ORGANIZATIONAL CHANGES, EMPLOYEE STRESS, AND CUSTOMER SATISFACTION: EMERGENCE OF THE FLEXIHEALTH CONCEPT

Prof. C. Vandenberghe, coordinator
Université catholique de Louvain

Prof. V. De Keyser
Université de Liège

Prof. P. Vlerick
Universiteit Gent

Prof. W. D'hoore
Université catholique de Louvain

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Introduction

Work organizations have been encountering tremendous changes since the early 1990s. These changes have been diversely called organizational restructuring, revitalization, or reorganization, and in most cases have been accompanied by significant reductions in the employment workforce. These dramatic changes are related to the worldwide globalization of markets and the tendency of most companies to merge into big multinational enterprises.

Given the pervasiveness of these organizational changes, it is surprising how little we know about how different groups of employees react to these changes and how employees' health and well-being can be affected by them. This is even more astonishing that it is well recognized that the success of organizational changes often rests on the motivation and commitment of employees themselves (Armstrong-Stassen, 1998; Kozlowski, Chao, Smith, & Hedlund, 1993). Moreover, one can assume that if organizational changes adversely impact employee health and well-being, they may indirectly decrease performance, and ultimately lead to reduced customer satisfaction with services and products.

The Flexihealth research project has been developed to identify the effects of flexibility practices and changes in work environments on well-being indicators, health and quality of life, and ultimately customer satisfaction indicators. A major starting point of the project was the attempt to isolate the practical changes that accompany large-scale organizational changes. We thought employees are much more sensitive to transformations of their work environement than to more distal changes that may be difficult to understand. Thus, we were interested to identify most frequent changes (change of supervisor, tasks, etc.) and flexibility practices (in terms of labor contract, work time, etc.) encountered by employees and then to assess how they affected health-related outcomes and well-being, and customer satisfaction.

Our research was based on a transactional approach to stress, which basically assumes that the stress process is activated when stressful demands from the environment combine with a lack of personal resources to cope with them. In this process, perception is important. Environmental demands will generate stress outcomes when they are perceived by the individual as threatening. Consistent with this view, we measured not only the objective changes encountered by employees but also how they appraised them, in terms of threat and/or challenge.

Using analyses conducted on a data base built to properly represent the Belgian active population within the secondary and tertiary sectors, we examined the impact of changes and flexibility practices, and their perception, on employee stress, well-being, mental and physical quality of life, and customer satisfaction.

This report includes several sections. The first section is devoted to the presentation of the Flexihealth model. All concepts underlying the research will be thoroughly discussed in this section. The second section begins with a complete description of the scales included in the Flexihealth instrument, and reports the psychometric information relevant to them. This section also conveys the information concerning the creation of the Flexihealth data base. The third section provides the main results of the Flexihealth research program. This section begins with the presentation of findings across demographic groups. Then, the effect of changes and flexibility practices on stress, as moderated by perceptual mechanisms (challenge or threat) is examined. Next, the role of positive stress and control at work is determined. The fourth section of the report deals with the medical aspects of the survey: (a) medical status (personal antecedents and subjective complaints), (b) life habits, and (c) mental and physical quality of life. A key issue there was to determine whether changes and flexibility practices were related to health status. Finally, the fifth section treats the issue of customer satisfaction and its linkages with changes, flexibility practices and other work conditions variables. As customer satisfaction can be assessed by a variety of indicators, we acknowledged this multidimensionality by using the following satisfaction facets: general service quality, tangibles, responsiveness, assurance, empathy, general product quality, satisfaction with products, satisfaction with services, and behavioral intentions (cf.

SERVQUAL instrument developed by Parasuraman, Zeithaml, & Berry, 1991). A general conclusion is offered at the end of the report.

1. Theoretical framework

1.1. Context

Many companies are facing major organizational changes that may affect their staff. Some of them concern the organization at large (restructurings, mergers, downsizings), others affect some specific units, departments or dimensions of the organization (subcontracting, IT projects), and while still others focus on work groups or employees (job redesigns, training devices, and flexible work schedules). All these changes may have implications, either positive or negative, on worker well-being in general and on the quality of work life in particular.

Although numerous experts pointed out the advantages of flexibility for increasing productivity and enhancing the quality of work life through the development of new competencies, one should not neglect the fact that another facet of flexibility has been a severe reduction of the workforce, greater employment precarity, and higher exposure to physical and psychosocial risks on the part of employees. While it is difficult to estimate the magnitude of the negative effects associated with the recent large-scale organizational changes, some authors consider the increase of stress symptoms and burnout among employees as the necessary counterpart of the search for economic efficiency (Hansez & De Keyser, 1997).

The assessment of the effects of organizational changes on employees is at the core of the Flexihealth project. This concept has been introduced to emphasize the importance, for all, to reach a balance between the requirements of flexibility and the necessity to protect employee health. Indeed, current organizational changes necessitate that employees adjust to changes themselves but also adapt to the new working conditions generated by the search of greater flexibility. In reality, these changes whose objective is to increase organizational performance may actually engender counterproductive effects because they may indirectly increase employee stress, and ultimately, lower the quality of services and products (Elliot, 1990).

The Flexihealth project, funded by the Department of Scientific, Technical, and Cultural Affairs, builds on the 1996 law promoting worker well-being, which has been translated into a collective agreement (N°72 of March 30, 1999) stating that each employer has to implement a policy purported to *collectively* prevent employees from being exposed to stress and/or to search for *collective* remedies if needed.

The Flexihealth project permits to conduct *a dynamic analysis of the work conditions that could potentially lead to stress under change conditions*. More precisely, it allows to determine which factors among the consequences of restructurings and flexibility practices represent a source of stress or of well-being among employees.

This research meets (a) the objectives of most organizations which, under conditions of major organizational changes, are concerned with the maintenance of employee motivation, and (b) the goals of politicians and unions, by suggesting avenues for building *a legal environment that would favor flexibility while respecting worker health and well-being*.

More and more organizations are confronted with major organizational changes that affect their employees. As mentioned by Armenakis and Bedeian (1999), the literature related organizational change deals with this issue using four perspectives: the content, context, process and consequences of organizational changes. Most studies that have investigated the consequences of organizational changes focused their attention on *downsizing* practices. Indeed, although layoffs do not represent the sole type of organizational change, they have often been used as a prototypical example of change. Kozlowski et al. (1993, p. 267) defined downsizing as an organizational decision intended to reduce the number of employees in order to improve organizational effectiveness.

The findings associated with the studies conducted on the impact of layoffs display two paradoxes. First, layoffs do not contribute to significant improvements in long-term organizational profitability. Moreover, some researchers (Brockner, 1988 ; Cascio, 1993 ; Kets de Vries & Balazs, 1997 ; Kozlowski et al., 1993) have highlighted the negative consequences of downsizing for both victims and survivors. Indeed, the challenge for any downsizing organization is to maintain or even improve its performance using a workforce that is both reduced and adversely affected by layoffs.

As an example, Armstrong-Stassen (1998) conducted a longitudinal study of the impact of layoffs among civil servants in Canada showing that they were associated with poorer job performance, perception of more employment insecurity, and lower organizational commitment, morale, and trust in management. In another study, Armstrong-Stassen (1997) reported that managers designated as being *redundant* felt more stressed and more generally, this status resulted in negative personal and organizational effects. These findings are in line with Cascio's (1993) contention that more than 50% of survivors report an increase of occupational stress and of symptoms of burnout following an organizational downsizing. Studying the impact of downsizing on employee well-being and health is thus worthwhile.

Nonetheless, these studies do not provide an unambiguous answer to the question as to what concretely happens to employees when they are faced with a major organizational change. Therefore, the development of the psychosocial part of the Flexihealth project was targeted at three objectives. First, we wanted to identify the indicators of changes in workers' environment. Second, we were concerned with the meaning of changes for employees themselves. Finally, we were willing to determine the consequences, either positive or negative, of organizational changes in terms of well-being at work.

1.2. The Flexihealth model

We relied on a stress framework in order to assess the consequences of organizational changes. This type of framework was felt to be relevant here. Indeed, Cartwright and Cooper (1997) distinguished among six types of occupational stress factors, that is job characteristics (e.g., overload, type of work schedule, quality of physical environment, etc.), professional roles (e.g., level of authority, role ambiguity or conflict, etc.), relationships among colleagues, with the supervisor or subordinates, factors associated with career progress (employment insecurity, inter- and intra-organizational mobility, etc.), organizational factors (work climate, corporate culture, management style, etc.), and work-life balance. Of interest, these characteristics may be directly or indirectly related to major changes encountered by organizations.

Figure 1 presents the theoretical model developed by the Flexihealth research group. We provide a brief overview of the psychosocial variables hereafter. These can be grouped into three categories. First, one finds the indicators designed to capture job conditions and their change over time (appraised changes, perceived changes, and flexibility practices). These are followed in the process by mediating variables liable to enlighten how organizational changes do affect employees (e.g., employment insecurity) and by moderating variables depicting the conditions that can enhance, reduce or neutralize the effects of organizational changes on employee well-being (affectivity, self-esteem, external locus of control, organizational support, and control over job conditions). Finally, the model includes indicators of well-being at work (negative stress, positive stress and job satisfaction).

1.2.1 Axis 1 – Working conditions

1.2.1.1. Perception of changes in the work environment as potential sources of stress

Numerous studies, due to their methodology, cannot account for the underlying factors that may explain why a given event but not another one tends to generate more stress among some categories of employees but not among others. In building the Flexihealth instrument, our intention was to develop a method to assess the mechanisms through which changes in the work environment could affect employee well-being.

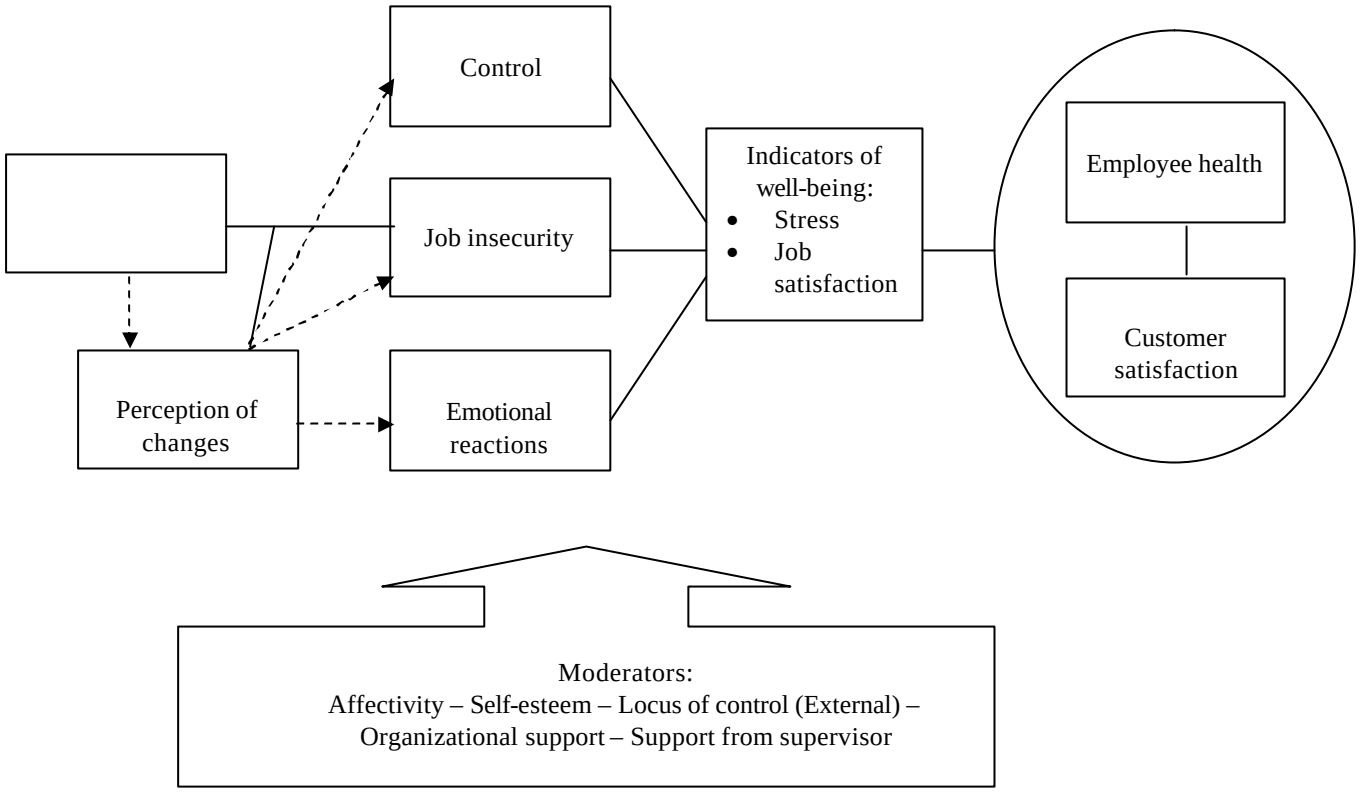


Figure 1. The Flexihealth model

According to Terry and Callan (1997), it is necessary to take into account both situational characteristics and individual perceptions in order to understand how people react to organizational changes. Payne, Jabri, and Pearson (1988) also argue that identifying the affective meaning of job situations is crucial for understanding the extent to which demands are stressful for employees. Indeed, being exposed to a demanding situation does not automatically lead to stress. According to Dewe (1992), conceptualizing stressors as situations that inherently possess a stressful nature and would be straightforwardly perceived as being stressful does not lead to an accurate depiction of stress levels. Payne et al. (1988) contend that work environments are more or less stressful depending on the meaning attributed to them by individuals. The notion of personal *meaning* refers to what Lazarus and Folkman (1984) define as the *appraisal* of events in the stress process.

Therefore, the Flexihealth group adopted a transactional perspective on stress which assumes that individuals' responses, e.g., in terms of personal adjustment efforts, is largely determined by the subjective perception of situations and that some personal and situational characteristics may influence both the appraisal process and adjustment efforts (Schwartz & Stone, 1993). This approach is both *transactional* because stress is viewed as the result of the interaction between individuals and their environments (Cox & Ferguson, 1991), and *evolving over time* because the adjustment efforts of individuals may modify their environment and future reactions or adjustment efforts (De Keyser & Hansez, 1996 ; Schwartz & Stone, 1993).

It is quite common to distinguish *primary* appraisal from *secondary* appraisal. According to Perrewé and Zellars (1999), any person confronted with a given situation tries to determine the extent to which it represents a threat for his/her well-being (primary appraisal). This may result in three types of appraisal: either the situation is *non relevant, positive* (the situation is perceived to be attractive), or *threatening*. Afterwards, through secondary appraisal, the individual will examine whether s/he has means to overcome the situation or problem and/or to adjust to it properly.

To conclude with, the transactional approach views stress as « a response from the worker towards the demands of a situation s/he doubts having the necessary resources to cope with but nonetheless thinks s/he has to deal with » (De Keyser & Hansez, 1996, p. 133). In the context of organizational changes, this means that events will be perceived as either positive or negative depending on the meaning employees will attribute to them and that objective changes will not tell us much about the actual stress reactions among employees. Payne and Morrison (1999) regret however that few studies have independently assessed the situations

individuals are faced with from the meaning they attribute to them. Therefore, the Flexihealth group made a distinction between actual changes and how they were perceived.

1.2.1.2. Flexibility practices

Everaere (1997) defines flexibility as « the ability to adjust under the double constraint of uncertainty and urgency ». The introduction of flexibility in the management of organizations is a response by which companies adapt their structures, operations, and staff to the demands of international competition. This trend towards flexibility is justified by the evolution of markets. Jenkins (1998) also stresses that, concerned by the increasing number of bankruptcies, governments have encouraged organizations to use more proactive forms of management, notably to avoid layoffs.

Employment flexibility has been increasing from the early 1990's. It would affect a quarter if not one third of the workforce. These practices are associated with constant changes that engender side-effects (e.g., more stress reactions). Atypical forms of employment contracts do appear as well (flex-time contracts, fixed-term contracts, etc.). These new forms of flexibility practices have been incorporated into Flexihealth surveys.

Flexibility practices affect the type of labor contract, salaries, work schedules, job descriptions (workload, level of authority, etc.), appraisal systems, control systems (number of procedures, automated procedures, etc.), the social environment (telecommuting, work climate, etc.), professional skills (use of competencies, polyvalence, etc.), and customer-related behaviors. Klein Hesselink and Van Vuuren (1999) suggested distinguishing between work flexibility (internal flexibility) and employment flexibility (external flexibility). The former affects permanent workers and the adjustment of the characteristics of their jobs to the requirements of organizations while the latter addresses flexibility among labor contracts and consequently concerns temporary workers more directly.

These flexibility practices may affect work-related well-being through different ways. First, they contribute to the intensification of work. That is, the trend is towards quantitative intensification, meaning that there are fewer workers for the same global workload. Second, intensification may also be qualitative, such that there is both a lateral and vertical expansion of tasks that contributes to job enrichment. In other words, jobs are becoming more complex and require more sophisticated competencies for proper completion of tasks.

Flexibility practices may also have a detrimental effect on work-related well-being via an increase of job insecurity. However, relationships among flexibility, job insecurity and well-being are complex. According to Klein Hesselink and Van Vuuren (1999), temporary workers will experience higher levels of job insecurity because they do not benefit from long-term labor contracts. On the other hand, these workers have less to loose than permanent workers. So, their reactions may be less severe. Klein Hesselink and Van Vuuren (1999) stress the fact that temporary workers do not have the same expectations than permanent workers towards their employer. Thus, they assert that a large portion of flexible workers prefer a flexible contract rather than steady employment.

1.2.2 Axis 2a – Mediating variable

1.2.2.1. Job insecurity

Ashford (1988) as well as Nelson, Cooper, and Jackson (1995) noted that it is essential to examine ① how organizational changes globally affect employees and ② what characteristics of work environments mediate these effects. According to Nelson et al. (1995), employees' perceptions of uncertainty are an essential part of that process. These researchers actually found that during times of organizational turbulence, job satisfaction and mental and physical health appear to decrease. Although these effects differ across groups of employees, those at risk include individuals who experience the greatest uncertainty and have little control over their situation.

Greenhalgh and Rosenblatt (1984) suggested adopting a multidimensional perspective on job insecurity, defined as the perceived inability to maintain employment within the context of a threatening environment (Greenhalgh & Rosenblatt, 1984, p. 438). Ashford, Lee and Bobko (1989) recommend measuring the insecurity related to losing some valued components of work, the perceived risk of losing one's job, and the

feeling of not being able to neutralize the perceived threats. In contrast, Jacobson (1991) suggests limiting the measure of job insecurity to uncertainty concerning the maintenance of one's job. This subjective appraisal represents the perceived probability of keeping one's job in the future. According to Klandermans, Van Vuuren, and Jacobson (1991), job insecurity will be proportional to the perceived probability of losing one's job and to the seriousness of the consequences associated with this loss.

Numerous empirical studies (Ashford et al., 1989 ; De Witte, 1999 ; Ferrie et al., 2001 ; Kinnunen, Mauno, Natti, & Happonen, 2000 ; Probst, 2000 ; Reissman, Orris, Lacey, & Hartman, 1999 ; Roskies & Louis-Guérin, 1990 ; Roskies, Louis-Guérin, & Fournier, 1993) have demonstrated the relevance and importance of job insecurity during changing times. Along this line, de Vries and Balazs (1997) stated that the long-lasting threat of being laid off is potentially the primary source of the worsening of psychological well-being and may cause stress deseases. Within the Flexihealth research project, this variable has been considered as a potential mediator of the effects of changes on employee work-related well-being.

1.2.3 Axis 2b – Moderating variables

Because *appraisal* plays a central role in the understanding of employee reactions to changes, its origins are important to identify. Among them, individual differences are potentially important and relevant. Some empirical studies (Armstrong-Stassen, 1998; Judge, Thoresen, Pucik, & Welbourne, 1999) showed indeed that these variables are critical. In this research, four dispositional variables were considered, positive and negative affectivity, self-esteem, and locus of control.

Relatedly, some organizational characteristics are also likely to influence individuals' reactions towards changes encountered. We focused our attention on perceived organizational support, perceived supervisor support, and on control over working conditions. These variables have been included in the Flexihealth surveys.

1.2.3.1. Negative and positive affectivity

The concept of negative affectivity has been introduced by Watson and Clark (1984) who defined it as a personality trait related to mood. According to them, individuals whose affectivity is negative tend to focus on the negative aspects of themselves, others and of the world in general, and are more inclined to feel distressed in most situations. In contrast, those who are high on positive affectivity feel enthusiastic, full of energy, concentrated and determined.

Several studies demonstrated that negative affectivity is associated with measures of psychological tension (Brief et al., 1988; Eysenck, 1991; Nelson et al., 1995), management's adjustment efforts (Armstrong-Stassen, 1994 ; Judge et al., 1999 ; Roskies et al., 1993), and perceptions of social support (Vinokur, Schul, & Caplan, 1987). However, Watson, Pennebaker, and Folger (1987) hypothesized that the correlations reported between stressors and tensions may be explained by the fact that they represent those sides of the same phenomenon, the tendency to respond negatively. According to these authors, negative affectivity may be a confounding variable because it correlates with both the perception of environmental characteristics and with measures of psychological tension. Watson et al. (1987) predicted that the relation between perceptions of the environment and tension would tend to zero when negative affectivity is controlled for.

In a review of the negative affectivity literature, Moyle (1995) examined the links between stressors, well-being and job satisfaction, and negative affectivity. He contended that the role of the latter may be of four different types. It may have (a) a *direct effect* on stress measures, (b) an *indirect effect* on tensions via perceptions of stressors, (c) a *moderating effect* on the relationship between stressors and tensions, or (d) a *substitution effect* on the relationship between stressors and tensions. The findings can be summarized as follows.

First, negative affectivity, albeit negatively associated with job satisfaction and well-being, displays stronger correlations with well-being than with job satisfaction. Second, even if negative affectivity accounts for a significant portion of the correlation between perceptions of environment and job satisfaction and well-being (a substitution effect), this correlation remains significant after negative affectivity has been controlled for. Moreover, negative affectivity does not contribute to inflate the correlation between stressors and job

satisfaction. Third, individuals who report higher negative affectivity also report less perceived control, with the latter predicting job satisfaction. Perceived control mediated the relationship between negative affectivity and job satisfaction. In other words, it might be that negative affectivity contributes to modify the perceptions of the environment such that the individual feels less in control when s/he is high in negative affectivity. Fourth, negative affectivity exerted a moderating effect on the relationships between stressors and well-being but not between stressors and job satisfaction. In fact, individuals with low negative affectivity reported fewer stress symptoms, all else being equal.

In contrast to negative affectivity, positive affectivity has not been extensively examined in connection with stressors and tensions. One may however argue that positive affectivity would correlate negatively with stress measures. As an example, Cropanzano, James, and Konovsky (1993) demonstrated that negative and positive affectivity are associated with a variety of work attitudes. However, Moyle (1995) reported non significant associations between positive affectivity and tensions.

1.2.3.2. Self-esteem

Pierce, Gardner, Cummings, and Dunham (1989) stated that many studies that investigated the role of self-esteem did so with the assumption that the way the individual reacts to work situations varies according to his/her level of self-esteem. Kahn and Byosiere (1992) argued that self-esteem can be considered as a personal resource that can be used to cope successfully with stressful situations. Self-esteem may affect the perception of work situations, the choice of coping strategies or the intensity with which a given individual takes action.

Korman (1976) predicted that individuals tend to maintain or preserve their level of self-esteem. Individuals with a high self-esteem would develop positive attitudes towards their job and behave so as to maintain their level of self-esteem, hence will be effective at work in order to be consistent with the feeling of being competent. In contrast, those with a low self-esteem will tend to develop negative attitudes towards their job and be less productive in order to match their feeling that they are not competent.

In terms of measurement, several authors recommended that self-esteem be targeted towards the attitude or behavior one wants to predict (Simpson & Boyle, 1975; Song & Hattie, 1985; Tharenou, 1979). Along this line, Pierce et al. (1989) developed a scale for measuring organization-based self-esteem which they define as a set of beliefs developed by individuals concerning them within the context of the organization. The organization-based self-esteem is rooted on more general personal beliefs but also includes some specific beliefs reflecting the feeling of personal fit with the organization and one's value as a member of the organization. As mentioned by Pierce et al. (1989), individuals with a high level of self-esteem feel they are good fits as members of their organization. Kahn and Byosiere (1992) reported that among the at-that-time eight studies published on the links between self-esteem and organizational stress, six found a significant a negative effect of self-esteem on tensions.

1.2.3.3. Locus of control

The concept of locus of control emanates from the work of Rotter on the theory of social learning. Reinforcers, either positive or negative, will raise or reduce the probability of occurrence of the target behavior only if individuals perceive that the reinforcement is contingent upon their own actions. Locus of control is considered as a stable variable across time and situations. However, some studies have shown that it can somewhat evolve with age and can change as a result of enduring exposure to some situations (e.g., unemployment).

The locus of control refers to a basic belief that either all what occurs in one's life is under the control of the individual (internal locus of control) or that all of what is happening is determined by some set of external forces (external locus of control). According to Hurrell and Murphy (1991), four hypotheses can be drawn concerning the links between locus of control and well-being.

First, it could be that locus of control has both a direct and an indirect effect on stressors, through the choice of specific occupational careers. Second, locus of control may interact with subjective or objective demands in predicting health-related outcomes. Empirically, it has been shown that an external locus of control is

associated with poor health (self-reported) (Hurrell et Murphy, 1991). In work-related settings, an external locus of control has been shown to correlate with burnout (Glogow, 1986; McIntyre, 1984), less job satisfaction (Spector, 1982), more stress (Halpin, Harris, & Halpin, 1985; Kyriacou & Sutcliffe, 1979; Lester, 1982), more alienation (Korman, Wittig-Berman, & Lang, 1981) and a lower self-esteem (Lester, 1986).

Third, one could argue that locus of control moderates the relationships among objective and subjective demands, such that depending on their type and/or level of locus of control, individuals do not perceive external demands the same way. A number of findings suggest that the effect of stressors on *internals* is lower than on *externals*. Such a moderating effect has been reported for relationships between composite scales of occupational stress and psychophysical distress (Krause et Stryker, 1984), for relationships between role ambiguity and work-related tensions (Keenan & McBain, 1979), distress (Arney, 1988), and job satisfaction (Abdel-Halim, 1980), and finally for relationships between role conflict and somatic complaints (Fusilier, Ganster & Mayes, 1987).

1.2.3.4. Control over working conditions

As mentioned by Frese (1989), the concept of control cannot be separated from that of goal and also cannot be limited to the predictability of events. He argues that a person experiences the notion of control when s/he has an influence over his/her own actions and over the conditions within which s/he behaves. This approach is quite close to the definition put forth by Smith (1997) who defines control as the ability to exert an influence over the environment such that it becomes more satisfying and less threatening.

According to Frese (1989), this power of influence presumes that the individual is able to act upon the sequence of tasks on the job (determining the order of tasks, and benefiting from feedback in order to improve task completion), the flow of tasks (determining when a given task is achieved and how much time one needs to devote to it), and on the content of tasks themselves (including a decision latitude over working conditions).

The idea that work stress reflects the impossibility for the worker to gain sufficient control over his/her environment is not new. It does not exclude the possibility that personal factors act as moderators in the relationship between the environment and stress but it determines the areas where the organization can act primarily in terms of stress prevention. That is, the organization should provide the means and resources to employees to enable them to deal effectively with the demands of their work environment, through work organization interventions, ergonomics, and training.

Perceived control is central in the transactional approach to stress because it is directly related to the way individuals appraise the relative balance between external demands and internal resources. Scandinavian studies conducted over the control of working conditions (Aronsson, 1989, cited by Hansez, 2001) support the idea that, in order to adjust successfully to work-related stressors, the individual must have the needed resources and the necessary control over events, conditions, and processes.

In the Flexihealth project, we used the perspective of Wall, Jackson, and Mullarkey (1995) who stressed that a major work characteristic to be assessed is the degree of control over time and methods. This form of control allows the worker to determine the sequence of tasks to be accomplished and the way to achieve it.

1.2.3.5. Social support

The concept of social support evokes the possibility of helping relations (Leavy, 1983). Quick, Nelson, Matuszek, Wittington, and Quick (1996) noted that it is commonly accepted that individuals need stable relations in order to be protected against the health-related risks of social isolation.

Numerous studies have highlighted the impact of social support on health. In their meta-analytic review, House, Landis, and Umberson. (1988) have demonstrated that social support is associated with better health and longer life expectancy. Those who live in social isolation do present more health-related problems and their life expectancy is shorter. Social support has been considered in many studies as a buffer in the relationship between stressors and health-related outcomes. Viswesvaran, Sanchez and Fisher (1999), in their meta-analysis of the relevant literature, noted however that more research is needed to clarify the role played by social support in the stressors-strain relationship. Indeed, several models can be put forth.

In the Flexihealth project, social support was measured through two variables, perceived organizational support, and perceived supervisor support. We hypothesized that employees who perceive that their contribution is valued by their organization and/or supervisor and feel supported by them should react more positively to changes in their environment.

1.2.4 Axis 3 – Indicators of well-being

1.2.4.1. Positive and negative stress

The stress process may engender different consequences at the individual level, which may be grouped into three categories: psychological, physical, and behavioral responses. Psychological and behavioral responses have been extensively examined in organizational stress research. However, the stress phenomenon has often been studied from a negative point of view, due to its detrimental consequences for mental and physical health.

This focus on negative outcomes has led researchers to neglect some positive aspects of the stress phenomenon. In fact, some argue that stress can be either positive (*eustress*) or negative (*distress*) (Doménech, 2001). Distress corresponds to a reaction of the individual in order to adjust effectively to situations perceived as threatening while eustress suggests that a reaction of the individual is generated when faced with situations perceived as challenging. In the latter, the reaction ends up when the challenging situation is removed.

There is currently a debate concerning the relationship between negative and positive stress. It seems that the two concepts are correlated with one another. Previous work on positive and negative emotions (Russell & Caroll, 1999; Folkman & Moskowitz, 2000) suggests that these two stress dimensions represent the opposing poles of the same continuum. However, our own research within the Flexihealth project and a recent study by Schaufeli et al. (2000) support the idea that eustress and distress might be distinguishable.

1.2.4.2. Job satisfaction

According to Cooper, Dewe and O'Driscoll (2001), job satisfaction has been among the most widely investigated indicators among the consequences of the stress process in organizations. That's the reason why we thought it was necessary to include it in our surveys.

1.3. Health and stress

The Flexihealth model highlights the importance of taking into consideration the interaction between individuals and their work environment in the study of stress. The model is based on previous work (Bruchon-Schweitzer & Duntzer, 1994, p. 47; Kahn & Byosière, 1992; Karasek, 1979; Karasek & Theorell, 1990) suggesting that when faced with an obstacle, individuals assess the threat associated with it and the amount of resources available to them in order to cope with the situation, and ultimately develop stress responses only if the imbalance between demands and resources is too high. Karasek and Theorell (1990) argued that the combination of high demands and little perceived control and support is particularly stressful and may result in serious mental and physical health problems. The Flexihealth model predicts that this form of misfit between demands and control is likely to end up with more physiological (e.g., arterial tension), emotional (e.g., depression), cognitive (e.g., reduced creativity, inefficient decisions, concentration problems), and behavioral (e.g., addictions) problems.

Following a review of the relevant literature, we noticed the large variety of stress outcomes (e.g., mental and physical problems, behavioral changes, feeling of insecurity and vulnerability, concentration problems, increase of accident rates, higher absenteeism rates, etc.) (Hemingway et al., 2003; Lee et al., 2003; Metcalfe et al., 2003; Heslop et al., 2002; de Jonge et al., 2000; Kivimäki et al., 2000; Ramsay, 1999; Marmot et al., 1997; Vahtera et al., 1997). A number of studies have reported significant associations between job insecurity or perceived stress and the following : dorsolumbar affections (Vahtera et al., 1997), arterial hypertension and

cardiovascular diseases (Ferrie et al., 1998; Heslop et al., 2002; Lee et al., 2003), depression and mental health problems (Ferrie et al., 2001), sleep dysfunctions and fatigue (Ferrie et al., 1998), increase of the body mass index (Ferrie et al., 1998), and behaviors injurious to health (Metcalfe et al., 2003).

Aside from their implications on work climate, organizational changes are demanding in terms of personal flexibility and adjustment for workers. The stress induced by changes may affect employee mental and physical health (Ferrie et al., 1998; Wheelock, 1999). For example, in contexts of increased competition, workers tend to do extra hours without paying attention to their quality of life and health (Wheelock, 1999). In a study conducted in Canada, Mc Donough (2000) underlines this trend and reports that a higher level of job insecurity raises the level of stress among employees and increases drug consumption. In a cross-sectional study over the links between organizational changes and health, Metcalfe et al. (2003) observed a positive association between the frequency of job changes and the frequency of behaviors injurious to health. Without speaking of a causality phenomenon between these variables, the authors noted that workers having experienced more job changes smoked more, drank more alcohol, and did less physical exercice. However, the associations between the frequency of job changes and cardiovascular diseases (e.g., ischemia, angina pectoris) could not be convincingly established, neither in this study nor in that conducted by Heslop et al. (2002) who examined the links between job dissatisfaction and mortality rates associated with cardiovascular diseases.

In a study conducted among local employees in Raisio (Finland), Kivimäki et al. (2000) found that downsizing affected employee behaviors, with absenteeism rate being multiplied by a 2.2 factor and smoking being more frequent after changes occurred. However, Cheng et al. (2000) stated that most studies have investigated the links between stress indicators and objective measures of diseases through morbidity and/or mortality rates. Much less studies have addresed the relationships between stress and perceived well-being or health quality among individuals (e.g., Väänänen et al., 2003). Nonetheless, self-reported measures of health are consistent with measures and data reported in other studies (Heaney et al, 1994), hence are worth using.

The originality of the Flexihealth project is to examine what employees really experience in terms of health and well-being during or after a restructuring or major change. Following a prevention logic, we decided to determine any stress condition that could be detrimental during changing times. In doing so, we used the term *health-related quality of life*. This concept is multidimensional and incorporates physical, mental, social, and functional aspects of health (Wilson & Cleary, 1995; Testa & Simonson, 1996). Measuring perceived quality of life has the advantage to take into account the preferences of respondents in terms of health, their hopes, expectations and/or fears concerning the future (Grujic et al., 1998 ; Wilson & Cleary, 1995).

The objective of the medical part of the Flexihealth survey was thus to assess the global health state of employees in organizations undergoing changes, in order to estimate the prevalence and distribution of some health-related problems (health complaints, perceived quality of life, life styles, drug consumption), and to determine which portion among them can be attributed to stress. The project had thus two main objectives:

(1) Describing the situation at Time 0 (at the moment of survey delivery) in terms of health complaints. As illustrated in Figure 2, the medical status of employees is defined through data about subjective health, perceived quality of life, and life habits.

   - ⇨ Subjective health refers to complaints and symptoms expressed at the moment of the survey. They can be typical somatic complaints, psychological complaints, or some general or aspecific somatic complaints.
   - ⇨ The concept of quality of life is related to health in general.
   - ⇨ Life habits are linked to both personal choices and influences of the environment.

(2) Determining the portion of problems attributable to organizational stress, i.e., the development or worsening of problems that do not seem to be related to the medical status of patients per se. The

variations of health status will be judged in regard to both the medical history of the patient and changes of his/her life habits.

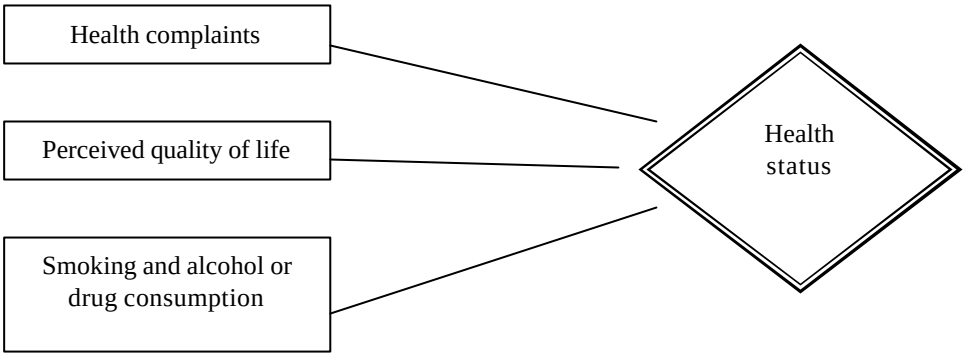


Figure 2. Health-related dimensions within the Flexihealth research project

1.4. Issues related to relationships with customer satisfaction

In recent years, for a variety of reasons, there have been a large number of organizations that have introduced some kind of organizational change, be it a merging operation, acquisition, downsizing or restructuring of some type. Although these are introduced to improve organizational performance, it is unclear to what degree they may possibly have adverse effects on customer satisfaction (CS), either by directly influencing customers' perceptions of organizational performance or through the impact these changes have on the well-being of employees confronted with these changes. Larger organizational changes can introduce changes in employees' working environments, which might cause stress and a decrease in employees' well-being. These might in turn influence the effectiveness of organizational processes, the quality of services and products delivered to the customer and ultimately customer satisfaction. It seems logical to assume that customer satisfaction will at least partly depend on customers' perceptions of employee behaviors such as friendliness and helpfulness and this has effectively been shown in studies conducted in the service sector (Dant, Lumpkin, & Rawwas, 1998; Parasuraman, Zeithaml, & Berry, 1985). In turn, it can be argued that these employees' behaviors will depend on their attitudes towards their work and the organizations they work for and their sense of well-being at work. Based on this argument, the issue of improving customer satisfaction in services has resulted in recent years in a combination of two fields of research that were traditionally separated, namely research on organizational behavior and research in marketing. These two fields are combined in order to assess the effects of certain organizational aspects (either at higher levels, such as managerial practices, or at the level of individual employees, such as job satisfaction) on customer satisfaction. Until now however, research conducted in this particular area has yielded mixed results whilst the relationships discussed above have not yet been examined in the context of organizational changes.

Finally, the Flexihealth study aims at investigating the effects of organizational changes on customer satisfaction in a Belgian context. The main objectives of this part are situated at two levels: firstly at the level of individual employees and secondly at the level of the organizations. We want to gain insight into the relationships that might exist between organizational changes, working conditions and stress on one side and indicators of customer satisfaction on the other side.

