose that this would be due to the fact that they tend to be more organized, hard working, self-disciplined, and persevering. In this way, conscientious workers will perhaps be able to accomplish more tasks in less time and multi-task more effectively due to their organized and hard working nature. They may also be more willing to work long hours or on an irregular schedule in order to reach their professional goals. For these reasons, we predict that conscientiousness will have a moderating effect on the relationship between work organization condition and psychological distress by attenuating the impact of psychological demands, number of hours worked and having an irregular schedule [H19].

Neuroticism is proposed to have a moderating effect on the relationship between work organization conditions and psychological distress. To our knowledge, this has not been explored to date. Due to the wide negative connotations of the neuroticism trait we

propose that it will be influential in numerous dimensions, including: psychological demands, physical demands, social support, job security and recognition. First, neurotic workers tend to set unattainable goals for themselves (Bakker et al. 2006), rendering themselves to be more negatively affected by high psychological demands than less neurotic workers. Second, neurotic workers tend to be hypochondriacal, whereby they may experience more distress due to high physical demands than less neurotic workers. Third, neurotic workers will experience less positive social support due to their emotional nature and maladaptive responses in social situations, therefore, not allowing them to benefit from their protective nature. Fourth, neurotic workers will experience more distress over job insecurity due to their worrisome and insecure nature. Finally, due to their feelings of inadequacy, neurotic workers will be less able to pull the positive effects of job recognition. As a result, we predict that neuroticism will have a moderating effect on the relationship between work organization condition and psychological distress by increasing the impact of psychological demands, physical demands, and job insecurity, reducing social support, and undermining the positive effects of recognition [*H20*].

Finally, our model suggests that openness to experience produces a moderating effect on the relationship between work organization conditions and psychological distress. To our knowledge, this has not been addressed in previous studies. We hypothesize that this moderation will occur primarily in the irregular schedule and job security dimensions. First, workers who are open to new experiences would be less affected by the negative effects of an irregular work schedule because they are believed

to be untraditional and open to the unfamiliar. In this way, they may view more positively the change from the common nine to five mold. Second, since they are not afraid of the unfamiliar and approach the unknown with a sense of curiosity, job insecurity may be less negatively viewed. Workers who are open to new experiences may simply view a lay off as a chance to live a new adventure. Therefore, we predict that openness to experience will have a moderating effect on the relationship between work organization condition and psychological distress primarily by attenuating the negative impacts of having an irregular schedule and job insecurity [H21].

2.3 – Hypotheses summary

Based on the model presented in Figure 1 and the proposals made in the previous section we put forward the following twenty-one hypotheses. They are organized in three groups: those concerning the direct effect of work organization conditions; those concerning the direct effect of personality; and those concerning the moderating effect of personality.

Hypotheses concerning the direct effect of work organization conditions

H1 – Skill utilization is negatively related to psychological distress

H2 – Decision authority is negatively related to psychological distress

H3 – Psychological demands are positively related to psychological distress

H4 – Physical demands are positively related to psychological distress

H5 – The number of hours worked is positively related to psychological distress

H6 – An irregular work schedule is positively related to psychological distress

H7 – Social support from colleagues is negatively related to psychological distress

H8 – Social support from supervisors is negatively related to psychological distress

H9 – Pay is negatively related to psychological distress

H10 – Job insecurity is positively related to psychological distress

H11 – Recognition is negatively related to psychological distress

Hypotheses concerning the direct effect of personality

H12 – Extraversion is negatively related to psychological distress

H13 – Agreeableness is negatively related to psychological distress

H14 – Conscientiousness is negatively related to psychological distress

H15 – Neuroticism is positively related to psychological distress

H16 – Openness to experience is negatively related to psychological distress

Hypotheses concerning the moderating effect of personality on the relationship between work organization and psychological distress

H17 – Extraversion has a moderating effect on the relationship between work organization and psychological distress

H18 – Agreeableness has a moderating effect on the relationship between work organization and psychological distress

H19 – Conscientiousness has a moderating effect on the relationship between work organization and psychological distress

H20 – Neuroticism has a moderating effect on the relationship between work organization and psychological distress

H21 – Openness to experience has a moderating effect on the relationship between work organization and psychological distress

The following chapter will expose the methodology which will be employed in this research to evaluate the interactions exposed above.

Chapter 3 – Methodology

This chapter is divided into three parts. The first section will delineate the sample data used in this study. The second section will demonstrate the methods used to measure each of the variables of interests. Finally, the third section will explain the methods by which the data was analyzed.

3.1. – Sample

The current study utilized secondary data which was collected in the context of a pre-test for the project “Developing better assessment, interventions, and policies in occupational mental health: A multi-disciplinary approach” undertaken by the Équipe de Recherche sur le Travail et la Santé Mentale (ERTSM). The project’s timeline extends from 2007 to 2012 and takes places entirely in Québec.

The goal of the aforementioned project is to develop new tools to improve the detection of mental health problems in the workplace such as psychological distress, job burnout and depression. The project will also evaluate a variety of human resource practices that aim to reduce these mental health problems. The project includes two phases. The first seeks to identify the sources of mental health problems, while the second will attempt to evaluate organizational practices and potential intervention techniques.

The specific sample of interest retained from this research is a cross-sectional survey based on the pilot study containing a voluntary sample of 410 workers from a municipal police service. Of these, 15 participants were eliminated ($n = 395$) due to incomplete questionnaires. Participants were both police officers ($n = 273$) and civilian workers ($n = 122$). The population (including permanent and temporary employees) at the time of collection (December 5th 2008 to February 8th 2009) was 7036 workers. Sampling for our study was based on a selection of typical units, which had a combined population of 855 workers within 14 units/services. The participation rate was 48.07%, however it is important to note that this rate varied depending on the unit (between 7.41% and 100%). This high discrepancy is due to the fact that certain units were either in the field or on call, which made it difficult to increase participation. Another note of interest is that in the police officer sample 71.4% of participants were men, while in the civilian workers sample men only represented 37% of participants. These gender differences are representative of the actual gender distribution in the study population. Finally, both groups included participants from a variety of occupations.

3.2 – Measures

The following section illustrates the measures employed to appraise each of the variables of interest in this study. Note that participants were permitted to answer either a French or English version of the questionnaire.

3.2.1 – The dependent variable

The dependent variable was psychological distress. Due to the cross-sectional nature of this study, this variable (and all subsequent variables) were measured once at the time of sampling. Psychological distress was measured using a 12-item revised version of the General Health Questionnaire (Pariente, Challita, Mesbah, & Guelfi, 1992). In this questionnaire, participants are asked a series of questions pertaining to a series of indicators as follows: concentration, trouble sleeping, sense of importance, ability to take decisions, feelings of stress or tension, sense of helplessness in regards to difficulties, appreciation of daily activities, ability to face problems, sadness or depression, self-confidence, feelings of worthlessness and happiness. Participants must rate the occurrence of each of these indicators on an additive 4-point Likert scale. In six of the twelve questions, “1” refers to a *more than usual occurrence* and “4” refers to a *much less than usual occurrence*. In the other six questions, the opposite is true (“1” = *much less than usual*, “4” = *more than usual*). The sum of these responses provided a total on 48 possible points. The higher the score, the higher the amount of psychological distress experienced by the subject. This measure had a high internal consistency with an alpha level of 0.86.

3.2.2 – The independent variable

In this study, work organization conditions constituted the independent variable. More specifically, this includes: skill utilization, decisional authority, psychological

demands, physical demands, contractual demands (number of hours worked and having an irregular schedule), support from colleagues, support from supervisors, pay, job security and recognition.

Of the eleven conditions stated above, five (skill utilization, decisional authority, psychological demands, support from colleagues and support from supervisors) were measured using the Job Content Questionnaire-12 (Larocque, Brission & Blanchette, 1998; Niedhammer, Chastang, Gendrey, David, & Degioanni, 2006; Niedhammer, 2002), adapted from Karasek (1985). In each case, participants were asked to respond to questions pertaining to their current work situation. These conditions and their indicators can be found in Table 2 below.

TABLE 2 – Work organization conditions measures (JCQ)

DEPENDENT VARIABLES	INDICATORS
Skill utilization	Additive 4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 6 indicators: learning new skills, high skill necessity, need for creativity, repetitive tasks (inversed), diversity of tasks, personal development. Total of 48 points. Alpha = 0.72
Decisional authority	Additive 4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 3 indicators: freedom to make own decisions regarding work, make autonomous decisions, influence on work tasks. Total of 48 points. Alpha = 0.76
Psychological demands	Additive 4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 9 indicators: high work speed, high mental effort, achievable quantity of work (inversed), sufficient time allotted to each task, no conflicting tasks (inversed), need for intense concentration over long periods of time, large quantity of interruptions, very active work, high dependence on others to complete tasks. Total of 36 points. Alpha = 0.74

Support from colleagues	Additive 4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 4 indicators: colleagues are competent, colleagues are interested in the subject, colleagues are friendly, and colleagues are helpful. Total of 16 points. Alpha = 0.87
Support from supervisors	Additive 4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 4 indicators: supervisors are concerned for employee well-being, supervisors pay attention to things said by employees, supervisors are helpful, supervisors are able to coordinate employee activities. Total of 16 points. Alpha = 0.93

Four of the remaining conditions (physical demands, pay, job security, and recognition) were measured using the Effort-Reward Imbalance scale (Niedhammer, Siegrist, Landre, Goldberg & Leclerc, 2000; Siegrist & Peter, 1996). Once again, participants were asked to respond to the questions pertaining to their current work situation. These conditions and their indicators are presented in Table 3 below.

Table 3 – Work organization conditions measures (ERI)

INDEPENDENT VARIABLES	INDICATORS
Physical demands	4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 1 indicator: physical efforts required to complete tasks.
Pay	Individual salary per year before income tax and deductions 1 = less than 20,000\$ 2 = 20,000\$ - 29,000\$ 3 = 30,000\$ - 39,000\$ 4 = 40,000\$ - 49,000\$ 5 = 50,000\$ - 59,000\$ 6 = 60,000\$ - 69,000\$ 7 = 70,000\$ - 79,000\$ 8 = 80,000\$ - 89,000\$ 9 = 90,000\$ - 99,000\$ 10 = \$100,000 and more

Job insecurity	4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 1 indicator: threats to job security
Recognition	4-point Likert scale (1 = completely disagree, 4 = completely agree) measuring 1 indicator: low perception of promotion opportunities (inversed)

The final condition, contractual demands, were measured using questions from the Quebec Health and Social Survey conducted in 1998 (QHSS-98). This condition and its indicators are presented in Table 4 below.

Table 4 – Work organization conditions measures (QHSS-98)

INDEPENDENT VARIABLES	INDICATORS
Contractual demands	<p><i>Number of hours worked per week:</i> numerical scale between 6 and 168 hours. Indicator: number of hours worked per week.</p> <p><i>Schedule stability:</i> 4-point Likert scale (1 = never, 4 = all the time) measuring 1 indicator: exposure to an irregular or unpredictable work schedule</p>

3.2.3 – The moderating variable

The moderating variable in our study was the Big Five personality traits. It was measured using the 20-item Mini-IPIP scale (Donnellan, Oswald, Baird & Lucas, 2006). Table 5 exposes each trait and its indicators.

