The Effects of Motivation and Work Climate on Employee Acceptance and Usage of Two New Information Systems: A Study at Five Partner Hospitals in Canada

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ABSTRACT

The Effects of Motivation and Work Climate on Employee Acceptance and Usage of Two New Information Systems: A Study at Five Partner Hospitals in Canada

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Despite tremendous financial investments in information technology (IT), many technological interventions that are initiated in organizational work environments ultimately fail as employees do not fully accept and use the available IT. In an effort to understand the specific conditions that lead to the acceptance of new IT and related work outcomes, this research examined the relationships between work climate, motivation, and the acceptance and usage of new IT, using the motivational framework of Self-Determination Theory. Two studies were conducted. In Study One, 336 clerical and administrative staff, nurses, technicians, and professionals completed questionnaires following the implementation of a patient scheduling and appointment management information system. In Study Two, 64 pharmacists, pharmacy assistants, and managers completed web-surveys following the implementation of a pharmacy information system. Results indicated that perceived organizational support and distributive justice were positively related to employee acceptance of an organizational IT change and employee enjoyment and interest in using IT. In some cases, perceived organizational support and distributive justice were also negatively related to the pressure and tension experienced. Supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour were also related to employee attitudes toward IT. Situational autonomous motivation to use new IT was shown to mediate several of the above-mentioned relationships. Recommendations for health-care organizations are discussed, as are contributions to theory and general organizational practice.

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CHAPTER 1: INTRODUCTION

Over 316 billion dollars is spent annually on information technology in the United States alone (Ryan & Harrison, 2000). Despite such tremendous sums of money being devoted towards information technology (IT), many technological interventions that are initiated in organizational work environments ultimately fail, leading to much wasted time and money (Aiman-Smith & Green, 2002). IT has the potential to substantially improve employee job performance, but such performance gains are prevented by employees' unwillingness to accept and use available systems (Davis, 1989). In order to realize organizational productivity gains, making the technology available is simply not enough; the systems must be accepted and used appropriately by the target user groups (Agarwal & Prasad, 1997). In other words, little return from IT investments can be expected if workers fail to accept or fully use IT capabilities (Lucas & Spitler, 1999).

Understanding the specific factors that lead to the success of IT in an organization, and IT acceptance and use by employees, continues to be of paramount importance. The present research aims to explore the key relationships between work climate, motivation, and the acceptance and use of new IT in organizations. Despite much research in Management and Psychology on motivation, and much research in Management Information Systems (MIS) on IT acceptance and use, this particular relationship has yet to be explored.

A thorough understanding of these relationships is thus of importance to organizations that are in the midst of, or will be experiencing an IT implementation in the future. This research area will likely become increasingly important as the role of IT in organizations continues to increase in importance (Micklethwait & Wooldridge, 2000).

The present studies were aimed at a better understanding of how work climate influences motivation to use a new IT, and how this motivation, in turn, influences attitudes towards the new IT and its usage.

CHAPTER 2: LITERATURE REVIEW

The literature reviewed has been drawn from the MIS literature, the Organizational Behaviour literature, and the Psychology literature. I start by reviewing the literature that pertains to the dependent variables: change acceptance, attitudes toward the new IT, and usage of the new IT. Then I discuss the motivation literature and link it to acceptance and usage of a new IT. Finally, I discuss the literature related to the work climate variables included in the two studies: perceived organizational support, distributive justice, and leader reward and punishment behaviour.

Employee Acceptance of Organizational Change

An IT implementation is considered a specific form of organizational change (Wanberg & Banas, 2000). In viewing a technological intervention as an organizational change, it can be seen that many of the same challenges arise when motivating employees to accept an IT change.

Change acceptance implies an agreement between management and subordinates about the goals and plan of the organizational change (Sagie & Koslowsky, 1994, 1996). Sagie and Koslowsky (1994, 1996) argued that change acceptance involves shared knowledge, personal involvement and motivation, and group discussion. By surveying several hundred public employees in Israel undergoing organizational change, Sagie and Koslowsky (1994, 1996) found that participative decision making for tactical change decisions (i.e., when, where, and how to implement the change) rather than strategic decisions (i.e., whether to proceed with a change or not) was positively related to a number of positive work outcomes. These outcomes included control as perceived by

employees, change acceptance, organizational commitment, job satisfaction, productivity, effectiveness, and time invested in work activities. This implies that managers can improve employee work attitudes by encouraging more opportunities for employee participation in tactical change decisions, thereby decreasing the level of ambiguity associated with organizational change.