Customer satisfaction can be measured by surveying customers or asking employees about their perceptions of CS. Given the practical difficulties we experienced in reaching actual clients of the organizations participating in this study, we largely used employee perceptions of CS as a proxy measure for CS. In earlier research, it was established that there is a fairly strong correlation between global quality evaluations from customers and employees (Schneider, Parkington & Buxton, 1980; Schneider & Bowen, 1985; Schmit & Allscheid, 1995; Johnson, 1996). In one of the preliminary Flexihealth studies, this correspondence was also examined.

More specifically, in this final report we will examine a model conceptualizing the relationships between diverse customer satisfaction indicators[1] (CSI); and the impact of employee well-being and work-related attitudes, perceived working conditions and changes in employees' working environment on these CSI are investigated.

[1] In the remainder of this report, we will use the general term 'customer satisfaction indicators' to refer to the whole range of quality, satisfaction and behavioral intentions ratings we will be using.

2. Method

2.1. Measures

The Flexihealth project included a pilot phase during which measures were developed. During that stage of the research, the teams from Liege and Louvain-la-Neuve worked together in order to develop their measurement instrument concerning the dimensions discussed in the section devoted to the Flexihealth model.

The final version of this part of the survey (called *psychosocial*) included 87 items reflecting 19 dimensions. Six sections are included in this part of the survey:

A. What changes did you experience?

B. How do you perceive your work?

C. How do you perceive the work climate?

D. How do you react in general?

E. How do you feel at work?

F. Control at work

Table 1 provides the items and response scales for the whole survey. The order of presentation of items is the same than in the standard Flexihealth survey.

The following sections describe the steps of the development of the psychosocial part of the Flexihealth research program. For this purpose, four sets of data have been collected:

- ✓ *Study 1*. The first data collection has been undertaken using a sample of Flemish and French-speaking workers from a variety of organizations (N = 774). This represented the opportunity for Liege and Louvain-la-Neuve teams to test a first version of the questionnaire.
- ✓ *Study 2*. The second data collection has been achieved within a petrochemical company (N = 134).
- ✓ *Study 3*. The tird study involved data from a sample of employees working in a public administration (N = 171). The collection was conducted by the Louvain-la-Neuve team. It allowed to test a revised version of the scales measuring actual changes, perception of changes, and emotional responses to changes.
- ✓ *Study 4*. The final pilot study was undertaken within a public administration (N = 1551). Data collection was directed by the Liege team and permitted to develop a measure of positive and negative occupational stress (PNOS).

Note that several scales from the pilot studies were removed from the standard Flexihealth survey. Table 2 provides an overview of the development of the Flexihealth survey across pilot studies. It includes all scales used from the beginning and reports those that have been removed from the final version. Table 2 also reports the number of items for each scale and the reliabilities across pilot studies.

Table 1. Items for the psychosocial part of the Flexihealth survey

	Item	Response scale	Name of scale
	A. WHAT CHANGES DID YOU EXPERIENCE?		
	In your job, have you been personally exposed to the following flexibility practices?		
1	Yes, in terms of work schedules (e.g., flexible schedules, etc.)	Yes vs. No	Flexibility practice
2	Yes, in terms of work time (e.g., part-time, shift work, night work, working on week-ends, etc.)	Yes vs. No	Flexibility practice
3	Yes, in terms of contract (e.g., fixed-term contract, contract as temporary worker, etc.)	Yes vs. No	Flexibility practice
4	Yes, in terms of location (e.g., teleworking, work in call centers, etc.)	Yes vs. No	Flexibility practice
5	Yes, in terms of task assignment (e.g., job rotation, job enrichment, job polyvalence, etc.)	Yes vs. No	Flexibility practice
	Here is a list of changes. Please report whether you experienced any of them during the last six months.		
6	A change of supervisor?	Yes vs. No	Change in work environment
7	A change in task assignment?	Yes vs. No	Change in work environment
8	A change among colleagues?	Yes vs. No	Change in work environment
9	A change in work schedule?	Yes vs. No	Change in work environment
10	A change in geographic location?	Yes vs. No	Change in work environment
	Think about the changes you experienced during the last six months. How did you react to them:		
11	These changes were as a challenge for me	1=completely disagree; 5=strongly agree	Perception of changes - Challenge
12	These changes did conflict with my objectives and expectations	1=completely disagree; 5=strongly agree	Perception of changes - Threat
13	I think my organization was able to make things happen in a different manner	1=completely disagree; 5=strongly agree	Perception of changes – Organization's accountability
14	I was able to influence the course of events during the change	1=completely disagree; 5=strongly agree	Perception of changes - Control
15	I experienced these changes as a challenge to meet	1=completely disagree; 5=strongly agree	Perception of changes - Challenge
16	These changes did not match my expectations	1=completely disagree; 5=strongly agree	Perception of changes - Threat
17	I think my organization was able to manage events in a different manner	1=completely disagree; 5=strongly agree	Perception of changes - Organization's accountability
18	I was convinced that changes did offer new job opportunities	1=completely disagree; 5=strongly agree	Perception of changes - Challenge
19	Changes boded no good	1=completely disagree; 5=strongly agree	Perception of changes -

			Threat
20	I was convinced my organization could have acted differently	1=completely disagree; 5=strongly agree	Perception of changes - Organization's accountability
21	I could not influence events anyway	1=completely disagree; 5=strongly agree	Perception of changes - Control

How did you react to changes identified? Please report the extent to which you experienced the following emotions:

22	Distressed	1=not at all 5=at a high intensity	Emotional reaction towards events
23	Upset	1=not at all 5=at a high intensity	Emotional reaction towards events
24	Helpless	1=not at all 5=at a high intensity	Emotional reaction towards events
25	Angry	1=not at all 5=at a high intensity	Emotional reaction towards events
26	Calm	1=not at all 5=at a high intensity	Emotional reaction towards events
27	Enthusiastic	1=not at all 5=at a high intensity	Emotional reaction towards events

B. How do you perceive your work?

To what extent do you agree with the following items ?

28	Overall, I am satisfied with my job	1=completely disagree; 5=strongly agree	Job satisfaction
29	I feel that my job is threatened	1=completely disagree; 5=strongly agree	Job insecurity
30	As compared to other jobs, mine is interesting	1=completely disagree; 5=strongly agree	Job satisfaction
31	I feel anxious about the stability of my job	1=completely disagree; 5=strongly agree	Job insecurity
32	If you want to make money, you need to know the *right* persons.	1=completely disagree; 5=strongly agree	External locus of control
33	When we are in search of a good job, « the persons we know » count more than « what we know ».	1=completely disagree; 5=strongly agree	External locus of control
34	Getting the job one wants is essentially a matter of luck.	1=completely disagree; 5=strongly agree	External locus of control
35	For getting a good job, it is necessary to have members of one's family or friends in good positions.	1=completely disagree; 5=strongly agree	External locus of control

C. How do you perceive the work climate?

To what extent do you agree with the following climate-related items?

36	I count within this organization	1=completely disagree; 5=strongly agree	Organization-based self-esteem
37	My organization takes pride in my accomplishments at work	1=completely disagree; 5=strongly agree	Perceived organizational support
38	My supervisor tries to extend himself/herself in order to help me perform my job to the	1=completely disagree; 5=strongly agree	Perceived supervisor

	best of my ability		support
39	I am taken seriously by this organization	1=completely disagree; 5=strongly agree	Organization-based self-esteem
40	My organization values my contribution to its well-being	1=completely disagree; 5=strongly agree	Perceived organizational support
41	My supervisor tries to make my job as interesting as possible	1=completely disagree; 5=strongly agree	Perceived supervisor support
42	I am important for this organization	1=completely disagree; 5=strongly agree	Organization-based self-esteem
43	My organization really cares about my well-being	1=completely disagree; 5=strongly agree	Perceived organizational support
44	My supervisor cares about my opinions	1=completely disagree; 5=strongly agree	Perceived supervisor support
45	I am trusted by this organization	1=completely disagree; 5=strongly agree	Organization-based self-esteem
46	My organization strongly considers my goals and values	1=completely disagree; 5=strongly agree	Perceived organizational support
47	Help is available from my supervisor when I have a problem	1=completely disagree; 5=strongly agree	Perceived supervisor support

D. How do you react in general?

For each emotional state, please report the extent to which it applies to you in general:

48	Interested	1=Not at all; 5=Completely	Positive affectivity
49	Nervous	1=Not at all; 5=Completely	Negative affectivity
50	Upset	1=Not at all; 5=Completely	Negative affectivity
51	Determined	1=Not at all; 5=Completely	Positive affectivity
52	Alert	1=Not at all; 5=Completely	Positive affectivity
53	Anxious	1=Not at all; 5=Completely	Negative affectivity
54	Scared	1=Not at all; 5=Completely	Negative affectivity
55	Active	1=Not at all; 5=Completely	Positive affectivity
56	Enthusiastic	1=Not at all; 5=Completely	Positive affectivity
57	Afraid	1=Not at all; 5=Completely	Negative affectivity

E. How do you feel at work?

For each item, please determine the extent to which it reflected how you felt during the last 7 days :

58	I'm very active at work	1=Never or rarely; 4=Always or almost always	Positive stress
59	I feel I can't cope with everything I have to do at work.	1=Never or rarely; 4=Always or almost always	Negative stress
60	Once I'm at work, I feel more focused	1=Never or rarely; 4=Always or almost always	Positive stress
61	I feel demoralized by my work.	1=Never or rarely; 4=Always or almost always	Negative stress
62	I work in a rush	1=Never or rarely; 4=Always or almost always	Negative stress

63	I have insomnia because of my working life	1=Never or rarely; 4=Always or almost always	Negative stress
64	My work allows me to excel myself	1=Never or rarely; 4=Always or almost always	Positive stress
65	My work stresses me	1=Never or rarely; 4=Always or almo st always	Negative stress
66	Work gives me great satisfaction	1=Never or rarely; 4=Always or almost always	Positive stress
67	I find my work mentally exhausting	1=Never or rarely; 4=Always or almost always	Negative stress
68	I'm full of energy at work	1=Never or rarely; 4=Always or almost always	Positive stress
69	I suffer from nausea when I'm at work	1=Never or rarely; 4=Always or almost always	Negative stress
70	I feel stimulated by my work	1=Never or rarely; 4=Always or almost always	Positive stress
71	I'm tired at work	1=Never or rarely; 4=Always or almost always	Negative stress
72	My work is fascinating	1=Never or rarely; 4=Always or almost always	Positive stress
73	I'm nervous at work	1=Never or rarely; 4=Always or almost always	Negative stress
74	I get easily irritated at work	1=Never or rarely; 4=Always or almost always	Negative stress
75	When I'm working I forget my tiredness	1=Never or rarely; 4=Always or almost always	Positive stress
76	I'm worried by my working life	1=Never or rarely; 4=Always or almost always	Negative stress

F. CONTROL AT WORK

For each sentence below, please report the extent to which it applies to your situation

77	Do you have a control over the order of doing things?	1=Not at all; 5=Absolutely	Control over time
78	Do you have a control over when to start a new task at work?	1=Not at all; 5=Absolutely	Control over time
79	Do you have a control over when to finish a given task?	1=Not at all; 5=Absolutely	Control over time
80	Do you determine the pace of your work by your own?	1=Not at all; 5=Absolutely	Control over time
81	Do you have a control over the quantity of what you produce?	1=Not at all; 5=Absolutely	Control over methods
82	Can you change the manner in which you complete your tasks?	1=Not at all; 5=Absolutely	Control over methods
83	Do you have a control over the planning of your work?	1=Not at all; 5=Absolutely	Control over methods
84	Do you have a control over the quality of what your produce?	1=Not at all; 5=Absolutely	Control over methods
85	Can you decide the way of working in order to perform your job effectively?	1=Not at all; 5=Absolutely	Control over methods
86	Can you choose the methods to be used in order to get the job done?	1=Not at all; 5=Absolutely	Control over methods

Table 2. Development stages of the Flexihealth survey and reliability coefficients

	Number of items					Internal consistency				
	Study 1	Study 2	Study 3	Study 4	Final version	Study 1	Study 2	Study 3	Study 4	Other studies
Axis 1 – Working conditions										
Actual changes	7	3	6		5	NA	NA	NA		
Perception of changes[1]	9	7								
Challenge			4		3			.81		
Threat			4		3			.79		
Control			4		2			.71		
Organization's accountability			4		3			.93		
Importance of changes			4		Deleted					
Coping			4		Deleted					
Destinity			2		Deleted					
Emotional reactions			6		6			NA		
Flexibility practices[2]	17	4	6		5	NA	NA	NA		
Work intensification	12	7	Deleted		Deleted					
Axis 2a – Mediating variables										
Job insecurity	1	1	2		2			.91		
Information	4	Deleted	7		Deleted					
Participation to decision making	3	Deleted	Deleted		Deleted					
Organizational justice	4	4	Deleted		Deleted					
Possibility to adjust to change	4	Deleted	Deleted		Deleted					
Uncertainty climate	1	1	Deleted		Deleted					
Coworker interdependence	2	2	Deleted		Deleted					
Axis 2b – Moderating variables										
Positive affectivity	10	Deleted	10		5	.80[3]		.79[3]		
Negative affectivity	10	13	10		5	.75[3]		.79[3]		
Organization-based self-esteem	10	Deleted	Deleted		4	.78[3]				
External locus of control	8	Deleted	Deleted		4	.74[3]				
Perceived organizational support	8	8	4		4			.90		
Perceived supervisor support	2	Deleted	4		4			.90		
Control over time					4					.76 - .86
Control over methods					6					.61 - .79
Internal locus of control	8	Deleted	Deleted		Deleted					
Perceived coworker support	2	Deleted	Deleted		Deleted					
Axis 3 – Indicators of well-being										
Negative stress									.88	
Positive stress									.83	
Job satisfaction	2	2	2		2	.74	.67	.69		
Intention to quit	3	3	Deleted		Deleted					

Note. NA = not applicable.

1. In Study 1 and 2, items concerning the perception of changes were to be completed for each change separately. In the final version, the perception of changes was globally assessed for all changes altogether.

2. In the final version, flexibility practices were grouped into 5 categories.

3. Cronbach's alpha coefficients were computed based on the number of items retained in the final version.

2.1.1 Axis 1 – Working conditions

2.1.1.1. Perception of changes in work environment

In Study 1 and 2, respondents were asked to report if they were confronted to a set of changes in their work environment and how they perceived these changes if any. In these studies, perception of changes was measured using a 7-item scale from Schwartz and Stone (1993).

The analysis of data from these studies showed that there was a difference between actual changes and how they were perceived. However, our first version of the Flexiheath survey did not permit to have a fine-grained assessment of the dimensions used by individuals when appraising changes. For example, in contrast to the literature in this area, no distinction was made between primary and secondary appraisal. Also, the first version of the survey was a little bit long and did present some psychometric weaknesses. We thus decided to revise the survey from both a conceptual and methodological point of view. Two main changes were introduced.

First, we asked respondents to provide an *overall rating* of the meaning attributed to changes encountered. Second, we revised and improved measurement scales devoted to capturing the dimensions used by individuals in their appraisal of changes as well as their emotional reactions to them.

The final version of the survey included three sections focusing on changes, i.e., actual changes, perception of changes, and emotional reactions to changes. We turn now to the description of these subsections.

A. ACTUAL CHANGES

ORIGIN

This scale has been specifically developed for this research. Our objective was to get information over the actual changes employees were confronted with in their environment. The list of changes was determined from a series of in-depth interviews[2] (N = 57) conducted with workers pertaining to different occupations and organizations where changes occurred. In total, workers represented 7 organizations, either private or public.

FINAL VERSION

In the final version, we asked employees to report which changes they have been exposed to during the last six months. In doing so, a list of 5 changes was established. For each change, the respondent reported if s/he had been exposed to it or not (cf. items 6-10 from Table 1).

B. APPRAISAL OF CHANGES

ORIGIN

We found no prior study investigating the perception of change events within organizations. Consequently, we developed our own scale based on findings from the Flexihealth pilot studies and on the literature[3]. Items were written so as to take into account the context of this research and its objectives.

SCALE DEVELOPMENT

A first validity of the revised version of our survey has been conducted in Study 3. Exploratory factor analysis has been used to determine the underlying structure of items. As a result of this procedure, 6 items were retained for primary appraisal and 5 others for secondary appraisal (cf. alpha coefficients reported in Table 2).

[2] These interviews were conducted during the preliminary stage of the Flexihealth project.

[3] Dewe, 1992; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Frese & Zapf, 1999; Frijda, 1993; Hemenover, 2001; Lazarus, 1991; Lazarus, 1994; Payne & Morrison, 1999; Perrewé & Zellars, 1999; Schaubroek, 1999; Scherer, 1993; Schwartz & Stone, 1993; Smith & Ellsworth, 1985; Smith & Lazarus, 1993.

FINAL VERSION

The final scale thus contains 11 items. Four dimensions are covered by this scale: 3 items tap into *perceived threat* associated with changes, 3 items measure *perceived challenge*, 3 items relate to the *organization's accountability* for changes, and finally 2 items deal with *perceived control* over changes. The first two refer to primary appraisal while the latter ones do relate to secondary appraisal. Each item is assessed using a 5-point Likert-type scale (cf. items 11-21 in Table 1).

C. EMOTIONAL REACTIONS TO CHANGES

ORIGIN

The literature concerning appraisal processes indicates that appraisal criteria combine to generate discrete emotional reactions. We paid attention to specifically measure emotions that made sense for employees confronted with changes.

SCALE DEVELOPMENT

Within this research, each item is considered separately because items refer to discrete emotions. Hence, factor analysis and reliability computation were not used here.

FINAL VERSION

Respondents were asked to report the degree to which they experienced the emotions referred to by the items. Some emotions were negative in nature (2) while others were positive (4). Among negative emotions, 2 were more oriented toward the individual (*distressed* and *upset*) while 2 others were more directed towards the situation (*helpless* and *angry*). Each item is assessed using a 5-point Likert-type scale. Table 1 reports these items (22-27).

2.1.1.2. Flexibility practices

ORIGIN

In the first pilot studies, we developed a scale for measuring flexibility practices. It was a long list of items and the respondent was invited to check which practice(s) s/he had been confronted with. However, we noticed that these practices were so specific to each organization, that any comparison across organizations was rather difficult to make. Both the number and the form of flexibility practices varied a lot across organizations. We thus decided for the remaining studies to define sets of flexibility practices grouped by category. The categories were: flexible work schedules, time-based flexibility, atypical labor contracts, geographic flexibility, and functional flexibility.

SCALE DEVELOPMENT

For purpose of this research, each flexibility practice category is considered separately. No factor analysis was conducted and reliability was not computed for these items.

FINAL VERSION

Five categories of flexibility practices were identified in the final version. Respondents had also the opportunity to check a category called *other*. Each category contained examples of flexibility practices. Table 1 reports the categories and examples of flexibility practices (items 1-5).

2.1.2 Axis 2a – Mediating variable

2.1.2.1. Job insecurity

ORIGIN

The scale devoted to job insecurity has been specifically developed for this research. We used Jacobson's (1991) approach who recommends limiting the construct to uncertainty regarding the continuity of one's job.

SCALE DEVELOPMENT

In the first two pilot studies, job insecurity was measured through two items. While the first item referred explicitly to the fear of losing one's job, the second reflected more of a perceived uncertainty climate. We thus decided to change the second item and to rewrite it so as to focus more clearly on the fear of losing one's job. The internal consistency of this scale is now quite good (see table 2).

FINAL VERSION

In the final version of the survey, job insecurity was thus measured through two items, assessed by means of a 5-point Likert-type scale (see items 29 and 31 reported in Table 1).

2.1.3 Axis 2b – Moderating variables

2.1.3.1. Negative and positive affectivity

ORIGIN

The scale used for measuring negative and positive affectivity stems from that developed by Watson, Clark and Tellegen (1988; *Positive and Negative Affective Schedule* [PANAS]). This scale contains 20 items reflective of emotions dealing with either negative or positive affectivity. Depending on the target question (*how do you feel now* or *how do you feel in general*), the PANAS can feature either a transient mood or a trait.

SCALE DEVELOPMENT

In their study, Watson et al. (1988) indicate that their instrument displays good psychometric properties. Depending on the instructions used, coefficients alphas range from .86 to .90 for positive affectivity, and from .84 to .87 for negative affectivity. The stability of measures over two months was also quite good.

We factor analyzed the data from pilot studies and, for reasons of space in the final version of the survey, we retained the best items for each scale. Alpha coefficients for the reduced scales are presented in Table 2.

FINAL VERSION

The final version contains 10 items (5 for negative affectivity and 5 for positive affectivity). We intended to measure a stable trait, so we asked respondents to describe their affective states in general. Items were assessed by means of a 5-point Likert-type scale (see items 48-57 in Table 1).

2.1.3.2. Self-esteem

ORIGIN

We relied on the organization-based self-esteem (OBSE) scale developed by Pierce et al. (1989) (10 items). Pierce et al. developed this scale in order to capture employees' feeling of being important in their organization.

SCALE DEVELOPMENT

We factor analyzed the data of the OBSE from the pilot studies and retained the highest-loading items. Alpha coefficients for the reduced scale are presented in Table 2.

FINAL VERSION

The final version contains 5 items. Each item is assessed by means of a 5-point Likert-type scale (see items 36, 39, 42, 45 in Table 1).

2.1.3.3. Locus of control

ORIGIN

We relied on the Work Locus of Control scale developed by Spector (1988), which includes 16 items measuring either internal locus of control or external locus of control.

SCALE DEVELOPMENT

Spector (1988) reports psychometric evidence regarding the properties of the scale. The internal consistency of the subscales has been found to range from .80 to .85[4]. For reasons of space limitation, we chose to focus on external locus of control. Subsequent factor and reliability analyses allowed us to select the highest-loading items (4). Alpha coefficients are reported in Table 2.

FINAL VERSION

The final version contains 4 items, measured by means of a 5-point Likert-type scale (see items 32-35 in Table 1).

2.1.3.4. Control at work

ORIGIN

The instrument for capturing control at work has been initially developed by Wall et al. (1995). The scales used here represent 2 out of the 5 developed by the authors in order to assess control in a variety of occupations. In the context of the Flexihealth project, we decided to focus on the ability to get control over time and planning of activities and over the way to perform the job.

SCALE DEVELOPMENT

Wall et al. (1995) used confirmatory factor analysis. Several models were tested on two independent samples. Results showed that the two aspects of control (*time and planning* and *how to complete tasks*) were distinguishable, albeit related, constructs. Internal consistency varied from .76 to .86 for *time and planning* and from .61 to .79 for *how to complete tasks*. High levels of control on these subscales correlated positively with job satisfaction and negatively with anxiety and depression.

FINAL VERSION

Control was measured using 10 items (4 items for *time and planning* and 6 items for *how to complete tasks*). Items were assessed using a 5-point Likert-type scale (see items 77-86 in Table 1).

2.1.3.5. Social support

ORIGIN

The scale used here stemmed from the *Survey of Perceived Organizational Support* (SPOS; Eisenberger, Huntington, Hutchison & Sowa, 1986).

SCALE DEVELOPMENT

Initially, Eisenberger et al.'s (1986) SPOS contained 36 items. They reported an internal consistency of .97. For reasons of space limitation in our final version, we selected 8 high-loading items from the SPOS to be used to measure perceived support from organizations. Aspects covered were the feeling of being valued and that the organization cares about the employee. Because we were interested to measure the perception of support not only from the organization but also from the supervisor, we changed the target of 4 of these items and replace it by the supervisor. The coefficient alphas for the 2 four-item support scales are given in Table 2.

[4] http://chuma.cas.usf.edu/~spector/scales/wlcsover.html

FINAL VERSION

The final version contained 8 items (2 x 4) for measuring perceived support from organizations and from supervisors. The items were assessed using a 5-point Likert-type scale (see items 37, 38, 40, 41, 43, 44, 46, and 47 in Table 1).

2.1.4 Axis 3 – Indicators of well-being

2.1.4.1. Positive and negative stress

ORIGIN

The negative and positive stress scale has been developed in order to capture the reactions of employees towards organizational changes. It comprises items tapping into either positive stress or negative stress.

SCALE DEVELOPMENT

A first version of 34 items of the scale has been tested based on data collected from university students. Items were reflective of the four aspects of stress identified by Lemyre and Tessier (1990), that is affective, cognitive, behavioral, and somatic aspects.

An exploratory factor analysis has been conducted on 31 items (3 items were removed following the inspection of correlations between items and the overall scale. Three factors were extracted from the data. Factor 1 reflected the expressions of negative stress (11 items), Factor 2 dealt with positive stress (8 items) and Factor 3 represented job performance aspects (2 items). The factor solution thus included 21 items. To be consistent with the purpose underlying the development of the scale, we retained only Factors 1 and 2. The reliability and validity of these scales were tested using data collected within an educational institution.

Afterwards, the instrument was tested upon a sample of 1551 civil servants. Confirmatory factor analysis of the data yielded a good fit for the two-factor solution.

FINAL VERSION

The final version thus included 8 items for positive stress and 11 items for negative stress. The items were assessed using a 4-point Likert-type scale (see items 58-76 reported in Table 1).

2.1.4.2. Job satisfaction

ORIGIN

For measuring job satisfaction, we used a scale adapted from Shortell et al. (1991) and Dunham and Smith (1979).

SCALE DEVELOPMENT

Alpha reliabilities for the scale are shown in Table 2.

FINAL VERSION

Two items were used, each one being assessed using a 5-point Likert-type scale (see items 28 and 30 in Table 1.

2.1.5 Medical section

The medical section of the survey addressed the health-related consequences of stress. This section includes (a) health complaints, (b) quality of life, and (c) change in employees' behaviors injurious to health. In addition to providing an empirical assessment of employees' health, statistical analyses are intended to show how much variance in health problems can be explained by stress.

1) Medical status (21 items)

This subsection deals with health complaints. It includes two parts:

a) Personal antecedents, allowing determining the medical history of the individual and their potential effect on current health status. Five categories of antecedents were examined: cardiovascular, psychic, digestive, osteo-articulatory and neurological antecedents. These antecedents were rated as *yes* or *no*.

b) Subjective complaints of a medical nature. This subset of symptoms was assessed using a list of 15 items dealing with the following complaints (rated in terms of occurrence and frequency):

- cardio-respiratory affections: chest-related pain or precordialgies, palpitations, raises of blood pressure.
- aspecific symptoms: loss of appetite, fatigue.
- emotional problems: irritability, depression, distress.
- digestive problems: stomac-related pain (gastralgies), pain in abdomen (colic pain).
- osteo-articulary affections: back or neck pain.
- neurological symptoms : headaches.
- sleep dysfunctions.
- cognitive problems: concentration problems, distraction.

2) Life habits (10 items)

We examined smoking habits, drug (antalgic, anxiolytic, antidepressive and sleeping drugs) and alcohol consumption, as well as changes in attitudes (addictions).

3) Quality of life (12 items)

The SF36 is amongst most widely used and validated measures of quality of life (Ware & Sherbourne 1992). It has been specifically designed to measure perceived quality of life from the individual's perspective. The SF36 form (Short-Form 36 items Health Scale) is a self-reported questionnaire allowing determining a profile of quality of life associated with health. It includes 8 subscales: physical activity, physical health, mental health, energy, emotional well-being, social well-being, absence of pain, and general heath status. It covers all dimensions relevant to quality of life. The SF36 is a generic questionnaire not suited for assessing a specific disease. A French version has been developed by Alain Leplege (1995).

Due to its length, the short form of the SF-36 (SF-12; Ware et al., 1998) has been used in the Flexihealth research program. Two dimensions are included in the questionnaire:

- the physical component which assesses the perceived physical quality of life
- the mental component which assesses the perceived mental quality of life.

2.1.6 Relationships with customers

In this project, the study of the effects of organizational changes is not limited to the impact for each individual employee in terms of stress, health and well-being, but we will also examine the consequences on organizational performance. Customer satisfaction and quality are considered as indicators of organizational performance, since satisfied customers are more likely to be repeat customers (Jones & Sasser, 1995). A number of studies have examined the link between some organizational policies, working climate, individual employee attitudes and various indicators of customer satisfaction but the findings are not conclusive at the

moment (see for instance Jimmieson, & Griffin ,1998; Leiter, Harvie, & Frizzell, 1998; Schneider & Bowen, 1985; Hartline, & Ferrell, 1996; Ryan, Schmit, & Johnson, 1996; Schmit, & Allscheid, 1995; Schneider et al., 1980). To examine these types of relationships, one can use a range of indicators to measure customer satisfaction.

In this final theoretical section, we will therefore first introduce relevant concepts from the quality and customer satisfaction literatures, outlining a model of interrelations between the different concepts we suggest to measure in this study, followed by an overview of the research literature linking organizational and employee variables to diverse CSI.

2.1.6.1. Customer satisfaction indicators (CSI)

Nowadays, many organizations are searching for ways to measure, manage and ultimately improve customer satisfaction with their organization – being forced to do so either by the highly competitive nature of certain markets or driven by societal concerns that result in governmental regulations.

There has been an abundance of research published on customer reactions (customer satisfaction and perceived quality in particular) but we also encountered a lack of consistency in the conceptualization and measurement of customer satisfaction (Babin & Griffin, 1998; Giese & Cote, 2000). The major problem has to do with distinguishing quality and customer satisfaction. In a service context, quality and satisfaction are often treated as synonymous.

A popular model throughout the 80's and early 90's was Oliver's expectancy disconfirmation model (Oliver, 1980; Woodruff, Cadotte & Jenkins, 1983) where satisfaction or dissatisfaction is supposed to result from a comparison process in which expectations prior to consumption are compared with actual experiences. A similar model was proposed in a large number of studies on perceived quality (Zeithaml, Berry & Parasureman, 1993), in which service quality is considered as the degree of discrepancy between customers' normative expectations for the service and their perceptions of the service performance (Parasuraman et al., 1985). Other researchers report distinctions between these two constructs. In an examination of consumers' understanding of satisfaction and quality, Iacobucci, Ostrom and Grayson (1995) found some differences on a number of antecedents that determined these two constructs: for example, satisfaction was influenced more by pleasant surroundings and positive tangible response and quality more by expertise. Sometimes, quality is perceived as an antecedent of satisfaction (Peyrot, Cooper & Schnapf, 1993; Woodside, Frey, Daly, 1989; Gotlieb, Grewal & Brown, 1994; Cronin & Taylor, 1992; Oliver, 1993, Rust & Oliver, 1994), and satisfaction is supposed to be a subjective interpretation of the (dis)confirmation of expectations and is a summarized affective and cognitive reaction at the overall level. Others consider satisfaction as an antecedent of quality: satisfaction is related to discrete transactional episodes and is an emotional state resulting from this transaction, based on comparison with expectations, whereas quality is a higher order, abstract and more stable variable, only implicitly related to internal expectation standards (Henig-Thureau & Klee, 1997; Bitner & Hubbert, 1994; Bolton & Drew, 1991, Parasumeran et al, 1985, 1988). de Ruyter, Bloemer & Peeters (1997) found that service quality (measured with SERVQUAL adaptation) preceded overall satisfaction (combined outcome and process satisfaction), and that quality was influenced by perception. Satisfaction was also influenced by perceptions directly, and indirectly via service quality and disconfirmation. Gotlieb et al. (1994) compared a model in which quality (conceptualized as an attitude) precedes satisfaction (conceptualized as an emotional response) and one in which satisfaction precedes quality, and found that the quality-satisfaction model provided a better fit to their data. Thus, when reviewing the recent literature, it seems that perceived quality, conceptualized as an evaluation of attributes, precedes satisfaction, which is defined as a more affective overall response (see de Ruyter et al. 1997, for a chronological overview).

Apart from this affective summary satisfaction response and quality perceptions, there are a number of other reactions customers can experience and exhibit upon choosing, acquiring, using or evaluating a product or service experience. A difference can be made between behavioral and attitudinal reactions. Attitudinal reactions include satisfaction, dissatisfaction, perceived quality, commitment to the organization, perceived

value, preference over competitors, identification with the organization, tolerance for dissatisfying experiences, price sensitivity and so forth. Behavioral customer reactions include recommendations, repeat purchase or use, additional or increased purchase or use, switching behavior, complaining behavior and negative word of mouth for example. An overview of empirical research that examines these attitudinal or behavioral reactions can be found in Allen and Grisaffe (2000).

The diverse indicators we use in this study fit in a model that is based on existing research literature and the current psychological framework of attitude theory (Bagozzi, 1992; Gotlieb et al., 1994). It is suggested that the appraisal process involves the assessment of outcome-desire-conflicts or fulfillment experiences, which are followed by either negative or positive emotional responses. These emotional responses are followed by coping intentions to either reduce the conflict or maintain the fulfillment. Behavior then follows from these intentions.

Adapted to the context of customer reactions, our model (see Figure 3) proposes that cognitive quality evaluations are appraisals made by an individual which precede emotional responses such as satisfaction, which might in turn influence behavioral intentions and actual behaviors (Cronin, Brady, & Hult, 2000). Quality perceptions are defined as evaluations of the performance of a product or service on relevant dimensions or attributes. As such, an assessment of quality is considered as an evaluative appraisal process (Gotlieb et al., 1994). The SERVQUAL instrument developed by Parasuraman, Zeithaml, and Berry (1991) is currently most widely used to assess functional service quality. Satisfaction with products or services is considered to be a more affective and global response (which can nevertheless contain certain cognitive elements) which results from a prior evaluative appraisal process. Satisfaction is presumed to be a higher order construct which results from quality evaluations but is also influenced by other factors as well (Gotlieb et al., 1994; de Ruyter, Bloemer & Peeters, 1997; Cronin et al., 2000). Finally, for most organizations, the ultimate goal is not only to achieve high levels of quality and customer satisfaction. In order to gain competitive advantage, satisfaction and quality should ultimately aid in attracting and retaining a loyal customer base. Behavioral intentions, or intentions to re-use/re-purchase from the organization and intentions to tell positive things about the organization are indicators of customer satisfaction (in the broad sense) and fit in the model we suggest as coping mechanisms which result from the global affective response (satisfaction) and which ultimately lead to behavior (Gotlieb et al., 1994; Cronin et al., 2000).

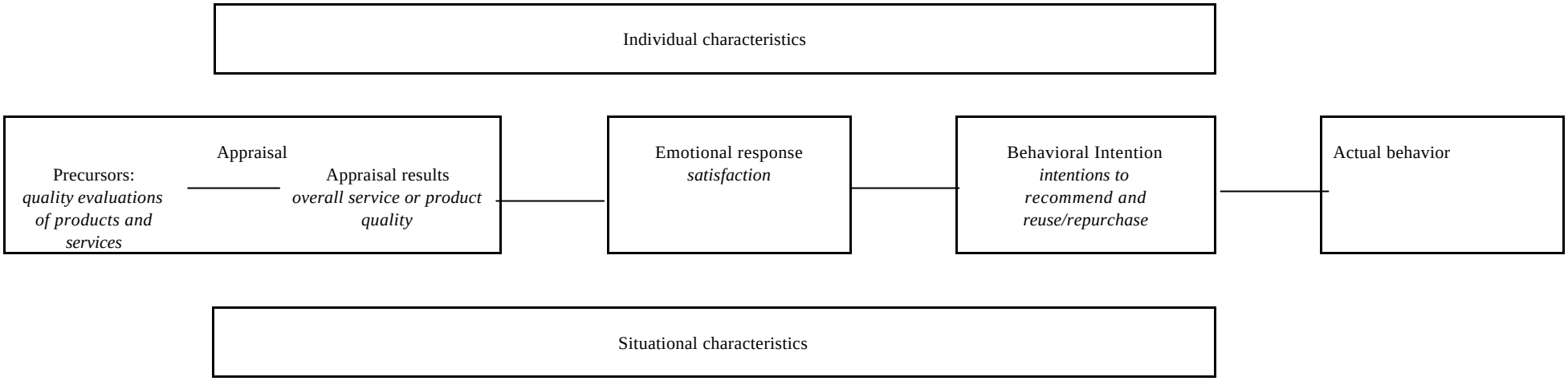
2.1.6.2. Relationships with employee variables

In this study, we will examine the relationships between customer reactions, working conditions and employee well being indicators in the context of organizational changes. Above we discussed models of customer satisfaction. Since it can be assumed that – to the extent that these reactions are influenced by employees and organizational factors – customer reactions are determined primarily by employees' behaviors, the factors that would be most important in affecting customer reactions are those that influence directly employees' behaviors on the job, such as job satisfaction, motivation, role conflict and other attitudinal characteristics. Prior studies that examined such a relationship between organizational factors, employee attitudes, behaviors and customer reactions are reviewed in the following section, although we realize this overview is not exhaustive or complete. Before starting an overview of empirical findings however, we wish to emphasize two important points in the context of this study and its design.

First, it seems that there is a strong correlation between overall quality or satisfaction as perceived by employees or customers (Schneider et al., 1980, Schneider & Bowen, 1985; Schmit & Allscheid, 1995; Johnson, 1996). Second, when choosing employee attitudes or characteristics to examine in terms of the relationship with customer reactions it might seem obvious to choose those that allow differentiating in behavior towards the customer. In order to examine the relationships between employee attitudes and customer reactions, one would prefer to concentrate primarily on attitudes that have already been shown to be associated with work-related behaviors. Similarly, one might choose to examine only employees who have high levels of direct contact with customers, assuming that organizational processes invisible to the customer and non-contact employees' attitudes cannot influence customer reactions. However, these assumptions are

counteracted by the empirical work of Schneider, Hanges, Goldstein and Braverman (1994), who found that student evaluations of faculty in the classroom are consistent with ratings for non-teaching facets of the faculty role, suggesting that what takes place inside an organization, out of sight of the customer, can actually be reflected in customer perceptions. Thus, less may be hidden from the customer than was previously thought.

Figure 3. Customer satisfaction: An extended attitude-intention-behavior model



Among the variables that are supposed to have an impact on customer reactions are job satisfaction, organizational commitment and fairness perceptions, linked with influences such as role conflict, role ambiguity, and empowerment and climate variables. What follows is an illustrative overview of – often-conflicting – relevant research findings.

Schneider et al (1980) found that bank employees' job satisfaction was not related to any of the customer variables, but organizational satisfaction was related to overall quality, as were other climate elements. Employees' own ratings of service quality were related to climate elements and employees' job satisfaction. Schneider et al. (1980) and Shamir (1980) found that employee role stress and dissatisfaction were related to the inability to deliver good service; Schlesinger and Zornitsky (1991) showed that satisfied employees believe they are better able to deliver quality service. In a financial service environment, Herrington and Lomax (1999) found a relationship between job satisfaction and repurchase intentions. There was no relationship between job satisfaction and customer quality perception or recommendation intention. Bernhardt, Donthu and Kenneth (1994) found an association between job satisfaction and customer satisfaction and Puffer (1987) showed a relation between job satisfaction and prosocial behaviors in salespeople. Hartline and Ferrell (1996) showed a positive relation between job satisfaction for hotel employees and perceived quality, and self-efficacy and perceived service quality. Bettencourt and Brown (1997) found that job satisfaction had a non-significant relationship with contact employees' prosocial behaviors when effects of fairness were partialled out. Overall fairness was related to job satisfaction and prosocial service behaviors. Role prescribed and extra-role behaviors were significantly related to customer satisfaction, but employee cooperation was not significantly related to customer satisfaction. For customer service behaviors, the key predictors were fairness of pay rules, pay administration and job supervision. In Bradley and Sparks' (2000) study, it was found that service provider levels of empowerment were related to higher customer satisfaction ratings, moderated by employees' communication style.