Table 5 – Personality measures

MODERATING VARIABLES	INDICATORS
Extraversion	Additive 5-point Likert scale (1 = completely disagree, 5 = completely agree) measuring 4 indicators: active, does not talk a lot (inversed), attraction to groups of people, stay's away from people (inversed). Total of 20 points. Alpha = 0.80
Agreeableness	Additive 5-point Likert scale (1 = completely disagree, 5 = completely agree) measuring 4 indicators: empathy, lack of concern with other people's problems (inversed), feeling other people's emotions, lack of interest for others (inversed). Total of 20 points. Alpha = 0.64
Neuroticism	Additive 5-point Likert scale (1 = completely disagree, 5 = completely agree) measuring 4 indicators: mood swings, usually relaxed (inversed), easily angered, rarely sad (inversed). Total of 20 points. Alpha = 0.73
Conscientiousness	Additive 5-point Likert scale (1 = completely disagree, 5 = completely agree) measuring 4 indicators: cleaning right away, forgetting to put things back in their place (inversed), like's order, often makes a mess (inversed). Total of 20 points. Alpha = 0.61
Openness to experience	Additive 5-point Likert scale (1 = completely disagree, 5 = completely agree) measuring 4 indicators: vivid imagination, lack of interest in abstract ideas (inversed), difficulty understanding abstract ideas (inversed), does not have a good imagination (inversed). Total of 20 points. Alpha = 0.57

3.2.4 – The control variables

Eight control variables were included. These are: age, gender, marital status, education, occupation, alcohol consumption, tobacco consumption and physical

activity. Table 6 identifies each variable and the indicators which were used to quantify them.

Table 6 – Control variable measures

CONTROL VARIABLES	INDICATORS
Age	Number of years (2010 – year of birth)
Gender	1 = Male 2 = Female
Marital status	1 = Married 2 = Common-law 3 = Widow or Widower 4 = Separated 5 = Divorced 6 = Single, never married
Education	1 = None 2 = High school 3 = Professional school 4 = College (general) 5 = College (technical) 6 = University (undergraduate certificate) 7 = University (bachelors degree) 8 = University (graduate diploma) 9 = University (masters degree) 10 = University (doctorate degree)
Occupation	1 = Police officer 2 = Civilian worker
Alcohol consumption	Number of glasses of alcohol consumed per week
Tobacco consumption	Number of cigarettes smoked per day
Physical activity	Frequency of participation in physical activity (20-30 minutes per session) over the last three months 1 = None 2 = About once per month 3 = About 2-3 times per month 4 = About once per week 5 = About twice per week 6 = About 3 times per week 7 = 4 or more times per week

3.3 – Analyses

The data collected in the context of this study was analyzed using the STATA software. The first step was to produce descriptive statistics for each of the variables (including the eleven work organization conditions, the five personality variables, psychological distress and the eight control variables). These statistics included the mean and standard deviation. The second step was to perform a bivariate analysis using the Pearson correlation. This test allowed us to determine whether an association (whether positive or negative) exists between any two variables, as well as identifying colinearity problems. The third, and final, step was to perform a multivariate analysis. This type of analysis is necessary because two variables rarely exist alone. Instead, other variables must be considered simultaneously to ensure that associations still hold true regardless of the influence of other variables.

3.3.1 – Linear regression models

Three regression models needed to be considered in order to test our research question: *Do the Big Five personality characteristics have a moderating effect on the relationship between work organization conditions and psychological distress?*

The first regression model considered the case of the work organization conditions. Its purpose was to determine the influence of the work organization conditions on the risk of experiencing psychological distress with only the control variables being taken into account. This allowed us to determine the effect of the eleven

work organization conditions on psychological distress before the inclusion of the personality traits.

The second regression model considered the case of personality. It considered all the same variables as the first model, but also took into account the influence of the five personality traits. This allowed us to determine the direct effect of both the work organization conditions and the Big Five personality traits on psychological distress, therefore testing hypotheses 1 through 16.

The third regression model had six phases. Each of the first five phases included a set of interactions between the work organization conditions and the personality characteristics. Since there are eleven work organization conditions and five personality traits, there were fifty-five interactions which were distributed evenly through the first five phases. Phase one explored the interaction between each of the eleven work organization conditions, the eight control variables and the eleven interaction variables concerned with extraversion. Similarly, phase two maintained the same conditions but substituted extraversion for agreeableness. Phase three considered the interactions with neuroticism. Phase four looked at the interactions with conscientiousness and phase five the interactions with openness to experience, all the while maintaining the original conditions.

Finally, phase six considered the work organization conditions, the personality traits, the control variables and the significant interactions from the previous five

phases. This final analysis ensured that the significant interactions still hold true when considered simultaneously. As a whole, Model 3 allowed us to determine if a moderating relationship exists between the five personality traits and any of the eleven work organization conditions, thus testing hypotheses 17 through 21 as well as answering our research question.

The results of these analyses will be presented in the following chapter.

Chapter 4 – The results

This chapter presents the results of the statistical analyses proposed earlier in chapter 3. We begin by outlining the descriptive statistics which address the dependent variable, the independent variables, the moderating variables and the control variables. Subsequently, we present the bivariate analyses which expose the associations between each of the aforementioned variables. This is ultimately followed by the results of the multivariate analyses.

4.1 – The descriptive analyses

Descriptive statistics, including the mean, standard deviation, minimum and maximum allow us to summarize the data set. The results obtained in the context of this study are presented in Table 7 below.

The dependent variable, the level of psychological distress, was relatively low in this sample. The results show that the mean level of psychological distress was 2.17 on a scale of 0 to 11, the median was 1, and the standard deviation was 2.64. Given that the mean is at the lower end of the scale (middle of the scale = 5.5) we can deduce that psychological distress was generally low.

Table 7 - Descriptive statistics

Variable	Min-Max	Mean	Standard deviation
Dependent variable			
Psychological distress	0-11	2.17	2.64
Independent variables			
Skill utilization	20-48	36.26	5.70
Decisional authority	12-48	33.59	7.82
Psychological demands	11-35	23.18	3.88
Physical demands	1-4	2.20	0.93
Number of hours worked	7.3-80	36.14	6.59
Irregular schedule	1-4	2.52	1.22
Support from supervisor	4-16	11.69	3.02
Support from colleagues	7-16	13.15	1.86
Pay	1-10	5.99	2.06
Job insecurity	1-4	1.42	0.58
Recognition	3-4	3.30	0.46
Moderating variables			
Extraversion	11-20	15.25	2.31
Agreeableness	10-20	16.33	1.97
Conscientiousness	10-20	15.87	1.93
Neuroticism	8-19	12.55	1.73
Openness to experience	11-20	15.72	1.93
Control variables			
Gender (female)	0-1	0.38	-
Age	20-57	38.35	8.48
Marital status (couple)	0-1	0.70	-
Education	2-10	5.32	1.50
Occupation (police)	0-1	0.69	-
Alcohol consumption	0-52	5.92	6.65
Tobacco consumption	0-32	1.35	4.69
Physical activity	1-7	4.73	1.97

The next set of results relate to the independent variables. With respect to skill utilization, the mean was 36.26 with a standard deviation of 5.70. This is slightly above the middle of the scale (34) which indicates that workers demonstrate moderately elevated skill utilization. A similar situation appears with decisional authority. In this case the mean was 33.59 with a standard deviation of 7.82 and the middle of the scale

being 30, indicating moderately elevated decisional authority. Psychological demands for this sample were moderate, with a mean of 23.18, a standard deviation of 3.88 and the middle of the scale also being 23. Physical demands were also moderate. The mean was 2.20 with a standard deviation of 0.93. Note that in this case a '2' signified that a worker disagreed with the affirmation that physical efforts were required in their work and a '3' signified that a worker agreed with this affirmation. With regards to the number of hours worked, the mean was 36.14 hours worked per week, with a standard deviation of 6.59. For the variable having an irregular work schedule, the mean was 2.52 with a standard deviation of 1.22. This suggests that workers had an irregular work schedule between 'sometimes' and 'often'. However, given the large standard deviation the results are largely distributed within the four categories. Both types of support were moderately high. Support from the supervisor had a mean of 11.69 with a standard deviation of 3.02 and the middle of the scale being 20, while support from colleagues had a mean of 13.15 with a standard deviation of 1.86 and the middle of the scale being 11.5. Pay had a mean of 5.99 with a standard deviation of 2.06 which indicates that the mean salary was approximately between 60,000\$ and 69,000\$ per year. Job insecurity was moderately low, with a mean of 1.42 on a scale of 4 and a standard deviation of 0.58. Finally, recognition was high, with a mean of 3.30 on a scale of 4 with a standard deviation of 0.46. However, given the minimal degree of variation between the minimum and maximum for this variable, recognition will not be included in future analyses.

With regards to the moderating variables we can observe that extraversion was moderate, with a mean of 15.25, a standard deviation of 2.31 and the middle of the scale being 15.5. Agreeableness was slightly higher, with a mean of 16.33, a standard deviation of 1.97 on a scale of 10 to 20 (middle of the scale = 15). Conscientiousness was moderate, with a mean of 15.87, a standard deviation of 1.93 and the middle of the scale being 15. Neuroticism was moderately low, a mean of 12.55, a standard deviation of 1.73 on a scale of 8 to 19 (middle of the scale = 13.5). Finally, openness to experience was moderate, with a mean of 15.72, a standard deviation of 1.93 and the middle of the scale being 15.5.

The analyses of the control variables showed that 38% of the sample was female. The mean age of the participants was 38.35 years of age with a standard deviation of 8.48 years. 70% of participants were in a couple. The level of education was 5.32 on a scale of 2 to 10, which indicates that the majority of participants had a collegial education. 69% of participants were police officers and 31% were civilian workers. Alcohol and tobacco consumption were relatively low. Results showed a mean of 5.92 glasses of alcohol consumed per week and 1.35 cigarettes smoked per day. Finally, physical activity was moderate, with a mean of 4.73 which signifies participation in a physical activity roughly once to twice per week.

4.2 – The bivariate analyses

Bivariate analyses allow us to determine whether any of the variables of interest are significantly associated to psychological distress. The results of these correlations are presented in Table 8.

As can be observed, fifteen of the twenty-three variables are significantly correlated with psychological distress, eleven of which show a negative correlation. A negative correlation signifies that as the variable increases, psychological distress decreases. Inversely, a positive correlation implies that as the variable increases so does psychological distress.

In regards to the ten remaining work organization conditions, seven showed a significant correlation with psychological distress. Thus skill utilization ($r = -0.19$, $p < 0.01$), decisional authority ($r = -0.30$, $p < 0.01$), physical demands ($r = -0.15$, $p < 0.01$), support from colleagues ($r = -0.19$, $p < 0.01$), support from a supervisor ($r = -0.37$, $p < 0.01$) and pay ($r = -0.13$, $p < 0.01$) were associated with less psychological distress. On the other hand, psychological demands ($r = 0.31$, $p < 0.01$) were associated with more psychological distress.