Denton (1996) suggested that the difference between positive and negative change lies not in the nature of the actual change, but in how such change is implemented. Organizational change, if properly implemented, is an actual positive change because it results in a rewarding and invigorating experience. Miller, Johnson, and Grau (1994) suggested that it is very important to secure favourable employee attitudes early in the change process. They noted that several studies have shown that sharing organizational information with employees reduces resistance to change and induces cooperation. Miller et al. examined the factors that influence employee openness to participate in the initial stage of a planned organizational change (i.e., the factors that influence employee evaluations of whether the change should be supported, opposed, or treated with indifference). In this case, the change was the restructuring of a division at a large U.S. insurance company. Openness was conceptualized as support for change and positive feelings about the potential consequences due to the change. Results based on 168 respondents indicated that employees who received "quality" information about the change, i.e., ample, truthful information in a timely and appropriate fashion, viewed the change favourably and were willing to participate in the change (Miller et al., 1994). Employees' anxiety about the change did not influence their attitude towards the change. To reduce employee resistance to change, Miller et al. suggested facilitating an "open"

communication climate so that employees feel adequately informed of impending changes. Employees who are well-informed about their role and their organization in the initial stage of change will likely accumulate more and higher quality change information, compared to employees who do not have such an information network (Miller et al., 1994).

Wanberg and Banas (2000) also discussed the role of several variables, such as organizational justice and self-efficacy, in employee acceptance of an organizational change. Information received about the changes, self-efficacy for coping with the changes, and participation in the change decision process were shown by Wanberg and Banas to be predictive of higher levels of employee openness to the changes and greater change acceptance. Wanberg and Banas suggested that these variables are more malleable by organizational intervention efforts than other individual difference or personality variables. Equally important, lower levels of change acceptance were associated in Wanberg and Banas' study with less job satisfaction, more work irritation, and increased turnover intentions.

Employee acceptance of organizational change (which I examine in my study) is considered to be the opposite construct of resistance to organizational change (Miller et al., 1994). Miller et al. concluded that resistance results from such factors as investment in the status quo, existing organizational values and norms, and a lack of motivation to change. This resistance may also be due to fear and mistrust of the unknown, and anxiety about future outcomes (Gagné, Koestner, & Zuckerman, 2000). Employee resistance to change has been associated with reduced output and work slowdowns, hostility, lack of cooperation, and pessimistic employee attitudes (Miller et al., 1994). Denton (1996)

suggested that it is normal for change to be met with resistance, and greater resistance can be expected for larger organizational changes.

I argue that motivation is critical in persuading employees to accept organizational change and I investigate this hypothesis in my study.

Employee Attitudes toward IT

One main theme of IT attitudes research focuses on the satisfaction and emotions that employees experience in their interaction with IT. The affective or attitudinal component of accepting IT in my research model consisted of three dependent variables: interest/enjoyment, pressure/tension and perceived competence. Interest/enjoyment is considered to be a measure of intrinsic motivation (Deci, 1995). Perceived competence is suggested to be a positive predictor of intrinsic motivation, while pressure/tension is suggested to be a negative predictor of intrinsic motivation (Deci, 1995).

Self-report measures have been developed and validated to assess intrinsic motivation and these attitudes of interest/enjoyment, perceived competence, and pressure/tension at the situational level. One such measure is the Intrinsic Motivation Inventory (IMI; Ryan, 1982), which was originally designed to assess participants' subjective experience related to a target activity in a laboratory setting. However, as Guay, Vallerand, and Blanchard (2000) argued in their review of the IMI, this scale has been used extensively in studies. Furthermore, they noted that a number of studies have revealed high levels of internal consistency for the subscales of the IMI and that the measure's construct validity has also been validated by results conforming to existing theories.

In the present study, interest/enjoyment, perceived competence, and pressure/tension were dependent variables. As such, the corresponding measures focused on how the employees feel rather than "why" they do something. In this way, the IMI was used to assess three underlying dimensions of intrinsic motivation while using a specific IT.

Employee Use of IT

The causes of employee acceptance and usage of IT has garnered significant attention in the MIS literature, and many definitions and measures of acceptance and usage exist. In the literature that follows, particular attention is paid to two central points. First, how can system-specific usage be appropriately measured in a context where usage is mandated by management? Second, what is the relationship between organizational factors and IT acceptance and usage?