Schmit and Allscheid (1995) examined support in security systems organizations and their relationship with an underlying affective variable, which was strongly associated with service intentions. The latter was associated with customer service. Johnson (1996) examined the relationship between service climate dimensions in financial services and customer satisfaction, and found that all climate dimensions were related to one or more of the customer satisfaction dimensions, and eight of the 11 dimensions had significant correlations with overall satisfaction, especially information seeking, training, and rewards and recognition. Hoffman and Kelly (1994), and Parasuraman et al. (1990) found positive relationships between employee cooperation and service quality perceptions.

Wetzels, de Ruyter and Bloemer (2000) examined the antecedents and consequences of role stress, and found a negative relationship between organizational commitment and perceived service quality and a positive relationship between commitment to quality and perceived service quality. They found no significant relation between role conflict or role ambiguity and perceived service quality. Satisfaction was positively associated with professional orientation of employees and satisfaction with their organization (Kitzman, 2000) and with organizational citizenship behaviors (Adcock, 2000). Quality ratings from customers were positively related to employee organizational commitment (Steffen, Nystrom, & O'Connor, 1996).

In Jimmieson and Griffin (1998), it was found that a significant amount of variance in client satisfaction with a health care service was accounted for by employees' role conflict, even when client characteristics and client attitudinal measures were taken into account. Atkins et al. (1996) found a relationship between nurse job satisfaction and intention to recommend and intention to return. Satisfaction with services in healthcare was significantly and negatively related to employee burnout (emotional exhaustion) and intentions to leave the organization, and positively related to the degree to which employees perceived their job as meaningful (Leiter et al., 1998).

Williams (2000) found satisfaction with products and services to be only weakly associated with employee ratings of supervision, job satisfaction, stress and workload. In a study on the relationships between job conditions and customers' quality ratings, Dormann and Kaiser (2002) found job satisfaction, task control and

emotional exhaustion to be related to higher quality ratings (except for the tangibles dimensions which are less influenced by employee behaviors than the other four dimensions) while time control, coworker and superior support and psychosomatic complaints were associated with lower service quality ratings. High performance workers in a liaison position reported lower stress levels than workers whose performance was evaluated less positively (Varca, 1999).

A limited number of longitudinal studies have been conducted on the subject. One of these was done by Schneider, White and Paul (1998), who examined antecedents and consequences of a climate for service. They found that global service climate was the result of a complex set of system issues, some foundation issues and some more specifically focusing on service policies and practices. In addition, they found that the relationship between employee and customer perceptions was a reciprocal one (via customer feedback). Interdepartmental service and customer feedback had a strong direct relation to customer perceived quality. This indicates that internal cooperation can be strongly related to customer perceived quality. Cooperation can also be seen as a mediator of the relationship between shared attitudes and performance, because individual satisfaction levels are not strongly related to performance (see meta-analysis by Iaffaldano and Muchinsky, 1985). Ryan et al. (1996) found that, contrary to common wisdom and the assumptions held by for example Burke, Rupinski, Dunlap, and Davison (1996), customers influence employees over time. More specifically, customer satisfaction ratings at time one caused 'morale' ratings for employees at time two.

Finally, also relevant in the context of the Flexihealth research project are studies that have tried to link customer satisfaction perceptions from within the organization to employee well-being. Griffith (2001) found that employees' ratings of customer satisfaction were positively related to job satisfaction, teamwork and satisfaction with supervision. Ratings of quality of services made by superiors were not related to employee job satisfaction in a call center environment (Todd, Robson & Lomax, 2000). Employees' perceptions of their ability to satisfy customers were directly and positively influenced by other department support, organizational commitment and evaluation effectiveness (Sergeant & Frenkel, 2000).

In summary, we can conclude that although there exists a body of research on relationships between employee attitudes, employee well-being and customer satisfaction, results are not conclusive and there are no studies incorporating organizational changes or changes in employees' working conditions. Furthermore, with the exception of Herrington and Lomax (1999) and Hagan (1999), there are virtually no studies that simultaneously include behavioral intentions as well as other indicators of customer satisfaction in relationships with employee attitudes and well-being. In this study, we will examine the effects of a number of employee indicators on quality ratings, customer satisfaction ratings and behavioral intentions. These employee indicators and the theoretical framework are defined and described in the psychosocial section. Concerning the relationships with CSI, we expect that negative job stress, positive stress and job satisfaction as indicators of employee well-being will show the strongest relationships with CSI. We also test for the effects of personal and situational moderators.

2.1.6.3. Customer satisfaction in the context of organizational changes

In the Flexihealth project, one of the main goals was to examine the effects of organizational changes on organizational performance in the form of customer satisfaction. Most studies concerned with effects of organizational changes are limited to investigating the effect of one or more major organizational changes on individuals' responses, which makes it difficult to know exactly *what* has changed for each individual employee. In the Flexihealth study, rather than only examining the effects of large-scale organizational changes, we chose to obtain information on changes in the working environment that each individual employee was directly confronted with.

According to a transactional perspective (Lazarus & Folkman, 1984), the appraisal of an event or the way in which an individual evaluates a situation may be more important to employee well-being than the actual presence of stressors. This evaluation process results in a certain emotional response (positive or negative) which will in turn lead to certain coping responses. Following this line of reasoning, Payne and Morrison

(1999) argued that it is important to distinguish among potentially 'stressful' or 'harmful' situations from the 'importance' or affective value of these situations for the individual. In a transactional perspective, the changes in the environment of employees will have a differential impact on employee well-being according to the way they are evaluated and experienced. Here, we examined not only the 'objective' changes in employees' environment, but also the degree to which employees perceived the changes as controllable, threatening, challenging or involving the organization's accountability, and the degree to which they experienced positive or negative emotional reactions resulting from the changes. It is hypothesized that the perception of changes and emotional responses to these changes will be more important in determining employee well-being than the number of changes actually experienced.

The main question here is to what degree changes in employees' working environment exert a direct effect on perceived CSI, or if these effects are completely mediated by employee well-being and moderator variables.

2.1.6.4. Summary

In summary, we will be guided by the following main research questions:

- To what degree can we find evidence for the correspondence between employee and customer ratings of satisfaction?
- Does the model of relationships between quality ratings, satisfaction ratings and estimation of behavioral intentions fit with our data collected from employees in a wide range of organizational settings and activities?
- What employee variables are related (directly or indirectly) to employees' perceptions of customer satisfaction?
- Is there evidence for an effect of changes and the perception of changes in employees' working environment on CSI and if so, can we find evidence for a direct effect or are these effects mediated through working conditions and well-being variables?

2.2. Samples

2.2.1 Data collection

After validating scales and instruments pertaining to the Flexihealth survey, a major objective was to develop a data base. During the last two years of the project, several surveys were conducted in the primary and secondary industries in Belgium. These surveys were held by one of the Flexihealth teams, in collaboration with the other teams. During years 2002 and 2003, the following surveys[5] were conducted (cf. Table 3):

Table 3. Surveys conducted by the Flexihealth research network.

Organization's business	Flexihealth team involved	Nb respondents	Industry	Domain
Union	Gent	105	tertiary	Private, service
Occupational medicine	Gent	51	tertiary	Private, service
Telecommunications and aerospace	Liege	310	secondary	Private, production
Energy	Liege	74	secondary	Private, production
Transportation	Liege	445	secondary	Private, production
Retailing	LLN	4352	tertiary	Private, service
Retailing – headquarters	LLN	600	tertiary	Private, service
Retailing – logistics	LLN	218	tertiary	Private, service
Training	Liege	65	tertiary	Private, service
Hospital	Liege	278	tertiary	health
Paper bag production – site 1	Gent	31	secondary	Private, production
Paper bag production – site 2	LLN	41	secondary	Private, production
Printing	Gent	92	secondary	Private, production
Telecommunications	LLN	465	tertiary	Private, service
Federal public department – site 1	LLN	71	tertiary	public
Federal public department – site 2	LLN	30	tertiary	public
Glass production	LLN	274	secondary	Private, production
Transportation public department	LLN	80	tertiary	public

2.2.2 Data base

The data base has been developed by the Liege team, in an attempt to generalize the findings from the Flexihealth project to the whole Belgian active population.[6]

STEP 1: SELECTION OF DATA

We first cleaned up the sets of collected questionnaires, excluding any questionnaire with less than 100 items filled out. Note that the final version of the instrument contained nearly 200 items, including demographics.

STEP 2: SELECTION OF VARIABLES COMMON TO ALL DATA SETS

To avoid confusion, we selected occupational and demographic characteristics common to all studies (cf. Table 4). These were gender, civil status, age and tenure. We also created a variable pertaining to occupation category. When occupational categories were too sample-specific, they were recoded as *other*. In the public sector, the variable *occupation* was not used and was replaced by that of *level*.[7] Finally, we used new variables for the data base in order to distinguish among data sets (organization, language, industry, and business domain).

[5] Data collected by September 30, 2003. Note that the Gent team also collected data from 8173 respondents within Flemmish hospitals and from 202 respondents from a service organization.

[6] This has been possible thanks to an internet website where all data were freely accessible to Flexihealth researchers. This website has been developed by the LLN team.

[7] This variable will not be used here because it refers to a single organization. However, it can be used in later studies for comparison purposes.

Table 4. Description of demographic variables used in the data base.

Code	Variable (available data)	Categories
Ech	Organization (n=4961)	From 1 to 18
Secteur	Industry (n=4961)	2=secondary 3=tertiary
secteur bis	Business domain (n=4961)	1=private, production 2=private, service 3=health 4=public
Lg	Language (n=4961)	1=francophone 2=Flemish
Sexe	Gender (n=4934)	1=male 2=female
etat_civ	Civil status (n=4863)	1=single 2=married 3=divorced 4=widowed
Age	Age (n=4747)	1=less than 25 2=26-35 3=36-45 4=46-55 5=more than 55
Tenure	Tenure (n=4496)	1=less than 1 year 2=1-5 3=5-10 4=11-15 5=16-20 6=21-25 7=26-30 8=more than 30
Catprof	Occupational category (n=1459)	1=blue-collar 2=white-collar 3=manager 4=upper level manager
Niveau	Occupational category for public sector (n=97)	1=level 1 2=level 2+ 3=level 2 4=level 3 5=level 4

In terms of substantive variables, those included in the data base were from the standard Flexihealth survey. In addition, we included a set of variables that were measured in most (but not all) studies (e.g., work intensification).

STEP 3: CORRESPONDENCE BETWEEN DATA BASE AND BELGIAN POPULATION

The criterion used for achieving the correspondence between the data base and the Belgian active population is the industry. To avoid an overrepresentation of the service sector, we randomly deleted 2554 respondents from the retailing industry. This procedure allowed us to match the 25-75 distribution of secondary and tertiary sectors in Belgium as established by the National Institute for Statistics in 1999 (published by the Labor and Employment Ministry). In total, this reduced the data base to a set of 4961 respondents, representative of the whole Belgian active population from secondary and tertiary sectors (see Table 5).

Table 5. Description of the data base.

Organization's business	Industry	Business domain	Nb	% overall	% industry
Telecommunications and aerospace	Secondary	Private, production	310	6.2	24.6
Energy	Secondary	Private, production	74	1.5	5.9
Transportation	Secondary	Private, production	444	8.9	35.3
Paper bag production – site 1	Secondary	Private, production	30	0.6	2.4
Paper bag production – site 2	Secondary	Private, production	40	0.8	3.2
Printing	Secondary	Private, production	92	1.9	7.3
Glass production	Secondary	Private, production	269	5.4	21.4
Total secondary sector			**1259**	**25.4**	**100.0**
Union	Tertiary	Private, service	105	2.1	2.8
Occupational medicine	Tertiary	Private, service	45	0.9	1.2
Vente - grande distribution	Tertiary	Private, service	1755	35.4	47.4
Retailing – headquarters	Tertiary	Private, service	599	12.1	16.2
Retailing – logistics	Tertiary	Private, service	215	4.3	5.8
Training	Tertiary	Private, service	65	1.3	1.8
Hospital	Tertiary	Health	276	5.6	7.5
Telecommunications	Tertiary	Private, service	464	9.4	12.5
Federal public department – site 1	Tertiary	Public	69	1.4	1.9
Federal public department – site 2	Tertiary	Public	30	0.6	0.8
Transportation public department	Tertiary	Public	79	1.6	2.1
Total tertiary sector			**3702**	**74.6**	**100.0**
Total			**4961**	**100.0**	

LIMITATIONS

Some limitations concerning the value of the data base should be pointed out. First, the tertiary sector is largely represented through data collected from a large retailing company. Second, it would have been interesting to refine the data base by using criteria such as gender, age, or language. However, the more criteria we selected, the more difficult it was to retain enough data representing the Belgian active population. Thus, we were constrained not to use criteria other than industry. Of course, it will be possible in the future to collect other data sets and to refine the data base by including additional criteria. Finally, the occupation criterion was difficult to use due to the number of specifics that occurred across organizations. We thus retained the most common classification of occupations (see Table 4). In total, relevant information was available for 1459 respondents on this criterion. *Level* was a specific variable used in the federal public sector only. Hence, we will not use it in this report.

2.2.3 Description of population from the Flexihealth data base

In this section, we will compare the demographic characteristics of the Flexihealth data base to those of the Belgian active population (for secondary and tertiary sectors), based on data from the National Institute for Statistics (as published by the Labor and Employment Ministry in 1999).

2.2.3.1. Comparison

There are a little bit more women in the Flexihealth data base than in the general population. In terms of industry representation[8], the health and service industries are underrepresented while the private sector is overrepresented (cf. Table 6).

Table 6. Comparison of Flexihealth respondents to the Belgian active population.

INDUSTRY					
	Flexihealth			Belgian active population (NIS, 1999)	
	N	%		N	%
Secondary	1259	25.4	Secondary	954 807	25
Tertiary	3702	74.6	Tertiary	2 807 355	75
Total	4961	100.0	Total	3 762 162	100.0
GENDER					
	Flexihealth			Belgian active population (NIS, 1999)	
	N	%		N	%
Male	2424	48. 9	Male	2 201614	57
Female	2510	50.6	Female	1 645 938	43
Total	4934	99.5	Total	3 762 162	100.0
Missing	27	0.5			
Total	4961	100.0			
BUSINESS DOMAIN					
	Flexihealth			Belgian active population (NIS, 1999)	
	N	%		N	%
Private, production	1259	25.4	Private, production	954 807	25
Private, services	3248	65.5	Private, services	2 086 346	55
Health	276	5.6	Health	412 961	11
Public	178	3.6	Public	308 048	8
Total	4961	100.0	Total	3 762 162	100.0

[8] The data over business domain are not available from the NIS report because this classification emanates from the Flexihealth group itself.

2.2.3.2. Demographic description

The Flexihealth data base includes 4961 workers. Among them, 2424 (48.9 %) are male and 2510 (50.6 %) are female (missing=27). Their mother language is French (N=2934; 59.1%) or Flemish (N=2027; 40.9%). Most employees are married (68.7%) while a minority (19%) are single. For a majority (83.7%), age is between 26 and 55. There are few workers aged over 55 (N=197; 4%). Low-tenured (1-5 years) employees represent the largest tenure category (26%). Others approximate 10%, except the youngest (5%). Among the 1459 workers for whom occupation category was reported, one counts 493 blue-collar workers, 467 white-collar, 421 managers, and 78 upper-level managers.

2.2.4 Flexibility practices and changes

Most workers do report having encountered flexibility practices and changes during the last six months (see Table 7 and 8).

Table 7. Flexibility practices among Flexihealth respondents.

Flexibility practice	Yes (%)	No (%)	Missing (%)
Work schedules	**3048 (61.4%)**	1873 (37.8%)	40 (0.8%)
Task assignments	**2022 (40.8%)**	2939 (59.2%)	0 (0%)
Work time	**1463 (29.5%)**	4358 (69.7%)	40 (0.8%)
Geographic location	**448 (9%)**	4351 (87.7%)	162 (3.3%)
Type of contract	**133 (2.7%)**	1920 (38.7%)	2908 (58.6%)

Only 279 (14.4%) workers among the 1931 for whom data are available were not exposed to any flexibility practice. A majority of workers were exposed to one or more flexibility practices at the moment of the survey (1279 out of 1931; 66.2%).

Table 8. Changes encountered among Flexihealth respondents.

Change	Yes (%)	No (%)	Missing (%)
Colleagues	**2760 (55.6%)**	1669 (33.6%)	532 (10.7%)
Supervisor	**2364 (47.7%)**	2105 (42.4%)	492 (9.9%)
Tasks	**2069 (41.7%)**	2220 (44.7%)	672 (13.5%)
Schedules	**1287 (25.9%)**	2839 (57.2%)	835 (16.8%)
Location	**1134 (22.9%)**	2993 (60.3%)	834 (16.8%)

Only 714 (14.9%) of the 4801 workers of the data base were not exposed to any change. Most workers (3356 out of 4801; 69.9%) were exposed to one or more changes at the moment of the survey.

2.3. Studies involving customer relationships issues

2.3.1. Phase 1: preliminary research

Preliminary study 1

In collaboration with the Scientific Institute of Public Health (Wetenschappelijk Instituut Volksgezondheid), we conducted a survey in 45 Belgian nursing homes. Standardized interviews on quality and satisfaction were conducted by the Scientific Institute with nursing home residents (N=2315) and we surveyed employees (N=882) and residents' family members (N=1481). This study allowed us to examine the correspondence between employees' perceptions of customer satisfaction and customer satisfaction ratings as supplied by residents and proxies of residents. Results on this correspondence are presented in the first section of the results on customer satisfaction.

Preliminary study 2

In collaboration with the complete Flexihealth network, a first exploratory study was conducted in a Research and Development department of a petrochemical company that underwent several organizational changes during the past year. The goal was to test a first version of the full Flexihealth questionnaire, including scales measuring employees' perceptions of quality and customer satisfaction. Since the results from this study primarily served scale construction purposes, the results are reported in the context of a description of the measures as reported in the technical document provided by the Flexihealth team and section 2.3.3. on customer satisfaction measures.

Preliminary study 3

We conducted a preliminary study in 17 institutions that are frequented by or accommodate for people with mental disabilities in Flanders. Employees (N= 491) and proxies for customers (N= 513) were surveyed in the context of a different ongoing research project. The goal here was to examine some properties of customer questionnaires and the correspondence between employee and customer ratings of customer satisfaction. Results on this correspondence are reported in the first section of the results on customer satisfaction.

2.3.2. Phase 2: validation

REMARK: In general, this is similar for all teams, however:
For CSI, we used the data sample and split it according to activity and sector for some of our analyses. In short, we constructed Sample 1, regrouping those organizations that are either private production companies or private service organizations who also provide products (N=4507), Sample 2 which grouped private and public service organizations that do not provide products (N=454) and Sample 3 which consisted of 11 Flemish hospitals (N= 8173).

2.3.3. Customer satisfaction variables

The employee questionnaire included a number of indicators for employee perceived customer satisfaction. These indicators comprised evaluations of service and product quality – if applicable –, perceived customer satisfaction with services and products and estimations of customers' behavioral intentions.

Findings referring to the preliminary research are based on studies conducted with clients (family members) from nursing homes in study 1 (N=1481) and employees from a research and development department from a petrochemical company in study 2 (N=134). Other reported figures are based on the data that were collected within the validation phase.

2.3.3.1. Service and product quality ratings

The 22-item performance scale from the SERVQUAL instrument (see Table 9 for description; Parasuraman et al., 1991) was included in the questionnaire, as well as a general service (1 item) and product quality (1 item) rating. SERVQUAL measures five separate dimensions of service quality: ① tangibles (4 items), ② reliability (5 items), ③ responsiveness (4 items), ④ assurance (4 items) and ⑤ empathy (5 items).

Table 9: Description of Servqual dimensions

	Description
Tangibles	The appearance of the organization, physical facilities, equipment, staff and communication materials.
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	The willingness to help customer and provide prompt service

Assurance	The knowledge and courtesy of the employees and their ability to convey trust and confidence
Empathy	The caring, individualized attention the company provides to customers.

The α -coefficient from the five Servqual scales can be found in 10.

Table 10: Cronbach Alphas for SERVQUAL dimensions

	study 1 (clients)	study 2 (employees)	Flexihealth Private (production and services)	Flexihealth Public services	Flexihealth Hospitals
Tangibles	.79	.70	.75	.72	.82
Reliability	.93	.93	.89	.87	.88
Responsiveness	.87	.77	.80	.80	.77
Assurance	.88	.81	.83	.87	.85
Empathy	.90	.79	.81	.83	.84

2.3.3.2. Satisfaction with services and products

In the preliminary studies, we measured satisfaction initially through two scales: one measuring satisfaction with services (5 items) and one measuring diverse aspects of satisfaction with products (7 items). The results from the two preliminary studies indicated however that the satisfaction with services scale was measuring a single construct (factor analysis yielded a 1-factor solution with eigenvalue 3.33 in study 1 and 2.69 in study 2, explaining respectively 66.74 % and 53.76 % of the total variance). A factor analysis of the product-satisfaction scale also resulted in a singe factor solution with eigenvalue 4.23, explaining 60.48 % of the variance. Apart from the strong consistency across items, we also found high correlations between the scale scores for satisfaction and a single item measure for satisfaction with products and services (r= .84 in study 1 and r=.63 in study 2 for satisfaction with services and r=.87 in study 2 for satisfaction with products).

In the final Flexihealth questionnaire, perceived satisfaction with services was measured through two global items and perceived satisfaction with products was also measured through two global items. The items were chosen on the bases of their performance in the preliminary studies. The α coefficient for the Flexihealth samples can be found in the Table 11.

Table 11: Cronbach alphas for satisfaction with services and products

	Flexihealth Private (production and services)	Flexihealth Public services	Flexihealth Hospitals
Satisfaction services	.77	.79	.82
Satisfaction products	.83		

2.3.3.3. Behavioral intentions

Here, we measured two aspects of perceived behavioral intentions: ① the intention to say positive things about the organization, its products and services and ② the intention to remain loyal (adapted version of Zeithaml, Berry & Parasuraman, 1996). In one of the preliminary studies (study 1), only one item measured the intention to remain loyal and one measured the likelihood of positive communication. The reliability for these two items was however insufficient (Cronbach's α = .61). In study 2 we included in total four items measuring behavioral intentions and here the reliability was much better, not only between the four items (α=.90), but even when split in two items measuring the intentions to say positive things (α=.85) and two items probing the perceived intention to remain loyal (α=.82).

2.3.3.4. Other information

Apart from indicators for perceived customer satisfaction, the questionnaire also included indicators for the amount of contact employees have with customers.

Table 12: Cronbach alphas for intention to recommend, intention to return and behavioral intentions in general.

	study 2 (employees)	Flexihealth Private (production and services)	Flexihealth Public services	Flexihealth Hospitals
Recommend	.85	.87	.90	.91
Loyal	.82	.85	.82	.83
Total	.90	.92	.92	.92

2.3.4. Analytical Procedures

2.3.4.1. Correspondence between employee and customer ratings of customer satisfaction.

In preliminary study 1, correspondence between ratings from different sources were examined by computing mean family and resident satisfaction scores for each nursing home and reporting the correlations between these aggregated customer ratings and ratings from individual employees. The resident and family satisfaction scores for each organization were aggregated over customers within each organization, since customer perceived satisfaction is largely the result of organizational processes as a whole and not attributable to individual employees (Wetzels, de Ruyter, & Bloemer, 2000). Therefore, the individual employee is the unit of analysis here, and mean scores for customer perceived satisfaction were assigned to each employee. The suitability of this aggregation of customer data within organizations was assessed by computing within-group interrater reliabilities (r_{WG}) for each organization (James, Demaree, Wolf, 1984). Average r_{WG} across nursing homes for resident satisfaction was .86 and average r_{WG} across organizations for family perceived satisfaction ratings was .92.

In preliminary study 3, agreement between employees' perceptions and customers' perceptions was examined both by analyzing an ANOVA design with source and organization as independent factors and further by correlating the satisfaction score for each employee with the aggregated satisfaction score for each organization. Average r_{WG} across organizations for customer perceived satisfaction was .97.

2.3.4.2. Testing the quality-satisfaction-behavioral intentions model

In this section, we examine the extent to which our theoretical model detailing the relationships between service quality, product quality, satisfaction and behavioral intentions is represented in the data collected with individual employees. This will be investigated by testing two alternative structural equation models on three separate samples (see results section for more details on samples). Using Lisrel 8.54 we compared the fit of the models presented in Figures 18-21.

The first model represents the current viewpoint that satisfaction is a more global response based on evaluative quality appraisal. The second model predicts that the more affective satisfaction response would influence a summary quality evaluation. These models are tested in three sets of data: data from private sector production and services organizations containing product satisfaction and quality measures; private and public sector services and healthcare data. For each dataset, model fit was examined using a parceling procedure. Instead of using separate items as indicators, three or two parcels of items were created in a random fashion for several factors (SERVQUAL dimensions, and behavioral intentions) from our initial analyses, and these were used as indicators of the latent constructs. According to Marsh, Hau, Balla, and Grayson (1998), parceling has some advantages with respect to the modeling of latent factors. Parceling results in a smaller number of indicators per latent factor, individual parcels are likely to have a stronger

relation to the latent factor, are less likely to be influenced by method effects, and are more likely to meet the assumptions of normality. In addition, the reliability of the factors is unaffected by the use of parcels because the same items are used to form the latent factor.

Following Anderson and Gerbing's (1988) recommendations, the measurement model was first assessed using confirmatory factor analysis on the three samples (sample 1: $N_{products}$= 1456, sample 2: $N_{services}$ = 158 and sample 3: $N_{healthcare}$ = 4821). To evaluate the goodness of fit of the measurement model, the Root Mean Squared Error of Approximation (RMSEA) and the Standardized Root Mean Squared Residual were selected. According to Hu and Bentler (1999), the combined cut-off values of .06 for RMSEA and .09 for SRMR indicate good fit. Initial estimation of the measurement model indicated a good fit in all three samples. Although model $?^2(76) = 670.68$; $?^2(56) = 91.59$; $?^2(56) = 932.84$ was significant for each sample, the other fit indices met the values for acceptable to good model fit (RMSEA= .07; SRMR = .05; RMSEA= .06; SRMR = .04; RMSEA= .06; SRMR = .02 in respectively Sample 1, 2 and 3).

2.3.4.3. Examining the relationships between employee variables and customer satisfaction indicators

In a first step, bivariate analyses are performed to check whether there exist significant differences groups within our samples. We will test for differences between gender groups and language groups and correlations with tenure and degree of contact with customers. In case of significant differences, we will further control for these in our subsequent analyses.

In a second step, zero-order correlations between CSI and employee variables are reported. A third analysis consists of regressing CSI on employee variables, controlling for pre-existing group differences. This will allow us to see to what degree employee well-being, job conditions and personal characteristics are related to CSI. In this section we perform hierarchical multiple regression analyses on the data in the three samples. In each sample, customer satisfaction indicators are regressed on 'control' variables (language, gender, tenure, degree of contact with customers) depending on the results from the bivariate analyses reported above. In a following step, we examine the extent to which personal characteristics can predict the ratings employees made of CSI. In the following step, work condition variables are added and in the final step, the predictive value of employee well-being is examined.

2.3.4.4. Impact of change

Firstly, we examine whether we can find evidence for deteriorated performance (lower CSI) in organizations where employees experienced more change (irrelevant from the perceptions and emotions employees experienced). Although all variables are measured at the individual level of employees, these employees are nested within organizations and we primarily wanted to examine the impact of change taking place within the organization, conceptualized as a characteristic of organizations. Therefore, we estimate a simple multilevel random intercept (variance components) model. In a first step, the variance in CSI at the level of individual employees was examined to estimate the degree to which average CSI varied within and between organizations. In a second step, we estimated a similar model but now including organizational-level average changes. These analyses are performed on the total dataset including samples 1, 2 and 3 in order to achieve a considerate N at level 2.

Secondly, to examine whether the number of changes experienced or the evaluation and emotions associated with these changes had a direct impact on customer satisfaction perceptions, hierarchical regression analyses were conducted. If change-related indicators allow a significant increase in the predicted variance of customer satisfaction indictors, we can conclude that a direct effect exists.

3. Results

The Liege team has treated three themes during the final stage of the research:

- ✓ The relationships between flexibility practices and/or changes, and the perception of work situations and employee well-being, in connection with demographic characteristics
- ✓ The relationships between the number of changes, their perception, positive stress, negative stress, and mental quality of life
- ✓ The relationships between the number of changes, their perception, control at work, positive stress, and negative stress.

The UCL team has conducted analyses on the role of personal and organizational variables as moderators of the relationships between the number of changes and their perception.

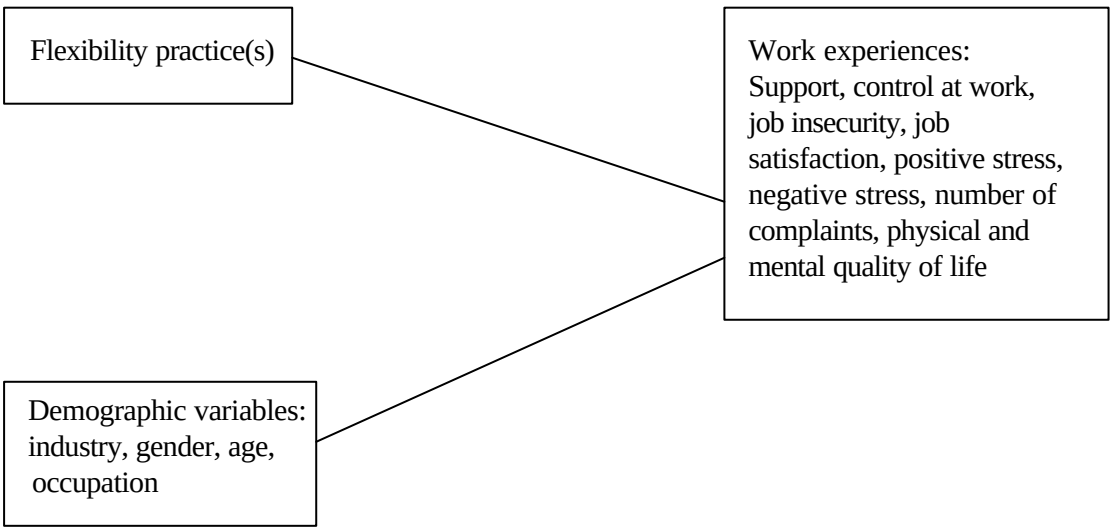
3.1. Theme 1 – Relationships between flexibility practices, changes, work situations and well-being as related to demographic variables

As a first step, we examined the effects of flexibility practices and changes on their potential outcomes measured in the research. We first focused on the effects across demographic categories and then assessed the effects attributable to each flexibility practice and/or change.

3.1.1 Hypotheses

The following hypotheses have been drawn:

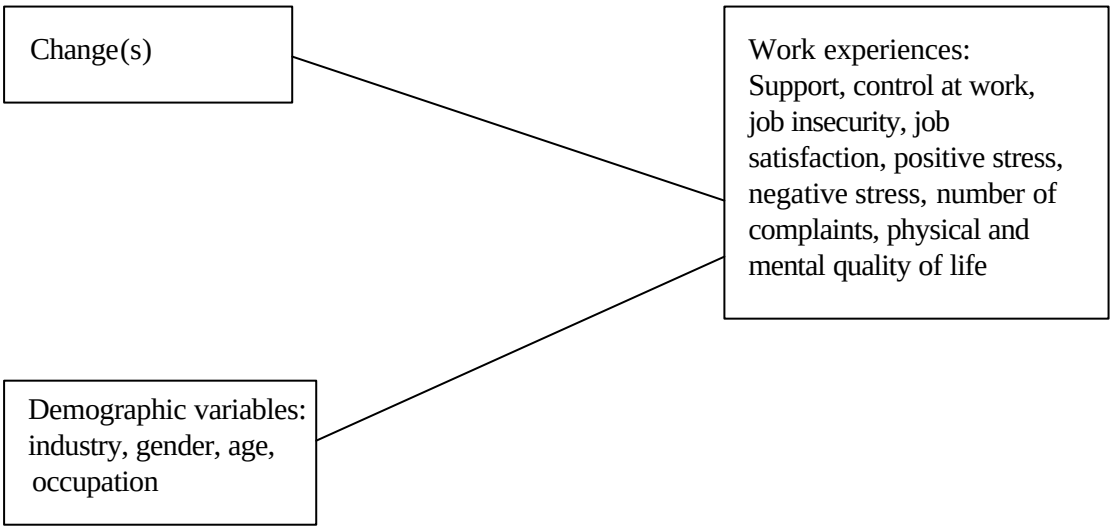
- ✓ We thought the effect of flexibility practices on work conditions and well-being would differ across industries, gender and age groups, and occupations.



- ✓ We also hypothesized that the effects would differ across flexibility practices[9].

[9] The interaction effects between each flexibility practice and age or occupation have been examined. The results of these analyses can be found in Hansez, I., Grisard, A., & De Keyser, V. (decembe r 2003). *Description de la base de données Flexihealth. Contribution de l'équipe ULG au rapport final de la recherche SSTC intitulée Flexihealth*. Université de Liège.

✓ Employees' work experiences and well-being may differ depending on whether they encountered changes or not in their environment; and these effects may differ across industries, gender and age groups, and occupations.



✓ Each category of changes will influence work experiences and well-being in a different manner[10].

[10] The interaction effects between each category of changes and age or occupation have been examined. The results of these analyses can be found in Hansez, I., Grisard, A., & De Keyser, V. (december 2003). *Description de la base de données Flexihealth. Contribution de l'équipe ULG au rapport final de la recherche SSTC intitulée Flexihealth*. Université de Liège.

3.1.2 Data analysis

Analysis of variance was used to test the foregoing hypotheses concerning the potential effects of flexibility practices and changes on work experiences and well-being. We also tested the interaction effects between independent variables and demographic variables using two-way analysis of variance.

3.1.3 Results

We compared the status of workers exposed to at least one flexibility practice to those who were unexposed to flexibility. Differences in terms of changes, intensification, social support, control at work, job insecurity, and well-being indicators (satisfaction, positive stress, negative stress, mental quality of health, and number of medical complaints) are reported in Table 13.

Table 13. Summary statistics for workers exposed vs. unexposed to flexibility.

	p value	Unexposed M (SD)	Exposed M (SD)
Number of changes	**.00**	**1.87 (1.33)**	**2.21 (1.31)**
Work intensification	**.01**	**3.59 (.77)**	**3.82 (.80)**
Support organization	NS	2.57 (.91)	2.66 (.92)
Support supervisor	NS	3.13 (1.14)	3.18 (1.13)
Control at work	**.01**	**3.45 (.95)**	**3.28 (1.04)**
Control over methods	NS	3.46 (.80)	3.34 (.87)
Overall control	NS	3.46 (.81)	3.32 (.88)
Job insecurity	**.01**	**2.89 (1.22)**	**2.66 (1.31)**
Job satisfaction	NS	3.60 (.88)	3.69 (.90)
Positive stress	**.01**	**48.67 (10.24)**	**50.31 (10.11)**
Negative stress	NS	49.22 (10.16)	49.34 (10.18)
Number of medical complaints	NS	9.5 (3.42)	9.54 (3.70)
Physical quality of life	NS	52.44 (6.31)	52.49 (6.39)
Mental quality of life	NS	44.12 (11.09)	44.33 (11.00)

Note. NS = Non significant at $p < .01$.

Interestingly, Table 13 shows that workers experiencing flexibility practices are more likely to encounter changes in their work environment (e.g., changes among colleagues, of supervisor, and of task assignments). They also experience more work intensification (overload, increasing number of tasks, or more competencies to be used). At the same time, they have less control over task scheduling. Using Karasek's (1979) model, it is obvious that this group of workers are at risk in terms of stress (more constraints, less control). However, in terms of consequences, one sees that these workers do not feel as insecure concerning their job, and report to be more positively stressed than those who are unexposed to flexibility practices. One could hypothesize that a higher job security and more positive stress are achieved at the expense of more work intensification, more exposure to flexibility, and more precarious job conditions.

INFLUENCE OF DEMOGRAPHIC VARIABLES

Workers exposed vs. unexposed to flexibility were compared in terms of changes, work intensification, social support, control at work, job insecurity, and well-being indicators for different demographic variables such as industry, gender, age and occupation (cf. Tables 14 and 15).

Several conclusions can be drawn from these results. For industry comparisons, the same pattern of differences occurs for either category of workers (exposed vs. unexposed). However, for the tertiary sector, more support from supervisors, higher levels of job satisfaction, and less negative stress, were reported among workers exposed to flexibility, as compared to the secondary sector. Similarly, control over methods is higher within the tertiary sector than in the secondary sector, but only for workers unexposed to flexibility.

Table 14. Results of analyses of variance and Post-Hoc t tests according to industry, gender, age, and occupation, for workers exposed to flexibility.

	Industry		Gender			Age group		Occupational group
	p	M	*p*	M	*p*	Post-Hoc *t* tests	*p*	Post-Hoc *t* tests
Number of changes	.000	S>T	.011	M>F	.038	-	.033	-
Work intensification	NS	-	.001	M>F	.000	+55=less	NS	-
Support organization	.000	T>S	NS	-	.013	-	.000	Blue-c.<White-c./Manager
Support supervisor	.000	T>S	.006	F>M	.000	26-35>36-45/46-55	.000	Blue-c.<White-c./Manager
Control at work	.000	T>S	.004	F>M	NS	-	.000	Blue-c.<White-c./Manager
Control over methods	NS	-	NS	-	NS	-	.000	Manager >Blue-c./White-c.
Overall control	.046	T>S	NS	-	NS	-	.000	Blue-c.<White-c.<Manager
Job insecurity	.000	S>T	.000	M>F	.029	+55=less	.000	Blue-c.>Manager >White-c.
Job satisfaction	.045	T>S	.033	F>M	NS	-	NS	-
Positive stress	.001	T>S	.000	F>M	.004	+55>-25/26-35	.000	Blue-c.<White-c./Manager
Negative stress	.016	S>T	NS	-	.001	+55=less	NS	-
Nb of medical complaints	NS	-	NS	-	NS	-	NS	-
Physical quality of life	.012	S>T	.000	M>F	.000	Decreases with age	.000	Manager >Blue-c./White-c.
Mental quality of life	.042	T>S	NS	-	NS	-	NS	-

Note. NS = non significant at $p < .05$. S=secondary sector; T=tertiary sector; F=Female; M=Male; The sign '-' means that no difference was found between groups.