Table 8 - Correlations between variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	Psychological distress	1.00																							
2	Skill utilization	-0,19**	1.00																						
3	Decisional authority	-0,30**	0,57**	1.00																					
4	Psychological demands	0,31**	0,06	-0,20**	1.00																				
5	Physical demands	-0,15**	0,28**	0,15**	-0,10*	1.00																			
6	Number of hours worked	0,02	0,27**	0,14**	0,12*	-0,14**	1.00																		
7	Irregular schedule	0,08	0,08	-0,06	0,15**	0,21**	0,06	1.00																	
8	Support from colleagues	-0,19**	0,23**	0,20**	-0,08	0,08	0,07	0,04	1.00																
9	Support from supervisors	-0,37**	0,40**	0,50**	-0,40**	0,20**	0,07	-0,10	0,36**	1.00															
10	Pay	-0,13**	0,26**	0,31**	-0,02	-0,05	0,31**	-0,01	-0,02	0,10*	1.00														
11	Job insecurity	0,06	-0,20**	-0,20**	-0,03	-0,03	-0,24**	0,02	-0,21**	-0,06	-0,17**	1.00													
12	Recognition	0,03	0,00	-0,05	0,04	-0,10*	0,10*	0,03	0,02	-0,04	0,04	-0,18**	1.00												
13	Extraversion	-0,12*	0,24**	0,12*	0,07	0,06	0,06	0,08	0,26**	0,11*	0,09	-0,15**	0,05	1.00											
14	Agreeableness	0,04	0,17**	0,06	0,13**	-0,02	0,12*	0,00	0,18**	0,09	-0,04	-0,10*	0,10*	0,46**	1.00										
15	Conscientiousness	-0,12*	0,09	0,09	-0,08	-0,02	0,04	-0,05	0,14**	0,16**	0,17*	-0,15**	0,08	0,21**	0,22**	1.00									
16	Neuroticism	0,28**	-0,12*	-0,18**	0,17**	-0,06	-0,03	0,01	-0,05	-0,14**	-0,06	0,04	0,00	-0,10*	-0,08	-0,04	1.00								
17	Openness to experience	0,04	0,09	-0,09	0,26**	-0,11*	-0,01	0,06	0,11*	-0,10*	-0,04	-0,07	0,18**	0,26**	0,32**	0,03	-0,04	1.00							
18	Age	0,04	-0,02	0,06	0,08	-0,29**	0,21**	-0,16**	-0,16**	-0,12*	0,54**	-0,05	0,20**	-0,12*	-0,08	0,08	-0,03	0,02	1.00						
19	Gender (female)	0,28**	-0,25**	-0,24**	0,10*	-0,25**	-0,09	-0,02	-0,08	-0,13*	-0,27**	0,07	-0,08	0,00	0,24**	0,04	0,08	-0,05	-0,08	1.00					
20	Marital status (couple)	-0,15**	0,02	0,08	-0,01	-0,01	-0,07	-0,05	-0,02	0,08	0,08	0,05	-0,03	0,00	-0,13**	0,05	0,01	-0,04	0,04	-0,01	1.00				
21	Education	-0,10	0,19**	0,25**	0,04	0,04	-0,01	-0,15**	-0,09	0,12*	0,24**	0,08	-0,04	0,04	0,08	-0,03	0,03	0,07	0,01	-0,06	0,05	1.00			
22	Occupation (police)	-0,28**	0,38**	0,44**	-0,33**	0,49**	-0,05	0,02	0,08	0,40**	0,43**	-0,13*	-0,06	0,09	-0,03	0,12*	-0,15**	-0,17**	0,00	-0,33**	0,05	0,23**	1.00		
23	Alcohol consumption	0,07	0,06	0,03	0,02	0,05	0,02	0,09	0,09	0,07	0,09	-0,03	0,06	0,07	0,02	-0,10	0,02	-0,02	-0,06	-0,05	-0,07	-0,04	0,10*	1.00	
24	Tobacco consumption	0,31**	-0,07	-0,14**	0,05	-0,16**	0,08	0,03	0,00	-0,05	-0,05	0,05	0,08	-0,08	0,04	-0,06	0,18**	0,07	0,02	0,05	-0,08	-0,08	-0,17**	0,13*	1.00
25	Physical activity	-0,19**	0,20**	0,17**	0,00	0,23**	-0,03	0,06	0,04	0,16**	0,03	0,01	-0,06	0,08	0,01	0,05	-0,08	-0,06	-0,10*	-0,12*	-0,13**	0,11*	0,28**	0,02	1.00

Legend
* : p < 0,05
** : p < 0,01

Moving on to the moderating variable, three of the five personality traits showed a significant correlation with psychological distress. Two of these traits, extraversion ($r = -0.12, p < 0.05$) and conscientiousness ($r = -0.12, p < 0.05$) showed a negative relationship with psychological distress. On the other hand, neuroticism ($r = 0.28, p < 0.01$) was positively associated to psychological distress.

Looking at the eight control variables, five were significant. Being female ($r = 0.28, p < 0.01$) and tobacco consumption ($r = 0.31, p < 0.01$) correlated with increased psychological distress. Conversely, being in a couple ($r = -0.15, p < 0.01$), being a police officer ($r = -0.28, p < 0.01$), and engaging in physical activity ($r = -0.19, p < 0.01$) were found to decrease psychological distress.

Finally, the results of the bivariate analyses confirm that no collinearity issues ($r > 0.7$) (Tabachnick & Fidell, 2007) exist between variables for the independent variables, the dependent variables, the moderating variables or the control variables. This implies that no two variables are overly correlated, which would have limited our ability to observe each variable as a unique contributive factor.

4.3 – The multivariate analyses

The multivariate analyses conducted in this study were organized into three linear regression models. The first model was concerned with observing the role of the

work organization conditions on the level of psychological distress before the inclusion of the personality traits. This initial model therefore only considered the ten work organization conditions and the eight control variables. Subsequently, the second model included the five personality traits into the equation, therefore allowing us to answer hypotheses 1 through 16, as described in chapter 3.

Finally, the third model which was composed of six phases, included the fifty interaction variables. The first five phases considered the interaction variables concerned with a single personality trait and the final phase took into account the significant interaction variables. The results of these analyses are presented in Table 9.

Beginning with model 1, we can observe that two of the work organization conditions had an effect on psychological distress when personality was not considered. This included psychological demands ($b=0.13$, $p < 0.01$) and support from a supervisor ($b=-0.16$, $p < 0.01$). We can thus conclude that when personality is not taken into consideration, a worker will experience more psychological distress when faced with high psychological demands and will experience less psychological distress when provided with support from a supervisor. With regards to the control variables, two were positively associated with psychological distress: being female ($b=1.10$, $p < 0.01$) and tobacco consumption ($b=0.13$, $p < 0.01$). Thus, women were significantly more likely to experience psychological distress than men and high tobacco consumption was associated with higher psychological distress. On the other hand, two variables were negatively associated with psychological distress: being in a couple ($b=-0.66$, $p < 0.01$)

and physical activity ($b=-0.14$, $p < 0.05$). Workers who were in a couple experienced less psychological distress than those who were single and workers who engaged in more physical activity experienced less distress.

The second model proceeded with the inclusion of the Big Five personality traits into the analyses. With personality included, psychological demands ($b=0.12$, $p<0.01$) and support from a supervisor ($b=-0.16$, $p<0.01$) continued to have the same effect on psychological distress as in the initial model. This allows us to confirm H3 and H8, such that psychological demands are positively related to psychological distress and social support from a supervisor is negatively related to psychological distress. H1, H2, H4, H5, H6, H7, H9, H10, and H11 are therefore not confirmed. When looking at the personality traits we find that neuroticism is positively associated with psychological distress ($b=0.25$, $p < 0.01$) such that a worker who is high on the neuroticism trait will experience more psychological distress than a worker who is low on this trait. This hereby confirms H15. Since neither of the other four traits showed a significant relationship with psychological distress, H12, H13, H14, and H16 are not confirmed. With regards to the control variables, being female ($b=1.09$, $p<0.01$) and tobacco consumption ($b=0.12$, $p < 0.01$) remain positively associated to psychological distress and being in a couple ($b=-0.67$, $p < 0.01$) and engaging in physical activity ($b=-0.13$, $p < 0.05$) remain negatively associated to psychological distress as was the case in model 1.

Table 9 - Results of linear regression analysis

Psychological distress	Model 1	Model 2	Model 3.1	Model 3.2	Model 3.3	Model 3.4	Model 3.5	Model 3.6
Work organization conditions								
Skill utilization	0.00	0.00	-0.08	-0.06	-0.09	-0.36	0.06	0.00
Decisional authority	-0.02	-0.01	-0.09	-0.02	0.01	-0.24	-0.23	-0.01
Psychological demands	0,13**	0,12**	0.27	0.32	-0.13	0,71**	0.18	0,59**
Physical demands	0.02	0.00	-0.47	-1.05	1.73	0.06	-0.78	-0.01
Number of hours worked	0.01	0.01	0.18	0.02	-0.05	0.16	0.23	0.01
Irregular schedule	0.06	0.07	-0.68	0.27	0.25	-0.32	-0.89	0.07
Support from colleagues	-0.12	-0.10	-0.22	-0.06	0.44	-0.39	0.72	-0.11
Support from supervisors	-0,16**	-0,16**	-0.03	0.58	-0.14	0.10	0.55	-0,14**
Pay	-0.10	-0.09	0.09	-0.14	0.28	-0.33	-0.30	-0.08
Job insecurity	0.09	0.07	1.91	0.73	0.39	-1.04	0.42	0.09
Control variables								
Age	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02
Gender (female)	1,10**	1,09**	1,08**	1,12**	1,06**	1,11**	1,13**	1,07**
Marital status (couple)	-0,66**	-0,67**	-0,67**	-0,61*	-0,62*	-0,60*	-0,70**	-0,67**
Education	-0.03	-0.06	-0.08	-0.06	-0.05	-0.04	-0.08	-0.04
Occupation (police)	0.36	0.42	0.40	0.34	0.49	0.42	0.56	0.42
Alcohol consumption	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.03
Tobacco consumption	0,13**	0,12**	0,12**	0,12**	0,11**	0,12**	0,12**	0,12**
Physical activity	-0,14*	-0,13*	-0,14*	-0,13*	-0.12	-0.12	-0,14*	-0,13*
Personality traits								
Extraversion		-0.05	0.21	-0.05	-0.05	-0.04	-0.06	-0.05
Agreeableness		0.02	0.02	0.68	0.01	0.01	0.04	0.02
Conscientiousness		-0.04	-0.05	-0.03	-0.04	-0.47	-0.03	0.64
Neuroticism		0,25**	0,25**	0,25**	0.49	0,24**	0,23**	0,23**
Openness to experience		-0.01	-0.01	-0.01	-0.03	-0.02	1.11	-0.01
Interaction variables								
(1) Extraversion								
X Skill utilization			0.01					
X Decisional authority			0.00					
X Psychological demands			-0.01					
X Physical demands			0.03					
X Number of hours worked			-0.01					
X Irregular schedule			0.05					
X Support from colleagues			0.01					
X Support from supervisor			-0.01					
X Pay			-0.01					
X Job insecurity			-0.12					
(2) Agreeableness								
X Skill utilization				0.00				
X Decisional authority				0.00				
X Psychological demands				-0.01				
X Physical demands				0.06				
X Number of hours worked				0.00				
X Irregular schedule				-0.01				
X Support from colleagues				0.00				
X Support from supervisor				-0.04				
X Pay				0.00				
X Job insecurity				-0.04				