Igbaria and Tan (1997) noted that several indicators of IT acceptance have been used in past research, with IT satisfaction and system usage being generally the most popular measures. Traditionally, IT satisfaction was the sole indicator of system success. However, Igbaria and Tan suggested that more recently, system usage is also used as an indicator of IT acceptance, as it is the primary variable through which IT may affect individual performance. They found that IT satisfaction is an important factor affecting system usage. Igbaria and Tan's results indicated that IT acceptance had a significant effect on individual performance; IT acceptance was shown to help individuals accomplish their tasks more effectively and productively.

In a computing environment, individuals interact directly with the application software to enter information or prepare output reports. Doll and Torkzadeh (1988) investigated a number of factors influencing system usage. They found that to facilitate voluntary use of IT, ease of use or "user friendliness" was especially important. The easier the application is to use, the higher the probability that employees will take advantage of the different software capabilities. Doll and Torkzadeh (1988) argued that usage can be employed as a measure of system success when usage is voluntary. However, usage is often mandated, and in this involuntary situation, they suggested that perceptual measures of satisfaction may be more appropriate. Alternatively, Doll and Torkzadeh (1991) noted that application-specific measures may be necessary. These measures of performance should recognize the context in which work is accomplished, as well as the extent to which information is used. They argued that satisfaction leads to usage rather than usage stimulating satisfaction.

Most user training programs focus on improving employees' technical abilities and do not include components to improve IT acceptance (Lee, Kim, & Lee, 1995). Lee et al. conducted structured interviews with training managers at eleven large companies in the United States, and surveyed 236 employees. IT acceptance was found to be significantly related to both system usage and IT satisfaction. A significant relationship between IT satisfaction and job satisfaction was also found. IT ability did not have a strong direct effect on IT satisfaction, indicating that while employees with enhanced skills or abilities may use IT more in their jobs, this higher ability level does not necessarily enhance IT or job satisfaction (Lee et al., 1995). Thus, Lee et al. argued that

if employees are to accept new IT, they must regard their current IT as easy-to-use, useful, relevant, and efficient for performing their jobs.

Davis (1989) found that perceived usefulness and perceived ease of use were the two main fundamental determinants of initial acceptance, adoption of the IT, as well as continued use. Perceived usefulness refers to the extent to which employees believe that their use of the IT will allow them to improve their job performance. Davis asserted that employees tend to use a computer application to the extent that it displays a high degree of perceived usefulness, as such systems will facilitate job performance and thus a high level of desired organizational rewards. However, if a given system is too hard to use, the effort required to use it will outweigh any performance benefits. This second factor is known as perceived ease of use, and Davis defined it as "the degree to which a person believes that using a particular system would be free of effort" (p. 320).

Davis (1989) also found that both perceived usefulness and perceived ease of use were highly correlated with self-reported current usage and with self-predicted future usage. He also found that usefulness of the IT had a significantly greater correlation with usage behaviour than did ease of use. The easier a system is to use, the more effort can be directed at other job activities that are important to performance (Davis, 1989). Davis suggested that employees adopt IT primarily because of the functions it performs, and secondly for how easy or hard it is to use. Thus, employees will be more willing to cope with the difficulty of use of a system that is more critical to their performance. Furthermore, Davis argued that while difficulty of use can prevent the adoption of a useful technology, ease of use cannot compensate for a system that does not perform a useful function. Davis' findings, formalized as the Technology Acceptance Model

(TAM), were subsequently empirically validated by hundreds of authors (e.g., Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Taylor & Todd, 1995; Venkatesh, 1999; Venkatesh & Davis, 1996; Venkatesh & Morris, 2000).

Howard and Mendelow (1991) found that both individual-level and organizational support variables were significant in predicting computer use. A higher level of computer literacy, positive attitudes regarding the societal impact of computers, reward systems, incentives, and computer training availability were all associated with increased computer usage. Thus, managerial policy decisions in these areas significantly impact system usage. Considering computers as a threat to employment and privacy, as well as feelings of computer anxiety, were associated with decreased computer usage in Howard and Mendelow's study.

Thompson, Higgins, and Howell (1991) found that social factors (co-workers, supervisors, and senior management), job fit, and future anticipated benefits had a positive effect on usage. Their study involved 212 managers and professionals in a large multinational manufacturing organization. Job fit measured the extent to which individuals believe that usage can enhance their job performance. Anticipated benefits included long-term consequences or desired outcomes that have a pay-off in the future, such as promotion opportunities. Perceived complexity of the IT had a negative effect on usage. Thompson et al. advocated training as a means to reduce the perceived difficulty of using IT, thereby increasing usage. They also suggested that organizational communications and highly-regarded visible organizational members using the IT will serve to increase the perception of job fit.