Table 15. Results of analyses of variance and Post-Hoc t tests according to industry, gender, age, and occupation, for workers unexposed to flexibility.

	Industry		Gender			Age group		Occupational group
	p	M	*p*	M	*p*	Post-Hoc *t* tests	*p*	Post-Hoc *t* tests
Number of changes	.043	S>T	NS	-	NS	-	.043	White-c.<Cadre- Blue-c.
Work intensification	NS	-	NS	-	NS	-	NS	-
Support organization	.000	T>S	NS	-	NS	-	.000	Manager>White-c.- Blue-c.
Support supervisor	NS	-	NS	-	.013	26-35>36-45	.000	Manager >White-c.- Blue-c.
Control at work	.000	T>S	NS	-	NS	-	.001	Manager >White-c.- Blue-c.
Control over methods	.000	T>S	NS	-	NS	-	NS	-
Overall control	.000	T>S	NS	-	NS	-	NS	-
Job insecurity	.002	S>T	NS	-	NS	-	NS	-
Job satisfaction	NS	-	NS	-	NS	-	NS	-
Positive stress	.007	T>S	NS	-	NS	-	.012	Blue-c.<Manager
Negative stress	NS	-	NS	-	.008	36-45=more stressed	NS	-
Nb of medical complaints	NS	-	NS	-	NS	-	NS	-
Physical quality of life	.029	S>T	NS	-	NS	-	NS	-
Mental quality of life	.026	T>S	NS	-	NS	-	NS	-

Note. NS = non significant at $p < .05$. S=secondary sector; T=tertiary sector; F=Female; M=Male; The sign '-' means that no difference was found between groups.

Gender differences occur for workers exposed to flexibility. Men do report more changes, perceive more work intensification and less support from their supervisor, have less control over scheduling, and feel more job-insecure. Women are more satisfied with their job, experience more positive stress, but have a lower physical quality of life.

There are more age differences among workers exposed to flexibility. Among them, the 55+ age group perceive less work intensification, feel less job-insecure, experience more positive stress but have a lower physical quality of life.

Among occupational groups, and within those exposed to flexibility, blue-collar workers perceive less support from the organization and the supervisor, less control over scheduling, less overall control, more job insecurity and less positive stress. Managers report more control over methods and a higher physical quality of life. Among those unexposed to flexibility, differences are less prevalent across demographic groups.

Finally, blue-collar workers and managers feel more job-insecure when they are exposed to flexibility practices while white-collar workers feel less job-insecure when they are exposed to flexibility.

INFLUENCE OF FLEXIBILITY PRACTICES

Table 16 displays the comparison across flexibility practices of mean scores on key outcomes for workers exposed vs. unexposed to flexibility.

Tableau 16. Mean score on key outcomes across flexibility practices.

	Schedules	Tasks	Work time	Geographical location	Type of contract
Number of changes	NS	+	+	NS	NS
Work intensification	NS	+	NS	+	-
Support organization	NS	-	-	+	NS
Support supervisor	+	NS	NS	+	NS
Control at work	-	+	-	+	NS
Control over methods	-	+	-	+	NS
Overall control	-	+	-	+	NS
Job insecurity	-	NS	NS	NS	NS
Job satisfaction	NS	NS	NS	+	NS
Positive stress	+	NS	NS	+	NS
Negative stress	NS	+	NS	NS	NS
Nb of medical complaints	NS	+	+	NS	NS
Physical quality of life	NS	+	NS	+	NS
Mental quality of life	NS	-	NS	NS	NS

Note. NS = non significant at $p < .01$. + vs. – report the status of those exposed to flexibility as compared to those unexposed to it.

Workers who are exposed to flexibility in terms of work schedules do perceive less control over task scheduling and methods but feel more supported by their supervisor. They also feel less job-insecure and more positively stressed. However, one should be careful in interpreting these findings, because these positive consequences may be somewhat costly in terms of personal involvement at work and work-life balance, and could be offset by a loss of control over one's job situation, which ultimately may reduce well-being. Also, it might be interesting to know whether these flexibility practices have been imposed or freely chosen. It could be that if they are freely chosen, they allow a better work-life balance. On the other hand, it might be that support from the supervisor is a moderator of the relationship between flexibility in terms of work schedules and well-being. This possibility should be examined in future research.

Task assignment flexibility is associated with more job-related changes and work intensification. Workers exposed to this type of flexibility feel less supported by their organization and also report more negative stress and medical complaints, and poorer mental quality of life. However, they experience a better physical quality of life. This finding is in line with preliminary results from the Flexihealth project (De Zanet, Hansez, Bossut, Vandenberghe, & De Keyser, in press). This study showed that workers exposed to changes in workload and task assignment perceive them as resulting in a worsening of their job conditions while other changes are sometimes perceived more positively (e.g., changes in required competencies, responsibilities, autonomy, management methods, and work site). The latter are viewed as qualitative work intensification. However, even if qualitative intensification is higher for workers exposed to flexibility in terms of work schedules, this has detrimental effects on well-being. Perceived organizational support may play a moderating role in that process.

Flexibility in terms of work time (part-time, shiftwork, etc.) is associated with less support from the organization and less control at work. In terms of potential consequences, this category of flexibility practices is only associated significantly with more medical complaints. Actually, work time flexibility is largely implemented in companies using just-time processes and, even it is associated with less support from the organization (fewer contacts with top management and/or other workers, difficulties in transmitting information, etc.), these disadvantages are offset by a better work-life balance.

Flexibility in terms of work location (e.g., diverse forms of teleworking) is related to more work intensification but also has positive consequences: higher perceived organizational and supervisor support, more control, higher job satisfaction, more positive stress, and better physical quality of life. Note that only 9% of workers

are concerned by teleworking. As shown in Table 17, all occupational groups are affected by teleworking (especially white-collar workers).

Table 2. Flexibility in terms of work location across occupational groups.

Flexibility in terms of geographic location		Occupational group Blue-c.	White-c.	Manager	Upper Mgt	Total
Yes	N	15	64	34	33	146
	% within Flexibility/location	10.3%	43.8%	23.3%	22.6%	100.0%
Non response	N	351	376	384	45	1156
	% within Flexibility/location	30.4%	32.5%	33.2%	3.9%	100.0%
Total	N	366	440	418	78	1302
	% within Flexibility/location	28.1%	33.8%	32.1%	6.0%	100.0%

Note. χ^2 (3) = 103.24, $p < .000$.

Finally, nearly no difference is found among workers exposed vs. unexposed to flexibility in terms of type of labor contract. The single difference is related to work intensification (lower for those exposed to this type of flexibility).

3.1.4 Influence of changes on attitudes and well-being

We compared workers reporting at least one change to those who did not report any change during the last six months. Differences in terms of flexibility practices, social support, control at work, job insecurity, and well-being indicators were then examined (cf. Table 18).

Table 18. Differences among workers exposed vs. unexposed to changes during the last six months.

Variable	*p* value	No change M (SD)	Change M (SD)
Number of flexibility practices	**.00**	**1.25 (1.00)**	**1.61 (1.10)**
Work intensification	**.00**	**3.66 (.90)**	**4.2 (.74)**
Support organization	**.00**	**2.89 (.99)**	**2.61 (.99)**
Support supervisor	**.00**	**3.41 (1.11)**	**3.13 (1.18)**
Control at work	NS	3.15 (1.21)	3.06 (1.18)
Control over methods	NS	3.26 (1.04)	3.16 (1.02)
Overall control	NS	3.21 (1.04)	3.12 (1.02)
Job insecurity	**.00**	**2.36 (1.27)**	**2.62 (1.34)**
Job satisfaction	**.00**	**3.81 (.87)**	**3.67 (.96)**
Positive stress	**.01**	**51.96 (9.96)**	**50.92 (10.42)**
Negative stress	**.00**	**46 (9.48)**	**49.21 (10.4)**
Nb of medical complaints	**.00**	**8.36 (3.91)**	**9.21 (3.78)**
Physical quality of life	NS	51.07 (6.86)	51.06 (7.3)
Mental quality of life	**.00**	**47.86 (9.98)**	**45.15 (11.01)**

Note. NS = non significant at $p < .01$.

In general, workers exposed to changes experience more flexibility practices and perceive more work intensification. They feel less supported by their organization and supervisor. They are less satisfied with their job, less positively stressed, more negatively stressed and report more medical complaints and a poorer mental quality of life. They also feel more job-insecure. These are the negative aspects of changes. However, it is plausible that workers react to changes in the long run by using coping strategies to better adjust to them (Buchanan & Huczynski, 1997; Côté, Bélanger & Jacques, 1994). Nonetheless, this possibility may be ineffective in the case of repeated changes across time.

INFLUENCE OF DEMOGRAPHIC VARIABLES

We considered workers who experienced at least one change during the last six months as a separate group from those who did not report any change. Differences in terms of flexibility practices, work intensification,

social support, control at work, job insecurity, and well-being indicators were examined across demographic groups (cf. Tables 19 and 20).

Table 19. Results of analyses of variance and Post-Hoc *t* tests for industry, gender, age, and occupational group, among workers exposed to change(s).

	Industry		Gender		Age group		Occupational group	
	p	**M**	***p***	**M**	***p***	**Post-Hoc *t* tests**	***p***	**Post-Hoc *t* tests**
Number of flexibility practices	.000	T>S	.000	F>M	NS	-	.000	Managers: lower
Work intensification	NS	-	NS	-	NS	-	NS	-
Support organization	.000	T>S	NS	-	.002	-25/+55: higher	.000	Increases with hierarch. level
Support supervisor	.000	T>S	.041	F>M	.000	46-55: lower	.000	Increases with hierarch. level
Control at work	NS	-	.000	M>F	.000	26-35: higher	.000	Increases with hierarch. level
Control over methods	.000	S>T	.000	M>F	.000	26-35: higher	.000	Increases with hierarch. level
Overall control	.005	S>T	.000	M>F	.000	26-35: higher	.000	Increases with hierarch. level
Job insecurity	.000	S>T	.000	M>F	.000	+55: lower	.000	Upper Mgt < White c. < Managers < Blue-c.
Job satisfaction	NS	-	.036	F>M	.006	+55: higher	.000	Upper Mgt: higher
Positive stress	.000	T>S	.000	F>M	.000	+55: higher	.000	Increases with hierarch. level
Negative stress	.000	S>T	.000	M>F	.000	-25; +55: lower	.038	Upper Mgt: lower
Nb of medical complaints	.000	S>T	NS	-	.000	26-55: higher	.001	White-c.: higher
Physical quality of life	.000	S>T	.000	M>F	.000	Decreases with age	.000	Blue-c./White-c.: lower
Mental quality of life	.000	T>S	NS	-	.000	26-55: lower	.001	Upper Mgt: higher

Note. NS = non significant at $p < .01$. S=secondary sector; T=tertiary sector; F=Female; M=Male.

Table 20. Results of analyses of variance and Post-Hoc *t* tests for industry, gender, age, and occupational group, among workers unexposed to change(s).

	Industry		Gender		Age group		Occupational group	
	p	**M**	***p***	**M**	***p***	**Post-Hoc *t* tests**	***p***	**Post-Hoc *t* tests**
Number of flexibility practices	.000	T>S	.012	F>M	NS	-	NS	-
Work intensification	NS	-	NS	-	NS	-	-	-
Support organization	.000	T>S	NS	-	NS	-	.003	Increases with hierarch. level
Support supervisor	.003	T>S	NS	-	NS	-	.007	Increases with hierarch. level
Control at work	NS	-	.000	M>F	.022	-25: lowest; 36-45: highest	.000	Increases with hierarch. level
Control over methods	.036	S>T	.000	M>F	.05	-	.000	White-c.<Blue-c. <Managers<Upper Mgt
Overall control	NS	-	.000	M>F	.021	-25: lowest; 36-45: highest	.000	Increases with hierarch. level
Job insecurity	.000	S>T	.002	M>F	NS	-	.000	Blue-c.: higher
Job satisfaction	NS	-	NS	-	.044	-	.008	Upper Mgt>Blue-c./White-c. /Managers
Positive stress	.000	T>S	.008	F>M	.038	-	.000	Upper Mgt: higher; Blue-c.: lower
Negative stress	.037	S>T	NS	-	NS	-	NS	-
Nb of medical complaints	.007	S>T	NS	-	NS	-	NS	-
Physical quality of life	NS	-	.04	M>F	.000	Decreases with age	.017	Blue-c./White-c.: lower
Mental quality of life	NS	-	NS	-	NS	-	NS	-

Note. NS = non significant at $p < .01$. S=secondary sector; T=tertiary sector; F=Female; M=Male. The sign '-' means that no difference was found between groups. The sign '-' in *p* cells means that there were not enough subjects in each group (less than 10) for conducing the analysis of variance.

There are a large number of differences between the two sectors for either category of employees (those who were exposed vs. unexposed to change during the last six months). In addition, among workers who

were exposed to change(s), those working in the secondary sector reported more global control and a better physical quality of life but a weaker mental quality of life. Several differences also occurred for gender. Specifically, when exposed to change(s), women felt more supported by their supervisor, were more satisfied with their job and were less negatively stressed than men.

Among workers unexposed to change, there were few differences across age categories. However, workers aged between 46 and 55 and exposed to change(s) perceived less support from their supervisor than those from other age categories. In contrast, workers aged 55 or more and exposed to change(s) perceived more organizational support. In general, the 55+ age group was rather protected against adverse effects: they were more satisfied with their job and more positively stressed, felt less job-insecure, and were less negatively stressed (those aged less than 25 were also less negatively stressed). In contrast, those aged between 26 and 55 reported more medical complaints and had a poorer mental quality of life. The single interaction effect detected was between exposure to change(s) and age group for job satisfaction. In general, job satisfaction was higher when there was no change, except for those aged less than 25 or more than 55. Job satisfaction was higher for these age groups in case of exposure to change(s).

Several differences were observed across occupational groups. One finding of interest was that upper managers experienced less negative stress and more mental quality of life when exposed to change(s) as compared to other occupational groups, while white-collar workers reported more medical complaints.

TYPE OF CHANGE

Si on analyse plus en détail les types de changement (table), d'autres résultats émergent. Le principe de base de ces analyses est de comparer les travailleurs ayant vécu tel type de changement à ceux qui ne l'ont pas vécu.

Table 21. Mean score on key outcomes according to type of change.

Variable	Colleagues	Supervisor	Tasks	Work schedule	Job location
Number of flexibility practices	+	NS	NS	+	NS
Number of changes	+	+	+	+	+
Work intensification	+	+	+	+	+
Support organization	-	-	-	-	-
Support supervisor	-	-	-	-	NS
Control at work	NS	-	+	-	NS
Control over methods	NS	-	+	-	NS
Overall control	NS	-	+	-	NS
Job insecurity	NS	+	+	NS	+
Job satisfaction	-	-	-	-	-
Positive stress	NS	-	NS	NS	-
Negative stress	+	+	+	NS	+
Nb of medical complaints	+	+	+	NS	+
Physical quality of life	NS	-	NS	-	NS
Mental quality of life	-	-	-	NS	-

Note. NS = non significant at $p < .000$. + vs. – report the status of those exposed to change as compared to those unexposed to it.

In general, a change among colleagues or of work schedule affects employee well-being to a lesser degree than a change in task assignments or of supervisor. Change also tends to be associated with decreased well-being: higher work intensification, more flexibility practices, less support from the organization and the supervisor, less control, more job insecurity, lower job satisfaction and positive stress, more negative stress and medical complaints and a poorer quality of life.

In particular, changing supervisors appears to be problematic and is associated with the following: less social support, less control, more job insecurity, lower job satisfaction and positive stress, more negative stress and medical complaints, and a poorer quality of life.

Regarding change in task assignment, results are globally the same, except that perceived control is higher: less social support, less control, more job insecurity, lower job satisfaction and positive stress, more negative stress and medical complaints, and a poorer quality of life. Table 22 shows that change in task assignments affects all occupational groups.

Table 22. Changes in task assignments across occupational groups.

		Occupational group				
Change in task assignment		**Blue-c.**	**White-c.**	**Managers**	**Upper Mgt**	**Total**
Yes	N	219	224	253	34	730
	%	17.5%	17.9%	20.3%	2.7%	58.5%
No	N	158	177	140	43	518
	%	12.7%	14.2%	11.2%	3.4%	41.5%
Total	N	377	401	393	77	1248
	%	30.2%	32.1%	31.5%	6.2%	100.0%

As for flexibility practices related to tasks, change in task assignments may have positive implications for the work situation itself but detrimental effects on well-being.

Regarding change among colleagues, those who have been exposed to it report less support from the organization and the supervisor, a lower job satisfaction, more negative stress and less positive stress, more medical complaints and a lower mental quality of life. Change in work schedule does not affect that much well-being except that it is related to less social support and control. Finally, change in work location is mainly associated with a reduced well-being.

3.1.5 Conclusion

Flexibility practices appear to have few negative effects on worker health since workers exposed to flexibility report more positive stress and less job insecurity. These positive effects are accompanied by more work intensification and less control over scheduling which represent two main aspects of stress processes in organizations. If one examines each flexibility practice in particular, the effects differ. Flexibility practices related to work schedules and work time are associated with less control at work while flexibility practices related to task assignments are related to more control but have detrimental effects on stress, medical complaints, and quality of life.

Regarding the effects of changes, they are negative for worker well-being. Perceived support and job satisfaction were lower, negative stress was higher, positive stress lower, and mental quality of life poorer, and medical complaints more frequent among workers exposed to changes. Change of supervisor is the most detrimental to workers in terms of support, control, job insecurity, and well-being. Change among tasks and in job location has a negative effect on well-being mainly, while change in work schedules and among colleagues has milder negative effects on well-being.

Blue-collar workers and employees aged between 36 and 55 are more at risk since they experience more negative effects associated with flexibility and change. In contrast, workers aged 55 or more report higher levels of well-being than young employees.

3.2. Theme 2 – Moderating effects of dispositional variables on perception of changes

3.2.1 Hypotheses

The transactional model of stress predicts that the consequences of stressful events for employees are largely determined by how they are perceived. Perception is thus a key aspect of the stress process in the evaluation of health-related outcomes for employees.

Consequently, personal and situational factors susceptible to affect the perception of stressors should thus be examined. In this regard, the perception of changes is related to individual differences (De Zanet et al., 2004). Indeed, changes may be perceived positively (challenge) or negatively (threat).

We thought that some personal and situational variables played a moderating role in the perception of changes. Here are the effects we hypothesized.

Hypothesis 1. As individuals who are high on negative affectivity tend to view their environment negatively, we predict the following:

a) Individuals with a high level of negative affectivity will perceive changes more as a threat than those who have a low level of negative affectivity

b) Individuals with a low level of negative affectivity will perceive changes more as a challenge than those who have a high level of negative affectivity

Hypothesis 2. As individuals who are high on positive affectivity tend to view their environment positively, we predict the following

c) Individuals with a low level of positive affectivity will perceive changes more as a threat than those who have a high level of positive affectivity

d) Individuals with a high level of positive affectivity will perceive changes more as a threat than those who have a low level of positive affectivity

Hypothesis 3. As self-esteem may be considered as a set of resources that can be used to cope with stressful events, we predict the following:

e) Individuals with a low level of self-esteem will perceive changes more as a threat than those who have a high level of self-esteem

f) Individuals with a high level of self-esteem will perceive changes more as a challenge than those who have a low level of self-esteem

Hypothesis 4. Consistent with the findings of previous research on external locus of control, we predict the following:

g) Individuals with a high level of external locus of control will perceive changes more as a threat than those who have a low level of external locus of control

h) Individuals with a low level of external locus of control will perceive changes more as a challenge than those who have a high level of external locus of control

Hypothesis 5. As individuals who feel supported and valued by their organization tend to perceive their work environment more positively, we predict the following:

i) Individuals who feel unsupported by either their organization or their supervisor will perceive changes more as a threat than those who feel supported by either their organization or their supervisor

j) Individuals who feel supported by either their organization or their supervisor will perceive changes more as a challenge than those who feel unsupported by either their organization or their supervisor

3.2.2 Method

3.2.2.1. Sample

To test the hypotheses, we used data collected from a survey conducted among employees working in the retailing stores of a food company. In total, 4352 usable questionnaires were collected from the survey. Among them, 54.8 % emanated from Flemish-speaking respondents and 74.9 % from women.

3.2.2.2. Measures

The independent variable pertaining to our hypotheses was operationalized as the number of changes encountered during the last six months. The dependent variable was either the perception of threat or of challenge associated with the changes. Moderators were either personal characteristics (positive and negative affectivity, self-esteem, organization-based self-esteem, and external locus of control) or organizational characteristics (perceived organizational support and perceived supervisor support). Psychometric properties of the scales used have been presented in the section devoted to the development of the Flexihealth instrument.

3.2.3 Results

3.2.3.1. Descriptive statistics and correlations

Means, standard deviations and correlations for the study variables are shown in Table 23.

Table 23. Descriptive statistics and correlations for the study variables.

	M	ET	1	2	3	4	5	6	7	8	9	10
1. Nb of changes	1.86	1.35										
2. Challenge	2.64	1.27	.15***									
3. Threat	2.53	1.24	.10***	-.22***								
4. Support organization	2.68	1.09	-.13***	.31***	-.32***							
5. Support supervisor	3.17	1.21	-.10***	.26***	-.34***	.67***						
6. External LOC	2.78	1.21	.09***	-.14***	.28***	-.31***	-.30***					
7. Negative affectivity	1.82	.83	.10***	-.12***	.28***	-.32***	-.27***	.23***				
8. Positive affectivity	4.00	.75	-.00	.30***	-.26***	.39***	.35***	-.20***	-.27***			
9. Org.-b. Self-esteem	2.98	1.13	-.11***	.29***	-.31***	.88***	.61***	-.33***	-.33***	.41***		
10. Positive stress	51.96	10.33	-.02	.36***	-.29***	.47***	.40***	-.22***	-.25***	.65***	.47***	
11. Negative stress	48.22	10.60	.16***	-.16***	.36***	-.42***	-.37***	.31***	.70***	-.31***	-.41***	-.32***

3.2.3.2. Tests of moderating effects

We tested the moderation hypotheses using moderated multiple regression. As recommended by Aiken and West (1991), the independent and moderating variables were centered. Control variables (language, gender, and occupational group) were introduced in the first block of variables. Then the independent variables of interest were entered. Finally, the third block contained the product terms featuring the hypothesized interaction effects. The results of these analyses are shown in Tables 24-29.

Table 24. Results of moderated multiple regression for perceived threat and challenge using negative affectivity and number of changes as predictors.

Variable	Perceived threat	Perceived challenge
Block 1 :		
Language	-0.01	0.10***
Gender	-0.03	-0.10***
Occupational group	0.04*	-0.14***
ΔR^2	0.00	0.04***
Block 2 :		
Language	0.09***	0.07***
Gender	-0.03	-0.09***
Occupational group	0.05**	-0.13***
Nb of changes	0.08***	0.15***
Negative affectivity	0.30***	-0.11***
ΔR^2	0.09** *	0.03***
Block 3 :		
Language	0.09***	0.07***
Gender	-0.03	-0.09***
Occupational group	0.05**	-0.13***
Nb of changes	0.08***	0.15***
Negative affectivity	0.30***	-0.10***
Nb of changes x Negative affectivity	0.01	-0.04*
ΔR^2	0.00	0.00*
R^2	0.09** *	0.07***
	$F(6, 3061) = 52.48$***	$F(6,3113) = 39.73$***

Note. Entries are standardized regression coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 25. Results of moderated multiple regression for perceived threat and challenge using positive affectivity and number of changes as predictors.

Variable	Perceived threat	Perceived challenge
Block 1 :		
Language	-0.01	0.11***
Gender	-0.03	-0.10***
Occupational group	0.04*	-0.14***
ΔR^2	0.00	0.04***
Block 2 :		
Language	-0.01	0.11***
Gender	-0.02	-0.09***
Occupational group	0.03	-0.11***
Nb of changes	0.10***	0.14***
Positive affectivity	-0.25***	0.29***
ΔR^2	0.07***	0.10***
Block 3 :		
Language	-0.01	0.11***
Gender	-0.02	-0.09***
Occupational group	0.03	-0.11***
Nb of changes	0.10***	0.14***
Positive affectivity	-0.23***	0.28***
Nb of changes x Positive affectivity	-0.08***	0.06**
ΔR^2	0.01***	0.00**
R^2	0.08***	0.15***
	$F(6, 3058) = 43.85$***	$F(6, 3112) = 88.94$***

Note. Entries are standardized regression coefficients

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 26. Results of moderated multiple regression for perceived threat and challenge using organization-based self-esteem and number of changes as predictors.

Variable	Perceived threat	Perceived challenge
Block 1 :		
Language	-0.01	0.11***
Gender	-0.03	-0.10***
Occupational group	0.04	-0.14***
Δ R^2	0.00	0.04***
Block 2 :		
Language	0.07***	0.04**
Gender	-0.05**	-0.07***
Occupational group	0.05**	-0.13***
Nb of changes	0.07***	0.17***
Org.-b. self-esteem	-0.32***	0.30***
Δ R^2	0.10**	0.10***
Block 3 :		
Language	0.06***	0.05**
Gender	-0.04*	-0.07***
Occupational group	0.05**	-0.13***
Nb of changes	0.07***	0.16***
Org.-b. self-esteem	-0.29***	0.28***
Nb of changes x Org.-b. self-esteem	-0.08***	0.07***
Δ R^2	0.01**	0.004***
R^2	0.11**	0.15***
	$F(6, 3097) = 54.85$***	$F(6, 3148) = 88.64$***

Note. Entries are standardized regression coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 27. Results of moderated multiple regression for perceived threat and challenge using external locus of control and number of changes as predictors.

Variable	Perceived threat	Perceived challenge
Block 1 :		
Language	-0.01	0.11***
Gender	-0.03	-0.10***
Occupational group	0.03	-0.14***
Δ R^2	0.00	0.04***
Block 2 :		
Language	-0.01	0.12***
Gender	-0.01	-0.09***
Occupational group	0.04*	-0.12***
Nb of changes	0.09***	0.15***
External locus of control	0.27***	-0.15***
Δ R^2	0.08***	0.04***
Block 3 :		
Language	-0.02	0.12***
Gender	-0.01	-0.10***
Occupational group	0.04*	-0.13***
Nb of changes	0.09***	0.15***
External locus of control	0.26***	-0.14***
Nb of changes x External locus of control	0.03	-0.07***
Δ R^2	0.00	0.01***
R^2	0.09***	0.09***
	$F(6, 3086) = 49.17$***	$F(6, 3138) = 50.67$***

Note. Entries are standardized regression coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 28. Results of moderated multiple regression for perceived threat and challenge using perceived organizational support and number of changes as predictors.

Variable	Perceived threat		Perceived challenge	
Block 1 :				
Language	-0.01		0.11***	
Gender	-0.03		-0.10***	
Occupational group	0.04*		-0.14***	
Δ R^2		0.00		0.04***
Block 2 :				
Language	0.07***		0.04*	
Gender	-0.04*		-0.08***	
Occupational group	0.06**		-0.14***	
Nb of changes	0.07***		0.17***	
Org. support	-0.33***		0.32***	
Δ R^2		0.12** *		0.12***
Block 3 :				
Language	0.07***		0.04*	
Gender	-0.04*		-0.08***	
Occupational group	0.05**		-0.14***	
Nb of changes	0.07***		0.17***	
Org. support	-0.32***		0.31***	
Nb of changes x Org. support	-0.07***		0.07***	
Δ R^2		0.01** *		0.004***
R^2		0.12** *		0.16***
		$F(6, 3093) = 71.73$***		$F(6, 3141) = 100.18$***

Table 29. Results of moderated multiple regression for perceived threat and challenge using perceived supervisor support and number of changes as predictors.

Variable	Perceived threat		Perceived challenge	
Block 1 :				
Language	-0.01		0.11***	
Gender	-0.03		-0.09***	
Occupational group	0.04*		-0.14***	
Δ R^2		0.00		0.04***
Block 2 :				
Language	0.01		0.10***	
Gender	-0.04*		-0.08***	
Occupational group	0.05**		-0.13***	
Nb of changes	0.08***		0.16***	
Supervisor support	-0.33***		0.26***	
Δ R^2		0.12***		0.09***
Block 3 :				
Language	0.01		0.10***	
Gender	-0.04*		-0.08***	
Occupational group	0.05**		-0.13***	
Nb of changes	0.08***		0.16***	
Supervisor support	-0.31***		0.24***	
Nb of changes x Supervisor support	-0.08***		0.09***	
Δ R^2		0.01***		0.01***
R^2		0.13***		0.13***
		$F(6, 3098) = 76.10$***		$F(6, 3150) = 80.20$***

Note. Entries are standardized regression coefficients.

Note. Entries are standardized regression coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

NEGATIVE AFFECTIVITY

Negative affectivity exerts a significant moderating effect on the relationship between the number of changes and perceived challenge but not on the relationship between the number of changes and perceived threat.

Figure 4 displays the interaction effect between the number of changes and negative affectivity on perceived challenge, according to the procedure recommended by Aiken and West (1991).

The post-hoc *t* tests (Aiken & West, 1991) indicate that the regression coefficient is significantly different from zero within the subgroup of high negative affectivity individuals [t (3113) = 4.40, $p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of low negative affectivity individuals [t (3113) = 7.35, $p < 0.05$]. Finally, these two coefficients differ significantly from each other [t (3113) = -2.05, $p < 0.05$], revealing that changes are more often perceived as challenging when one is low on negative affectivity.

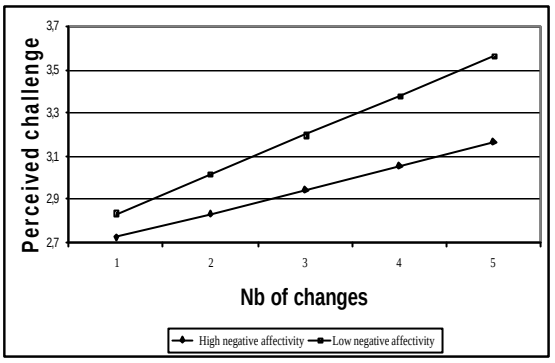


Figure 4. Effect of number of changes on perceived challenge for high vs. low negative affectivity individuals.

POSITIVE AFFECTIVITY

Positive affectivity exerts a moderating effect on the relationship between the number of changes and both perceived challenge and threat. Figures 5 and 6 display the pattern of these relationships for low vs. high positive affectivity individuals.

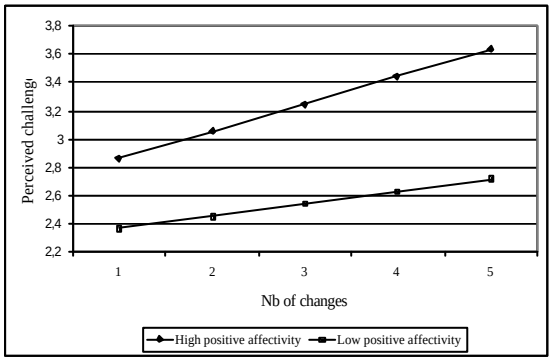


Figure 5. Effect of number of changes on perceived challenge for high vs. low positive affectivity individuals.

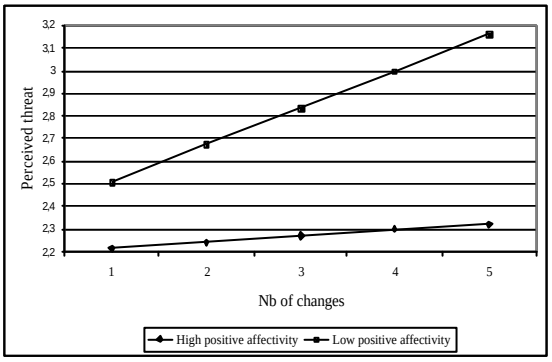


Figure 6. Effect of number of changes on perceived threat for high vs. low positive affectivity individuals.

Concerning the perception of changes as a challenge, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of high positive affectivity individuals [t (3112) = 8.28, $p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of low positive affectivity individuals [t (3112) = 3.79, $p < 0.05$]. Finally, these two coefficients differ significantly from each other [t (3112) = 3.21, $p < 0.05$] revealing that changes are more often perceived as challenging when one is high on positive affectivity.

Regarding the perception of changes as a threat, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of low positive affectivity individuals [t (3058) = 6.91, $p < 0.05$]. In contrast, the regression coefficient is not significantly different

from zero within the subgroup of high positive affectivity individuals [t (3058) = 1.12, *ns*]. This means that changes are perceived as a threat only when positive affectivity is slow. When positive affectivity is high, changes do not affect the perception of threat.

ORGANIZATION-BASED SELF-ESTEEM

Organization-based self-esteem exerts a moderating effect on the relationship between the number of changes and both perceived challenge and threat. Figures 7 and 8 display the pattern of these relationships for individuals with high vs. low self-esteem.

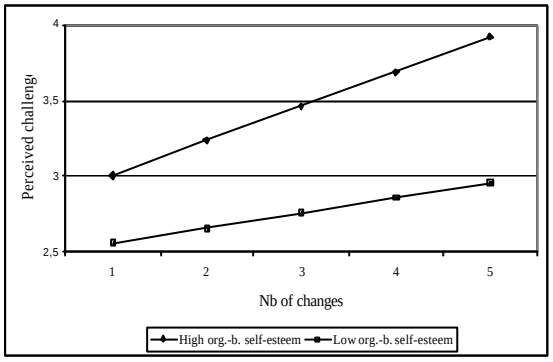


Figure 7. Effect of number of changes on perceived challenge for individuals with high vs. low self-esteem.

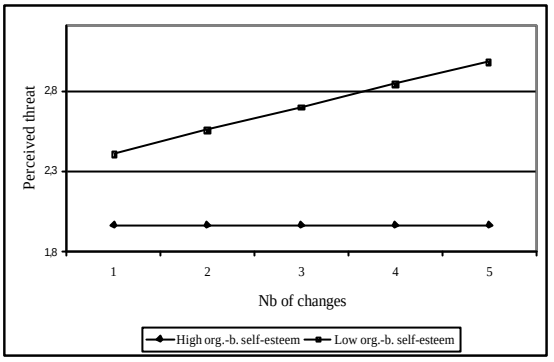


Figure 8. Effect of number of changes on perceived threat for individuals with high vs. low self-esteem.

Concerning the perception of changes as a challenge, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals with high organization-based self-esteem [t (3148) = 10.02, $p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of individuals with low organization-based self-esteem [t (3148) = 4.28, $p < 0.05$]. Finally, these two coefficients differ significantly from each other [t (3148) = 3.99, $p < 0.05$] revealing that changes are more often perceived as challenging when one has a high self-esteem.

Concerning the perception of changes as a threat, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals with low organization-based self-esteem [t (3097) = 6.06, $p < 0.05$]. In contrast, the regression coefficient is not significantly different from zero within the subgroup of individuals with high organization-based self-esteem [t (3097) = -0.04, *ns*]. This means that changes are perceived as a threat only when self-esteem is low. When self-esteem is high, changes do not affect the perception of threat.

EXTERNAL LOCUS OF CONTROL

External locus of control exerts a significant moderating effect on the relationship between the number of changes and perceived challenge but not on the relationship between the number of changes and perceived threat.

Figure 6 displays the interaction effect between the number of changes and external locus of control, according to the procedure recommended by Aiken and West (1991).

The post-hoc *t* tests (Aiken & West, 1991) indicate that the regression coefficient is significantly different from zero within the subgroup of individuals with high external locus of control [t (3138) = 3.65, $p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of individuals with low external locus of control [t (3138) = 8.99, $p < 0.05$]. Finally, these two coefficients differ significantly from each other [t (3138) = -3.98, $p < 0.05$], revealing that changes are more often perceived as challenging when one has a low external locus of control.

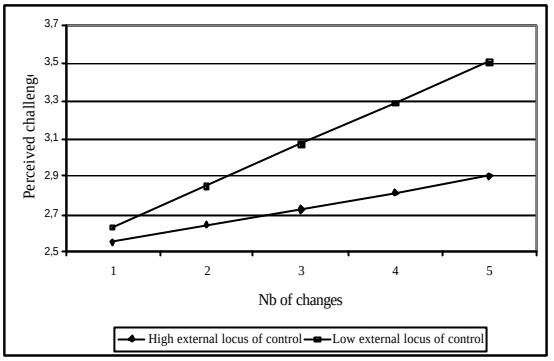


Figure 9. Effect of number of changes on perceived challenge for individuals with high vs. low external locus of control.

PERCEIVED ORGANIZATIONAL SUPPORT

Perceived organizational support exerts a moderating effect on the relationship between the number of changes and both perceived challenge and threat. Figures 10 and 11 display the pattern of these relationships for individuals perceiving high vs. low organizational support.

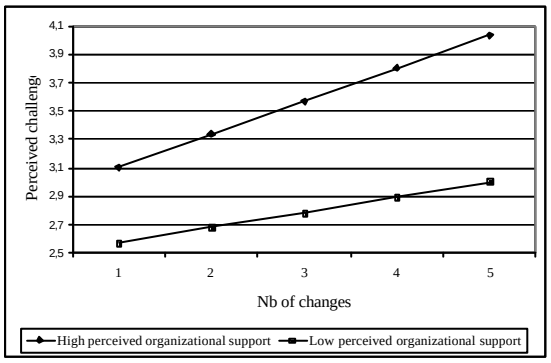


Figure 10. Effect of number of changes on perceived challenge for individuals perceiving high vs. low organizational support.

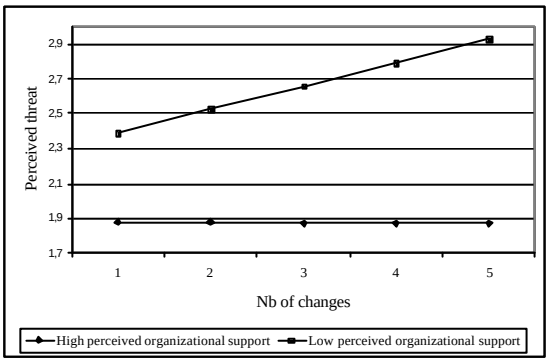


Figure 11. Effect of number of changes on perceived threat for individuals perceiving high vs. low organizational support.