(3) Neuroticism								
X Skill utilization						0.01		
X Decisional authority						0.00		
X Psychological demands						0.02		
X Physical demands						-0.14		
X Number of hours worked						0.00		
X Irregular schedule						-0.02		
X Support from colleagues						-0.04		
X Support from supervisors						0.00		
X Pay						-0.03		
X Job insecurity						-0.03		
(4) Conscientiousness								
X Skill utilization						0.02		
X Decisional authority						0.01		
X Psychological demands						-0,04*		-0,03*
X Physical demands						-0.01		
X Number of hours worked						-0.01		
X Irregular schedule						0.02		
X Support from colleagues						0.02		
X Support from supervisors						-0.02		
X Pay						0.02		
X Job insecurity						0.07		
(5) Openness to experience								
X Skill utilization							0.00	
X Decisional authority							0.01	
X Psychological demands							0.00	
X Physical demands							0.05	
X Number of hours worked							-0.01	
X Irregular schedule							0.06	
X Support from colleagues							-0.05	
X Support from supervisors							-0.04	
X Pay							0.01	
X Job insecurity							-0.02	
Constant	2.66	0.59	-3.47	-10.39	-2.25	6.97	-17.32	-10.33
R2	0.30	0.32	0.32	0.31	0.32	0.33	0.32	0.33
F	10.37	9.05	6.53	6.38	6.62	6.97	6.66	8.94

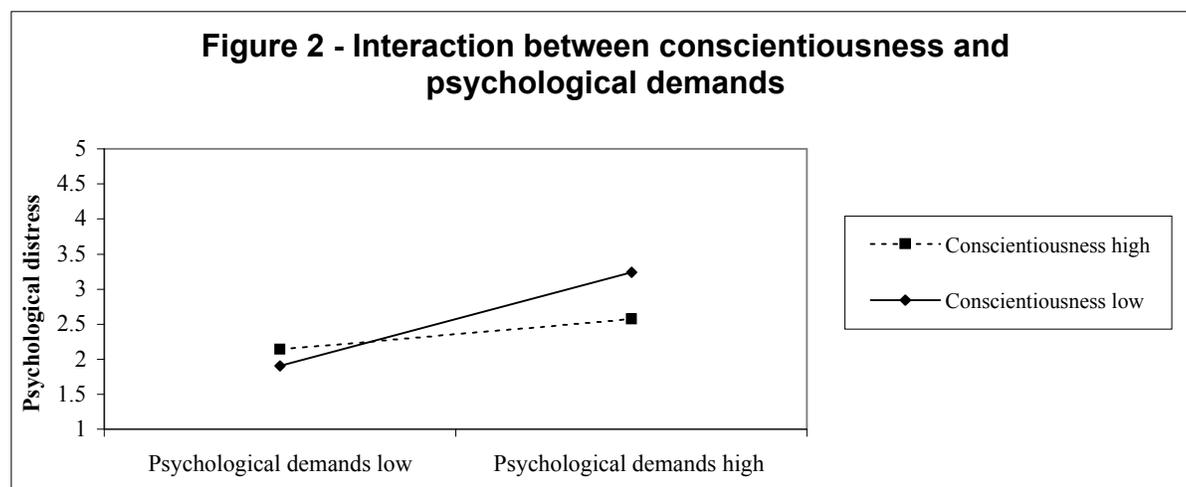
*: $p < 0.05$ **: $p < 0.01$

As previously mentioned, model 3 is composed of six phases which allow us to determine whether any of the Big Five personality trait have a moderating effect on the relationship between work organization conditions and psychological distress. Phase

one was concerned with the inclusion of the ten interaction variables which involve the extraversion trait. However none showed a significant moderating effect. Phase two proceeded with the inclusion of the interaction variables involving the agreeableness trait. Once again, none of the interaction variables were significant. Similarly, phase three brought about a set of interaction variables which included the neuroticism trait, but none showed a moderating effect. On the other hand, phase four was concerned with the interaction variables which included conscientiousness and one of the interaction variables was found to be significant. Results showed that conscientiousness reduces the effect of psychological demands on psychological distress ($b=-0.04$, $p<0.05$). Finally, phase five included the final personality trait, the interactions involving openness to experience. However, none of the interaction variables were significant.

Phase six served to ensure that the significant interaction found in the previous five phases still holds true with all things considered. In this final phase, psychological demands ($b=0.59$, $p<0.01$) were positively related to psychological distress. Furthermore, support from a supervisor ($b=-0.14$, $p<0.01$) was negatively related to psychological distress. Neuroticism ($b=0.23$, $p<0.01$) maintained its direct effect on psychological distress and the control variables, being female ($b=1.07$, $p<0.01$), being in a couple (-0.67 , $p<0.01$), tobacco consumption ($b=0.12$, $p<0.01$) and physical activity ($b=-0.13$, $p<0.05$) remained significant. Furthermore, the interaction variable (conscientious x psychological distress) remained significant ($b=-0.03$, $p<0.05$). This interaction is represented in Figure 2. The results presented above hereby give partial support to H19, given that conscientiousness produced a moderating effect such that in

more conscientious workers, psychological demands contribute less to psychological distress compared to less conscientious workers. Given that no other significant interactions were found, H17, H18, H20 and H21 were not confirmed.



4.4 – Summary of results

In sum, the results obtained in this study have yielded both direct effects and one moderating effect of note. First, we found that both psychological demands and support from a supervisor have a direct impact on the level of psychological distress. Results showed that high psychological demands increased psychological distress while support from a supervisor had the opposite effect. Second, we found that the neuroticism trait had a direct effect on psychological distress. Results showed that workers high on this trait experienced higher levels of psychological distress than those low on this trait. Third, one moderating effect was found involving conscientiousness and psychological

demands. Results showed that psychological demands are associated with higher level of psychological distress, but this association is stronger for less conscientious workers compared to more conscientious workers. Finally, with regards to the control variables, four had a significant impact on psychological distress. Being female and tobacco consumption were shown to increase psychological distress while being in a couple and engaging in physical activity were shown to decrease psychological distress.

The following chapter will provide a detailed discussion of these results.

Chapter 5 – Discussion

This chapter is composed of six main themes. First, a brief overview of the research will be presented. Second, each hypothesis proposed in chapter 3 will be either confirmed or rejected by reference to the results presented in chapter four. Third, we will present the new elements this research has brought to light. Fourth, the strengths and weakness of the research will be discussed. This will be followed by an examination of the implications of the current research. Finally, we will discuss certain paths for future research.

5.1 – Overview of the research

This project sought to disentangle the multiple relationships between work organization conditions, personality characteristics and psychological distress in the workplace. The main question of interest was whether *the Big Five personality traits have a moderating effect on the relationship between work organization conditions and psychological distress*. However, numerous other questions of interest were also explored. In particular, we sought to determine the direct relationships which exist between the three variables noted above and the moderating effect of personality on the relationship between work organization conditions and psychological distress. This allowed us to generate twenty-one hypotheses based on the relationships identified in the literature. The first eleven hypotheses examined the direct relationship between work organization conditions and psychological distress. The next five hypotheses

investigated the direct relationship between the Big Five personality traits and psychological distress. Finally, the last five hypotheses were concerned with the moderating effect of the Big Five personality traits on the relationship between work organization conditions and psychological distress.

In order to test the twenty-one hypotheses in question, we used secondary data collected in a cross-sectional survey of 395 workers from a municipal police service. These results will now be discussed.

5.2 – Supported and partially supported hypotheses

Twenty-one hypotheses were proposed in this study to test the relationship between our three variables of interest: work organization conditions, personality and psychological distress. Of the twenty-one hypotheses, four were supported or partially supported by our results while seventeen were not supported. These results will now be examined in more detail.

Hypotheses concerned with the direct effect of work organization conditions

The first hypothesis to be supported is **H3** which stated that *psychological demands are positively related to psychological distress*. This hypothesis is supported given that the results of our linear regressions showed that psychological demands were significantly related to psychological distress. These results suggest that workers who

are exposed to high psychological demands in the workplace will experience more psychological distress than workers who are exposed to low psychological demands. These findings are concordant with the bulk of the literature which also confirms this relationship (Albertsen et al. 2001; Bourbonnais et al. 1996, 2005; Cole et al. 2002; Paterniti et al. 2002; Vermulen & Mustard 2000). On the other hand, these findings differ from those found by Marchand et al. (2005a) who did not find any relationship between psychological demands and psychological distress. But as stated in section 1.2.3.2.1 this discrepancy may be due to the low internal consistency of the scale used to measure psychological demands in this study.

The second supported hypothesis is **H8** which proposed that *social support from a supervisor is negatively related to psychological distress*. Our multivariate analyses support this hypothesis by showing a significant negative relationship between these two variables. This implies that workers who receive social support from their supervisor will experience less psychological distress than workers who do not receive such support. This in turn suggests that increasing social support from supervisors in the workplace would reduce psychological distress among workers. These findings are concordant with those found in the literature (Albertsen et al. 2001; Lopes et al. 2010; Marchand et al. 2005a; Marchand et al. 2006a).

Hypothesis concerned with the direct effect of personality

H15 is the third hypothesis to be supported by our results. It stated that *neuroticism is positively related to psychological distress*. Our linear regressions showed the statistical significance of this relationship. Results show that workers who are high on the neuroticism trait will experience more psychological distress than workers who are low on this trait. To our knowledge, only one study has examined and supported this relationship between neuroticism and psychological distress (Miller et al. 1999). Nonetheless, these results are not surprising given that Costa & McCrae's (1992) definition of neuroticism implies demonstrating traits such as being worrisome, nervous, emotional and insecure which over time could produce a propensity toward psychological distress as well as other maladaptive responses.

Hypothesis concerning the moderating effect of personality

Finally, **H19** was partially supported by our results. It proposed that *conscientiousness has a moderating effect on the relationship between work organization and psychological distress*. This hypothesis is only partially supported because conscientiousness only moderated the relationship between one work organization condition, psychological demands, and psychological distress. Thus, our results suggest that psychological demands contribute less to psychological distress in conscientious workers compared to less conscientious workers. A potential explanation for this finding may come from the definition of conscientiousness proposed by Costa

& McCrae (1992). Conscientious individuals are described as organized, reliable, hard-working, self-disciplined, punctual, scrupulous, neat, ambitious and persevering. These characteristics may produce an individual who is better equipped to deal with psychological demands such as time pressure, high working pace, high quantity of work, and high mental efforts. In this way, a worker who is organized may be able to accomplish more work in less time than a disorganized worker. A worker who is hard-working and self-disciplined may be willing to accept a heavier work load than a less self-disciplined employee, and a worker who is ambitious and persevering may deal more adequately with high mental efforts if he believes that it will allow him to progress more rapidly compared to a weak-willed or lackadaisical worker. From a more theoretical standpoint, these results are also supported by the multilevel model of worker mental health determinants which proposes that work organization will affect workers mental health differently based on individual variations (Marchand et al. 2006b), in this case, personality. It is important to note however that these results must be interpreted with caution given that the strength of the moderating relationship presented here ($p=0.05$) is weak. This significance level implies that there is up to a 5% chance that the moderating relationship found here was caused by chance alone. Regardless, most statisticians agree that 0.05 is the reasonable alpha level for confirming a hypothesis (Pelham & Blanton, 2007). Furthermore, the slope of the interaction between conscientiousness and psychological demands is small, as demonstrated in Figure 2. This implies that the power of the conscientiousness trait in reducing the impact of psychological demands on psychological distress is not very pronounced.

5.3 – Non-supported hypotheses

Hypotheses concerning the work organization conditions

As previously stated, seventeen hypotheses were not supported by our results. The first is **H1** which stated that *skill utilization is negatively related to psychological distress*. Conversely our results did not show any significant relationship between these two variables. This goes against several studies which have reported a negative relationship between skill utilization and psychological distress (Albertsen et al. 2001; Karasek, 1979; Marchand et al. 2005b). Conversely, our findings are concordant with those of Marchand et al. (2005a). These authors also suggest that the negative relationship observed between skill utilization and psychological distress in numerous previous studies may only have occurred because they failed to take into consideration the influence of family variables, social network outside the workplace and agent personality and thus produce a distorted version of reality. This assertion is supported by the results of Marchand et al. (2005b) where skill utilization loses its significant relationship with psychological distress when family variables, social network, and agent characteristics are considered. With regards to our study, family variables such as marital status and agent characteristics such as alcohol and tobacco consumption, physical activity and education are included as control variables and may reduce the impact of skill utilization. Thus, our findings support the idea that the structure of daily life influences the way a worker is affected by skill utilization.