Agarwal and Prasad (1997) suggested that the more employees feel that they can experiment and explore a new system and its consequences personally, the greater the likelihood that they will be motivated to use the system immediately following its implementation. They suggested that potential users might be more willing to spend effort to overcome complex IT if it is critical to their job performance.

A link between motivation to use IT and actual IT usage has been proposed to complement the organizational innovation and IT implementation literatures (Howard & Mendelow, 1991; Thompson, Higgins, & Howell, 1994). Motivation was also one of the factors shown to be important in IT usage (Igbaria, Parasuraman, & Baroudi, 1996; Venkatesh, 1999, 2000). In the next section, I discuss how past motivational theory has been applied to research on IT acceptance and usage. I then review current motivational theory as it pertains to my research model.

Intrinsic Motivation, Extrinsic Motivation, and the Motivational Framework of Self-Determination Theory

What is motivation at the most basic level? Ryan and Deci (2000) suggested that "to be motivated means *to be moved* to do something... someone who is energized or activated toward an end is considered motivated" (p. 54). Over 800 publications have investigated the intrinsic-extrinsic dichotomy over the past two decades (Guay et al., 2000). According to Deci (1995), intrinsic motivation is associated with enjoyable experiences, the pursuit of challenges, and creativity. Deci (1972) defined intrinsic motivation in performing an activity as existing when "there is no apparent reward except the activity itself or the feelings which result from the activity" (p. 217). The activity is performed for itself, to experience its inherent pleasure and satisfaction. When

intrinsically motivated, an individual is moved to act for the fun or challenge involved, and not because of external pressures, rewards, or prods (Ryan & Deci, 2000). Deci and Ryan (1987) described extrinsic motivation as occurring when "the goal of [the individual's] behaviour is separable from the activity itself, whether the goal be avoidance of punishment or the pursuit of a valued outcome" (p. 1033).

As I review in the following section, there have been few IT studies that examined the role of intrinsic and extrinsic motivation. This research relating motivation to IT outcomes is very relevant to the current study. However, I argue that one of the inherent limitations in these studies lies in the adoption of a simplified definition of intrinsic and extrinsic motivation. In the present studies, I used Self-Determination Theory to expand the operationalization of extrinsic motivation to use IT.

The Role of Motivation in Introducing New IT

Howard and Mendelow (1991) argued that there is a clear tie between motivation to use computers and actual use. They argued that individual, job, and work situation characteristics must all be considered in order to understand the full employee environment that will influence motivation and behaviour. Howard and Mendelow proposed that motivational theory may therefore complement the organizational innovation and IT implementation literatures, providing a richer and more generalizable context for future research. Thompson et al. (1994) also suggested that motivation should be added to research models of IT usage.

Intrinsic motivation is very rarely used to study individual reactions to technology (Venkatesh, 1999). Venkatesh found that the use of an intrinsic motivator during training

increased business professionals' acceptance of new IT. In his study, a game-based training program led to higher perceptions of ease of use and higher acceptance of the IT compared to those users trained by a traditional training method. In this way, favourable perceptions of ease of use were increased and identified as a key factor affecting IT acceptance and intention to use the IT. Venkatesh showed that users who had a more enjoyable experience in training were more likely to perceive the technology to be easier to use, which increased the likelihood of sustained usage of the technology. According to Venkatesh, current training methods focus on learning outcomes as measured primarily by knowledge transfer. Emphasis is usually placed on the extrinsic value of using new IT in terms of its benefits, i.e., its perceived usefulness. Venkatesh's findings strongly favour attempts to create high levels of intrinsic motivation during the training process, due to its direct influence on perceived ease of use.

Davis, Bagozzi, and Warshaw (1992) found that intrinsic and extrinsic motivators were critical in determining an individual's behavioural intention to use new IT. Their results indicated that employees' intentions to use computers in the workplace are mainly influenced by the degree to which they believe that the IT will be useful for improving their job performance. Perceived usefulness, being an outcome expectancy, is considered to be an extrinsic motivator. Davis et al. argued that many systems are rejected by employees despite being easy to use and capable of producing high quality output, because these systems do not address important job tasks. The second factor that influenced employee-use intentions was the degree of enjoyment that employees experienced in using the IT, an example of intrinsic motivation. Davis et al. also found that enjoyment had an increased effect on IT acceptance for systems that were high in

perceived usefulness. Thus, overlooking the intrinsic enjoyment of IT may compromise IT acceptance and jeopardize potential productivity gains at work.