Concerning the perception of changes as a challenge, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals perceiving high organizational support [t (3141) = 4.61, $p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of individuals perceiving low organizational support [t (3141) = 10.32, $p < 0.05$]. Finally, these two coefficients differ significantly from each other [t (3141) = 3.97, $p < 0.05$] revealing that changes are more often perceived as challenging when one feels supported by the organization.

Concerning the perception of changes as a threat, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals perceiving low organizational support [t (3093) = 5.77, $p < 0.05$]. In contrast, the regression coefficient is not significantly different from zero within the subgroup of individuals perceiving high organizational support [t (3093) = -0.06, *ns*]. This means that changes are perceived as a threat only when perceived

organizational support is low. When perceived organizational support is high, changes do not affect the perception of threat.

PERCEIVED SUPERVISOR SUPPORT

Perceived supervisor support exerts a moderating effect on the relationship between the number of changes and both perceived challenge and threat. Figures 12 and 13 display the pattern of these relationships for individuals perceiving high vs. low supervisor support.

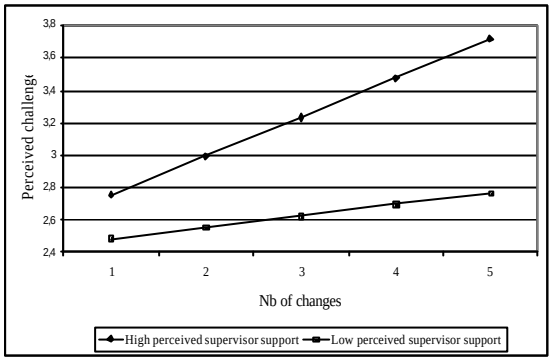


Figure 12. Effect of number of changes on perceived challenge for individuals perceiving high vs. low supervisor support.

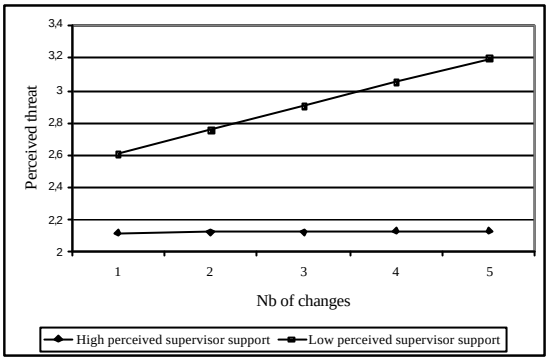


Figure 13. Effect of number of changes on perceived challenge for individuals perceiving high vs. low supervisor support.

Concerning the perception of changes as a challenge, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals perceiving high supervisor support [$t(3150) = 10.33, p < 0.05$]. The regression coefficient is also significantly different from zero within the subgroup of individuals perceiving low supervisor support [$t(3150) = 2.93, p < 0.05$]. Finally, these two coefficients differ significantly from each other [$t(3150) = 5.17, p < 0.05$] revealing that changes are more often perceived as challenging when one feels supported by the supervisor.

Concerning the perception of changes as a threat, post-hoc *t* tests (Aiken & West, 1991) reveal that the regression coefficient is significantly different from zero within the subgroup of individuals perceiving low supervisor support [$t(3098) = 6.28, p < 0.05$]. In contrast, the regression coefficient is not significantly different from zero within the subgroup of individuals perceiving high supervisor support [$t(3098) = 0.14, ns$]. This means that changes are perceived as a threat only when perceived supervisor support is low. When perceived supervisor support is high, changes do not affect the perception of threat.

3.2.4 Conclusion

According to the transactional approach to stress, negative events do not explain by themselves the array and magnitude of stress reactions among individuals. Rather, stress reactions are due to negative transactions between a potentially stressful situation and the subjective cognitive appraisal of that situation by the individual. Previous research (De Zanet et al., 2004) has shown that organizational changes are often interpreted in a variety of ways by employees. In fact, results presented here indicate that, in general, the more people are confronted with changes, the more they perceive them as either a threat or a challenge. To better understand the origin of employees' perception of changes, we tested a number of hypotheses involving moderating effects between changes and personal or situational characteristics.

In general, our moderation hypotheses were supported. Only the moderating effect of negative affectivity and external locus of control on the relationship between the number of changes and perceived threat was not supported. Contrary to expectations, the number of changes did not affect the

perception of threat differently for individuals high vs. low on negative affectivity and external locus of control.

In contrast, changes are more perceived as a threat when the employee is low on positive affectivity and self-esteem, and when s/he perceives little support from the organization or the supervisor. It also appears from the findings that individuals who think they are important at work, hence are high on self-esteem, do not feel threatened by increasing changes in the workplace. The same phenomenon occurs for employees who feel supported by the organization or the supervisor. Finally, it is worth noting that all moderating effects concerning the perception of challenge are consistent with our hypotheses.

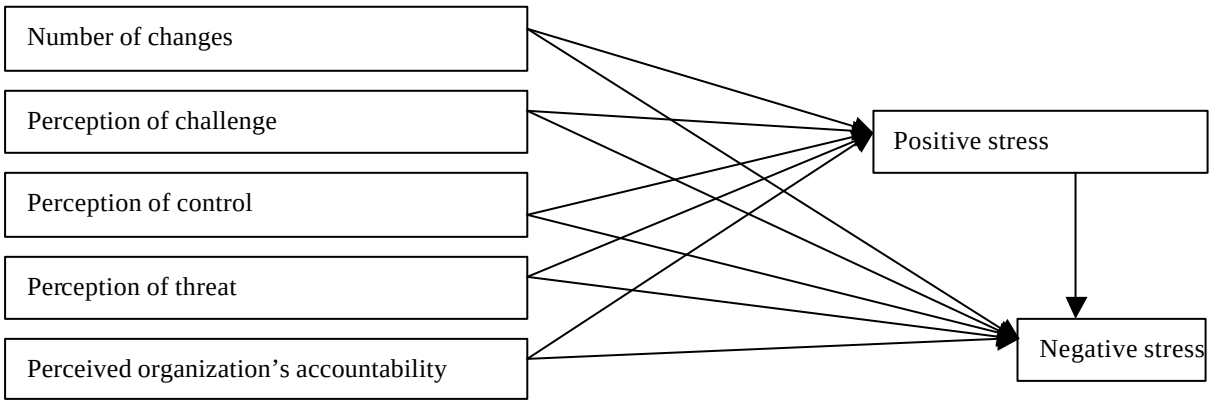
Although our findings support the idea that individual differences play a role in the perception of changes, one should not use these findings to undermine the role of companies in implementing stress prevention programs. Indeed, results show that when the organization is able to develop a trustful relationship with its employees (cf. perceived support and organization-based self-esteem), they will react more positively to changes. Thus, organizations who do not care about their employees will encounter more difficulties during the implementation of changes. In this regard, it is important to underline that trust must exist before the implementation of change because it is more difficult to built trust during the change program itself due to the numerous efforts and sacrifices expected from employees.

3.3. Theme 3 – Relationships between the number of changes, perception of changes, and positive and negative stress

The analyses conducted to date were intended to determine the influence of the number of changes on perceived challenge and threat using variables treated as moderators. In the case of positive stress, we investigated a mediational approach, suggesting that positive stress might mediate the relationship between work situations and stress outcomes. As the definitions of researchers suggest (Baron & Kenny, 1986; Rascle & Irachabal, 2001), moderators generally are either qualitative (e.g., gender, ethnic group, etc.) or quantitative (e.g., net revenues, etc.) variables that affect the relationship between a target independent variable and a dependent variable. In contrast, a mediator defines a process through which a given independent variable influences a dependent variable. The latter was thus the approach we used to examine the influence of positive stress.

3.3.1 Hypothesis

We thought that positive stress would partially or fully mediate the effect of the number of changes and/or their perception on negative stress.



For mediation to be demonstrated, four conditions must be satisfied:

1. the independent variable should exert a significant effect on the mediating variable
2. the independent variable should exert a significant effect on the dependent variable

3. the effect of the independent variable on the dependent variable should be significantly decreased after the mediating variable is entered in the regression equation
4. in case of full mediation, the effect of the independent variable on the dependent variable should drop to non significance after the mediating variable is entered in the regression equation (this suggests that the mediator should significantly impact the dependent variable)

Hierarchical multiple regression analysis is used to test mediation. Differences in R-square values and values of beta coefficients as well as their level of significance provide the necessary information used to check whether the four conditions for mediation are met.

3.3.2 Results

The analyses reported deal with the role of positive stress as a moderator of the relationship between the number of changes, the perception of changes, and negative stress. Although longitudinal research designs are better suited for testing mediation processes, concurrent analyses among variables provide useful information concerning well-grounded theoretical models.

In general, the results of these analyses show that positive stress mediates some of the relationships between the number of changes or the perception of changes and negative stress. Moreover, positive stress fully mediates the effect of perceived challenge on negative stress. Complete results are reported below.

NUMBER OF CHANGES AND STRESS

The number of changes significantly affects positive stress [$F(1, 4702) = 20.975$, $p < 0.000$]. The number of changes also affects significantly negative stress [$F(2, 4656) = 47.553$, $p < 0.000$]. Moreover, the R^2 value is significantly increased when positive stress is added to the regression equation (Number of changes predicting negative stress: $R^2=0.020$; Number of changes + positive stress predicting negative stress: $R^2=0.109$). The R^2 difference between the two equations is significant [? $F(1, 4655) = 464.45$, $p < 0.000$]. Finally, the β coefficient associated with the effect of the number of changes drops slightly and non significantly (from 0.049 to 0.042) when positive stress is added to the equation, revealing that positive stress is a partial mediator of the relationship between the number of changes and negative stress.

PERCEPTION OF CHALLENGE AND STRESS

The perception of challenge significantly affects positive stress [$F(1, 3951) = 486.925$, $p < 0.000$] and negative stress [$F(2, 3921) = 41.724$, $p < 0.000$]. Moreover, the R^2 value is significantly increased when positive stress is added to the regression equation (Perception of challenge predicting negative stress: $R^2=0.021$; Perception of challenge + positive stress predicting negative stress: $R^2=0.105$). The R^2 difference between the two equations is significant [? $F(1, 3920) = 366.527$, $p < 0.000$]. Finally, the β coefficient associated with the effect of perception of challenge drops to non significance (from -0.06 to -0.01) when positive stress is added to the equation, revealing that positive stress is a full mediator of the relationship between the perception of challenge and negative stress.

PERCEPTION OF THREAT AND STRESS

The perception of threat significantly affects positive stress [$F(1, 3919) = 374.273$, $p < 0.000$] and negative stress [$F(2, 3892) = 248.069$, $p < 0.000$]. Moreover, the R^2 value is significantly increased when positive stress is added to the regression equation (Perception of threat predicting negative stress: $R^2=0.113$; Perception of threat + positive stress predicting negative stress: $R^2=0.166$). The R^2 difference between the two equations is significant [? $F(1, 3891) = 244.957$, $p < 0.000$]. Finally, the β coefficient associated with the effect of perception of threat drops slightly and non significantly (from 0.151 to 0.119) when positive stress is added to the equation, revealing that positive stress is a partial mediator of the relationship between the perception of threat and negative stress.

PERCEPTION OF CONTROL AND STRESS

The perception of control significantly affects positive stress [$F(1, 3967) = 167.785$, $p < 0.000$] and negative stress [$F(2, 3937) = 46.165$, $p < 0.000$]. Moreover, the R^2 value is significantly increased when positive stress is added to the regression equation (Perception of control predicting negative stress: $R^2=0.022$; Perception of control + positive stress predicting negative stress: $R^2=0.109$). The R^2 difference between the two equations is significant [? $F(1, 3936) = 382.512$, $p < 0.000$]. Finally, the β coefficient associated with the effect of perception of control drops slightly and non significantly (from -0.064 to -0.035) when positive stress is added to the equation, revealing that positive stress is a partial mediator of the relationship between the perception of control and negative stress.

PERCEIVED ORGANIZATION'S ACCOUNTABILITY AND STRESS

The perception of organization's accountability significantly affects positive stress [$F(1, 3928) = 261.764$, $p < 0.000$] and negative stress [$F(2, 3899) = 205.059$, $p < 0.000$]. Moreover, the R^2 value is significantly increased when positive stress is added to the regression equation (Organization's accountability predicting negative stress: $R^2=0.095$; Organization's accountability + positive stress predicting negative stress: $R^2=0.156$). The R^2 difference between the two equations is significant [? $F(1, 3898) = 280.939$, $p < 0.000$]. Finally, the β coefficient associated with the effect of organization's accountability drops slightly and non significantly (from 0.117 to 0.093) when positive stress is added to the equation, revealing that positive stress is a partial mediator of the relationship between the organization's accountability and negative stress.

3.3.3 Conclusion

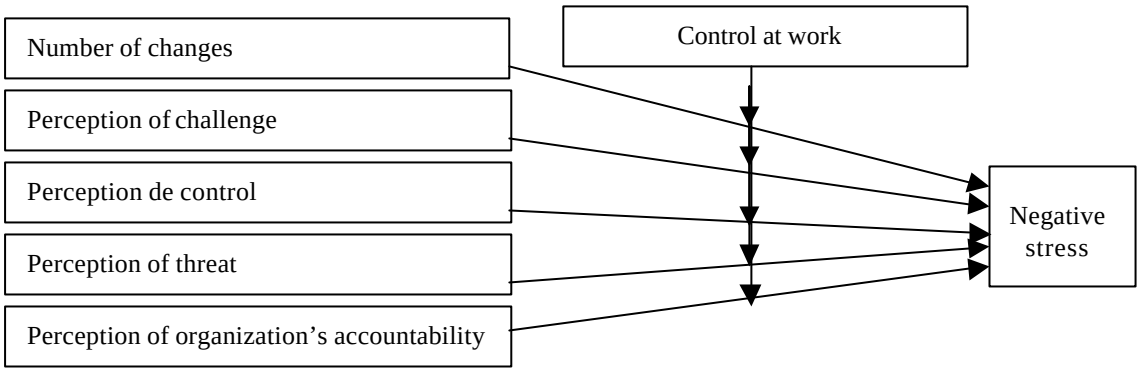
The results of these analyses suggest that positive stress plays a role as a mechanism activated by changes (the number of changes and their perception) that may potentially result in negative stress. It is a partial mediator of the relationship between number of changes, perceived threat, control, and organization's accountability on one hand and negative stress on the other hand. Relatedly, positive stress appears to be a full mediator of the relationship between perceived challenge and negative stress.

3.4. Theme 4 - Relationships between the number of changes, perception of changes, control, and stress

Control at work was thought to moderate the relationship between the number of changes or their perception and negative stress. This approach is consistent with Karasek's (1979) demands-control model.

3.4.1 Hypothesis

It is argued that perceived control will moderate the relationship between the number of changes or their perception and negative stress such that the more control the individual perceives the less negative stress s/he will experience.



To test a moderating effect, one should run a hierarchical regression analysis in which the main effects associated with the independent variable and moderator (centered) are assessed in the first step, and the product of the independent variable and moderator in the second step. A significant ΔR^2 associated with the second step indicates a moderating effect.

3.4.2 Results

Le contrôle de la situation de travail semble jouer un rôle de modérateur dans plusieurs des relations entre les variables de changements et le stress. Néanmoins, l'effet modérateur du contrôle apparaît plus clairement entre certaines variables et le stress que pour d'autres. L'effet modérateur du contrôle n'apparaît pas ou très faiblement au niveau des relations entre la perception de challenge, la perception de contrôle par rapport aux changements et le stress.

NUMBER OF CHANGES

Control at work moderates the relationship between the number of changes and negative stress as is shown by a significant increase in the R^2 value associated with the interaction term [$\Delta F(1, 4550)=10{,}806$, $p < 0.001$]. As is illustrated by Figure 14, control at work attenuates the effect of the number of changes on negative stress.

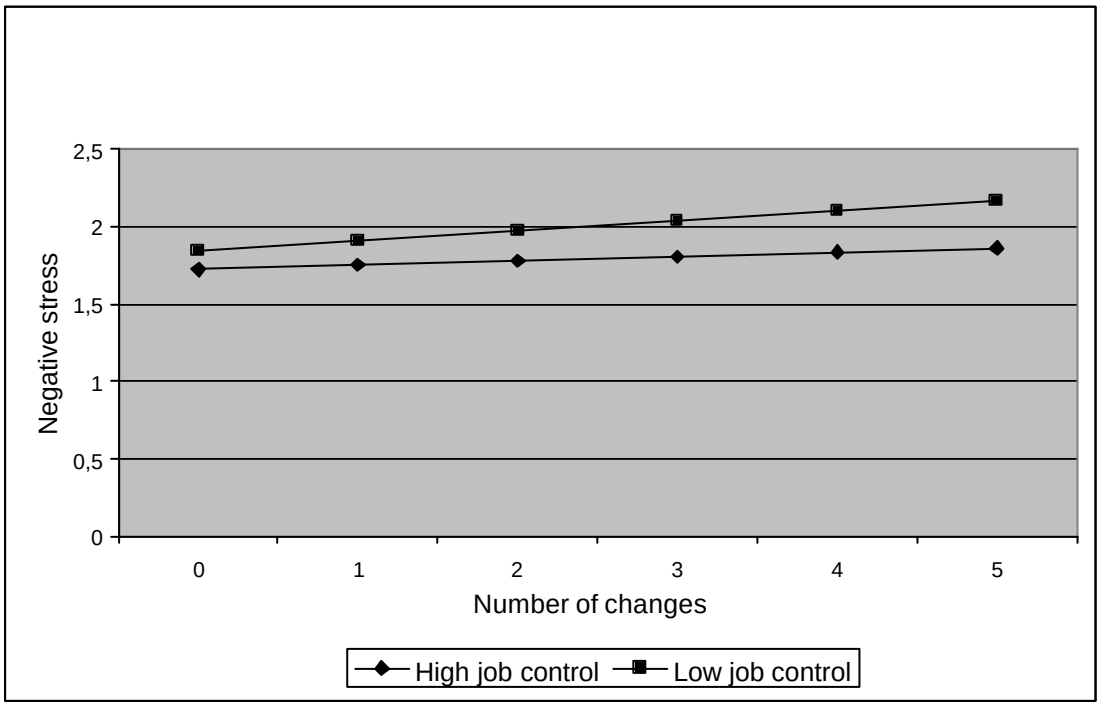


Figure 14. Moderating effect of control at work on the relationship between the number of changes and negative stress

PERCEIVED THREAT

Control at work moderates the relationship between perceived threat and negative stress as is shown by a significant increase in the R^2 value associated with the interaction term [$\Delta F(1, 3801) = 18.641$, $p < 0.000$]. As is illustrated by Figure 15, control at work attenuates the effect of perceived threat on negative stress.

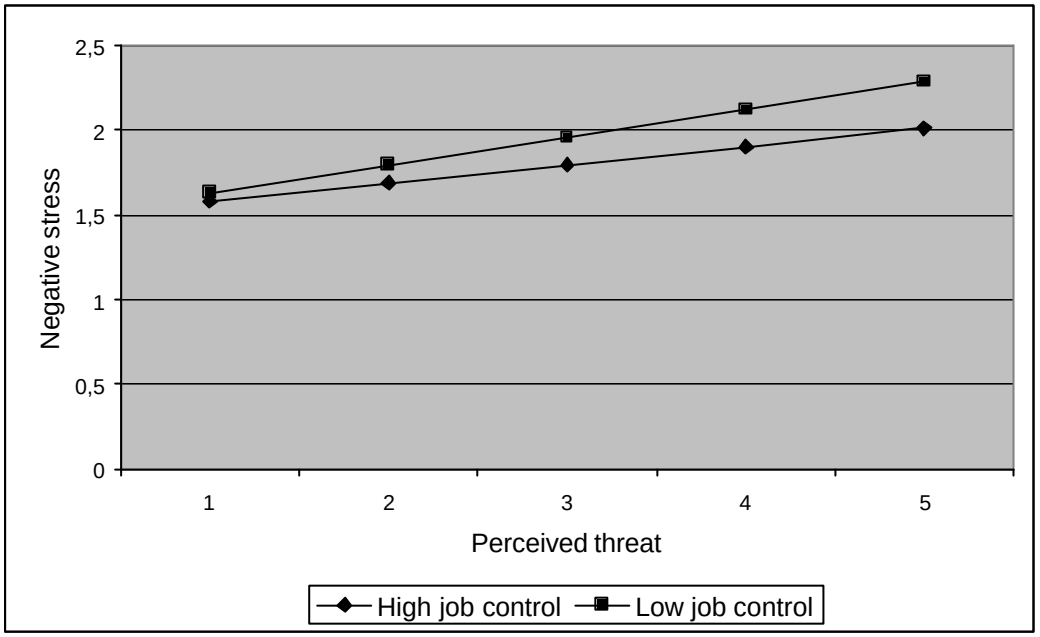


Figure 15. Moderating effect of control at work on the relationship between perceived threat and negative stress

PERCEIVED ORGANIZATION'S ACCOUNTABILITY

Control at work moderates the relationship between perceived organization's accountability and negative stress as is shown by a significant increase in the R^2 value associated with the interaction term [$\Delta F(1, 3809) = 17.255$, $p < 0.000$]. As is illustrated by Figure 16, control at work attenuates the effect of perceived organization's accountability on negative stress.

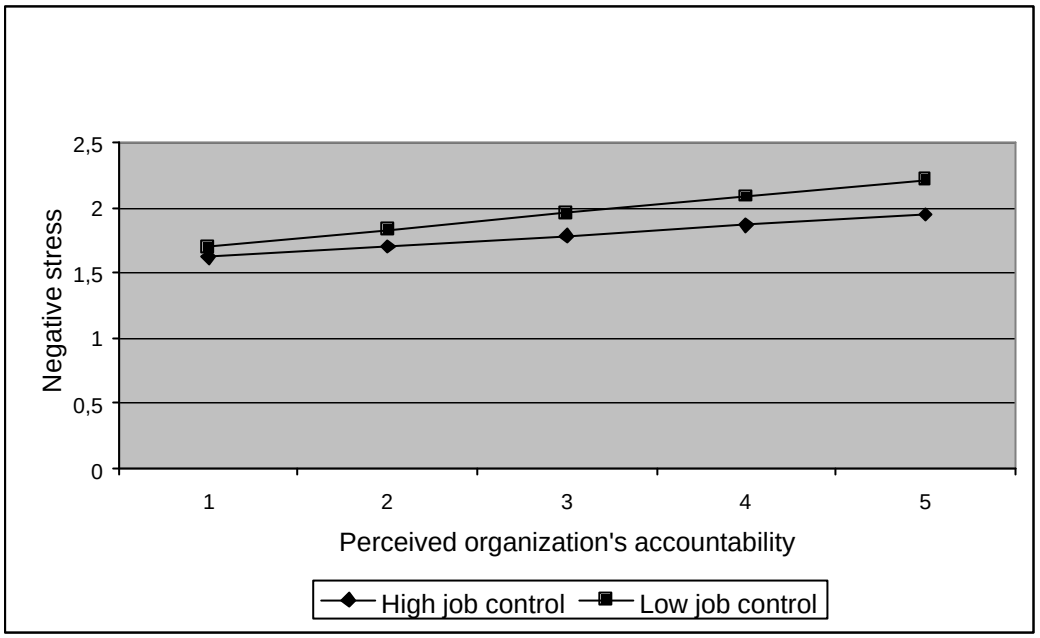


Figure 16. Moderating effect of control at work on the relationship between perceived organization's accountability and negative stress

3.4.3 Conclusion

To conclude with, control at work appears to alleviate the effect of changes and their negative appraisal on negative stress. It thus contributes to improve employees' resistance to stressful events.

3.5. Theme 5 - Relationships between the number of reported changes, perceived stress and physical and mental health of employees

3.5.1. Descriptive part

3.5.1.1. Medical history

The analysis of medical history allowed to assess past health disorders in order to identify present health disorders attributable to organizational stress, i.e. disorders which neither appeared nor worsened as a result of basic medical status of the respondent. Medical history of employees in the 18 companies of the sample was collected with a self-administered questionnaire. Items were dichotomous (yes-no) and related to 5 categories of health disorders possibly linked to stress, directly or indirectly:

a) Cardiovascular history (chest pain, myocardial infarction, high blood pressure, ...)
b) Mental history (depression, anxiety)
c) Gastro-intestinal history
d) Musculo-skeletal history (low-back pain, neck pain, spasmophilia …).
e) Neurological history (vertigo, headache, epilepsy, …).

a) cardiovascular history
On the average, 21.4% of people participating in this survey reported a history of cardiovascular disease (range : 7-91 ; median=12.3%). While 13.8% of workers in the secondary sector report previous cardiovascular disease, the proportion is 24% in the tertiary sector (χ^2 = 57.4, df=1, p<0.001).

b) mental history
On the average, 23.5% of workers report past mental disorders (range : 9-89 ; median=13.9%). A higher proportion of workers with a history of mental disorders was observed in the tertiary sector (27%) in comparison with the secondary sector (13%) (χ^2 = 101.1, df=1, p<0.001).

c) gastro-intestinal history
On the average, 23.2% of people participating in this survey reported a history of gastro-intestinal (GI) disease (range : 10-83 ; median=17.6%). There was a significant difference in the proportions of workers with a history of GI disease between work sectors : 16.8% in the secondary sector vs 25% in the tertiary sector (χ^2 = 37.5, df=1, p<0.001).

d) musculo-skeletal history
On the average, 41% of respondents reported past low-back and neck pain (range : 23-73; median =38.5%). Thirty-four % of workers in the secondary sector reported a history of musculo-skeletal disease, a proportion as high as 46.2% in the tertiary sector (χ^2 = 54.8, dl=1, p<0.001).

e) neurological history
On the average, 24.4% of employees reported a neurological history (headache, epilepsy, ...) (range : 10-95 ; median=17.2%). In the tertiary sector, the proportion of workers with a history of neurological disease (27.8%) was nearly twice as large as the proportion in the secondary sector (14.6%) (χ^2 = 85.1, df=1, p<0.001).

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For each category of medical history, it can be seen that the proportions of people with disorders was very variable. Three companies showed abnormally high proportions of workers with past medical disease or condition, except for the proportion of musculo-skeletal disorders, which was identical in these 3 companies in comparison with other companies. For the 4 other categories of medical antecedents, more than 85% of the employees of these 3 companies reported at least one of the 4 antecedents, whereas in the 15 other companies, less than 25% of employees reported the same antecedents. The 3 companies belong to the tertiary sector which, in general, had surprisingly high proportions of workers with medical history.

Since the prevalence of medical antecedents was dramatically higher in the tertiary sector in comparison with the secondary sector, we tried to find factors associated with this difference.

In our sample, characteristics of respondents in the secondary sector were as follows :

- 85% were males,
- 72.8% were married, others were single (unmarried : 19.6%, divorced or widowed : 7.6%),
- 41.4% of the sample were younger than 36, and 24.6% were older than 46, of which 0.5% was older than 55.

The characteristics of respondents in the tertiary sector of our sample are as follows :

- 37% were males,
- 69.2% were married, others were single (unmarried : 19.3%, divorced or widowed : 11.5%),
- 32.7% of the sample were younger than 36, 32.5% were older than 46 ans, of which 5.2% were older than 55.

In order to verify if one or more factors can explain the differences in prevalence of past medical disorders between the secondary and tertiary sectors, a logistic regression was conducted for each of the 5 medical antecedents (Table 30). Dependent variables were marital status, age and gender.

Table 30. Logistic regressions on medical antecedents (ATCD) for marital status, age, and gender (parameter estimates and their statistial significance)

	Model 1 : cardiovascular ATCD	Model 2 : mental ATCD	Model 3 : gastro-intestinal ATCD	Model 4 : musculo-skeletal ATCD	Model 5 : neurological ATCD
Marital status	- 0.001	0.04	- 0.09	**0.11***	- 0.017
Age	0.03	**- 0.15****	- 0.06	**0.29****	**- 0.15****
Gender	- 0.36	0.10	**- 0.14***	**0.17***	**0.22***

Note. * <0.05; ** <0.001

For regression model 1, –2 log L (covariates) = 24.8 pseudo-R^2=.005; for regression model 2, –2 log L (covariates) = 17.7 pseudo-R^2=.006 ; for regression model 3, –2 log L (covariates) = 12.6 pseudo-R^2=.006 ; for regression model 4, –2 log L (covariates) = 126.9 pseudo-R^2=.06 ; for regression model 5, –2 log L (covariates) = 28.9 pseudo-R^2=.06

If cardiovascular history seemed not explainable by variables in the regression equation, musculo-skeletal history were more prevalent among older, single, and female workers. Conversely, mental and neurological history were more prevalent among younger workers, and as regards neurological history, among females.

The differences however were very weak and socio-demographic characteristics did not discriminate job sectors. We recall that the tertiary sector is mostly represented by a large retailing company, in which the job content is probably very different (lifting heavy loads, flexibility of posts, contacts with customers, …) from other companies.

3.5.1.2. Medical complaints

The evaluation of medical complaints allowed to estimate the prevalence and distribution of present health problems in the population under study. It was performed with a list of 15 health complaints directly or indirectly linked to stress. A self-administered questionnaire was used, with items such as : « *Does it happen to you to experience this kind of health problem ?* » Four frequency modalities were possible : « *never, sometimes a year, sometimes a month, sometimes a week, everyday* ». Only the latter four modalities are presented in Table 31, which explains why the total of each row does not reach 100%.

To interpret the frequency of of medical complaints in the Flexihealth study, we used the results of the 2001 National Health Interview Survey, in which questions were as follows : *« do you have chronic disease or medical condition ?»* (Enquête de l'Institut Scientifique de la Santé Publique, HIS-ISSP, 2001). The health interview survey was aimed to estimate the prevalence and distribution of health indicators and to estimate time trends. The survey was conducted in Belgium (by region, province, and municipality) on a sample of 12111 citizens, without exclusion criteria, on the basis of the National Registry. The survey included people with of without job, e.g. students, jobless and retired people. Health-related questions were expressed as follows : «*Please indicate the degree with which you suffered from the following conditions last week, including today* ». The answers lied along a 5-point Likert scale : « not at all », « scarcely », « a little », « a lot », and « yes, extremely ».

According to this survey, 23% of Belgians reported a poor health (as perceived subjectively, in the physical, social and emotional dimensions), 52% of Belgians had at least one chronic illness, and 29% had more than one chronic illnesses (allergy, hypertension, arthritis,…). The prevalence of active chronic illnesses in the last year was the following : 20% had sleep disorders, 12% had hypertension, 10% had low-back and neck pain, 9% had depressive mood, 9% had headache, 6% had anxiety, 3% gastro-duodenal peptic ulcer, and finally 2% had chronic fatigue.

The Flexihealth study investigates the same complaints but only in a sample of workers, from the participating companies. It is then required to keep in mind that employees who filled the questionnaire had a health status good enough to be notified « fit for service ». This bias, known as the « healthy worker effect », is well illustrated in the scientific literature. We then expected to record *less* medical complaints as in the general population. To be comparable to the HIS-ISSP, we only took into account the answers « *sometimes a week, everyday* » to the question : « *Does it happen to you to experience this kind of health problem ?* ». For each kind of medical complaint, the Flexiheath study recorded the prevalences presented in Table 31.

For the medical complaints which have a reference in the HIS-ISSP 2001, we noticed a very high prevalence, which was higher than in the general population as regards fatigue, anxiety, musculo-skeletal disorders, and headaches. Other complaints, relating to mental health, have a prevalence close the figures estimated in the national survey.

This intriguing finding of such a high prevalence in medical complaints prompted us to investigate their relationships with characteristics such as gender and professional category, among others (Tables 32-34).

Table 31. Comparison, for each complaint, of the prevalences estimated in the Flexihealth study and the 2001 HIS-ISSP

	Sometimes a year	Sometimes a month	Sometimes a week / everyday	HIS-ISSP 2001
Chest pain	30%	7%	2.4%	
Cardiac palpitations	37%	11%	6%	
Hypertension	26%	9%	7%	12%
Anorexia	22%	11%	5%	
Fatigue	32%	24%	21%	2%
Nervousness, tension	33%	24%	18%	
Anxiety	26%	11%	9%	6%
Depression	49%	16%	8%	9%
Gastric pain	32%	16%	11%	
Colic pain	34%	14%	6%	
Low-back pain	34%	22%	26%	10%
Headache	43%	25%	12%	9%
Sleep disorders	30%	19%	17%	20%
Concentration difficulties	40%	16%	8%	
Lack of attention	40%	16%	10%	

Note. HIS-ISSP denotes Health Interview Survey-Institut Scientifique de la Santé Publique. Data of the HIS-ISSP 2001 should only be compared to the "sometimes a week/everyday" answer category of the Flexihealth study

Table 32. Comparison of the prevalences of medical complaints according to gender (chi-square)

Medical complaints	Males (n = 2424 – %)	Females (n = 2510 – %)	Chi-square (p-value)
Chest pain	**3.6**	**2.5**	5.15 (0.02)
Cardiac palpitations	**7.5**	**5.8**	5.67 (0.02)
Hypertension	5.3	6.4	2.5 (0.11)
Anorexia	5.7	4.5	3.37 (0.06)
Fatigue	**19.9**	**21.1**	33.3 (<0.001)
Nervousness, tension	18.5	12.7	0.36 (0.55)
Anxiety	8.7	9.6	1.23 (0.27)
Depression	8.7	8.3	0.24 (0.62)
Gastric pain	11.1	9.7	1.81 (0.17)
Colic pain	6.1	6.3	0.11 (0.74)
Low-back pain	**21.9**	**30.2**	43.04 (<0.001)
Headache	**8.4**	**14.1**	40.28 (<0.001)
Sleep disorders	**15.3**	**18.5**	9.0 (0.003)
Concentration difficulties	**9.1**	**6.9**	9.14 (0.002)
Lack of attention	**10.8**	**8.6**	6.44 (0.01)

Fatigue, musculo-skeletal disease, headaches and sleep disorders were more frequent among females, whereas cardiovascular complaints (chest pain, hypertension), concentration difficulties and lack of attention were more frequent in males (Table 32). These results do not differ from the HIS-ISSP 2001 except for hypertension: in the national survey, the prevalence of hypertension was 10% in males and 13% in females (maybe a «screening effect» due to occupational physicians, not necessarily a true difference).

Somatic complaints were more frequent among low-status employees (blue and white collars) than among workers with a high position in the hierarchy (managers, upper-level managers) (Table 33). However, cardiovascular complaints did not differ according to the professional category. This finding is unexpected: Marmot et al. (1997) noticed the beneficial effect of job control (higher among managers) on cardiovascular disease, whereas the Flexihealth study did not show such a gradient.

Table 33. Comparison of prevalence estimates according to the professional category

Medical complaints	Blue-collars (n = 490 – %)	White-collars (n = 467 – %)	Managers (n = 421 – %)	High-level managers (n = 78 – %)	Others (n= 3305 – %)
Chest pain	4.1	2.8	4.0	5.1	2.6
Cardiac palpitations	7.4	9.9	5.6	7.8	6.1
Hypertension	6.7	8.6	5.3	2.6	5.5
Anorexia	7.8	3.6	3.1	1.3	5.3
Fatigue	23.5	22.2	17.4	12.8	20.4
Nervousness, tension	22.0	30.2	13.9	8.9	17.9
Anxiety	13.5	11.6	7.2	2.6	8.4
Depression	14.3	8.6	6.2	5.2	8.1
Gastric pain	16.5	11.7	9.5	6.5	9.7
Colic pain	8.6	6.7	5.7	1.3	5.8
Low-back pain	28.8	25.6	15.4	12.8	27.7
Headache	11.8	10.9	6.7	7.8	11.9
Sleep disorders	21.4	20.0	16.4	3.8	16.1
Concentration difficulties	9.5	11.5	9.0	1.3	7.3
Lack of attention	11.9	12.0	12.4	5.2	8.7

Note. All differences in proportions of medical complaints are statistically significant between professional categories (chi-square, df=4, p< 0.001).

As can be seen from Table 34, the prevalence of medical complaints was higher in the «private production » and «health » domains. Musculo-skeletal disorders affected ¼ of workers and seemed independent of the business domain.

Table 34. Comparison of prevalence estimates according to the business domain

Medical complaints	Private Production (n=1251 – %)	Private Service (n=3216 – %)	Health (n=274 – %)	Public sector (n=174 – %)
Chest pain	**3.8**	2.7	2.2	1.7
Cardiac palpitations	**7.2**	6.3	4.5	**7.0**
Hypertension	7.9	5.3	**8.1**	4.1
Anorexia	5.4	5.2	**16.6**	5.8
Fatigue	**22.4**	19.8	**23.5**	15.7
Nervousness, tension	**19.7**	17.5	**19.9**	13.8
Anxiety	11.5	8.0	**12.2**	7.5
Depression	**10.7**	7.7	7.8	6.9
Gastric pain	**13.3**	9.6	9.2	8.7
Colic pain	7.2	5.6	7.7	7.6
Low-back pain	**23.5**	**27.2**	**27.8**	**24.7**

Headache	10.2	**12.0**	10.6	7.5
Sleep disorders	**19.9**	16.0	15.3	16.1
Concentration difficulties	**10.4**	7.1	7.4	8.6
Lack of attention	12.4	8.3	11.1	**13.4**

Note. All differences in proportions of medical complaints are statistically significant between business domains. (chi-square, df=3, p< 0.001).

Finally, there were positive and significant (p<0.001) correlations between the medical history and related present complaints, a result expected and indicating good concordance in the answers of respondents:

- cardiovascular history was associated to chest pain (r = 0.16), to palpitations (r = 0.13) and to hypertension (r = 0.31);
- mental history was associated to anxiety (r = 0.29), depression (r = 0.28) and nervousness (r = 0.22) ;
- gastro-intestinal history was associated to gastric (r = 0.33) and colic (r = 0.22) pain;
- musculo-skeletal history was associated to low-back and neck pain (r = 0.42);
- neurological history was associated to headache (r = 0.29).

3.5.1.3. The « aggregate score » of medical complaints

The computation of an «aggregate score » of complaints is another measurement which provides a summary of the frequency of complaints. We here defined a score which ranges from 0 for a subject with no complaint to 60 for a subject who report experiencing everyday all 15 illnesses. The lower the score, the better the health status. In the computation, we attributed weights 0, 1, 2, 3, and 4 respectively to the frequencies « *never, sometimes a year, sometimes a month, sometimes a week, everyday* ». Please note that scores only reflect the reported prevalence of illnesses, but does not provide any information about intensity and variability of complaints.