H2 proposed that *decisional authority is negatively related to psychological distress*. Since our results do not show a significant relationship between these variables we must conclude that this hypothesis is not supported by our study. This does not reflect what was found in the literature. Both Karasek's (1979) demand-control model and Karasek & Theorell's (1990) demand-control-support model suggest that strain increases when workers perceive that they have little or no control over their work, a result not supported by our study. In addition, our findings on this matter oppose those of numerous studies which confirm the relationship between decisional authority and psychological distress (Albertsen et al. 2001; Bourbonnais et al. 1996). However, our findings do coincide with the results of other studies which found no such relationship (de Jonge, 1999; Marchand et al. 2005b). Fox, Dwyer & Ganster (1993) propose an explanation for the absence of a relationship between low decisional authority and psychological distress. They propose that when job autonomy is low, workers are less likely to internally attribute failure and thus experience less distress than if job autonomy is high. Although their findings were applied to health care professionals dealing with life or death situations, it is not a leap to propose that a similar situation may occur in our sample. This is especially for the police officers, who must also face life or death situations in their work. In this light, we propose that the advantages and disadvantages of high and low decisional authority may be similar, explaining the lack of relationship for this work organization condition in our results.

Next, **H4** stated that *physical demands are positively related to psychological distress*. This relationship was not manifested in our results since no significant

relationship was found between these variables. This is at variance with De Jagne et al.'s (1999), Gelsema et al.'s (2006), and Marchand et al.'s (2005b) studies which all found that physical demands increased psychological distress in the workplace. On the other hand, our findings do agree with Marchand et al. (2005a) who also did not find this relationship to be significant. We propose two possible explanations for this result. First, the lack of significance may be due to the one-item scale used to measure physical demands. This scale also does not differentiate between the different types of demands. Another explanation may lie in the physical requirements for becoming a police officer. Potential candidates are subjected to intense physical evaluations as part of the recruitment process. This may imply that those selected for the job are more resistant to the influence of high physical demands. Given that our sample is composed of police officers at 69%, this reasoning may account for the lack of relationship.

Our next hypothesis which was not supported by our results is **H5** which proposed that *the number of hours worked is positively related to psychological distress*. Conversely, our study suggests that the number of hours worked by an employee has no impact on his level of psychological distress. This is consistent with Marchand's (2006) findings that no such relationship seems to exist, but inconsistent with Hilton et al. (2008) and Hayasaka et al. (2007) which found that psychological distress increased when the number of hours worked per week was higher than 60 and 50 hours respectively. Our study is also concordant with Marchand et al.'s (2005a, 2005b) study which only found this relationship to be significant when personality was not considered. We propose that the impact of the number of hours worked on

psychological distress was not shown in our results because it acts on psychological distress indirectly, such as through the work-family interface. This was previously shown by Rantanen et al. (2005) who found that the number of weekly working hours is associated with work-family conflict. Furthermore, numerous studies have demonstrated that conflict within a couple (Clays et al. 2007; Hayasaka et al. 2007; Marchand et al. 2005b, 2006a) and strained parental relations (Almeida & Kesler, 1998; Marchand et al. 2005a, 2005b, 2006a) increase psychological distress. We can easily conceive that working a high number of hours per week on a regular basis would reduce the amount of quality time a worker spends with his family and in turn increase the likelihood of conflicts within the couple, as well as strained parental relations. Overtime, this could lead to the worker experiencing more psychological distress.

H6 which considered the second contractual demand, working on an irregular schedule, proposed that *an irregular work schedule is positively related to psychological distress*. This hypothesis was not supported by our results. We instead found that operating on an irregular schedule had no influence on psychological distress in the workplace. This is consistent with results found by Lopes et al. (2010) and Marchand et al. (2006) but opposed to the significant results found by Marchand et al. (2005a, 2005b). As was the case with the number of hours worked, we propose that working on an irregular schedule is perhaps related to psychological distress in an indirect way. Working on an irregular schedule, especially one that requires the worker to rotate between day, evening and night shifts, as is the case for many young police officers, may increase psychological distress by compromising the social support

network outside of work. In this way, the worker may become disconnected from his social group because he no longer operates on the same schedule as they do. The loss of this support system could reduce the workers resources when in need of help or support making him more vulnerable to experiencing psychological distress.

H7 addressed the importance of social support from colleagues in the workplace, by suggesting that *social support from colleagues is negatively related to psychological distress*. This hypothesis was not supported by our results. Although the literature shows strong support for the importance of social support in the workplace (Albersten et al. 2001; Karasek & Theorell, 1990; Lopes et al. 2010; Marchand et al. 2005a, 2006), few make the distinction between support from colleagues and support from supervisors. Therefore, although our study did not find the relationship between support from colleagues and lower psychological distress to be significant, it remains partially concordant with the literature since support from a supervisor was shown to significantly predict lower psychological distress (H8). Additionally, two alternate explanations for this lack of relationship can be examined. First, Vezina et al. (1992) propose that social support from colleagues may influence psychological distress by helping to solve the problems experienced by the workers. More specifically, we suggest that help from colleagues may allow a worker to deal more effectively with the psychological demands produced by his work. Given that psychological demands were associated with increased psychological distress, this implies that support from colleagues may in fact reduce psychological distress in a more indirect way. A second explanation may be found in the nature of the colleague-to-colleague relationships in

our sample. Police officers typically work in teams where the members are required to fully trust and support each other in order to be effective in a difficult work environment. Thus, it may be possible that since support from colleagues in this group is already high, adding more support will not have a significant impact on reducing psychological distress.

Next, **H9** proposed that *pay is negatively related to psychological distress*. However, the results of our linear regression analyses did not find this relationship to be significant. Our study therefore suggests that lower professional income does not increase psychological distress. This is consistent with the results of Marchand et al.'s (2005a, 2005b, 2006a) studies which showed that when all aspects of daily life are considered the relationship between pay and psychological distress does not exist. Our results on the other hand go against Orpana et al. (2009), McDonough (2000) and Turner et al. (1995) who did find the relationship between pay and psychological distress to be significant. We propose that a possible explanation for our findings derives from Siegrist's (1996) effort-reward imbalance model which suggests that distress will only be experienced if the worker perceives his efforts to be superior to the reward. Thus, even if the employee has a lower salary it will not increase distress as long as he does not believe that his effort is superior to his salary. This may be the case in our sample, thus explaining the lack of relationship.

Moving on to another work organization condition in the gratification category, **H10** proposed that *job insecurity is positively related to psychological distress*. The

results of our study do not provide any support for this hypothesis, and instead, the results suggest that job security does not have an impact on psychological distress in the workplace. This opposes the results of Bourbonnais et al. (1998), Marchand et al. (2005a, 2006) and McDonough (2000). As was the case with several other work organization conditions stated above, we believe that impact of job insecurity may be more indirect by affecting other aspects of a workers life which in turn makes him more vulnerable to psychological distress. In this case we propose that facing insecurity with regards to ones employment and income can cause the individual to become worrisome, insecure, and experience feelings of inadequacy. These are all characteristics that highly resemble the neuroticism trait which our study has found to directly increase psychological distress. We suggest that it may be possible, that exposure to certain stressors, such as job insecurity, could accentuate the impact of the neuroticism trait and thus increase psychological distress. On the other hand, it may also be possible, given that the majority of our sample was made up of unionized workers, that the participants simply experienced less job insecurity than workers in a non-unionized organization due to the protection offered by the collective agreement.

The final hypothesis pertaining to the work organization conditions, **H11**, was not tested, given the exclusion of the recognition variable from the bivariate and multivariate analysis as described in section 4.1.

Hypotheses concerning the direct effect of personality

Moving on to the hypotheses concerning the direct effects of personality, **H12** stated that *extraversion is negatively related to psychological distress*. This hypothesis was not supported by the results of our linear regression models, which is consistent with what was found in the literature (van den Berg & Feig, 2003; Miller et al. 1999). It appears that our findings and the literature agree that the extraversion trait does not have an impact on psychological distress in the workplace. Regardless, we posit that extraversion may indeed lower psychological distress by making it more likely that a worker will seek support from his supervisor. We believe that the characteristics associated with the extraversion trait such as being sociable, talkative, and person-oriented (Costa & McCrae, 1992) would push the worker to seek help or support from his supervisor when he needs help or advice. This would hopefully increase support from their supervisor which has already been shown in this study to be negatively associated with psychological distress.

H13 proposed that *agreeableness is negatively related to psychological distress*. We are unable to support this assumption given the results of our study. Furthermore, to our knowledge, no study had yet examined the relationship between agreeableness and psychological distress in the workplace, therefore no point of comparison exists. However, Rantanen et al. (2005) did find that agreeableness attenuates the link between work-family conflict and marital dissatisfaction. Given that evidence exists to support the link between marital dissatisfaction and psychological distress (Clays et al. 2007;

Hayasaka et al. 2007; Marchand et al. 2005a, 2006a), this may indicate that agreeableness indirectly decreases psychological distress in a more indirect way.

Next, **H14** hypothesized that *conscientiousness is negatively related to psychological distress*. This prediction was not confirmed by our results. In fact, our results found no significant relationship between conscientiousness and psychological distress. To our knowledge, only one study had previously examined conscientiousness in this context (Miller et al. 1999) and they also found that conscientiousness was not a significant predictor of psychological distress. Nonetheless, both our results and those of Miller et al. (1999) agree that conscientiousness acts on psychological distress in a more indirect way by producing the moderating relationship between psychological demands and psychological distress, as confirmed by our findings, and the relationship between role clarity and psychological distress, as discussed in section 1.2.4.3.

The final hypothesis concerning the direct effect of personality is **H16** which suggested that *openness to experience is negatively related to psychological distress*. Once again, the results of our linear regression models did not support this assumption. Instead we found that openness to experience does not have any impact on psychological distress in the workplace. McCrae & Costa (1991) explain that because openness to experience leads to a broader and deeper scope of awareness and a need to enlarge and examine experience, it is positively correlated with both positive and negative affect. In this way, openness to experience acts as a double-edge sword by predisposing individuals to experience both the good and the bad more deeply, making

its influence on well-being unclear (DeNeve & Cooper, 1998). In our study, the openness to experience trait may indeed have had both a positive and a negative impact on psychological distress, thus making it ultimately neutral.

Hypotheses concerning the moderating effect of personality

With regards to the hypotheses pertaining to the moderating effect of personality, **H17** postulates that *extraversion has a moderating effect on the relationship between work organization and psychological distress*. Based on the results of our multivariate analyses, this is not the case. Our results do not support a moderating role of the extraversion trait on the relationship between any of the work organization conditions and psychological distress. We had originally proposed in Section 2.2 that a moderating effect would exist in this case because extraversion would increase social support. This may still be partially true. Our findings indicate that extraversion does not moderate the relationship between support from colleagues or support from supervisors and psychological distress, but it may moderate the relationship between other kinds of support found outside the workplace and psychological distress. Previous research has shown that a social support network outside of work reduces the likelihood of experiencing psychological distress by allowing individuals to deal more easily with the strains of social life (Bourbonnais et al. 1999; Marchand et al. 2005a, 2006a). This may be what is occurring here.

Next, **H18** proposed that *agreeableness has a moderating effect on the relationship between work organization and psychological distress*. The results of our study do not support this hypothesis and instead suggest that the agreeableness trait does not have a moderating effect on the relationship between any of the work organization conditions and psychological distress. Once again, no previous literature exists with which to compare our findings. As was the case with the extraversion trait, we had originally proposed that agreeableness would have a moderating effect on the relationship between social support and psychological distress. We believe that this is partially true. Evidence from previous research links agreeableness to high levels of social support (Bakker et al. 2006). This is not surprising given the characteristics associated with the agreeableness trait, such as being soft-hearted, good natured, trusting, and helpful. Such evidence leads us to believe that an agreeable employee would have a vast support system outside the workplace. This would not only give the worker many opportunities to disconnect from work, such as through social events, but also provide him with a wide array of resources when in need of help. In this way, agreeableness may in fact be a moderator of the relationship between a workers social network outside the workplace and psychological distress.

H20 suggested that *neuroticism has a moderating effect on the relationship between work organization and psychological distress*. The results of our multivariate analyses do not support a moderating impact of the neuroticism traits on the relationship between any of the work organization conditions and psychological distress. We believe that the cross-sectional nature of this study may explain this result. Sutin & Costa

(2010) explain that workers high in neuroticism often have negative occupational trajectories which starts early and persists throughout their working life. Their results suggest that over a significant period of time, neurotic individuals in an established career would have fewer opportunities to learn new skills, express creativity, and/or make their own decisions. Given that these effects are believed to only be visible after a significant period of time they may not have been seen in our results.

Finally, **H21** hypothesized that *openness to experience has a moderating effect on the relationship between work organization and psychological distress*. As was the case with the other three personality traits described above, our results do not support this hypothesis and no prior research exists for comparison. Thus, according to our study, openness to experience has no moderating effect on the relationship between any of the work organization conditions and psychological distress. Given the limited amount of research examining the role of openness to experience in the workplace, this finding is difficult to interpret. But given that neither having an irregular schedule or job insecurity (the two work organization conditions that we had predicted openness to experience would moderate) were significant predictors of psychological distress and that openness to experience itself was not a predictor of psychological distress, it is not surprising that no moderating effect was found in this case.

5.4 – New elements brought to light by this study

The current study has brought to light numerous new elements of note in industrial relations research. Of primary importance, it is the first study to our knowledge to examine the moderating effect of the all the Big Five personality traits in the relationship between work organization conditions and psychological distress. To our knowledge only one study (Miller et al. 1999) had looked at the moderating effect of Big Five personality traits in this context and this only for the conscientiousness trait. This study is also one of few studies which examined the direct effect of all the Big Five personality traits on psychological distress in the workplace. By addressing these two goals, we were able to both confirm findings previously presented in the literature and bring forth new findings to be tested in future research.

First, with regards to the neuroticism trait, our results provide additional support to the only study to examine the direct effect of neuroticism on psychological distress (Miller et al. 1999) by showing a significant positive relationship between the two. Second, with regards to the conscientiousness trait, our results provided new evidence to suggest that it may have a moderating role on the relationship between psychological demands and psychological distress. Although conscientiousness has previously been shown to be a moderator in the relationship between job clarity and psychological distress, such that role clarity was less negatively related to psychological distress when conscientiousness was high (Miller et al. 1999), this is the first time that it has been proven an actor in this particular relationship. Given the moderating effect found in

Miller et al.'s (1999) study and the moderating effect of conscientiousness found in our own study, we can propose that conscientiousness is a significant trait in workplace dynamics. On this subject, Miller et al. (1999) suggest that “personality characteristics may influence perceptions of the work environment or may tap processes through which individuals shape their own work environment” (p. 11). More specifically related to this case, they suggest that conscientiousness attributes such as “carefulness, thoroughness, orderness, deliberation and need for achievement regulate an employees work environment in a way that reduces the impact of work demands on individual reactions to the work environment” (p. 11). Thus, although the strength of the moderating relationship found in our multivariate analysis was weak, it does suggest that possibility that this process of shaping one's own work environment is occurring, even if only in a minimal way.

Globally, the findings of this study suggest that worker personality is not a trivial factor in the working environment, and regardless of how minimal its contribution, it must still be taken into account.

5.5 – Strengths and weakness of this study

The current study has numerous strengths and weakness which will now be discussed. We will begin with the strengths. The first strength of this research is that although secondary data was used, the purpose of the pilot study by the ERTSM, to identify the sources of mental health problems, is aligned with the goal of the current

study. Consequently, the data collected included all the dimensions found in our analytical model allowing us to observe each facet of the issue and address our research question directly. The second strength of this study rests in the validity of the tests used to make up the questionnaire used by the ERTSM. The tests used to measure the work organization conditions, the personality traits, psychological distress and the control variables, have all been tested and validated in previous research, thus adding strength to the validity of our results. Furthermore, the measures used to measure psychological distress and many of the work organizations conditions have high internal consistency (alpha level's between 0.72 and 0.93) as shown in section 3.2. The third strength of this study is the analytical model itself, which controls for the influence of extraneous variables on the results. Variables such as age, sex, marital status, education, etc, were controlled in order to ensure that any direct or moderating effect of a personality trait was in fact due to that trait.

The current study also has some weakness of note. First, the small sample size of 395 workers in a homogenous population is not sufficient to generalize to the entire working population. Although the study considered both civilian employees and police officers rather than only one occupational group, the fact that they are both from the same organizational group limits our ability to extend our findings to other groups. Furthermore, given that being a police officer is an atypical employment which is not reflective of the general working population, these findings must be interpreted with caution. Second, the cross-sectional nature of this study does not allow us to propose a causal explanation for the sources of psychological distress given that we only measure

our findings at one moment in time. A longitudinal study would have been better equipped to provide causal links rather than simple associations. Third, reliance on self-reported data raises the concern about common method variance. This is variance that occurs due to the way a variable is measured rather than to the variable itself. This may occur when participants do not answer questions truthfully or correctly because of social desirability concerns, item ambiguity, priming effects, and/or simultaneous measurement of predictors (Podsakoff, MacKenzie, Lee, Podsakoff, 2003). Fourth, the openness to experience trait had low internal consistency ($\alpha = 0.57$) which may have caused an underestimation of the effects.

5.6 – Practical implications

Several practical implications can be drawn from the present findings. First, regarding the work organization conditions, employers should become familiar with the psychological demands associated with each position in their company in order to better monitor employees who occupy positions with high psychological demand. Vearing & Mak (2007) suggest that these employees could then be provided with stress prevention and management programs with a specific focus on relaxation techniques, the importance of physical activity, increased awareness of emotions, and strategies for coping with anxiety and worry. Employers should also invest in increasing supervisor support in the workplace. In order to accomplish this, Vearing & Mak (2007) propose two techniques. First, alert supervisors to the payoffs that come from displaying

sensitivity to their subordinates, and second, provide training to supervisors on how to effectively offer support and assistance to employees.

Second, regarding the direct effect of personality, employers should consider having all employees complete personality assessments in order to identify individuals who are high on the neuroticism trait and therefore potentially at risk for psychological distress. As mentioned earlier, this type of employee screening is still a controversial issue due to questions of validity, faking and ethics. However, if this type of screening could prevent an employee from experiencing psychological distress and the process is carried out in a confidential and non-discriminatory manner, it should be done for the employees best interest. Furthermore, results from these tests should not be used as an employee selection criterion, but as a tool to improve employee health and well being. In this way, employees who are identified as being high on the neuroticism trait, and thus at risk for experiencing psychological distress, could be invited to participate in stress prevention and management programs at their own discretion or be referred to the companies employee assistance program. This would allow employees to acquire information and help, without jeopardizing their workplace relations.

Third, with regards to the moderating effect of personality, we can look at the moderating effect of conscientiousness on the relationship between psychological demands and psychological distress in two ways. First, as described above for the neuroticism trait, workers who occupy positions with high psychological demands and who score low on the conscientiousness trait could be targeted for stress prevention and

management programs. Second, personality measures could be used for the evaluation of candidates for internal promotions to jobs with high psychological demands. We are in no way suggesting that personality should be a decisive criterion in such a decision, but, it could be a useful tool. In this way, a candidate who is high on the conscientiousness trait should be better equipped to deal with the increased psychological demands than a candidate who is low on this trait. On another note, when a candidate for promotion is judged as having personality weaknesses, such as being low on conscientiousness, actions could be taken prior to or during the promotion process to compensate for these limitations. This could include training to improve conscientiousness associated behaviors such as organization and self-discipline.

5.7 – Future research

Future research could be carried out to both improve and expand the scope of the current study. A larger sample should be used, encompassing workers from a variety of different occupations in a variety of different locations. This would not only increase the statistical power of the findings but also greatly increase the generalizability of the results. A longitudinal study could also be undertaken. Such a study could not only help to measure cause-effect relationships between the work organization conditions and personality on psychological distress, but also to estimating the variance of the first two variables influence on psychological distress at numerous points in time throughout a workers career.

Another interesting path future research could take would be to perform a similar study, but look at other mental health problems, such as depression and burnout, in order to explore the direct and moderating effects of personality on these problems. This could further support or reject the influence of personality in mental health problems in the workplace. On a more physiological note, future research could use physiological measures of stress, such as cortisol and alpha-amylase, as a point of comparison for the self-reported measures of mental health problems. Finally, future research could test different ways of diagnosing mental health problems in the workplace and different ways of intervening in order to find the most effective methods.

Conclusion

Mental health problems in the workplace represent a significant predicament for organizations and society alike. They represent not only a large economic burden but also place a heavy toll on worker health and well-being. In the first chapter of this thesis we demonstrated that mental health problems, such as psychological distress, job burnout and depressive symptoms, have their origins in numerous dimensions. First, work organization conditions play their part by increasing or decreasing the risk of experiencing mental health problems. Second, individual characteristics, such as personality, make individuals more or less likely to be affected by these mental health problems. Finally, on another level, personality may modify the way individuals react to similar work organization conditions and thus produce either positive or negative moderating effects. This effect is precisely what this research sought to explore with its research question: *do the Big Five personality traits have a moderating effect on the relationship between work organization conditions and psychological distress?*

The results of our study brought to light four significant interactions. First we found that two work organization conditions were directly associated to psychological distress. High psychological demands in the workplace were shown to increase psychological distress, while social support from a supervisor decreased psychological distress. Second, results showed that one personality trait, neuroticism had a positive relationship with psychological distress. Third, we found one moderating relationship which addressed our research question which showed that conscientiousness has a

moderating effect on the relationship between psychological demands and psychological distress. Finally, the analyses of our control variables showed that being female and consuming tobacco increased psychological distress while being in a couple and engaging in physical activity reduced psychological distress.

Throughout this thesis numerous suggestions were brought forth for the application of current and previous findings in the workplace. These suggestions included making employers aware of the work organization conditions used in their organization which puts their employees at risk for experiencing mental health problems; inciting employers to provide stress prevention and management programs to employees who may be at risk; advising employers to include personality assessments in their hiring process to identify employees high on the neuroticism trait who may be at a higher risk of experiencing psychological distress and providing them help accordingly; and advising employers to consider personality as one of the measures for getting employees into a position that is right for them.