The mean complaint score was 15 (*SD* = 10). This mean score is satisfying but its SD indicates a wide variability, and thus a substantial proportion of workers with high scores. The 3 companies with high proportions of workers having many medical antecedents had more «normal» complaint scores, i.e. 11.6, 15.5 and 13.7. Scores were higher in the private production domain (m=17.4) and the health domain (m=16.4), and lower in the private service domain (m=14.7) et the public business domain (m=14.6).

The means scores for groups defined by socio-demographic characteristics showed that:

- There was no difference between males (m=15, SD=10) and females (m=15, SD=9),
- There was no difference between singles and married (m=15.9 vs m=15.36 ; p=0.08),
- Blue collars had a mean complaint score of 18.6 (SD=11.6), i.e. a score higher than the score of other professional categories (17.7 in white collars (SD=10.2), 14.8 in managers (SD=8.7) and 12.2 in high-level managers (SD=7.4) – the category «others » having an average of 14.9 (SD=9.5). The heterogeneity between «blue collars » and «white collars » is attributable to differences in means, the coefficient of variation remaining approximately constant [CV=0.61 (CV= SD/m)].

3.5.1.4. Assessment of lifestyle

a) Alcohol consumption

The WHO defines alcohol abuse as drinking at least 6 standard glasses at one occasion, at least once a month (ISSP, 2001).

According to the HIS-ISSP 2001 survey, 81% of the Belgian population aged 15 or more report the

consumption of at least one alcoholic beverage during the past 12 months; 12% drink alcohol everyday, 36% usually drink alcohol during the week and 20% drink at least once a month 6 glasses or more at the same occasion.

The Flexihealth study did not examine the quantity of alcohol use (number of glasses), nor the kind of beverage (wine, beer, aperitive, liqueur, ...), but examined two dimensions of alcohol consumption. The first was the reported frequency of drinking (never, occasional, usual). The second was the recent change in drinking habits, in terms of increase in use and start in alcohol use.

In the absence of specific norms, we considered that the proportion of workers drinking « occasionally » was similar to the proportion of people having reported the consumption of at least one alcoholic beverage during the past 12 months in the HIS-ISSP 2001 survey. The « usual » consumption of alcoholic beverages was assimilated to the proportion of people reporting a daily consumption of alcohol, i.e. 12% in the Belgian adult population.

The Flexihealth study shows that 57% of workers reported an occasional consumption of alcohol, a frequency lower than the consumption in the Belgian population (81%). Fourteen percent of workers reported an usual use of alcohol, which is slightly above the 12% in the Belgian population. The remaining 29% were abstainers. Recent changes in alcohol consumption were noticeable, since 20% of respondents reported an increase in the quantiy of alcohol use, and 20.4% reported a recent start in alcohol use. Among « new » drinkers, 7.2% acknowledged an increase in alcohol consumption.

The proportion of workers who recently changed their drinking habits was higher in the tertiary sector. In the tertiary sector, 22.8% of workers reported drinking more alcohol (11.5% in the secondary sector) and 25.6% of workers reported having recently started drinking alcohol (7.6% in the secondary sector).

The analysis showed large differences between business domains (Table 35). Changes were unfrequent in the health domain and in the private production domain. In the private service domain, changes were reported by about ¼ of workers. In the public business domain, changes were reported by 1/3 of workers.

Table 35. Proportion of workers reporting a change in their drinking habits, according to the business domain

Business domains	**Increase in quantity**	**Recent start in alcohol use**
Private production (n=1251)	11.5 %	7.6 %
Private service (n=3216)	23 %	26 %
Health (n=274)	9.4 %	9 %
Public (n=174)	38.7 %	42.1 %

There were interesting differences between groups defined by socio-demographic characteristics :

- Males reported more often than females a recent increase in alcohol consumption (22.5% vs 16.4% ; $p<0.001$), but both genders similarly reported having recently started drinking alcohol (20.2% et 20.8% ; $p=0.66$).
- White collars, managers and « others » reported more frequently a recent increase in alcohol use (12.3%, 14.% et 22.3% respectively) than other professional categories (blue collars : 9.8% ; high-level managers : 7.5%). However, blue collars and « others » reported more often having recently started drinking alcohol (15.5% and 25% respectively).

- Marital status was linked to changes in drinking habits, since singles exhibited more frequently than married workers an increase in alcohol consumption (22.1%) or a recent start in alcohol use (24.3%). A significantly lower proportion of married workers reported those changes (19% and 18.8% respectively for the increase in quantity and the recent start).

b) Tobacco consumption

According to the HIS-ISSP 2001, 28% of Belgians are smokers (24% are daily smokers and 4% are occasional smokers). A third of these smokers are regarded as heavy smokers (20 cigarettes or more per day). Results of the national survey indicate that during the last two years, 13% of smokers stopped tobacco use, 28% reduced their consumption, 39% used the same quantity, and 20% increased their consumption.

In the same way than questions regarding alcohol consumption, the Flexihealth survey did not question the workers on the quantity of tobacco used nor on the type of tobacco consumption (cigarettes, cigars, cigarillos, pipes...), but investigated two specific dimensions. The first was the subjective perception about tobacco use (never, occasional, usual). The second was the modification of smoking habits, in term of increase in quantity or recent use of tobacco.

For a comparison between the two studies, the daily smokers who account for 24% of the Belgian population can be compared to the regular smokers in the Flexihealth investigation, whereas occasional smokers (4% of the Belgian population) can be compared to occasional smokers in the Flexihealth study.

Our analysis shows that 30% of the workers were smokers, 24% of the workers being usual consumers of tobacco and 6% being occasional consumers ; these proportions were similar than those observed in the Belgian population. Nevertheless, 38% of workers increased tobacco use recently and 17% began smoking recently. This observation is particularly interesting when it is compared with the Belgian population, in which 20% of regular smokers recognize to have increased their tobacco use.

Contrary to the alcohol consumption, no significant difference arose from the comparison between tertiary and secondary sectors. A more detailed analysis by business domain revealed important differences of proportions in recent tobacco use (Table 36). As for the alcohol consumption, the changes of behavior affected a small proportion of workers in health sector and private production sector, but affected 20 to 30% of workers in private services and in public companies.

Table 36. Proportion of workers having modified their tobacco use, by business domain

Business domains		**Increase in quantity**	**Recent start in tobacco**
Private production	(n=1251)	36.3 %	7.6 %
Private service	(n=3216)	38.5 %	20.3 %
Health	(n=274)	34.4 %	8.6 %
Public	(n=174)	39.1 %	32.2 %

According to socio-demographic variables, the analysis of tobacco use led to the following conclusions:

- Behavior changes were not different between males and females: 48.8% of males and 51.2% of females increased tobacco consumption whereas 18.7% of males and 16% of females were “new” smokers.
- Blue-collar workers, white-collar workers and “others” were proportionally more likely to increase their tobacco use (respectively, 42.3%, 37.2% and 38.3%) than other professional categories

(managers, 23.1%; upper-level managers, 13%). However, white-collar workers and "others" were more prone to start tobacco use (respectively 12.9% and 19.7%).

- Marital status seemed to be related to health behaviors changes, singles being more likely to increase their consumption of tobacco (40.5% vs 36.8%) or to recently smoke (18.5% vs 17.1%) than married workers.

Changes in these two health behaviors could consequently be observed in the same people. A 3 by 3 Table can be drawn to represent the changes in both alcohol and tobacco use.

Table 37. Workers having modified their use of tobacco and alcohol

		Alcohol consumption		
		None (n=1401)	**Increase in quantity**	**Recent start in alcohol use**
Tobacco consumption	**None (n=3442)**	1034	485	471
	Increase in quantities	163	**193**	171
	Recent start in tobacco use	39	141	**159**

If 70% of workers were non smokers, 28.5% reported being teetotalers. Globally, 21% of workers did not use tobacco or alcohol. Health-related behaviors changes are more difficult to interpret, because they can be combined or not. Data in bold represent people who have at the same time increased the use of tobacco and the use of alcohol (3.9% of workers), or recently use these two products (3.2% of workers).

c) Drug use

According to the HIS-ISSP 2001, one people on four in Belgium presented a "discomfort" associated with various mental disorders such as sleep disorders, depressive troubles or anxiety symptoms. These disorders are frequently associated with psychotropic drug use. Table 38 summarizes the proportion of Belgian people who use psychotropic drugs.

Table 38. Proportion of Belgian people who use psychotropic drugs (HIS-ISSP 2001 survey)

Proportion of people aged 15 or more who use…	
- sleep pills	8%
- tranquilizers	6%
- antidepressants	5%

In the Flexihealth study, data collection on drug use was realized with the following question: « *Do you use one or more drug among the following ones: to sleep (sleep pills), to relieve pain (analgesics), to reduce anxiety (antianxiety drugs), antidepressants?* »

Three answers were proposed (almost never, sometimes per week, almost daily). These three propositions were then grouped: rare consumption (aggregates the answers "almost never" and

"sometimes per week") and regular consumption (daily use). This last category can be compared with the HIS-ISSP 2001 results (Table 39).

Table 39. Comparison of drug users between the Flexihealth study and the HIS-ISSP 2001 survey

	ISSP	Flexihealth
- analgesics		24.8%
- sleep pills	8%	6.5%
- tranquilizers	6%	7.8%
- antidepressants	5%	6.4%

The interpretation of this table needs a lot of precaution. Few people know exactly in which pharmaceutical category belong their own drugs. Numerous potential interpretations can lead to consider one category instead of another. Nevertheless, we can conclude that proportions of people using these different drugs are very similar in the two studies.

Table 40. Comparison of drug consumption between business domains

Domains	**Analgesics**	**Sleep pills**	**Tranquilizers**	**Antidepressants**
Private production (n=1251)	22.1%	4.9%	6.3%	3.6%
Private service (n=3216)	25.5%	6.6%	7.9%	7.3%
Health (n=274)	32.7%	11.1%	11.4%	6.7%
Public sector (n=174)	17.7%	8.3%	8.8%	8.3%

In the health sector, the proportion of workers using analgesics, sleep pills and tranquilizers is the highest, even if in this sector, the proportion of workers reporting a medical complaint is similar than in the private production sector (Table 40). Direct accessibility to drugs in health sector and the fact that healthcare workers share the vision that drugs are part of the therapeutic arsenal whereas alcohol and tobacco have noxious effects to health can probably explain this high proportion of drug consumption.

According to socio-demographic variables, the analysis of drugs use led to the following conclusions:

- Female were significantly more likely than male to use each of these drugs: sleep pills (8% vs. 5%), analgesics (31.9% vs. 17.6%), tranquilizers (9.1% vs. 6.4%) and antidepressants (8% vs. 4.8%).
- Blue-collar workers, white-collar workers and “others” were significantly more prone than managers and upper-level managers to use each of these drugs (Table 41).

Table 41. Comparison of drug consumption between professional categories

Professional categories	**Analgesics**	**Sleep pills**	**Tranquilizers**	**Antidepressants**
Blue-collar workers (n=490)	30.7%	6.4%	7.9%	5.1%
White-collar workers (n=467)	23.4%	6.4%	7.1%	6.4%
Others (n=3305)	26.3%	7.1%	8.3%	7.4%
Managers (n=421)	10.3%	2.4%	4.3%	2.1%
Upper-level managers (n=78)	18.4%	0%	0%	0%

This result is in agreement with the report of physical and mental health complaints, since blue-collar workers, white-collar workers and "others" were more likely to report medical complaints (fatigue, tension, anxiety, depression, low-back pain, headaches, and sleep disorders).

- Finally, single were more likely to use antidepressants than married workers (7.8% vs. 5.7%, p=0.02). But no other significant difference in other drugs use can be mentioned.

3.5.1.5. Assessment of perceived quality of life

The quality of life of workers was assessed with the SF12 questionnaire. This instrument evaluates physical and mental dimensions of quality of life, as perceived by the respondent. A score is attributed for each dimension and their integration gives a global measure.
In a general adult population, the mean physical component score (PCS) and the mean mental component are expected to be equal to 50 (SD=10). The values are norms used for comparisons (Ware, Kosinski, & Keller, 1998). They help users to distinguish « low scores » (< 50) for a bad health status, and « high scores » (≥50) for a better perceived health status.

Globally, the mean score for the physical component was 51 (median = 53 and SD=7). The mean score for the mental component was 45 (median = 48 and SD=11). If workers assessed their physical health as satisfying, they reported a worse mental health status.

Table 42. Physical (PCS) and mental (MCS) components of quality of life, by business domain (mean, median and standard deviation)

	PCS			MCS		
Domains	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Private production (n=1251)	52	54	7	44	47	11
Private service (n=3216)	50	53	7	46	49	10
Health sector (n=274)	51	52	7	44	47	10
Public sector (n=174)	51	54	7	46	50	10
Global mean	51	53	7	45	48	11

According to socio-demographic variables, observations were following:
- Male scored higher than female on physical component (51.8 vs. 50.3; p<0.001). But mental component scores were similar among the two genders: mean MCS was 45.7 in males, and 45.5 in females (p=0.50) ;
- Single had significantly higher PCS (51.5) and lower MCS (44.9) than their married colleagues (PCS=50.9, p<0.05; MCS=45.8, p<0.001).
- If mean PCS declined with age (r= –0.23, p<0.001), mean MCS were not associated with age (r=0.01, p=0.24).
- Analysis of variance underlined that PCS and MCS significantly differed between professional categories (Table 43).

Table 43. Comparison between mean PCS and MCS of workers according to their professional category (ANOVA)

Professional category	Mean PCS	Mean MCS
Others (n=3305)	51	46
Blue-collar workers (n=490)	50	45
White-collar workers (n=467)	52	43
Managers (n=421)	53	44
Upper-level managers (n=78)	53	49
df	4	4
Sum of squares	4722.1	4380.6
F	22.9	9.3
p	< 0.001	< 0.001

Please note that there was no association between workers perception of their physical quality of life and their mental quality of life (r=0.01, p=0.36).
By analyzing associations between these two scores and medical complaints, we observed that complaints highly correlated to PCS were low-back pain complaints (r= –0.41, p<0.001), whereas complaints highly correlated to MCS were depression (r= –0.63, p<0.001), tension (r= –0.59, p<0.001), anxiety (r= –0.57,p<0.001), fatigue (r= –0.53, p<0.001), and sleep disorders (r= –0.45, p<0.001). In the same figures, analgesics use was more correlated to PCS (r= –0.41, p<0.001), whereas use of sleep pills (r= –0.21, p<0.001), tranquilizers (r= –0.28, p<0.001), and antidepressants (r= –0.26, p<0.001) was more correlated to MCS. These results support the idea that respondents have concordant attitudes and behaviors, assessed by a subjective investigation.

Finally, if perceived quality of life is considered as an integration of both PCS and MCS, 4 figures can be theoretically drawn:

		PCS	
		high	**low**
MCS	**high**	Satisfying QOL	Altered QOL
	low	Altered QOL	Altered QOL

Proportions of workers belonging to each of these categories can be reported as below:

		PCS	
		high	**low**
MCS	**high**	30.7%	12%
	low	36.2%	**21.1%**

Less than one-third of workers perceived their quality of life as satisfying or high. If 48% of workers felt an imbalance between physical quality of life, and mental quality of life, 21% assessed both physical and mental QOL as poor or bad. The analysis by business domain also revealed important differences, since mental QOL was badly assessed by 65.5% of health care workers, by 60.6% of workers in private production sector and by 48.7% of workers in public sector (χ^2= 54.4, 6 dl, p<0.001). Physical QOL, better estimated by two-thirds of workers was nonetheless badly assessed by 29.7% of health care workers, 25.2% of workers in private production sector, and by 32.8% of workers in private service sector, and finally, by 28.6% of workers in public sector (χ^2= 50.4, 6 dl, p<0.001). This result is convergent with the analysis of medical complaints (more frequently reported in health care sector and in private production sector) and the analysis of drug use (also higher in both

sectors). Recall that increased use of tobacco and alcohol consumption or recent use of these two substances was more prevalent in the two other sectors (private service sector and public service sector).

Some observations can be underlined from the descriptive part of the Flexihealth study, whose aim was to obtain a snapshot of workers in 18 Belgian companies (divided into 4 sectors), in the framework of job stress.

- Among the medical complaints assessed in the Flexihealth investigation, 4 of them had a higher prevalence in our population of workers than in the Belgian population. They were fatigue, anxiety, low-back pain and headaches.

- If the proportion of workers in our sample reporting occasionnally drinking alcohol was lower than in the Belgian population, 20% of respondents increased their consumption and 20.4% recently began to drink alcohol. These behavioral changes were more important in the tertiary sector than in the secondary sector and were adopted by one-third of workers in service sector and in public companies. Identical conclusions can be drawn for tobacco use, since 30% of workers smoked (28% in the Belgian population), but 38% of respondents reported having increased their use whereas this proportion was lower in the Belgian population (20%). Recent use of tobacco affected 20% of workers in private service companies and 32% of workers in public services.

- If psychotropic drugs and analgesics uses were comparable between our sample and the Belgian population, there were really more important in the health care sector. On the other hand, in the private production sector, the use of psychotropic drug was lowest. Among different professional categories, it was easy to note that managers and upper-level managers were less prone to use drugs.

- The workers from the 18 companies had higher mean physical component scores than norms reported in the literature, but lower mean mental component scores. More than half of workers assessed their mental QOL as "low"; this proportion was as high as 65.5% in the health care sector and 60.6% in the private production sector. Finally, 21% of workers combined an altered physical QOL and an altered mental QOL. It is difficult to distinguish voluntarily exaggerated answers of unfavorable personal situations. Occupational physicians, human resources directors and organizations having in their missions the improvement of working conditions having a specific role to play in analyzing individual situations in order to help and support these workers.

3.5.2. Analytical part

The objective of this second part of the Flexihealth investigation was to determine the part of problems attributable to organizational stress, in other words, whose occurrence or worsening did not seem to result from the basic medical status of the worker. The variations in health status were then assessed according to medical history and potential changes in life habits.

In this part of the report, we try to give an answer to the following questions:

- Is there a direct relationship between, on the one hand, organizational changes and flexibility practices and, on the other hand, indicators of job stress and perceived health status?

- Are there relationships between indicators of job stress, well-being in the workplace and health-related behaviours, such as smoking, alcohol consumption, and drug use?

1st research hypothesis: organizational changes and flexibility practices have an impact on perceived stress and on (physical and mental) quality of life of workers

Before testing this first research hypothesis, let us recall that flexibility practices with which workers are confronted are changes on work schedules, working times, contract, geographical localization or nature of tasks whereas organizational changes affect the level of authority, job descriptions, colleagues or work environment.

Changes experienced by workers can be added to obtain a maximum of 5 flexibility practices and a maximum of 5 organizational changes. The average number of changes to which workers of the 18 Belgian companies was confronted with varied according to their business domain as illustrated in Table 44.

Table 44. Average number of changes according to business domain

	Private production (n=1251)	Private service (n=3216)	Health (n=274)	Public (n=174)
Flexibility practices	1.3	1.8	2.0	1.5
Organizational changes	2.3	1.9	2.1	1.4

On the average, if health care workers were confronted to 2 organizational changes and 2 flexibility practices, private production sector was submitted to 2.3 organizational changes. The other business domains were confronted to a lower number of organizational mutations. In order to test our first hypothesis, Table 45 presents associations tested between dependent and independent variables.

Table 45. Correlations between organizational changes, flexibility practices and health indicators (coefficients and statistical significance)

	Organizational changes	Flexibility practices	Stress	Complaints scores	PCS
Flexibility practices	0.12**				
Stress	0.13**	0.05*			
Complaints score	0.12**	0.04	0.67**		
PCS	-0.01	-0.02	-0.20**	-0.33**	
MCS	-0.13**	-0.02	-0.62**	-0.65**	0.01

*p<0.05; ** p<0.001

Low correlations observed between organizational changes, flexibility practices, on the one hand, and stress, complaints scores and quality of life scores, on the other hand, underscored the low association between these variables. Organizational evolutions (which practically are minor changes) to which workers were confronted seemed to have no impact on physical quality of life. Moreover, associations between organizational changes, flexibility practices and the aggregate score of complaints, even significant, did not exceed 0.11-0.13, a very low.

Significant correlations between stress and mental component score and between stress and physical health indicators (complaint scores and PCS) confirmed our theoretical assumptions: the potential effects of stress in work situation can be multiple and varied (deterioration of physical and/or psychological health) and can induce behavioral changes among employees. More exactly, stress was significantly and positively correlated to medical complaints (p<0.001):

	r

Tension	0.66
Anxiety	0.59
Depression	0.55
Fatigue	0.55
Sleep disorders	0.48
Gastric pain	0.39
Cardiac palpitations	0.38
Low-back pain	0.33
Colic pain	0.32
Chest pain	0.32
Anorexia	0.32
Headaches	0.31
Hypertension	0.31

These correlations were not unexpected since a lot of these medical complaints are also stress symptoms. Nevertheless, any interpretation has to be done with precaution according to the cross-sectional design of the Flexihealth study. A longitudinal investigation should probably be successful to pursue this objective, but was not possible according to the budget and the timetable assigned to the Flexihealth project.

Since socio-demographic variables (sex, age, and marital status) seemed to confound effects presented in the descriptive part, these variables will be systematically integrated in regression analyses.

Table 46. Multiple linear regressions of organizational changes on workers stress, adjusted for socio-demographic variables (parameter estimates and statistical significance)

	Standardized β coefficient	t	p
Constant		38.5	0.001
Sex (male=1; female=2)	-0.05	-1.89	0.06
Age	-0.03	-1.2	0.23
Marital status (single=1; married=2)	-0.01	-0.38	0.70
Flexibility practices	0.02	0.99	0.32
Organizational changes	0.12	5.08	0.001

Note: R^2 =0.14 (df=5, F=7.3, p<0.001)

Table 46 well illustrates the impact of organizational changes on perceived stress among workers, socio-demographic variables having no additional effect.

To explain mental quality of life of workers by occurrence of organizational changes, including confounding variables, a multiple regression analysis was conducted. The more a worker was confronted to a lot of organizational changes, the more his/her mental quality of life was altered. Workers marital status also explained a part of this result since married workers had a better perception of their mental quality of life (Table 47).

Table 47. Multiple linear regressions of organizational changes on workers MCS, adjusted for socio-demographic variables (parameter estimates and statistical significance)

	Standardized β coefficient	t	p
Constant		28.5	0.001

Sex (male=1 ; female=2)	-0.008	-0.317	0.75
Age	0.01	0.55	0.58
Marital status (single=1 ; married=2)	0.06	2.19	0.03
Flexibility practices	0.02	0.72	0.47
Organizational changes	-0.16	-6.43	0.001

Note: R^2 =0.03 (df=5, F=9.7, p<0.001).

If we add to this model the perceived stress score as independent variable, the mental health quality of life seemed to be highly affected by organizational changes, but also and almost by the stress in work situation (which can be a consequence of changes occurrence). This result is illustrated by the multiple linear regressions of organizational changes and stress on workers MCS, adjusted for socio-demographic variables (Table 48). Independent variables explained 40% of the MCS variance.

Table 48. Multiple linear regressions of organizational changes and stress on workers MCS, adjusted for socio-demographic variables (parameter estimates and statistical significance)

	Standardized β	t	p
Constant		47.4	0.001
Sex (male=1 ; female=2)	-0.04	-1.98	0.05
Age	-0.001	-0.06	0.95
Marital status (single=1 ; married=2)	0.06	2.73	0.006
Flexibility practices	0.03	1.75	0.08
Organizational changes	-0.08	-4.3	0.001
Perceived stress	-0.61	-31.1	0.001

Note: R^2 =0.40 (df=6, F=173.7, p<0.001).

The physical quality of life was better explained by gender, age and stress than by the organizational changes introduced into the company (Table 49). Females, older workers and workers living a high stress in work situation perceived their physical quality of life as altered.

Table 49. Multiple linear regressions of organizational changes and stress on workers PCS, adjusted for socio-demographic variables (parameter estimates and statistical significance)

	Standardized β	t	p
Constant		57.9	0.001
Sex (male=1; female=2)	-0.10	-4.24	0.001
Age	-0.18	-6.89	0.001
Marital status (single=1 ; married=2)	-0.02	-0.89	0.37
Flexibility practices	-0.02	-0.84	0.40
Organizational changes	-0.01	-0.51	0.61
Perceived stress	-0.18	-7.6	0.001

Note: R^2 du modèle=0.08 (df=6, F=22.1, p<0.001).

2d research hypothesis: organizational changes and flexibility practices have an impact on perceived stress and health-related behaviors (tobacco, alcohol and drugs use)

Complementary analyses were led in order to test the impact of organizational changes on workers stress and health-related behaviors (tobacco, alcohol and drugs use).

Table 50. Correlations between organizational changes, flexibility practices and health-related behaviors (coefficients and statistical significance)

	Organizational changes	Flexibility practices	Stress	Complaints scores	Alcohol use
Flexibility practices	0.12**				
Stress	0.13**	0.05*			
Complaints scores	0.12**	0.04	0.67**		
Alcohol use	0.01	-0.02	0.01	0.01	
Tobacco use	0.03*	0.06*	0.04**	0.08**	0.07**

Note: *p<0.05, ** p<0.001.

Even if associations between organizational changes and tobacco use (occasional or regular) were significant, they were particularly low, and we can not confirm that these events are linked. In the same way, organizational changes introduced in a company were not associated to alcohol use (occasional or regular).

Beyond this occasional or regular use of alcohol and tobacco, it is more important to investigate behaviors changes in consumption (increase in quantity and recent start of use). Four behaviors changes were then analyzed by logistic regression. Independent variables introduced in the regression equation were number of organizational changes, perceived stress, physical and mental quality of life (Table 51).

If most of medical complaints considered in the Flexihealth study were linked to medical antecedents, health-related behaviors changes, in the form of tobacco or alcohol use in increased quantities, were principally associated with workers age, younger workers being more likely to change health-related behaviors.

Table 51. Logistic regressions of socio-demographic variables, organizational variables, stress and QOL (predictor variables) for health-related behaviors changes (dependent variables) (parameter estimates and their statistical significance)

	Alcohol increase in quantity	Recent start in alcohol use	Tobacco increase in quantity	Recent start in tobacco use
Age	-0.33**	-0.48**	-0.18*	-0.54**
Sex	-0.40**	-0.01	0.03	-0.32*
Single	-0.02	-0.04	0.01	0.18
Organizational changes	0.03	-0.02	0.15**	-0.03
Stress	-0.003	-0.01*	0.02**	0.007
PCS	0.007	-0.02*	-0.02*	0.02
MCS	-0.03**	-0.02*	-0.03**	-0.01

Note. * <0.05; ** <0.001

For regression model 1, –2 log L (covariates) = 123.4 pseudo-R^2 = .04; For regression model 2, –2 log L (covariates) = 112.3 pseudo-R^2 = .04 ; For regression model 3, –2 log L (covariates) = 146.9 pseudo-R^2 = .09 ; For regression model 4, –2 log L (covariates) = 71.0 pseudo-R^2 = .05

The increase in alcohol intake and the recent start of tobacco use were more often observed among male workers. Let us underline an interesting observation: the tobacco use in increased quantity was principally explained by workers age and by the occurrence of organizational changes into the company. These results were corroborated by literature (Metcalfe et al, 2003; Kivimäki et al, 2000).

In the same vein, multiple regression analyses were conducted to appreciate the impact of organizational changes and stress on drugs use (Table 52).

Table 52. Multiple regression analyses of socio-demographic variables, organizational changes, stress, and QOL (predictor variables) on drugs use (parameter estimates and their statistical significance)

	Model 1 : Sleep pills	Model 2 : Analgesics	Model 3 : Anxiolytics	Model 4 : Antidepressants
Age	0.11**	0.03*	0.07**	0.04*
Sex	0.06**	0.11**	0.03	0.06**
Single	-0.04*	-0.01	-0.04*	-0.04*
Organizational changes	-0.003	-0.02	-0.002	-0.02
Stress	0.10**	0.10**	0.10**	0.06*
PCS	-0.12**	-0.37**	-0.16**	-0.10**
MCS	-0.14**	-0.19**	-0.22**	-0.23**

Note. * <0.05; ** <0.001

For model 1, $F(df = 7/3946, N = 4215) = 57.6$, $R^2 = .09$; For model 2, $F(df = 7/4007, N = 4280) = 183.3$, $R^2 = .25$; for model 3, $F(df = 7/3946, N = 4212) = 82.2$, $R^2 = .13$; for model 4, $F(df = 7/3924, N = 4192) = 56.5$, $R^2 = .09$; $p < .001$.

It is clear that organizational changes do not explain psychotropic drugs and analgesics use. The consumptions of these two medicines are better explained by stress and quality of life, in its physical and mental dimensions. On the other hand, the older worker will be more likely to use drugs belonging to the 4 pharmaceutical groups.

3.5.3. Conclusion

This survey intended to draw a reliable snapshot picture of health status of workers in 18 Belgian companies, belonging to 4 business domains, through data collection about medical history, medical complaints, and health-related behaviours, all possibly linked to stress. This study allowed to estimate the prevalence of several health problems and conditions in an ad hoc sample of workers and to compare these estimates to the situation of the Belgian population. Moreover, the study intended to explore the association between organisational changes, job stress and perceived health.

Medical antecedents were correlated to related medical complaints, which show a reasonably good concordance of data. As regards medical complaints, we observed prevalence as high as or even higher than those reported in the HIS-ISSP 2001 survey for fatigue, anxiety, low-back pain and headache. Mental complaints had prevalence close to what was seen in the national survey. This finding is surprising since we expected a better health status in this selected population of workers in comparison with a representative sample of the Belgian adult population, because of the « healthy worker effect ».

The analysis of medical complaints according to socio-demographic characteristics, such as gender and professional status showed results similar to the results of the national HIS-ISSP 2001 survey: females were more likely to report headache, low-back pain, and sleep disorders, while males were more likely to report cardiovascular complaints.

As reported previously by Vahtera et al. (1997), blue- and white collars were more likely to report somatic complaints than managers and high-level managers. This was confirmed by the aggregate score of complaints, which was much higher in blue-collars than in other professional categories. Cardiovascular complaints are an exception to this finding since they were equally prevalent across professional categories. We did not observe the gradient reported by Marmot et al. (1997), who showed the beneficial influence of job control, higher in managers, on the prevalence of cardiovascular disease.

The evaluation of lifestyle in the Flexihealth study showed results somewhat different from the results of the HIS-ISSP 2001 survey. Alcohol consumption was lower in our sample than in the Belgian population. However, recent changes in alcohol consumption were noticeable, with 20% of respondents reporting increase in alcohol use. As in the HIS-ISSP 2001 survey, males were more likely to report increase in drinking than females. White collars, managers and «others » reported a higher level of alcohol intake than blue-collars and high-level managers. Marital status was also associated with drinking habits: singles were heavier users than married workers.

As regard tobacco use, the proportions of occasional and usual smokers are close to the proportions in the Belgian population. However, 38% of workers report an increase in smoking (vs. 20% in the HIS-ISSP survey), and 17% report a recent start in tobacco use. Contrarily to alcohol use, there was no difference between the secondary and tertiary sectors. Changes in smoking habits affected especially workers of the service and public domains. There was no difference in changes in smoking habits according to marital status.

Thirty % of workers reported smoking and 57% reported occasional use of alcohol. Both behaviours may be associated but a minority of workers reported an increase in both alcohol and tobacco use or a recent start in both alcohol and tobacco consumption. We did not collect information about workers who adopted healthy lifestyle (e.g. smoking cessation), but we believe that health-related behaviours did not improve. We would like to emphasize the fact that workplace should be a place for health promotion.

Drug use was close in the HIS-ISSP 2001 survey and the Flexihealth survey. However, caution is required because it is unclear whether people exactly know to which therapeutic family belong the drug(s) they take.

Analgesics sleep pills, and tranquilizers use was higher in the health sector, whereas this sector was comparable to other sectors as regard medical history and complaints. Accessibility of drugs in health facilities could explain this phenomenon, as well as the culture of health services, according to which drugs are therapeutic means whereas tobacco and alcohol are harmful to health. Females were more likely than males to use drugs, blue- and white collars were more likely to use drugs than managers, singles were more likely to use drugs than married workers.

In the Flexihealth study, the mean physical component of quality of life was 51 (SD =7) and the mean mental component was 45 (SD=11) (norms are 50 with SD=10 in a general adult population). Perceived physical health was better than perceived mental health. Males had a better physical quality of life than females but there was no difference between genders in the mental quality of life. As expected, marital status was associated to quality of life: singles had a better physical health than married workers, but a worse mental health. Physical component score decreased with age and mental component score remained stable, a finding difficult to interpret in a cross-sectional survey (is this consequence of the selection of more « robust » workers?).

Correlations of quality of life scores, medical complaints and drug use allow, once again, asserting that

data have a good internal consistency. Physical quality of life was negatively associated to musculo-skeletal complaints and with analgesic use. Mental quality of life was negatively associated to depression, nervousness, anxiety, fatigue and sleep disorders and the use of sleep pills, tranquilizers and antidepressants.

We observed that only 31% of workers had a satisfactory quality of life on both dimensions, 48% had a bad score on one dimension and a good score on the other, and 21% had a poor quality of life. Substantial differences were present between business domains: mental quality of life was low in 65% of workers in the health sector, 60.6% of the workers in the private production sector, 52.2% of the workers in the private service sector, and 48.7% of workers in the public sector. Physical quality of life was better. However, physical quality of life was poor for 29,7% of workers in the health sector, 25,2% of workers in the private production sector, 32,8% of workers in the private service sector, and 28,6% of workers in the pblic sector. These results are concordant with medical complaints, more frequently reported in the same sectors, and drug use, which follows the same trends. Discrepancies in perceived physical and mental health could reflect the selection made by occupational physicians or difficulties of workers in ther present job context.

The second part of the Flexihealth study consisted in the identification of health problems, including health-related behaviours, attributable to stress and organisational changes. Only weak correlations were observed between organisational changes and flexibility practices, on the one hand, and the aggregate score of medical complaints and quality of life, on the other hand. Conversely, we observed a high and significant correlation between stress, on the one hand, and the aggregate score of medical complaints and the mental dimension of quality of life, on the other hand. As in the study by Metcalfe et al. (2003), the interpretation of these relationships should be done with caution, given the nature of data in this cross-sectional study, which prevents to conclude to causal links.

In multivariate analyses, organisational changes and stress, but not flexibility practices, influenced the mental component of quality of life, which was observed by Kivimäki et al. (2001), Tennant (2001) and Ferrie et al. (1998).

When stress and quality of life are taken into account, there was no association between organisational changes and changes in alcohol use. Alcohol use may be viewed as a generic self-treatment used to deal with disease (feeling bad). Conversely, organisational changes were associated to changes in tobacco consumption, a central stimulant which increases vigilance. As regards drug use, organisational changes did not explain the use of psychotropic drugs and analgesics, whereas stress and both dimensions of quality of life were associated to drug use. Please note that changes in health-related behaviours (increase in use and recent start in alcohol and tobacco use) were inversely related to age, which may reflect, in younger subjects, more impulsive reactions, immature coping mechanisms, or even a more acute perception of distress situations. The opposite was observed for drug consumption, as if older workers sought medical answers to their suffering.

Our study corroborates former results about tobacco consumption, but more surprisingly, no relationship was found between organisational changes and changes in alcohol intake (Metcalfe et al., 2003; Kivimäki et al., 2000). It is possible that the high proportion of females, less prone than males to use alcohol, in most exposed sectors (health and retailing) and jobs explains the absence of the expected response.

In conclusion, the subjective evaluation of health and of physical and mental quality of life provides interesting information with regard to workers well-being in the companies confronted to organizational changes. Compared to objective approaches used in numerous studies, the subjective evaluation helps to consider how workers perceived their own health status; these results could be useful in health

promotion programs in companies. Nevertheless, caution is required with self-reported data. We can not exclude that some bias due to exaggeration or desire to conceal some "touchy" information were introduced. The lack of major or spectacular associations between organizational changes and flexibility practices on the one hand, and health status on the other hand, could result from the situation of our sample companies being confronted only to minor changes.

In accordance with the literature, the Flexihealth study suggests a relation between medical antecedents of workers and medical complaints and quality of life scores. Moreover, some links between organizational changes, workers perceptions towards their health and health-related behaviors changes have been underlined. We also observed the impact of socio-demographic variables, which indicates an intricacy between working situation and private life, which makes the analysis very difficult (Danna et Griffin, 1999). Given its cross-sectional design, this study needs a lot of precautions in interpreting associations, for which it is impossible to define the causal nature.

3.6. Relationships with customers

3.6.1. Correspondence between employees' and customers' perceptions of customer satisfaction

In preliminary study 1 and preliminary study 3, we were able to assess the degree of correspondence between employee and (proxy) customer ratings for customer satisfaction.

In study 1, we examined rank order correlations between overall mean satisfactions with services scores for nursing homes from the three different sources. The ratings from the three different sources seem to be moderately associated. The strongest association exists between ratings from residents and family, but this might be because these are both aggregated ratings.

Table 53. Zero order correlations between individual employee and aggregated family and resident satisfaction scores

	SCS	RCS	FCS
SCS			
RCS	.16***		
FCS	.24***	.39***	

Note: SCS = staff perceived customer satisfaction; RCS= resident satisfaction; FCS= family perceived customer satisfaction.

In order to examine the agreement between employees' perceptions and customers' perceptions in preliminary study 3, an ANOVA design with source and organization as independent factors was applied. Due to large inequalities in cell sizes, data from 6 small organizations were removed from the analysis, and a 2(source: employee vs. customer)*11(organization) ANOVA design was examined, which showed main effects for both source [$F(1, 843)=167.12$, $p<.000$] and organization [$F(10, 843)=7.90$, $p<.000$], as well as an interaction effect between source and organization [$F(10, 843)=2.86$, $p<.002$]. As can be seen from Figure 17, employees in general score much lower than customers do in general- apart from this, there are organizational differences both within customer ratings as well as employee ratings, and these organizational differences seem to follow the same patterns with only a few exceptions. The correlation between employees' perceptions and customers perceived satisfaction is small but significant ($r=.18$, $p<.000$).

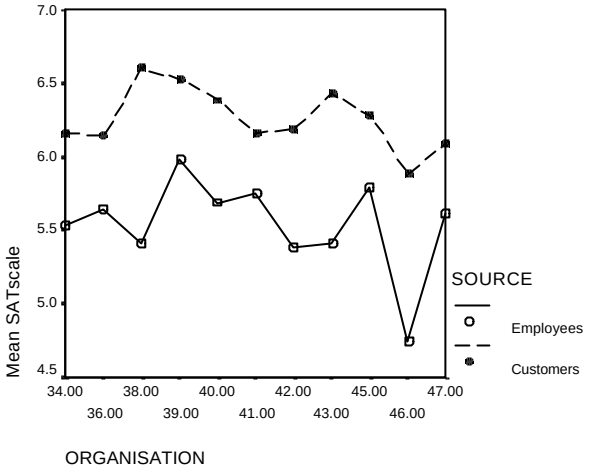

Figure 17. Mean satisfaction scores of employees and customers by organization.