Given that this study is one of few to address this issue and that it has minimal generalizability to the working population due to its small sample size and homogeneous population, it can only be considered a stepping stone for future research. Regardless, looking at the literature and the results of the current study we can conclude that personality, and more specifically the Big Five personality traits, are associated to mental health problems in the workplace in a mitigated way.

References

- Albertsen, K., Nielsen, M.L. & Borg, V. (2001). The Danish psychosocial work environment and symptoms of stress: the main, mediating and moderating role of sense of coherence. *Work & Stress, 15*(3), 241-253.
- Alexander, J.C. (1987). Action and its environments. In J.C. Alexander, B. Giesen, R. Münch, & N.J. Smelser (Eds), *The micro-macro link* (pp. 289-318). Berkeley: University of California Press.
- Almeida, D.M. & Kessler, R.C. (1998). Everyday Stressors and Gender Differences in Daily Distress. *Journal of Personality and Social Psychology, 75*: 670-680.
- American Educational Research Association, American Psychological Association & National Council on Measurement in Education. (1999). Standards for educational and psychological testing. Washington, D.C.: American Psychological Association.
- American Psychological Association (2000) *Diagnostic and Statistical Manual of Mental Disorders IV-TR*. (Fourth Edition, Text Revision.) Washington: American Psychiatric Association
- Archer, M.S. (1995). *Realist social theory: The morphogenetic approach*. Cambridge: Cambridge University Press.
- Bakker, A.B., Van der Zee, K.I., Lewig, K.A. & Dollard, M.F. (2006). The relationship between the Big Five Personality Factors and Burnout: A study Among Volunteer Counselors. *The Journal of Social Psychology, 146*(1), 31-50.
- Baldwin, P. Dodd, M. & Rennie, J. (1999). Young dentists' work, wealth, health and happiness. *British Dental Journal, 186*, 30-36.
- Barrick, M., & Mount, M. (1991). The Big Five personality dimensions and job performance : a meta-analyses. *Personnel Psychology, 44*, 1-26.
- Bourbonnais, R., Brisson, C., Moisan, J., & Vézina, M. (1996). Job strain and psychological distress in white-collar workers. *Scandinavian Journal of Work, Environment and Health, 22*, 139-145.
- Bourbonnais, R., Comeau, M., Vezina, M. & Dion, G. (1998). Job strain, psychological distress, and burnout in nurses. *American Journal of Industrial Medicine, 34*: 20- 28.
- Bourbonnais, R., Comeau, M., & Vézina, M. (1999). Job strain and evolution of mental health among nurses. *Journal of occupational health psychology, 4*, 95-107.

Bourbonnais, R., Brisson, C., Malenfant, R., & Vézina, M. (2005). Health care restructuring, work environment, and health of nurses. *American Journal of Industrial Medicine*, 47, 54-64.

Buhler, K.E., & Land, T. (2003). Burnout and personality in intensive care: An empirical study. *Hospital Topics: Research and Perspectives on Health Care*, 81, 5-12

Bultmann, U., Kant, I., Van den Brandt, P., Kasl, S. (2002). Psychosocial work characteristics as risk factors for the onset of fatigue and psychological distress: prospective results from the Maastricht Cohort Study. *Psychological Medicine*, 31, 333-345.

Caprana, G. V., & Cervone, C. (2000). *Personality: Determinants, dynamics, and potentials*. New York: Cambridge University Press.

Clays, E., De Bacquer, D., Leynen, F., Kornitzer, M., Kittel, F. & De Backer, G. (2007). Job stress and depression symptoms in middle-aged workers: prospective results from the Belstress Study. *Scandinavian Journal of work, environment & Health*, 33, 252-259.

Clumeck, N., Kempnaers, C., Godin, I., Dramaix, M., Kornitzer, M., Linkowski, P., & Kittel, F. (2009). Working conditions predict incidence of long-term spells of sick leave due to depression: results from the Belstress I prospective study. *Journal of Epidemiological Community Health*, 63, 286-292.

Cole, D. C., Ibrahim, S., Shannon, H. S., Scott, F. E., & Eyles, J. (2002). Work and life stressors and psychological distress in the Canadian working population: A structural equation modeling approach to analysis of the 1994 National Population Health Survey. *Chronic Diseases in Canada*, 23(3), 91-99.

Costa, P.T., JR., & McCrae, R.R. (1992). *NEO-PI-R: Professional manual*. Odessa, FL: Psychological Assessment Resources.

Daveluy, C., Pica, L., Audet, N., Courtemanche, R., Lapointe, F., Côté, L., et al. (2000). *Enquête sociale et de santé 1998*. Québec: Institut de la statistique du Québec.

De Jonge, J., Janssen, P. P. M., & Bakker, A. B. (1999). Specific determinants of intrinsic work motivation, burnout and turnover intentions: a study among nurses. *Journal of Advanced Nursing*, 29, 1360-1369.

DeNeve, K., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 124, 197-229.

Desjardins, C. (2000). Les tests de personnalité. *Effectif*, 4(5).

Devereux, J., Hastings, R., & Noon, S. (2009). Staff stress and burnout in intellectual disability services: work stress theory and its application. *Journal of applied research in intellectual disabilities*, 22 (6), 562-573.

Dompierre, J., Lavoie, F. et Pérusse, M. (1993) Les déterminants individuels, interpersonnels et organisationnels de la détresse psychologique en milieu de travail. *Journal of Occupational Health Psychology*, 3, 243-264.

Donnellan, M.B., Oswald, F.L., Baird, B.M., Lucas, R.E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality, *Psychological Assessment*, 18(2), 192-203.

Dragano, N., He, Y., Moebus, S., Jöckel, K-H. & Erbel, R. (2008). Two models of job stress and depressive symptoms- Results from a population-based study. *Social Psychiatry and Psychiatric Epidemiology*, 43, 72-78.

Drapeau, A., Rousseau, C., & Boivin, J-F. (2002). Mesure de la santé mentale dans une enquête longitudinale populationnelle. *Santé Mentale*, 2, 89-120.

Elovaino, M., Kivimäki, M., Ek, E., Vahtera, J., Honkonen, T., Taanila, A., Veijola, J. & Järvelin, M-R. (2007). The effect of pre-employment factors on job control, job strain and psychological distress: A 31- year longitudinal study. *Social Science & Medicine*, 65, 187-199.

Enquête sociale et de santé 1998. Québec: Institut de la statistique du Québec.

Fox, M., Dwyer, D., Ganster, D. (1993). Effects of stressful job demands and control on psychological and attitudinal outcomes in a hospital setting. *Academy of Management Journal*, 36, 289-312.

Finkelstein, M., Kubzansky, L.D., Capitman J., & Goodman, E. (2007). Socioeconomic Differences in Adolescent Stress: The Role of Psychological Resources. *Adolescent Health*, 40(2), 127-134.

Galanakis, M., Stalikas, A., Kallia, h., Karagianni, C., & Karela, C. (2009). Gender differences in experiencing occupational stress: The role of age, education and marital status. *Stress and Health*, 25(5), 397-404.

Gelsema, T., Van der Doef, M., Maes, S., Janssen, M., Akerboom, S., & Verhoeven, C. (2006). A longitudinal study of job stress in the nursing profession: Causes and consequences. *Journal of Nursing Management*, 14(4), 289-299.

Giddens, A. (1987). *La constitution de la société*. Paris: Presses Universitaires de France.

- Goldberg, L.R. (1981). Language and individual differences: the search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of personality and social psychology* (pp. 141-165). Beverly Hills, CA: Sage.
- Goldberg, D., & Williams, P. (1988). *User's guide to the GHQ*, NFER-Nelson, Windsor (1988).
- Goldstein, H. (1995). *Multilevel statistical models*. London, New York: Edward Arnold, Halstead Press.
- Goodstein, L., & Layon, R. (1999) Applications of personality assessment to the workplace: a review. *Journal of business and psychology*, 13 (3), 291-322.
- Grant, S. & Langan-Fox, J. (2006). Occupational stress, coping and strain: The combined/interactive effect of the Big Five traits. *Personality and Individual Difference*, 41, 719-732.
- Griffin, J., Greiner, B., Stansfeld, S., Marmot, M. (2007). The effect of self-reported and observed job conditions on depression and anxiety symptoms: A comparison of theoretical models. *Journal of occupational health psychology*, 12 (40), 334-349.
- Hayasaka, Y., Nakamura, K., Yamamoto, M. & Sasaki, S. (2007). Work Environment and Mental Health Status Assessed by General health Questionnaire in Female Japanese Doctors. *Industrial Health*, 45, 781-786.
- Hilton, M., Whiteford, H., Sheridan, J., Cleary, C., Chant, D., Wang, D., & Kessler, R. (2008). The prevalence of psychological distress in employees and associated occupational risk factors. *Journal of Occupational and Environmental Medicine*, 50 (7), 746-57.
- International Labour Office ILO. (2000). *Mental Health in the Workplace*. Geneva: International Labour.
- Jurado, D., Gurpegui, M., Moreno, O., Fernandez, MC., Luna, J.D. & Galvez, R. (2005). Association of personality and work conditions with depressive symptoms. *European Psychiatry*, 20, 213-222.
- Kalleberg, A., Neshelm, T., & Olsen, K. (2009). Is participation good or bad for workers?: Effects of autonomy, consultation and teamwork on stress among workers in Norway. *Acta Sociologica*, 52, 99-117.
- Karasek, R. A. (1979). Job Demands, Job Decision Latitude, and Mental Strain: Implication for Job Redesign. *Administrative Science Quarterly*, 24, 285-309.
- Karasek, R. A. (1985). *Job content questionnaire and user's guide*. Lowell, MA: Department of Work Environment, University of Massachusetts, Lowell.

Karasek, R. A., & Theorell, T. (1990). *Healthy work: stress, productivity, and the reconstruction of the working life*. New York: Basic Books.

Karasek, K., Brisson, C., Amick, B., Houtman, I., Bongers, P., Kawakami, N. (1998). The job content questionnaire (JCQ): an instrument for internationally comparative assessments of psychological job characteristics. *Journal of Occupation Health Psychology, 3*(4), 322-355.

Kim, H.J., Shin, K.H., & Swanger, N. (2009). Burnout and engagement: A comparative analysis using the Big Five personality dimensions. *International Journal of Hospitality Management, 28*, 96-104.

Kim, H.J., Shin, K.H., & Umbreit, W.T. (2007). Hotel job burnout: The role of personality characteristics. *Hospitality Management, 26*, 421-434.

Kowalski, C., Driller, E., Ernsmann, N., Alich, S., Karbach, U., Ommen, O., Schulz-Niewandt, F., & Pfaff, H. (2010). Associations between emotional exhaustion, social capital, workload, and latitude in decision-making among professionals working with people with disabilities. *Research in developmental disabilities, 31*, 470-479.

Larocque, B., Brisson, C., Blanchette, C. (1998). Cohérence interne, validité factorielle et validité discriminante de la traduction française des échelles de latitude décisionnelle du Job Content Questionnaire de Karasek. *Revue d'épidémiologie et de santé publique, 46*, 371-381.

Larson, L., Rottinghaus, P., & Borgen, F. (2002). Meta-analyses of big six interests and big five personality factors. *Journal of vocational behavior, 61*, 217-239.

Leung, T-W., Siu, O.L. & Spector, P.E. (2000). Faculty Stressors, Job satisfaction, and psychological distress among university teachers in Hong Kong: the role of locus of control. *International Journal of Stress Management, 7*, 121-138.