3.6.2. Descriptive results of data from the validation phase

3.6.2.1. Sample description.

Table 54. Number of questionnaires received in each language per sector

	French	%	Dutch	%	Total	%
Secondary sector	1136	38.72%	123	6.07%	1259	25.38%
Tertiary sector	1798	61.28%	1904	93.93%	3702	74.62%
Total	2934	100.00%	2027	100.00%	4961	100.00%

Table 55. Number of questionnaires received in each language per activity

	French	%	Dutch	%	Total	%
Private production	1136	38.72%	123	1.21%	1259	9.59%
Private services	1392	47.44%	1856	18.20%	3248	24.73%
Healthcare	276	9.41%	8173	80.13%	8449	64.33%
Public services	130	4.43%	48	0.47%	178	1.36%
Total	2934	100.00%	10200	100.00%	13134	100.00%

In the variety of organizations surveyed in the course of the Flexihealth study, we did not include product quality and satisfaction measures in the context of (public) services and healthcare. For this reason, we analyzed separately the data that contained quality and satisfaction ratings for products when examining models detailing interrelations between quality, satisfaction and behavioral intentions.

Secondly, a large sample of Flexihealth data was collected within hospitals, especially in the Dutch-speaking population. Since this constitutes an interesting and large dataset with properties that are probably not generalizable to other sectors, we provide separate analyses of these data (Sample 3).

3.6.2.2. Descriptive customer satisfaction indicators

In Table 56, means and standard deviations for all customer satisfaction ratings are reported for the private and public production and services organizations (N=4961), and in Table 57 similar results are provided for the healthcare sample (only Dutch speaking, N=8173).

Table 56. Means and SD for all CSI in Sample 1 and Sample 2

	Total		French		Dutch	
	Average	SD	Average	SD	Average	SD
service quality-general	4,57	1,48	4.51	1.48	4.65	1.47
Tangibles	4.91	1.08	4.72	1.10	5.17	0.99
Reliability	4.13	1.23	3.98	1.23	4.34	1.19
responsiveness	4.44	1.17	4.34	1.14	4.58	1.20
Assurance	4.95	1.07	4.87	1.08	5.06	1.04
Empathy	4.84	1.06	4.76	1.06	4.95	1.05
product quality-general	5.34	1.26	5.18	1.33	5.56	1.10
Satisfaction with services	4.76	1.03	4.76	1.04	4.75	1.01
Satisfaction with products	4.97	0.98	4.84	1.00	5.15	0.91
behavioral intentions	4.61	1.11	4.55	1.15	4.69	1.06

Table 57. Means and SD for all CSI in Sample 3

	Average	SD
service quality-general	5.72	1.03
Tangibles	4.92	1.26
Reliability	5.16	1.04
responsiveness	5.27	0.94
Assurance	5.75	0.83
Empathy	5.58	0.92
Satisfaction with services	5.59	0.75
behavioral intentions	5.48	0.92

In Table 58, average customer satisfaction ratings are provided per sector (excluding the Dutch-language healthcare sample) and in Table 59 average customer satisfaction ratings are provided separately per activity (including the Dutch-language healthcare sample).

Table 58. Means and SD per sector

	Total		Secondary		Tertiary	
	Average	SD	Average	SD	Average	SD
service quality-general	4.57	1.48	4.92	1.37	4.45	1.49
Tangibles	4.91	1.08	4.50	1.12	5.03	1.04
Reliability	4.13	1.23	4.02	1.22	4.17	1.23
Responsiveness	4.44	1.17	4.53	0.99	4.41	1.22
Assurance	4.95	1.07	5.11	0.92	4.91	1.10
Empathy	4.84	1.06	4.92	0.97	4.81	1.09
product quality-general	5.34	1.26	5.29	1.33	5.36	1.23
Satisfaction with services	4.76	1.03	4.98	0.91	4.69	1.05
Satisfaction with products	4.97	0.98	5.00	1.01	4.96	0.96
behavioral intentions	4.61	1.11	4.76	1.09	4.56	1.12

Table 59. Means and SD for all CSI per activity

	Total		private production		private services		healthcare		public services	
	Average	SD	Average	SD	Average	SD	Average	SD	Average	SD
service quality-general	4.57	1.48	4.92	1.37	4.38	1.51	5.09	1.08	4.77	1.39
Tangibles	4.91	1.08	4.50	1.12	5.02	1.04	5.29	0.88	4.69	1.02
Reliability	4.13	1.23	4.02	1.22	4.17	1.24	4.05	0.96	4.34	1.37
Responsiveness	4.44	1.17	4.53	0.99	4.40	1.23	4.34	0.99	4.75	1.16
Assurance	4.95	1.07	5.11	0.92	4.89	1.11	5.04	1.04	5.09	1.12
Empathy	4.84	1.06	4.92	0.97	4.82	1.09	4.72	0.97	4.80	1.19
product quality-general	5.34	1.26	5.29	1.33	5.36	1.22				
Satisfaction with services	4.76	1.03	4.98	0.91	4.63	1.06	5.19	0.79	4.88	0.99
Satisfaction with products	4.97	0.98	5.00	1.01	4.96	0.96				
behavioral intentions	4.61	1.11	4.76	1.09	4.51	1.12	5.10	0.87	4.63	1.15

3.6.3. Examination of fit of a model specifying the relationships between CSI

In this first part, we wanted to examine whether our proposed model for service quality (extended to product quality in the private sector sample), satisfaction and behavioral intentions hold for the employee perception data that were collected in the Flexihealth research.

In Table 60, model fit indicators are presented for the two models (see Figures 18-21) for each sample. An alternative model with both quality and satisfaction equally predicting behavioral intentions failed to fit. Although $?^2$, which is based on a comparison of the theoretical covariance matrix with the observed covariance matrix, is often used to assess model fit, it can lead to the rejection of good models that give a significant value in large samples (Bentler & Bonett, 1980). The Root Mean Square Error of Approximation is a fit index that is not influenced by sample size and which takes the complexity of the model into account. Values smaller than .05 indicate good model fit, values smaller than .08 indicate an adequate yet not optimal model (Hu & Bentler, 1999). The Non Normed Fit Index (NNFI) of 'Tucker Lewis index' gives an indication as to what degree a proposed model is an improvement of fit compared to a null-model, taking into account the complexity of the model and sample size. Values of .90 or more indicate an acceptable to good fit. The Akaike Information criterion is a measure based on information theory and is used primarily to compare competing models, taking into account the complexity of the models. When comparing values, the model with the lowest AIC value provides the best fit.

Table 60. Fit indices for model 1 and 2 in each sample

	$?^2$	df	RMSEA	CFI	NNFI	AIC
Sample private						
Model 1	886.87	108	.070	.99	.98	1012.87
Model 2	830.45	103	.070	.99	.98	966.69
Sample public						
Model 1	203.82	73	.107	.92	.90	297.82
Model 2	108.28	68	.061	.98	.98	212.28
Sample healthcare						
Model 1	1532.21	73	.064	.99	.98	1605.76

Model 2	1147.93	68	.057	.99	.99	1251.93

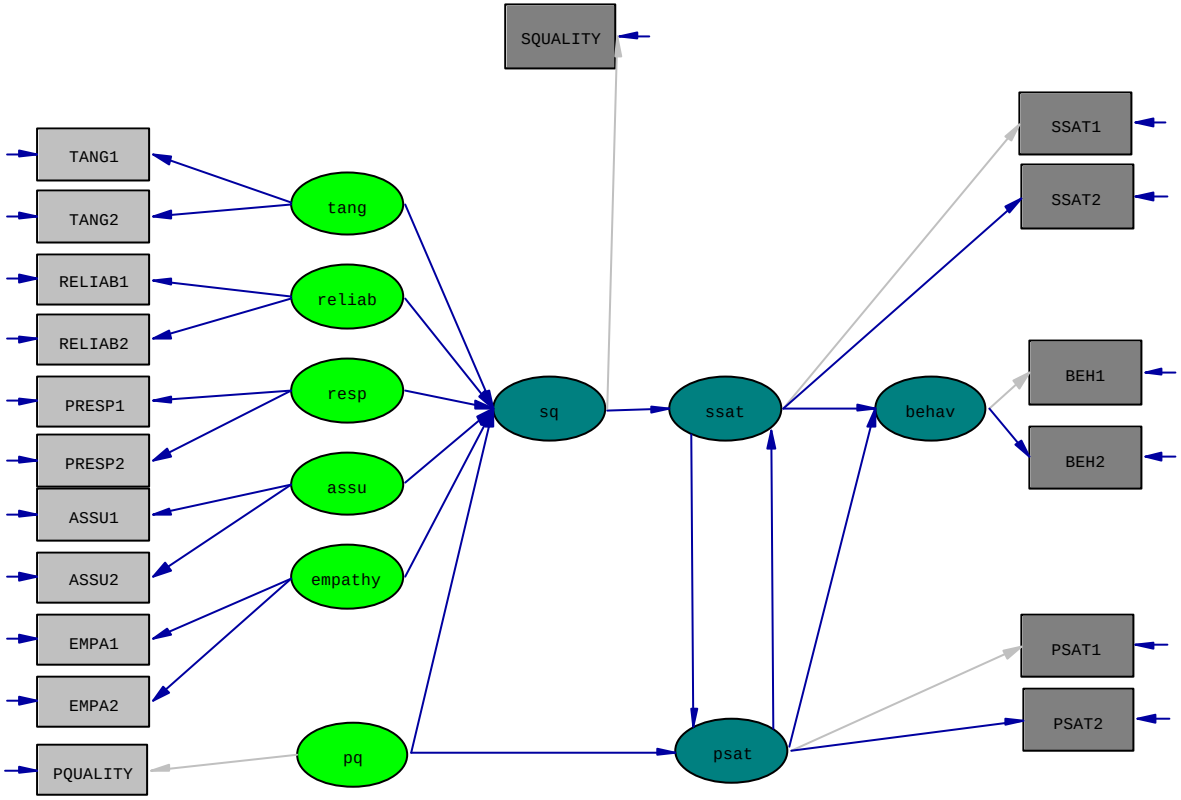

Figure 18. Model 1, Sample 1

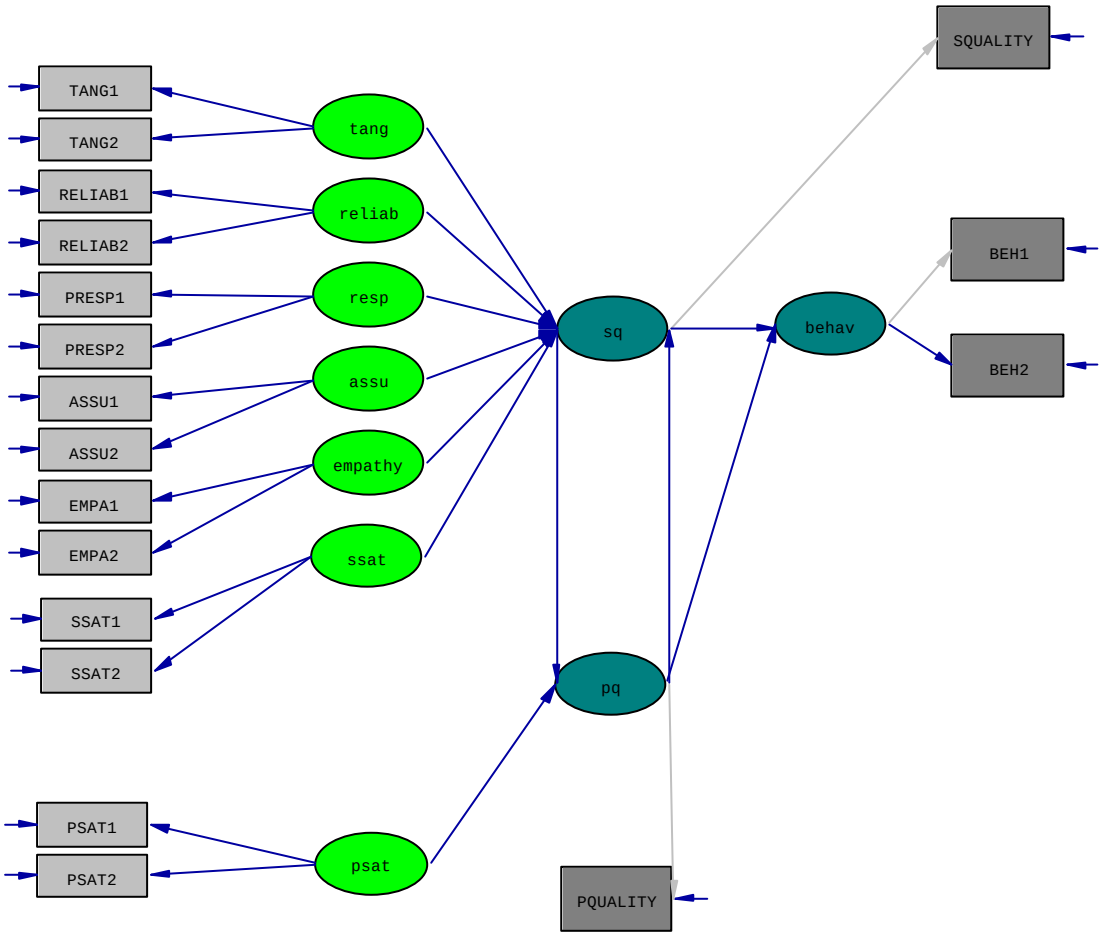

Figure 19. Model 2, Sample 1

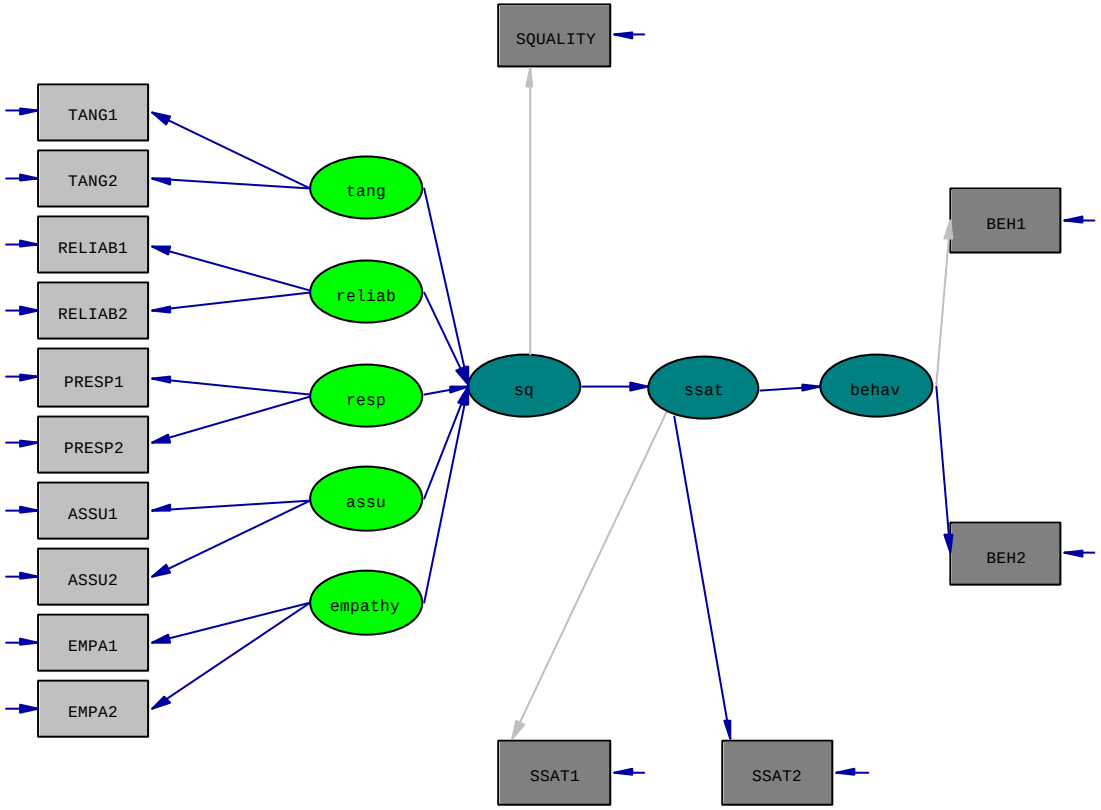

Figure 20. Model 1, Sample 2 and Sample 3.

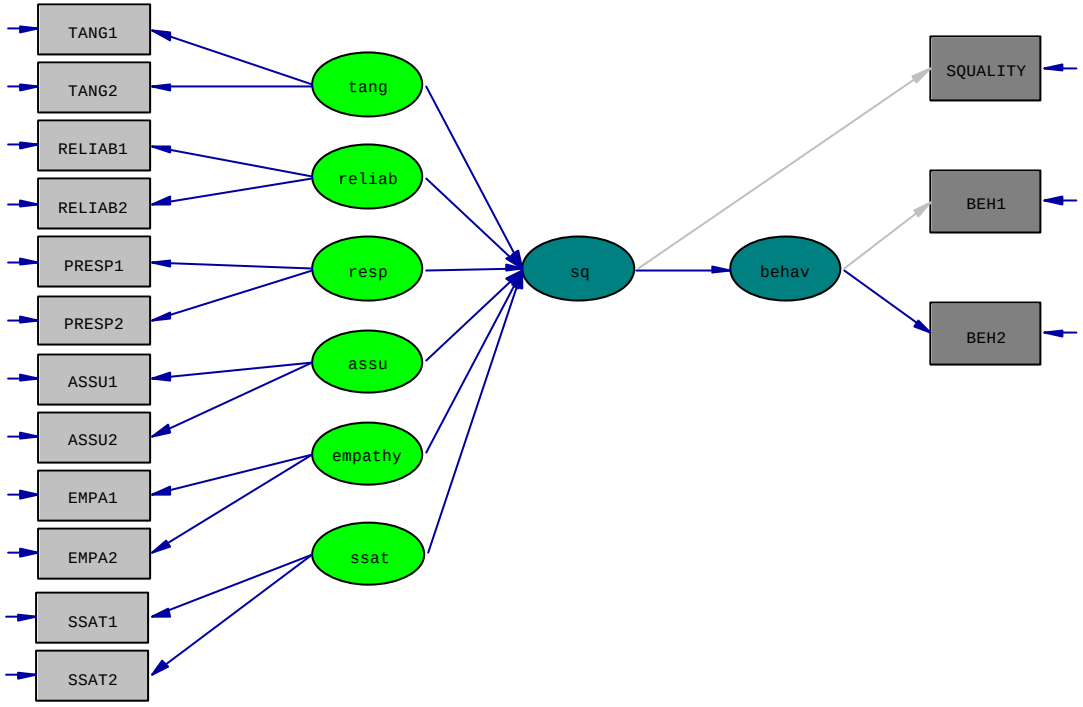

Figure 21. Model 2, Sample 2 and Sample 3

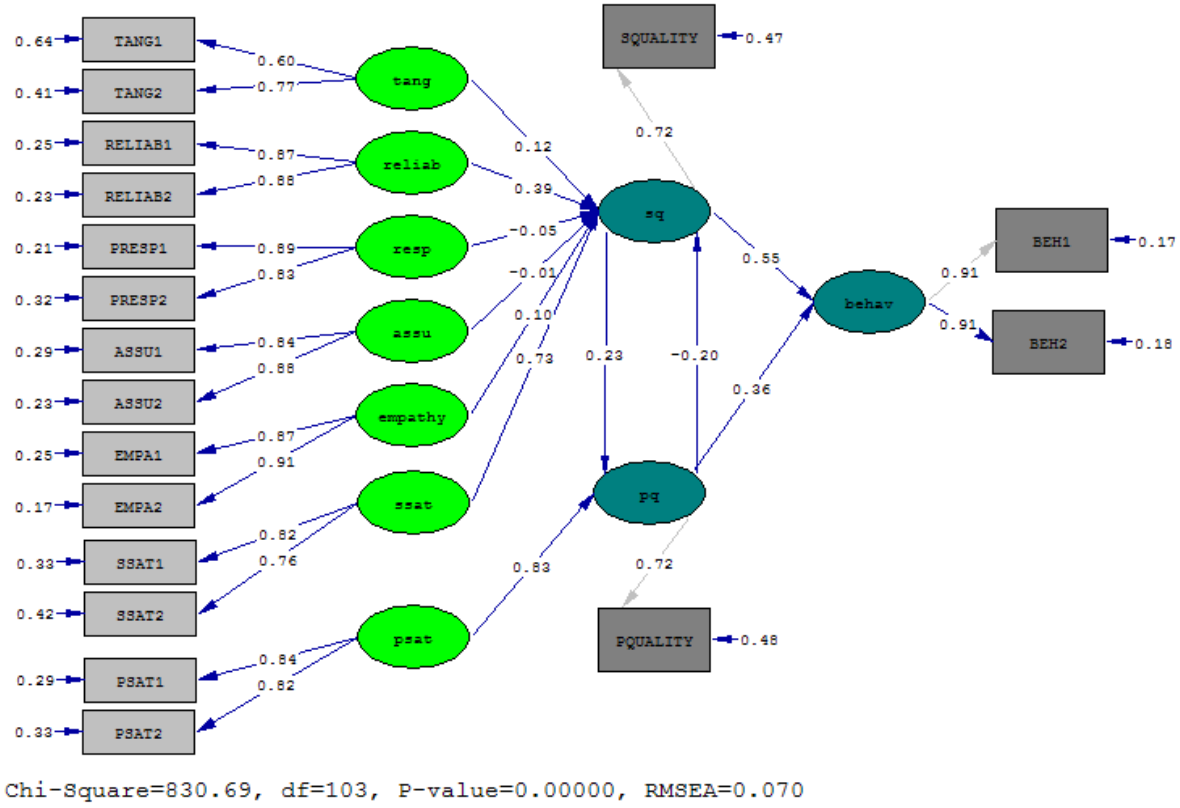

Figure 22. Standardized coefficients for Model 2 in Sample 1.

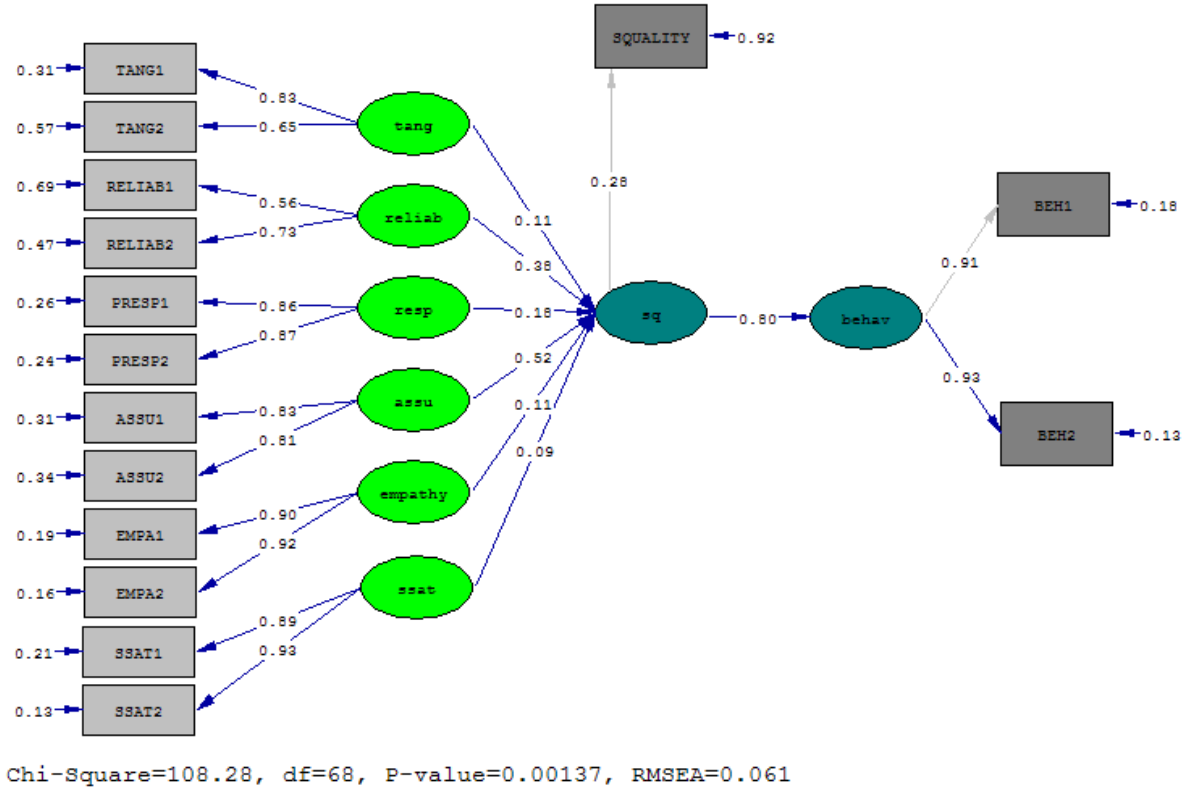

Figure 23. Standardized coefficients for Model 2 in Sample 2

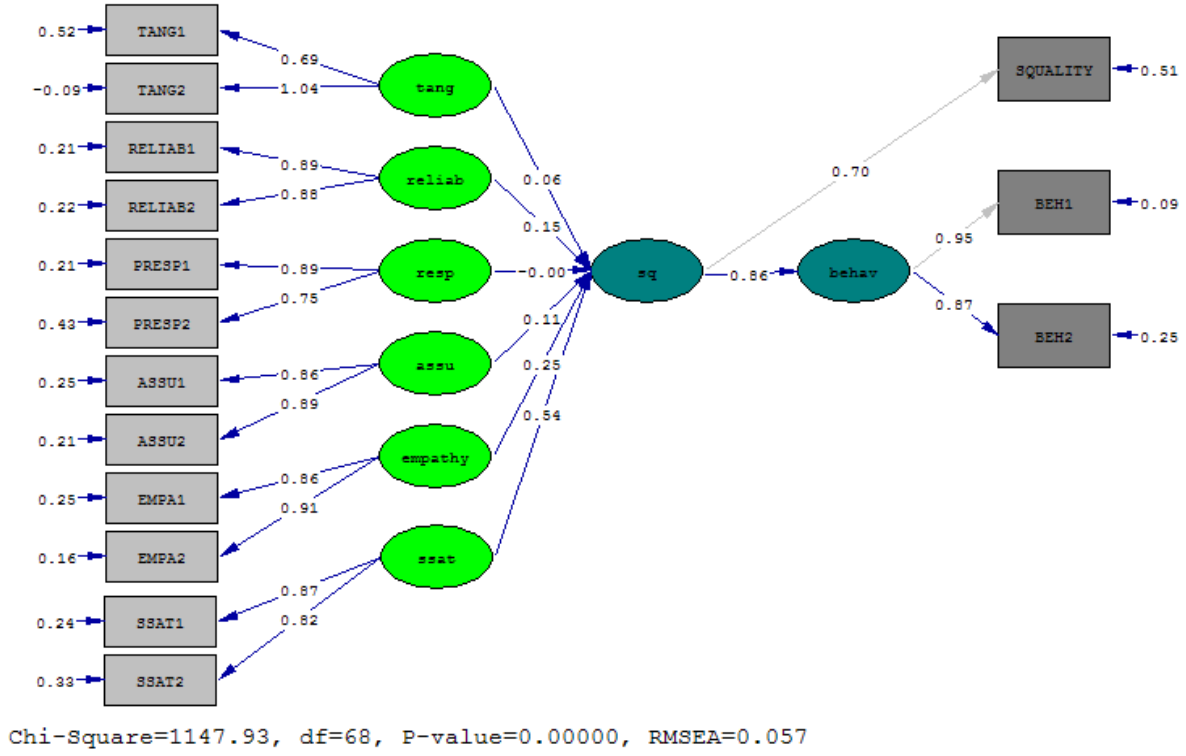

Figure 24. Standardized coefficients for Model 2 in Sample 3.

In samples 1 and 3, we found acceptable fit for model 1. Although $?^2$ was significant, RMSEA was below the cut-off value of .08 for acceptable fit and both CFI and NNFI are above .95, indicating good fit. In sample 2 however, we found values indicating a less than optimal fit. Model 2, proposing an influence from Servqual latent factors and satisfaction on general perceived quality that in turn influences behavioral intention perceptions, provided an acceptable to good fit in all three samples. AIC values, which allow comparisons between models, indicated a superior fit for model 2 in all samples.

In Figure 22, standardized coefficients are presented for sample 1. The path from Responsiveness to Service Quality in general was non-significant, as well as the path from Assurance to Service Quality and from Empathy to Service Quality. The relationship from overall Service Quality with Behavioral Intentions seems stronger than between overall Product Quality and Behavioral Intentions, but constraining these parameters to be equal did not lead to a significant increase in Chi-square ($? ?^2(1) = 1.13$, *ns*).

Standardized coefficients for model 2 in sample 2 are presented in Figure 23. Despite substantial coefficients, overall Service Quality was only significantly related to Assurance and Behavioral Intentions.

In the healthcare sample (sample 3, see Figure 24) we found significant paths from Satisfaction with Services to overall Service Quality and from all Servqual dimensions except Responsiveness to overall Service Quality. Satisfaction had the strongest association with Service Quality and this loading was significantly higher than the weight from Empathy on Service Quality (constraining these two parameters to be equal resulted in a significant increase of Chi-square, $? ?^2 (1) = 60.65$, $p<.001$).

3.6.4. Relationships between CSI, employee characteristics, perceived working conditions and well-being.

3.6.4.1. Bivariate initial analyses

In sample 1 (private production organizations and service organization also providing products), there are significant differences for all CSI between Dutch and French speaking respondents, with French language questionnaires having on average a slightly lower score for all indicators. There is no significant difference between male and female respondents. Employee tenure is weakly but significantly related to Service quality in general (r=-.12); Reliability of service (r=-.09), Responsiveness (r=-.10), Assurance (r=-.10), Empathy (r=-.10), Satisfaction with services (r=-.13), Product satisfaction (r=-.06) and behavioral intentions (r=-.12). Amount of contact with customers is weakly but significantly related to the SERVQUAL dimensions Responsiveness (r=.12), Assurance (r=.14) and Empathy (r=.15).

In sample 2- public and private services-, there are also significant language differences with again French speaking respondents scoring lower on all CSI. There are no significant differences between gender groups. Tenure is related significantly and negatively to behavioral intentions (r=-.22) while customer contact was not significantly related to CSI.

In sample 3 (Dutch speaking healthcare sample) we found slight differences between male and female respondents. Male respondents scored slightly but significantly lower on all CSI than their female colleagues. Tenure was virtually unrelated to customer satisfaction perceptions. Degree of contact with clients was significantly related to Service Quality in general (r= .11), Assurance (r=.12), Empathy (r=.17), Satisfaction with services (r= .14) and behavioral intentions (r= .18).

3.6.4.2. Correlations between number of changes, change perceptions and perceived customer satisfaction.

In Table 61, correlations are reported between the number of changes experienced, the appraisal of these changes (as a challenge, something over which the employee felt control, a threat or something that was the responsibility of the organization, for more details check the psychosocial section), the emotions experienced following these changes and CSI are reported. Only the correlations significant at the .001 level are reported since the sample size was quite large and this allows even small and not very informative correlations to reach less conservative significance levels. Correlations higher than .15 are put in bold and correlations above .20 are bold and underlined for visual clarity purposes.

The mere number of changes experienced is virtually unrelated to CSI. Positive appraisal of changes is positively but weakly related to all CSI, while negative appraisal of the changes as a threat and organization's accountability is linked to less positive customer satisfaction perceptions, especially relating to the tangible and reliability aspects of service and lower estimation of customer's intention to return or recommend. Negative emotions related to changes tend to be weakly and negatively related to customer satisfaction ratings whereas positive emotions are positively but weakly linked with perceived customer satisfaction.

Table 61. Correlations between change-related variables and employee perceived CSI in sample 1

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*PSAT*	*SQ*	*PQ*	*BI*
# CHANGES	-0.062	-0.058								
CHALLENGE	0.096	0.125	0.072	0.050	0.094	0.074	0.110	0.098	0.101	0.148
CONTROL	0.063	0.115	0.067	0.071	0.066	0.101	0.081	0.105	0.057	0.124
THREAT	**-0.154**	**-0.192**	-0.108	-0.110	-0.132	-0.107	-0.145	-0.146	-0.137	**-0.164**
ACCOUNTABILITY	**-0.157**	**-0.247**	-0.145	-0.136	**-0.177**	-0.146	**-0.169**	**-0.173**	**-0.156**	**-0.193**
STRESSED	-0.103	**-0.167**	-0.109	-0.118	-0.113	-0.108	-0.118	-0.111	-0.122	-0.134
UNBALANCED	-0.095	-0.147	-0.080	-0.093	-0.082	-0.079	-0.117	-0.091	-0.101	-0.116
POWERLESS	-0.124	**-0.189**	-0.128	-0.124	-0.137	-0.123	-0.133	-0.122	-0.122	**-0.160**
ANGRY	-0.142	**-0.196**	-0.115	-0.117	-0.127	-0.113	**-0.158**	-0.135	-0.146	**-0.154**
SEREEN	0.114	0.128	0.063	0.073	0.077	0.082	0.136	0.088	0.138	0.126
ENTHUSIASTIC	0.142	0.149	0.088	0.075	0.113	0.092	0.140	0.116	0.120	**0.152**

Note: T-SQ= SERVQUAL-Tangibles; R-SQ= SERVQUAL-Reliability; Re-SQ= SERVQUAL-Responsiveness; A-SQ= SERVQUAL-Assurance; E-SQ= SERVQUAL-Empathy; SSAT= Satisfaction with services; PSAT: Satisfaction with products; SQ= general Service Quality; PQ= general Product Quality; BI= Behavioral intentions.

Correlations from the much smaller sample 2 are reported in Table 62. Here, we report correlations significant at the .05 level to allow for this smaller sample size. Here, the number of changes experienced was weakly and negatively related to reliability and responsiveness perceptions of service quality. Moderate and positive relations can be observed between the appraisal of change as a challenge and higher reliability, responsiveness, assurance and empathy scores for service quality, satisfaction with services and behavioral intentions. Negative appraisal seems to be related to service quality ratings in general and reliability perceptions. There is no clear pattern of relationships with the emotions experienced as a result of the changes and customer satisfaction ratings.

Table 62. Correlations between change-related variables and employee perceived CSI in sample 2

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*PQ*	*BI*
# CHANGES		-0.100	-0.141						
CHALLENGE		**0.188**	**0.270**	**0.152**	**0.209**	0.136			0.138
CONTROL	0.121	**0.182**	**0.152**						0.128
THREAT		-0.106						**-0.156**	
ACCOUNTABILITY		-0.106					-0.117	**-0.182**	-0.113
STRESSED									
UNBALANCED	0.128								

POWERLESS	-0.121			
ANGRY				
SEREEN	0.122	0.106		
ENTHUSIASTIC		0.141	0.135	

In the third sample (healthcare), we had again a large number of respondents, resulting in small correlations reaching significance levels. Therefore, only correlations significant at the .001 level are reported in Table 63. Here we found that again the mere number of changes was only very weakly related to perceptions of customer satisfaction and quality. The negative appraisal of the changes in terms of threat and the organization's accountability were negatively related to CSI, and these correlations were the largest observed here.

Table 63. Correlations between change-related variables and employee perceived CSI in sample 3

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
# CHANGES		-0.072	-0.076	-0.064	-0.065	-0.048		-0.056
CHALLENGE	0.086	0.145	0.118	0.090	0.112	0.079	0.102	0.099
CONTROL	0.060	0.111	0.075	0.072	0.071	0.057	0.072	0.063
THREAT	-0.113	**-0.208**	-0.168	**-0.164**	**-0.177**	**-0.152**	**-0.156**	-0.142
ACCOUNTABILITY	-0.125	**-0.236**	**-0.194**	**-0.174**	**-0.181**	**-0.164**	**-0.154**	**-0.164**
STRESSED	-0.058	-0.133	-0.125	-0.104	-0.122	-0.094	-0.077	-0.102
UNBALANCED	-0.058	-0.122	-0.100	-0.109	-0.101	-0.100	-0.107	-0.085
POWERLESS	-0.096	**-0.181**	**-0.153**	-0.142	-0.143	-0.129	-0.128	-0.126
ANGRY	-0.098	**-0.189**	-0.145	-0.144	-0.144	-0.129	-0.133	-0.129
SEREEN								
ENTHUSIASTIC	0.119	**0.163**	0.138	0.132	0.138	0.124	0.112	0.131

3.6.4.3. Correlations between well-being indicators and customer satisfaction indicators

In Table 64, correlations between three indicators of employee well-being and customer satisfaction ratings are reported for sample 1. Compared to the values reported above, the relations between job satisfaction, negative stress and positive stress are distinctly stronger. As expected, positive stress and especially job satisfaction are moderately and positively related to CSI, while negative stress shows a similar but negative link. Especially, the ratings for the reliability dimensions of service quality seem to be influenced by employee well-being.

Table 64. Correlations between well-being indicators and employee perceived CSI in Sample 1

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*PSAT*	*SQ*	*PQ*	*BI*
JOB SATISFACTION	**0.207**	**0.251**	**0.170**	**0.167**	**0.219**	**0.186**	**0.205**	**0.210**	**0.219**	**0.259**
POSITIVE STRESS	**0.191**	**0.248**	**0.165**	**0.155**	**0.219**	**0.173**	**0.218**	**0.157**	**0.220**	**0.235**
NEGATIVE STRESS	**-0.221**	**-0.284**	**-0.215**	**-0.214**	**-0.207**	**-0.194**	**-0.234**	**-0.199**	**-0.221**	**-0.243**

Correlations in sample 2 are reported in Table 65. Compared to the private production sector and private service with products supplied sector, in this sample it seems that customer satisfaction ratings made by employees are slightly less influenced by negative stress and more by job satisfaction and positive stress.

Table 65. Correlations between well-being indicators and employee perceived CSI in Sample 2

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
JOB SATISFACTION	**0.208**	**0.204**	**0.166**	**0.180**	**0.197**	**0.261**	**0.195**	**0.239**
POSITIVE STRESS	**0.213**	**0.195**	**0.245**	**0.211**	**0.211**	**0.273**	**0.278**	**0.277**
NEGATIVE STRESS	-0.102	**-0.233**	**-0.197**		-0.108	-0.132	**-0.200**	**-0.150**

Similar results can be seen in Table 66 for sample 3. Although all correlations are moderate, those with job satisfaction and positive stress are slightly higher than with negative stress.

Table 66. Correlations between well-being indicators and employee perceived CSI in Sample 3

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
JOB SATISFACTION	**0.191**	**0.265**	**0.273**	**0.255**	**0.272**	**0.259**	**0.269**	**0.287**
POSITIVE STRESS	**0.206**	**0.291**	**0.276**	**0.275**	**0.292**	**0.281**	**0.271**	**0.315**
NEGATIVE STRESS	**-0.155**	**-0.253**	**-0.249**	**-0.206**	**-0.195**	**-0.184**	**-0.175**	**-0.176**

3.6.4.4. Correlations between work conditions and CSI

Correlations between perceptions of the working environment and customer satisfaction ratings are provided in Table 67 for sample 1. Job insecurity is negatively but weakly related to all customer satisfaction indictors. Perceived organizational and supervisor support are moderately and positively related to all indicators of customer satisfaction. Control over methods is weakly and positively related to satisfaction ratings while control over timing of one's work is unrelated to employees' perception of customer satisfaction.

Table 67. Correlations between perceived working conditions and employee perceived CSI in Sample 1

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*PSAT*	*SQ*	*PQ*	*BI*
JOB INSECURITY	-0.144	**-0.158**	-0.090	-0.079	-0.112	-0.091	**-0.164**	-0.093	-0.134	-0.136
ORANIZATION SUPPORT	**0.299**	**0.421**	**0.318**	**0.295**	**0.372**	**0.302**	**0.298**	**0.300**	**0.273**	**0.379**
SUPERVISOR SUPPORT	**0.210**	**0.314**	**0.209**	**0.201**	**0.268**	**0.225**	**0.239**	**0.214**	**0.211**	**0.277**
CONTROL TIMING		0.077				0.044	0.052	0.055		0.069
CONTROL METHODS	0.061	0.138	0.056	0.039	0.091	0.126	0.121	0.134	0.080	**0.156**

In Table 68 similar results are reported for sample 2. Here, job insecurity was only significantly related to ratings of tangible aspects, service quality and behavioral intentions. Again perceived organizational (and to a slightly lesser extent supervisor) support was positively and moderately related to all satisfaction indicators. Control over timing as well as methods was here positively related to perceived customer satisfaction.

Table 68. Correlations between perceived working conditions and employee perceived CSI in Sample 2

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
JOB INSECURITY	**-0.159**						-0.145	-0.100
ORGANIZATIONAL SUPPORT	**0.172**	**0.411**	**0.333**	**0.237**	**0.319**	**0.315**	**0.286**	**0.305**
SUPERVISOR SUPPORT	**0.183**	**0.248**	**0.186**	**0.193**	**0.204**	**0.280**	**0.233**	**0.283**
CONTROL TIMING	0.123	**0.196**	0.127	0.101	**0.205**	**0.162**	**0.230**	**0.244**
CONTROL METHODS		**0.211**	**0.170**	0.132	**0.188**	**0.177**	**0.237**	**0.222**

Finally, in Table 69, correlations are reported for the health care sample. Although all reported figures are significant, it is clear that the strongest relationships exist with perceived organizational and supervisor support.

Table 69. Correlations between perceived working conditions and employee perceived CSI in Sample 3

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
JOB INSECURITY	-0.102	-0.085	-0.078	-0.085	-0.092	-0.098	-0.106	-0.094
ORGANIZATIONAL SUPPORT	**0.206**	**0.440**	**0.353**	**0.362**	**0.355**	**0.333**	**0.308**	**0.370**
SUPERVISOR SUPPORT	**0.217**	**0.416**	**0.298**	**0.298**	**0.308**	**0.266**	**0.270**	**0.300**
CONTROL TIMING	0.043	0.152	0.120	0.110	0.151	0.130	0.129	0.130
CONTROL METHODS	0.088	0.182	0.161	0.141	0.181	0.162	0.163	0.172

3.6.4.5. Correlations between personal characteristics and CSI

The correlations between employee characteristics and CSI for sample 1 are reported in Table 70. External locus of control and negative affectivity is related weakly and negatively to all CSI while positive affectivity is weakly related to all satisfaction measures. Reliability with services and overall product quality perceptions show strongest consistent relationships with personality variables.

Table 70. Correlations between employee characteristics and employee perceived CSI in Sample 1

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*PSAT*	*SQ*	*PQ*	*Bi*
EXTERNAL LOCUS OF CONTROL	-0.108	**-0.192**	-0.110	-0.121	**-0.157**	-0.122	-0.143	-0.108	**-0.154**	-0.147
NEGATIVE AFFECTIVITY	**-0.153**	**-0.182**	-0.116	-0.135	-0.117	-0.087	**-0.162**	-0.078	**-0.162**	-0.124
POSITIVE AFFECIVITY	**0.153**	**0.186**	0.125	0.136	**0.192**	0.135	**0.172**	0.115	**0.196**	**0.189**

In sample 2 (Table 71), positive affectivity was related to four out of the five SERVQUAL dimensions while external locus of control and negative affectivity show the strongest correlations with Tangible aspects of service quality ratings.

Table 71. Correlations between employee characteristics and employee perceived CSI in Sample 2

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
EXTERNAL LOCUS OF CONTROL	**-0.165**	-0.130				-0.139	-0.134	-0.098
NEGATIVE AFFECTIVITY	**0.209**	-0.134	**-0.160**					
POSITIVE AFFECIVITY		**0.296**	**0.338**	**0.200**	**0.231**			

Negative and small but significant correlations can be observed between customer satisfaction perceptions and employees' external locus of control and negative affectivity for sample 3. However, moderate positive correlations exist between all customer satisfaction measures (except tangible aspects) and positive affectivity (Table 72).

Table 72. Correlations between employee characteristics and employee perceived CSI in Sample 3

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*BI*
EXTERNAL LOCUS OF CONTROL	-0.130	**-0.197**	-0.145	-0.141	**-0.153**	-0.142	-0.141	-0.131
NEGATIVE AFFECTIVITY	-0.078	-0.141	-0.147	-0.146	-0.129	-0.123	-0.115	-0.130
POSITIVE AFFECIVITY	0.132	**0.230**	**0.236**	**0.248**	**0.235**	**0.230**	**0.199**	**0.259**

3.6.4.6. Hierarchical regression analyses

For each hierarchical regression analysis, we provide a table with standardized coefficients and significance levels from the final step and the total amount of explained variance for each CSI, as well as the amount of variance explained by each subsequent step in the analysis.

In sample 1 (see Table 73), on average about 13% of the variance in CSI rated by employees could be explained by control variables, personal characteristics, working conditions and employee well-being indicators. The largest amount of explained variance was found for Reliability of services (21%). Looking at the added amount of variance explained by each subsequent step, we can see that although each additional step explains a significant part of the variance in CSI, in absolute terms the third step (working conditions) explains the largest amount of variance except for Tangible aspects of service quality, perceived Satisfaction with products and perceived Product Quality.

Looking more in detail at the individual predictors, we see that Perceived Organizational Support and Negative Stress consistently show the highest standardized coefficients for virtually all indicators of customer satisfaction. Language of the respondent was also a significant predictor for Tangible aspects, Reliability of services, perceived Satisfaction with services, perceived satisfaction with products and Product quality, reflecting the fact that French-speaking respondents had in general a less positive perception of these aspects of customer satisfaction. Tenure had a negative impact on employees' ratings of all service quality aspects except Tangibles, as well as on satisfaction with services, service quality in general and perceived behavioral intentions. Higher degree of contact with customer was a positive predictor of Responsiveness aspect of service quality, Assurance and Empathy. Perceived control over timing was also a consistent predictor but was negatively associated to nearly all customer satisfaction indicators (non-significant relationship with Reliability).

Table 73. Standardized beta weights and significance levels for sample 1

	T-SQ	R-SQ	Re-SQ	A-SQ	E-SQ	SSAT	PSAT	SQ	PQ	Bi
Total R^2	.13	.21	.14	.12	.17	.12	.12	.12	.12	.17
Step 1										
Language	-0.17 ***	-0.07 **	-0.02	-0.02	0.00	0.05 **	-0.11 ***	-0.02	-0.10 ***	-0.02
Tenure	-0.01	-0.05 *	-0.07 ***	-0.07 **	-0.06 ***	-0.09 ***	-0.03	-0.09 ***		-0.08 ***
Contact			0.08 ***	0.10 **	0.11 ***					
ΔR^2	0.06 ***	0.04 **	0.04 ***	0.04 **	0.04 ***	0.02 ***	0.03 ***	0.02 ***	0.03 ***	0.03 ***
Step2										
Negative aff.	0.04	0.05	0.07 **	0.03	0.07 *	0.08 ***	0.04	0.10 ***	0.02	0.09 ***
Positive aff.	0.06 **	-0.01	-0.01	0.02	0.03	-0.01	0.01	-0.02	0.07 *	0.01
Locus control	0.02	-0.02	0.02	0.00	-0.02	0.02	-0.01	0.03	-0.05 *	0.01
ΔR^2	0.03 ***	0.06 **	0.02 ***	0.02 **	0.04 ***	0.02 ***	0.04 ***	0.02 ***	0.05 ***	0.04 ***
Step3										
Job insecurity	-0.04 *	-0.01	0.01	0.02	0.01	-0.01	-0.05 **	0.00	-0.03	-0.02
Org. support	0.17 ***	0.31 **	0.27 ***	0.23 **	0.29 ***	0.25 ***	0.15 ***	0.24 ***	0.13 ***	0.28 ***
Sup. support	0.03	0.05 *	0.02	0.03	0.03	0.01	0.04 *	0.00	0.03	0.01
Control time	-0.06 **	-0.04	-0.13 ***	-0.08 *	-0.11 ***	-0.12 ***	-0.09 ***	-0.11 ***	-0.11 ***	-0.10 ***
Control meth.	0.02	0.01	0.04	-0.02	0.04	0.08 **	0.08 **	0.11 ***	0.05	0.09 ***
ΔR^2	0.04 ***	0.10 **	0.07 ***	0.05 **	0.08 ***	0.07 ***	0.04 ***	0.07 ***	0.03 ***	0.09 ***
Step4										
Satisfaction	0.06 **	0.01	0.00	0.00	0.01	0.02	0.01	0.07 **	0.05 *	0.05 *
Positive stress	-0.02	0.03	0.00	0.00	0.01	0.02	0.05	-0.01	0.02	0.02
Stress	-0.10 ***	-0.15 **	-0.16 ***	-0.14 **	-0.12 ***	-0.14 ***	-0.12 ***	-0.13 ***	-0.09 ***	-0.13 ***
ΔR^2	0.01 ***	0.01 **	0.01 ***	0.01 **	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***

In sample 2 (see Table 74), we could explain on average 19% of the variance in CSI with the employee variables included in the regression. For Reliability of services and Behavioral intentions, 23% of the variance could be explained while the smallest proportion of explained variance was found for Tangible aspects of Service quality. Since the sample here is considerably smaller than Sample 1, less significant standardized weights appear here.

Language of respondents was a significant predictor of virtually all indicators of perceived customer satisfaction, meaning the French-speaking employees tend to give lower ratings than Dutch-speaking employees except for the Tangible aspects of service quality and Service Quality in general. Tenure had a negative impact on employees' perception of Behavioral Intentions.

Perceived Organizational Support had a consistent positive effect on employees' ratings for all indicators except Tangibles and Behavioral Intentions. Employee well-being (Step 4) added only a limited amount of explanatory value for Tangibles, Satisfaction with services, Service Quality in general and Behavioral Intentions.

Table 74. Standardized beta weights and significance levels for sample 2

	T-SQ		*R-SQ*		*Re-SQ*		*A-SQ*		*E-SQ*		*SSAT*		*SQ*		*Bi*	
Total R^2	.14		.23		.22		.12		.17		.21		.16		.23	
Step 1																
Language	0.02		-0.16	**	-0.14	**	-0.12	*	-0.16	**	-0.17	**	-0.09		-0.17	**
Tenure															-0.13	*
ΔR^2	0.01		0.05	***	0.05	***	0.02	**	0.04	***	0.02	**	0.01		0.06	***
Step2																
Negative aff.	0.20	**	-0.01		-0.03		0.08		0.03		0.12	*	0.01		0.09	
Positive aff.	-0.12	*	0.15	**	0.17	**	0.13	*	0.09		-0.12	*	-0.13	*	0.01	
Locus control	-0.08		-0.08		0.02		0.04		0.00		-0.04		-0.01		0.03	
ΔR^2	0.06	***	0.09	***	0.09	***	0.05	***	0.05	***	0.04	**	0.02		0.03	*
Step3																
Job insecurity	-0.05		0.03		0.09		0.01		0.06		0.06		-0.02		0.01	
Org. support	0.10		0.24	***	0.18	**	0.12	*	0.21	***	0.19	**	0.13	*	0.12	
Sup. Support	0.01		0.04		0.02		0.08		0.04		0.11		0.07		0.15	*
Control time	0.05		0.10		0.00		-0.06		0.14		0.00		0.05		0.01	
Control meth	-0.06		-0.01		0.04		0.06		-0.02		0.05		0.09		0.09	
ΔR^2	0.04	**	0.09	***	0.06	***	0.04	**	0.08	***	0.12	***	0.10	***	0.11	***
Step4																
Satisfaction	0.10		0.04		-0.01		0.05		0.08		0.15	**	0.01		0.14	
Positive stress	0.10		-0.01		0.12		0.07		0.03		0.11		0.20	***	0.07	
Stress	-0.10		-0.06		-0.07		-0.02		0.03		-0.05		-0.06		-0.07	
ΔR^2	0.03	**	0.00		0.01		0.01		0.01		0.04	***	0.03	**	0.03	*

In Sample 3 (see Table 75) we found the largest amount of explained variance for Reliability of Services (24%) while only 8% of the variance in Tangible aspects of service quality could be explained by control variables, employee characteristics, work conditions and employee well-being. On average, about 17% of the variance in CSI could be explained by employee variables in the regression analysis. Employee characteristics (Step 2) and Work conditions (Step 3) had the largest explanatory value.

Being a male rather than female employee working in a healthcare setting had a small negative impact on all CSI except Tangibles and Reliability. Having a higher degree of contact with customers had a positive effect on employees' ratings of Assurance, Empathy, Satisfaction with services, Service Quality in general and Behavioral Intentions.

Positive affectivity had a positive effect on all indicators except Tangibles, Reliability and Service Quality in general, while the former two were predicted more by a lower external locus of control.

Perceived Organizational support was positively and moderately related to higher ratings for all CSI, and similar but to slightly smaller effects were observed for Perceived Supervisor Support.

Finally, employee well-being indicators were virtually all related consistently to CSI: job satisfaction and positive stress had positive effects while negative stress had a negative impact on employees' ratings.

Table 75. Standardized beta weights and significance levels for sample 3

	T-SQ		*R-SQ*		*Re-SQ*		*A-SQ*		*E-SQ*		*SSAT*		*SQ*		*Bi*	
Total R^2	.08		.24		.17		.18		.19		.16		.14		.20	
Step 1																
Gender	0.01		-0.02		-0.04	***	-0.06	***	-0.06	***	-0.02	*	-0.03	*	-0.02	*
Contact							0.09	***	0.14	***	0.10	***	0.08	***	0.14	***
ΔR^2	0.00		0.00		0.00	***	0.02	***	0.04	***	0.02	***	0.01	***	0.04	***
Step2																
Negative aff.	0.01		0.00		-0.01		-0.02		-0.01		-0.01		-0.01		-0.02	
Positive aff.	-0.01		0.02		0.05	***	0.08	***	0.05	***	0.06	***	0.02		0.07	***
Locus control	-0.04	***	-0.05	***	-0.02		-0.01		-0.02		-0.02		-0.02		0.00	
ΔR^2	0.03	***	0.08	***	0.07	***	0.07	***	0.07	***	0.06	***	0.05	***	0.08	***
Step3																
Job insecurity	-0.05	***	0.01		0.00		-0.01		-0.01		-0.02		-0.03	**	-0.02	
Org. support	0.04	*	0.23	***	0.19	***	0.22	***	0.17	***	0.19	***	0.13	***	0.20	***
Sup. Support	0.10	***	0.17	***	0.05	***	0.05	**	0.08	***	0.03		0.06	***	0.05	**
Control time	-0.05	**	0.04	*	0.00		0.02		0.04	**	0.03		0.02		0.02	
Control meth	0.02		-0.01		0.02		-0.01		0.02		0.01		0.02		0.01	
ΔR^2	0.03	***	0.14	***	0.07	***	0.07	***	0.08	***	0.06	***	0.06	***	0.08	***
Step4																
Satisfaction	0.05	**	0.00		0.06	***	0.04	**	0.06	***	0.06	***	0.09	***	0.06	***
Positive stress	0.11	***	0.07	***	0.07	***	0.07	***	0.08	***	0.09	***	0.09	***	0.11	***
Stress	-0.06	***	-0.11	***	-0.12	***	-0.07	***	-0.06	***	-0.05	***	-0.04	**	-0.03	
ΔR^2	0.01	***	0.01	***	0.02	***	0.01	***	0.01	***	0.01	***	0.02	***	0.01	***

3.6.5. Impact of change on CSI

First, a simple multilevel random intercept model is estimated for each CSI. In Table 76 we report parameter estimates and variances for step 1 (null model including only a constant) and step 2 (including a constant and average change per organization as predictor variables).

Table 76. Parameter estimates and variances for whole sample

	T-SQ	*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*PSAT*	*SQ*	*PQ*	*Bi*
N	11987	11965	11811	11870	11728	11855	4039	11967	4063	11684
Step 1										
Intercept	4.97**	4.77**	5.12**	5.55**	5.55**	5.45**	5.28**	5.09**	5.43**	5.28**
	(.08)	(.09)	(.08)	(.07)	(.07)	(.06)	(.08)	(.09)	(.10)	(.07)
Level 2 variance	.21**	.28**	.20**	.16**	.16**	.14**	.07*	.23**	.10	.18**
	(.06)	(.07)	(.05)	(.04)	(.04)	(.04)	(.03)	(.06)	(.05)	(.05)
Level 1 variance	1.37**	1.29**	1.09**	.88**	.88**	.72**	.94	1.84**	1.52**	.99**
	(.02)	(.02)	(.01)	(.01)	(.01)	(.01)	(.02)	(.04)	(.03)	(.01)
autocorrelation	.14	.18	.16	.15	.15	.16	.07	.11	.06	.15
Step 2										
Intercept	4.95**	4.79**	5.13**	5.55**	5.32**	5,46**	5.09**	5.08**	5.33**	5.23**
	(.08)	(.07)	(.07)	(.06)	(.06)	(.06)	(.12)	(.08)	(.18)	(.07)
Changes	-.17	-.65**	-.44**	-.33*	-.37*	-.27*	.22	-.29	.09	-.31*
	(.14)	(.13)	(.13)	(.11)	(.12)	(.11)	(.17)	(.15)	(.26)	(.12)
Level 2 variance	.20**	.17**	.16**	.12**	.13**	.12**	.03	.20**	.08	.14**
	(.05)	(.04)	(.04)	(.03)	(.04)	(.03)	(.02)	(.06)	(.04)	(.04)
Level 1 variance	1.37**	1.29**	1.10**	.88**	.99**	.73**	.95**	1.85**	1.53**	.99
	(.02)	(.02)	(.01)	(.01)	(.01)	(.01)	(.02)	(.04)	(.03)	(.01)
autocorrelation	.13	.12	.12	.12	.12	.14	.03	.10	.05	.12

Note. Standard errors of parameter estimates between parentheses, **: parameter >3 x SE; *: parameter > 2 x SE; autocorrelation function= level 2 variance/total variance

For each indicator, level 2 variance indicates the degree of variation between organizations, while level 1 variance indicates the variation between employees within organizations. From the table it is obvious that level 1 variance is substantially larger than level 2 variance, indicating differences at the level of individual employees within organizations rather than between organizations. Notwithstanding this difference, we still found evidence for significant level two variation for nearly all CSI except Product Quality and Product Satisfaction. When organizational level changes were added in Step 2, we found in general a slight decrease in level 2 variance and parameter estimates show that the average number of changes encountered in an organization had a negative impact on Reliability, Responsiveness and to a smaller degree on Assurance, Empathy, Satisfaction with services and Behavioral intentions.

The autocorrelation function gives an indication of the amount of variance that remains to be accounted for at the higher level. For all Servqual dimensions, about 15% of the variance exists at the between organization-level. On average about 3% of these between-organization differences can be accounted for by including the average number of changes at the organizational level. Similar results are found for Satisfaction with services and Behavioral intentions. For Satisfaction with products and overall Product Quality, level 2 variance is not or marginally significant, indicating no systematic between-organization differences. For these indicators, average change was a non significant predictor when added to the model in step 2.

Finally, we wished to examine the degree to which the number of changes employees experienced, the appraisal of these changes and emotional reactions to the changes could have a DIRECT impact on perceived CSI or whether the effects occurred primarily through the effects of changes and associated appraisal and emotional reactions on employee well-being or on perceived working conditions. From correlational analyses performed in the previous section, we already know that the mere number of changes in the working environment experienced by employees was not or only weakly related to CSI. We simplified the following analysis by a-priori grouping positive emotions (feeling enthusiastic and serene) into 'positive emotional reaction' following changes and grouping the four negative emotional reactions (feeling stressed, unbalanced, powerless and angry) into a 'negative emotional reaction' following changes.

In Table 77, the additional variance explained by the inclusion of changes and both the appraisal and emotional reactions to the regression equations from the previous section is provided. For Sample 1, including the number of changes experienced had no additional explanatory value for any of the CSI. Adding employees' appraisal and emotional reactions allowed a very small (1%) but significant increase in explained variance. This was due to the effect of perceived responsiveness of the organization concerning the changes, which had a negative effect on the majority of CSI except Tangibles, Product quality and perceived Behavioral Intentions.

Table 77. Change in R^2 by including change-related variables in the analyses for Sample 1

	T-SQ	R-SQ	Re-SQ	A-SQ	E-SQ	SSAT	PSAT	SQ	PQ	Bi
Changes	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Appraisal & Emotions	.00	.01 **	.01 *	.01 *	.01 **	.01 **	.01 *	.01 *	.00	.00

In Sample 2, a similar pattern was observed (see Table 78) but here the additional variance explained by the appraisal and emotional reactions to changes did not reach statistical significance except for Tangibles. Employees who report more negative emotional reactions following changes have lower ratings of Tangible aspects of the service.

Table 78. Change in R^2 by including change-related variables in the analyses for Sample 2

	T-SQ		*R-SQ*	*Re-SQ*	*A-SQ*	*E-SQ*	*SSAT*	*SQ*	*Bi*
Changes	.00		.00	.00	.01	.00	.01	.01	.00
Appraisal & Emotions	.05	***	.03	.04	.05	.02	.02	.04	.02

In Sample 3, the addition of the number of changes experienced did not explain any additional variance in CSI, but the inclusion of appraisal and emotional reactions explained a very small but significant additional proportion of the variance in CSI (see Table 79). Again, this was due largely to the negative impact of responsibility appraisals on service quality dimensions (except Tangibles).

Table 79. Change in R^2 by including change-related variables in the analyses for Sample 3

	T-SQ		*R-SQ*		*Re-SQ*		*A-SQ*	*E-SQ*		*SSAT*	*SQ*	*Bi*
Changes	.00		.00		.00		.00	.00		.00	.00	.00
Appraisal & Emotions	.00		.01	** *	.01	** *	.00	.01	* *	.00	.00	.00

3.6.6. Discussion and conclusion

Our main research question focused on the effect or impact of organizational changes on the organizations' ability to deliver high-quality products and services and satisfy its customers. This main point was elaborated to investigate the correspondence between employee perceptions of customer satisfaction and actual customer satisfaction ratings, the structure and internal relationships between employees' perceptions of diverse CSI and the linkages of CSI with employee characteristics, perceived working conditions and employee well-being.

First, we found a moderate correspondence between indicators of customer satisfaction provided by customers (or proxy customers) and the ratings given by employees. In general, however, when using the same scale, employees tend to rate all aspects of satisfaction slightly lower than customers in general do.

We tested a model that conceptualized the current views on satisfaction, quality and behavioral intentions in an appraisal- emotional reaction- intentions framework similar to that proposed by Bagozzi (1992) and applied to the context of CSI by Gotlieb et al. (1994). Overall, although we found acceptable to good fit in two out of the three samples, a model where satisfaction ratings were considered as antecedents of overall service and product quality ratings provided a superior fit in all three samples. At this point it is not possible to discern whether this means that satisfaction ratings should be considered more evaluative judgments along the lines of the evaluations made in Servqual which precede the more affective overall service and product quality assessments, or whether this means that we should reconsider the evaluation-first framework and move towards a model where affective satisfaction and service quality experiences are antecedents of evaluative overall service and product quality ratings.

In organizations which are either mainly production-based or which provide products as well as services, Tangibles aspects and Reliability of services had the largest impact on employee perceived overall service quality and indirectly on employees' estimates of customer recommendation and loyalty. In service-based organizations employees perceived only the Servqual dimension Assurance, or the knowledge and courtesy of the employees and their ability to convey trust and confidence, and satisfaction with service to be important in overall service quality judgments. Finally, in healthcare settings, we found that all Servqual dimensions predicted overall perceived service quality except responsiveness, indicating that employees perceived the willingness to help customers and provide

prompt service less important in overall service quality.

Considering the relationships between employee characteristics, work conditions and well-being, we found that on average these explained only a limited amount of the variance in employees' perceptions of CSI in sample 1 (13%), sample 2 (19%) and sample 3 (17%).

Overall we found Perceived Organizational Support to be consistently associated with CSI. Employees who report experiencing more support from their organization tend to rate quality and satisfaction higher and estimate a greater intention on the part of the customers to return, repurchase or recommend. Negative stress was a consistent predictor in samples 1 and 3. Employees who have higher levels of stress tend to give lower ratings for quality, satisfaction and behavioral intentions and the relationships remain even when controlling for employee characteristics such as the degree of negative affectivity.

Further, there were differences between language samples for nearly all CSI. Given that these differences often are parallel with different organizations, it is difficult at the moment to interpret these as stemming either from differences in meaning assigned to individual items (psychometric problems) or to actual existing differences in perceived customer satisfaction. Employee characteristics such as positive or negative affectivity and external locus of control could only explain a very small amount of variance in CSI, indicating that aspects related to the emotional state of employees as they estimated customer satisfaction was at least not a highly important determinant of their perceptions of customer satisfaction. Job insecurity, often associated with organizational changes and its negative impact on employee well-being and potentially organizational performance, was not consistently related to employees' perceptions of customer satisfaction. This could possibly be explained due to the fact that job insecurity is an extremely important issue before or during change processes, whereas the negative impact of changes on a slightly longer time perspective emerges at the moment most Flexihealth studies were conducting, i.e. after changes had taken place.

Control over the work situation included both control over timing aspects and control over methods. Control over methods was virtually not related or only weakly to CSI, whereas we found some contra-intuitive results for control over timing. For several CSI, we found significant negative effects of perceived control over timing aspects, especially in Sample 1 where we found particularly pronounced effects for Responsiveness and perceived Satisfaction with services. This mirrors results reported by Dormann and Kaiser (2002), who found that time control lead to lower (customer reported) customer satisfaction. They argued that control over time on the side of the employees makes service less predictable and reliable for time-related aspects and promptness from the point of view of the customer. Given that the strongest relationship was found with Responsiveness of service, which gives an indication of "the willingness to help customers and provide prompt service", we might argue for a similar explanation here.

Employee well-being was conceptualized as job satisfaction, positive stress and the lack of negative stress. In sample 1, we found the strongest effects of negative stress, which negatively impacted perceived CSI as expected. The lack of effects for satisfaction and positive stress might be due to the fact that these effects are already incorporated in the effects from work conditions that are predictive of satisfaction and positive stress. In sample 2, there was only a very limited effect of employee well-being when including employee characteristics and work conditions. In sample 3 we found again the strongest effect of negative stress.

To answer the question as to whether changes in organizations impact customer satisfaction, we examined the degree to which differences between organizations in CSI could – at least partly – be explained by the number of changes experienced. As was described in the results, the variation in

perceived customer satisfaction between organizations was considerably smaller than the variation between employees within organizations. Nevertheless, a small fraction of this variation could be explained by the number of changes encountered on average in each organization. This was particularly true for the more interaction-related aspects of customer satisfaction and service quality, and less for tangible aspects and product quality. These latter findings seem to indicate than the negative effects of changes on organizational performance are perceived to be more influential on customer relations and less so on issues related to more external characteristics of the service and production-related problems. The number of changes in the working environment encountered by employees had no direct impact on any of the CSI- its effects were shown to be mediated fully through its impact on perceived working conditions or employee well-being. The appraisal of changes as the responsibility of the organization did have a significant negative impact on several CSI in sample 1 and sample 3.

In summary, we found only very limited evidence for effects of organizational changes on perceptions of customer satisfaction and to the extent we found effects, these were indirect and worked through the impact of changes and the appraisal and emotional reactions associated with changes on perceptions of working conditions and employee well-being. In this context however, support as perceived by the employees seems a central determinant for customer satisfaction, at least as perceived through the eyes of the employees. Especially in turbulent times when organizations are restructuring, merging or otherwise changing, maintaining good internal communication, conveying trust and care and making employees feel appreciated by the organization seem the key in ensuring to maintain a competitively high level of quality and customer satisfaction.

4. General conclusion

The Flexihealth research project was intended to identify the effects of flexibility practices and changes in work environments on well-being indicators, health and quality of life, and ultimately customer satisfaction indicators. Based on analyses conducted on a data base built to properly represent the Belgian active population within the secondary and tertiary sectors, we found that changes and flexibility negatively affect employee well-being, in particular when they are interpreted as a source of threat by employees. These practices also affect health and quality of life but are generally less strongly related to customer satisfaction indicators, although there are some exceptions.

In general, flexibility practices exert some positive effects on worker well-being since workers exposed to flexibility report more positive stress and less job insecurity. However, these effects are counterbalanced by negative ones, such as less control at work, more negative stress, more medical complaints, and poorer quality of life. Differences were found however across flexibility practices, with flexibility in task assignments having the most detrimental effects.

The effects of changes on employee well-being are generally negative. In particular, more changes is associated with lower perceived support and job satisfaction, higher negative stress, lower positive stress, poorer mental quality of life, and more frequent medical complaints. Changing supervisors and task assignments has the most deleterious effects on well-being.

A look at differences across demographic groups reveals that blue-collar workers and employees aged between 36 and 55 are more at risk in terms of well-being worsening while workers aged 55 or more report higher levels of well-being than young employees.

Our research program also yielded interesting findings with respect to the effect of potential moderators. We found that the number of changes increases the perception of *threat* when employees are low on positive affectivity and self-esteem, or perceive little support from the organization or the supervisor. It also appears from the findings that individuals who think they are important at work, hence are high on self-esteem, do not feel threatened by increasing changes in the workplace. The same phenomenon occurs for employees who feel supported by the organization or the supervisor. Our findings also suggest that the number of changes increases the perception of *challenge* when (a) positive affectivity and self-esteem are high, (b) negative affectivity and external locus of control are low, and (c) perceived support from the organization or the supervisor is high. A final set of moderation analyses revealed that control at work alleviates the effect of changes and their negative appraisal on negative stress. It thus contributes to improve employees' resistance to stressful events.

A number of mediation processes were tested as well. It appears from these analyses that positive stress plays a role as a mechanism activated by changes (the number of changes and their perception) that may potentially result in negative stress. It is a partial mediator of the relationship between number of changes, perceived threat, control, and organization's accountability on one hand and negative stress on the other hand. Similarly, positive stress is a full mediator of the relationship between perceived challenge and negative stress.

The medical section of the Flexihealth survey addressed the medical antecedents and complaints of employees, and their quality of life and health-related behaviors. Of primary interest, we found that the prevalence of medical complaints such as fatigue, distress, dorsolumbar pain, and headaches was quite high among Flexihealth respondents as compared to national norms (ISSP, 2001). This is surprising since our sample was supposed to be in a more healthy condition than the general population, due to the well-known *healthy worker effect* (those who work are supposed to be healthier than the general population). However, the prevalence of other medical complaints (e.g., mental health affections) was quite close to the norms for the general population. A gender comparison reveals that women tend to report more headaches, dorsolumbar pain, and sleeping problems while men report more cardiovascular complaints. The prevalence of somatic complaints is significantly higher among blue-collar and white-

collar workers than among managers and upper-level management, except for cardiovascular complaints which are reported in equal proportions across occupational groups.

One interesting finding regarding work-life habits is that 20% of Flexihealth respondents report having recently increased their level of alcohol consumption and 20.4% having recently begun to drink alcohol. These proportions are significantly higher than the norms for the general population (ISSP, 2001). This trend affects significantly more men and isolated individuals (e.g., widowed, divorced, single, etc.) than women or married people. If one looks at smoking habits among respondents, data show that 38% of them report having increased their level of smoking recently while 17% report having begun to smoke recently. These proportions are also higher than in the general population (ISSP, 2001).

The mean score of the Flexihealth respondents on the physical component of quality of life was 51 (SD=7) while it was 45 (SD=11) for the mental component. In other words, they perceived their physical quality of life as reasonably good but were less positive about their mental quality of life. When the two components are combined, one notes that 31% of respondents perceive their quality of life as good or high, 48% report a poor score on either of the two scales, and 21% rate their quality of life negatively on both scales. A comparison across industries shows that the quality of life is particularly low in the health care industry (65% of employees report a poor mental quality of life and 29.75% report a poor physical quality of life).

The correlations between changes and flexibility practices on one hand, and medical complaints and quality of life on the other hand are generally low. However, there was a high association between perceived stress and the scores for medical complaints and quality of life. Multivariate analyses conducted on the data showed that the mental component of quality of life, but not the physical component, was affected by changes and stress, which confirms earlier work in this area (Ferrie et al., 1998; Kivimäki et al., 2001; Tennant, 2001). When stress and quality of life are accounted for in the analyses, changes do not appear to affect alcohol consumption, nor is there an effect of changes on recent increases in alcohol consumption, which contradicts previous research findings (Metcalfe et al., 2003; Kivimäki et al., 2000). However, the number of changes is associated with recent increases of smoking.

The main research question addressed within the customer section of the Flexihealth project focused on the effects of changes on the organizations' ability to deliver high-quality products and services and satisfy its customers. First, we found a moderate correspondence between indicators of customer satisfaction provided by customers and the ratings given by employees. In general, employees tend to rate all aspects of satisfaction slightly lower than customers do.

We tested a model that conceptualized the current views on satisfaction, quality and behavioral intentions in an appraisal–emotional reaction–intentions framework similar to that proposed by Bagozzi (1992). Overall, a model where satisfaction ratings were considered as antecedents of overall service and product quality ratings provided a superior fit in three data sets.

In organizations which are either mainly production-based or which provide products as well as services, Tangibles aspects and Reliability of services had the largest impact on employee perceived overall service quality and indirectly on employees' estimates of customer recommendation and loyalty. In service-based organizations, employees perceived only the Servqual dimension Assurance and Satisfaction with service to be important in overall service quality judgments. Finally, in healthcare settings, we found that all Servqual dimensions predicted overall perceived service quality except Responsiveness, indicating that employees perceived the willingness to help customers and provide prompt service less important in overall service quality.

Considering the relationships between employee characteristics, work conditions and well-being, we found that on average these explained only a limited amount of the variance in employees' perceptions of CSI in sample 1 (13%), sample 2 (19%) and sample 3 (17%). However, Perceived Organizational Support was consistently associated with CSI. Negative stress was also a consistent predictor of CSI in samples 1 and 3, even after employee characteristics such as negative affectivity were controlled for.

Further, there were differences between language samples for nearly all CSI. However, it is difficult to interpret these as stemming either from differences in meaning assigned to individual items (psychometric problems) or to actual existing differences in perceived customer satisfaction. Employee characteristics such as positive or negative affectivity and external locus of control explained only a small amount of variance in CSI, indicating that aspects related to the emotional state of employees as they estimated customer satisfaction was not a critical determinant of their perceptions of customer satisfaction. Job insecurity was not consistently related to employees' perceptions of customer satisfaction. This could possibly be explained by the fact that job insecurity is an extremely important issue before or during change processes, while most Flexihealth studies were being conducted after changes had taken place.

Control over the work situation included both control over scheduling and control over methods. Control over methods was only weakly to CSI, whereas we found some contra-intuitive results for control over scheduling. For several CSI, we found significant negative effects of perceived control over scheduling, especially in Sample 1 where we found particularly pronounced effects for Responsiveness and perceived Satisfaction with services. This mirrors results reported by Dormann and Kaiser (2002), who found that employee time control led to lower (customer reported) customer satisfaction. They argued that control over time on the side of the employees makes service less predictable and reliable for time-related aspects and promptness from the point of view of the customer. Given that the strongest relationship was found with Responsiveness of service, which gives an indication of "the willingness to help customers and provide prompt service", we might argue for a similar explanation here.

Employee well-being was conceptualized as job satisfaction, positive stress and the lack of negative stress. In sample 1, the strongest effect was attributable to negative stress, which negatively impacted perceived CSI as expected. In sample 2, there was a small effect of employee well-being, controlling for employee characteristics and work conditions. In sample 3, the strongest effect was again attributable to negative stress.

To answer the question as to whether changes in organizations impacted customer satisfaction, we examined the degree to which differences between organizations in CSI could – at least partly – be explained by the number of changes experienced. The variation in perceived customer satisfaction between organizations was considerably smaller than the variation between employees within organizations. Nevertheless, a small portion of this variance was due to the number of changes encountered in organizations. This was particularly true for the more interaction-related aspects of customer satisfaction and service quality, and less for tangible aspects and product quality. The number of changes in the working environment encountered by employees had no direct impact on any of the CSI – its effects were mediated through its impact on perceived working conditions or employee well-being. The organization's perceived accountability for changes did have a significant negative impact on several CSI in sample 1 and sample 3.

In summary, though the direct effects of changes on CSI were limited in magnitude, their indirect effects through perceptions of support and work conditions were more important. In fact, support as perceived by employees seems a central determinant of customer satisfaction. During turbulent times, when organizations are restructuring, merging or otherwise changing, maintaining good internal

communication, conveying trust and care and making employees feel appreciated by the organization are central to the maintenance of enduring customer satisfaction.

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For more informations:

Madame E. Bourgeois
Belgian Science Policy
rue de la science 8 Wetenschapstraat
Bruxelles 1000 Brussel
Tel.: +32-2-238.34.94
Fax.: +32-2-230.59.12
E-mail: boug@belspo.be
Internet: http://www.belspo.be