Lim, K-L., Jacobs, P., Ohinmaa, A., Schopflocher, D. & Dewa, C.S. (2008). A new population-based measure of the economic burden of mental illness in Canada. *Chronic Diseases in Canada, 28*, 92-98.

Lopes, C., Araya, R., Werneck, G., Chor, D., & Faerstein, E. (2010). Job strain and other work conditions: relationships with psychological distress among civil servants in Rio de Janeiro, Brazil. *Soc Psychiat Epidemiol, 45*, 345-354.

Luszczynska, A., & Cieslak, R. (2005). Protective, promotive, and buffering effects of perceived social support in managerial stress: The moderating role of personality. *Anxiety, Stress and Coping, 18* (3), 227-244.

Macklin, D.S., Smith, L.A. & Dollard, M.F. (2006). Public and private sector work stress: Workers compensation, levels of distress and job satisfaction, and the demand-control-support model. *Australian Journal of Psychology*, 58: 130-143.

Mäkikangas, A. & Kinnunen, U. (2003). Psychosocial work stressors and well-being: self-esteem and optimism as moderators in a one-year longitudinal sample. *Personality and Individual Differences*, 35, 537-557.

Marchand, A. (2007). Mental health in Canada: Are there any risky occupations and industries? *International Journal of Law and Psychiatry*, 30, 272-283.

Marchand, A., Demers, A., Durand, P. & Simard, M. (2003). Occupational variations in drinking and psychological distress: A multilevel analysis. *Work. Journal of Prevention, Assessment & Rehabilitation*, 21, 153-163.

Marchand, A., Demers, A., & Durand, P. (2005a). Do occupation and work conditions really matter? A longitudinal analysis of psychological distress experiences among Canadian workers. *Sociology of Health & Illness*, 27, 602-627.

Marchand, A., Demers, A., & Durand, P. (2005b). Does work really cause distress? The contribution of occupational structure and work organization to the experience of psychological distress. *Social Science & Medicine*, 60, 1-14.

Marchand, A., Demers, A., & Durand, P. (2006a). Social structures, agent personality and workers' mental health : a longitudinal analysis of the specific role of occupation and of workplace constraints-resources on psychological distress in the Canadian workforce. *Human Relations*, 59, 875-901.

Marchand, A., Durand, P. & Demers, A. (2006b). Un modèle multiniveaux des déterminants de la santé mentale dans la main-d'œuvre. *Revue Canadienne de Santé Mentale*, 25, 11-30.

McDonough, P. (2000). Job insecurity and health. *International Journal of Health Services* 30, 453-476.

McDonough, P., & Walters, V. (2001). Gender and health: reassessing patterns and explanations. *Social science and medicine*, 52 (4), 547-559.

McCrae, R., & Costa, P. (1991). Adolng liebe und arbeit: The full five factor model and well-being. *Personality and social psychology bulletin*, 17, 227-232.

Miller, R. L., Griffin, M. A., & Hart, P.M. (1999). Personality and organizational health: The role of conscientiousness. *Work & Stress*, 13, 7-19.

Mills, L.B., & Huebner, E.S. (1998). A Prospective Study of Personality Characteristics,

Occupational Stressors, and Burnout Among School Psychology Practitioners. *Journal of School Psychology, 36* (1), 103-120.

Morgeson, F., Campion, M., Dipboye, R., Hollenbeck, J., Murphy, K., Schmitt, N. (2007). Reconsidering the use of personality tests in personnel selection contexts. *Personnel Psychology, 60*, 683-729.

Naswall, K., Sverke, M. & Hellgren, J. (2005). The moderating role of personality characteristics on the relationship between job insecurity and strain. *Work and Stress, 19*, 37-49.

Niedhammer, I., Chastang, J.F., Gendrey, L., David, S., Degioanni, S. (2006). Propriétés psychométriques de la version française des échelles de la demande psychologique, de la latitude décisionnelle et du soutien social du Job Content Questionnaire de Karasek: résultats de l'enquête nationale SUMER. *Santé publique, 18*, 413-427.

Niedhammer, I., Siegrist, J., Landre, M., Goldberg, M., Leclerc, A. (2000). Étude des qualités psychométriques de la version française du modèle d'Équilibre efforts/récompense. *Revue d'épidémiologie et de la santé publique, 48*, 419-437.

Niedhammer, I. (2002). Psychometric properties of the French version of the Karasek Job Content questionnaire: a study of the scales of decision latitude, psychological demands in the GAZEL cohort. *International Archives of Occupational and Environmental Health, 75*, 129-144.

Orpana, H., Lemyre, L. et Gravel, R. (2009) Revenu et détresse psychologique : le rôle de l'environnement social, (No de catalogue 82-003-XPF) : Statistique Canada.

Podsakoff, P., MacKenze, S., Lee, J-Y., & Podsakoff, N. (2003). Common method bias in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88* (5), 879-903.

Parent-Lamarque, A., & Marchand, A. (2010). Une étude sur le rôle modérateur des traits de personnalité sur la relation entre les conditions de l'organisation du travail et la détresse psychologique. *Psychologie du travail et des organization, 16*, 79-99.

Pariante, P., Challita, H., Mesbah, M., Guelfi, J.D. (1992). The GHQ questionnaire in French: a validation survey. *Europe Psychiatry, 7*, 15-20.

Parker, D., Parker, E., Harford, T., & Farmer, G. (1987). Alcohol use and depression symptoms among employed men and women. *American Journal of Public Health, 77*, 704-707.

- Paterniti, S., Niedhammer, I., Lang, T., & Consoli, S. M. (2002). Psychosocial factors at work, personality traits and depressive symptoms. *British Journal of Psychiatry*, 181, 111-117.
- Pearlin, L. I., & Schooler, C. (1978). The Structure of Coping. *Journal of Health and Social Behavior*, 19, 2-21.
- Pearlin, L.I. (1999). Stress and mental health: A conceptual overview. In A.V. Horwitz & T.L. Scheid (Eds.), *A handbook for the study of mental health-social contexts and systems* (pp.161-175). New-York: Cambridge University Press.
- Pelham, B., & Blanton, H. (2007). *Conducting research in psychology: Measuring the weight of smoke*. 3rd Edition. Thomson Wadsworth.
- Piedmont, R.L. (1993). A Longitudinal Analysis of Burnout in the Health Care Setting: The Role of Personal Dispositions. *Journal of Personality Assessment*, 61(3), 457- 473.
- Podsakoff, P., MacKenze, S., Lee, J-Y., & Podsakoff, N. (2003). Common method bias in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88 (5), 879-903.
- Poirier, S., & Longpre, P. (2009). Les tests de personnalité et la discrimination en emploi: Qu'en pensent les tribunaux? *Bulletin évaluation personnel selection international, automne* (3).
- Pomaki, G., Maes, S. & Doest, L. (2004). Work Conditions and Employees' Self-Set Goals: Goal Processes Enhance Prediction of Psychological Distress and Well- Being. *Personality and Social Psychology Bulletin*, 30, 685-694.
- Rafferty, Y., Friend, R., & Landsbergis, P. (2001). The association between job skill discretion, decision authority and burnout. *Work & Stress*, 15 (1), 73-85.
- Rauch, A. & Frese, M. (2008). A personality approach to entrepreneurship. In S. Cartwright & C. Cooper (Eds.) (pp. 121-136). *The Oxford Handbook of Personnel Psychology*. Oxford: Oxford University Press.
- Robertson Blackmore, E., Stansfeld, S., Weller, I., Munce, S., Zagorski, B., & Stewart, D. (2007). Major depressive episodes and work stress: results from a national population survey. *American journal of public health*, 11, 2088-2093.
- Sekine, M., Chandola, T., Martikainen, P., Marmot, M., & Kagamimori, S. (2006). Socioeconomic inequalities in physical and mental functioning of japanese civil servants: explanations from work and family characteristics. *Social science & medicin*, 63(2), 430-445.

- Shimazu, A., de Jonge, J. & Irimajiri, H. (2008). Lagged effects of active coping within the demand-control model: A three-wave panel study among Japanese employees. *International Journal of Behavioral Medicine*, 15, 44-53.
- Shultz, K., Wang, M., Crimmins, E., Fisher, G. (2009). Age differences in the demand control model of work stress: an examination of data from 15 European countries. *Journal of applied gerontology*, 29 (1), 21-47.
- Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology*, 1, 27-41.
- Siegrist, J., & Peter, R. (1996). Threat to occupational status control and cardiovascular risk. *Israel Journal Medical Science*, 32, 179-184.
- Smelser, N.J. (1997). Problematics of sociology: The George Simmel Lecture 1995. Berkeley: University of California Press.
- Snijders, T.A.B., & Bosker, J.R. (1999). *Multilevel analysis. An introduction to basic and advanced multilevel modeling*. London: Sage Publications.
- Statistics Canada, CANSIM, table 282-0087, Catalogue no. 71-001-XIE. Last modified: 2010-03-12
- Sutin, A., & Costa, P. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality*, 78(1), 257-288.
- Tabachnick, B., & Fidell, L. (2007). Using multivariate statistics, 5th edition. *Boston: Allyn and Boston*.
- Thoits, P.A. (1999) Sociological approaches to mental illness. In A.V. Horwitz & T.L. Scheid (Eds.), *A hand- book for the study of mental health-social contexts and systems* (pp. 121-138). New York: Cambridge University Press.
- Tokar, D.M., Fischer, A.R., & Mezydlo Subich, L. (1998). Personality and vocational behavior: A selective review of the literature, 1993-1997. *Journal of Vocational Behavior*, 53, 115-153.
- Turner, R., Wheaton, B., & Llyod, D. (1995). The epidemiology of social stress. *American Sociological Review*, 60, 104-125.
- Van den Berg, P. & Feij, J. (2003). Complex relationships among personality traits, job characteristics, and work behaviors. *International Journal of Selection and Assessment*, 11(4), 326-339.

Van der Doef, M., & Maes, S. (1999) The job demand-control (support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress*, 13, 87-114.

Van Vegchel, N., de Jonge, J., Bosma, H., & Schaufeli, W. (2005). Reviewing the effort-reward imbalance model: Drawing up the balance of 45 empirical studies. *Social science & Medicine*, 60, 1117-1131.

Vearing, A. & Mak, A.S. (2007). Big five personality and effort-reward imbalance factors in employees' depressive symptoms. *Personality and Individual Differences*, 43, 1744-1755.

Vermeulen, M. & Mustard, C. (2000). Gender differences in job strain, social support at work, and psychological distress. *Journal of Occupational Health Psychology*, 5, 428-440.

Vézina, M., Cousineau, M., Mergler, D., & Vinet, A. (1992). *Pour donner un sens au travail. Bilan et orientations du Québec en santé mentale au travail*. Boucherville : Éd. Gaëtan Morin.

Voydanoff, P. & Donnelly, B.W. (1999b). Multiple roles and psychological distress: the intersection of the paid worker, spouse, and parent roles with the role of the adult child. *Journal of Marriage & the Family*, 61, 725-738.

Wheaton, B. (1999a). The nature of stressors. In A.V. Horwitz & T.L. Scheid (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems* (pp. 177-197). New York: Cambridge University Press.

Wheaton, B. (1999b). Social stress. In C.S. Aneshensel & J.C. Phelan (Eds.), *Handbook of sociology of mental health* (pp.277-300). New York, US: Kluwer Academic & Plenum Publishers.

Zellars, K.L., Perrewé P.L., & Hochwarter, W.A. (2000). Burnout in Health Care: The role of the five factors of personality. *Journal of Applied School Psychology*, 30 (8), 1570-1598.