Venkatesh (2000) found that computer playfulness, a form of intrinsic motivation, significantly influenced how employees perceived the ease of use of IT. After experience had been gained with the IT, three additional factors were found to be significant in IT acceptance. One such factor was identified as objective usability, or how much a system actually improved employees' ability to perform their jobs. The second such factor was perceived enjoyment, or the extent to which the use of a specific system was perceived to be enjoyable, apart from any resulting performance consequences. Employee perceptions of external control, specific to the new system environment, were also shown to be significant. Venkatesh suggested that one way to increase employee acceptance and usage of a new system is to raise employee comfort levels with IT in general. This can be accomplished by training programs that enhance (1) intrinsic motivation (by providing opportunities to experience computer playfulness and enjoyment), (2) general computer skills, and (3) employee perceptions and awareness about the specific system and new IT in general.

Igbaria et al. (1996) suggested that computer usage is a function of three direct motivational factors: perceived usefulness, perceived enjoyment, and social pressure. In their study, perceived usefulness stemmed from the TAM framework, while perceived enjoyment and fun represented intrinsic motivation for computer use. Social pressure was operationalized as the perception of appropriate behaviour with regard to computer use by any important individual, such as supervisors, co-workers, and subordinates. As Igbaria et al. discussed, this construct stemmed from Fishbein and Ajzen's Theory of

Reasoned Action (e.g., Fishbein & Ajzen, 1975), which suggested that behaviour is determined by individual perceptions and attitudes, as well as social influences. Igbaria et al. surveyed 471 managers and professionals from 52 different companies in North America. Computer usage was assessed by two self-reported measures: daily use and frequency of use. Perceived usefulness was found to have the strongest direct effect on usage. Employees were more likely to have favourable attitudes if they believed that the specific IT would increase their productivity and performance. While their effects on usage were smaller, perceived enjoyment and social pressure were additional motivators. Perceived IT complexity was found to have a negative effect on perceived enjoyment, while being a key intervening variable between (1) computer skills, organizational support, and organizational usage and (2) perceived usefulness, perceived enjoyment, and social pressure. Examples of organizational support included simple encouragement to use and experiment with the system, and educational programs.

In light of the above research, it seems important to investigate in greater depth the relationships that exist between motivation and IT acceptance and usage. Towards this goal, motivational theory will be reviewed in the following section. The present studies are based on the motivational framework of Self-Determination Theory, which allows for an exploration of the role of the different forms of extrinsic motivation in the acceptance of new IT.

Self-Determination Theory: Expanding the Definitions of Intrinsic and Extrinsic Motivation

A large body of research suggests that intrinsic motivation is extremely important to consider in explaining human motivation (for a review see Deci, 1995). Deci (1995)

suggested that people can be truly motivated to pursue tasks out of interest, for which they receive no benefits other than the enjoyment of the task itself. This motivational framework, known as Self-Determination Theory (Deci, 1995), suggests that different types of motivation underlie human behaviour. These types of motivation differ in their inherent levels of self-determination. Self-determination has been defined as involving a true sense of choice and feeling free to do what one chooses (Guay et al., 2000), and as experiencing a sense of choice in initiating and regulating one's own actions (Deci, Connell, & Ryan, 1989).

As represented in Figure 2.1, listed on a continuum from high to low levels of self-determination, Self-Determination Theory proposes three different general categories of motivation: intrinsic motivation, extrinsic motivation, and amotivation.

As Guay et al. (2000) noted in their review, self-determination is hypothesized to be associated with enhanced psychological functioning. As a result, intrinsic motivation is expected to be mostly associated with positive outcomes, such as persistence. Negative outcomes, such as depression and a sense of pressure, stem from motivational states with low levels of self-determination. Intrinsic motivation typically leads to more positive learning outcomes, willingness to spend more time on the task, lower levels of anxiety, positive mood, and complete absorption in the activity (Csikszentmihalyi, 1997). Intrinsic motivation results in the highest possible level of individual self-determination (Deci, 1995).

However, most activities that people perform are not intrinsically motivated (Ryan & Deci, 2000). Self-Determination Theory proposes that there are different types of extrinsic motivations, and they vary greatly in the degree to which the individual is

behaving autonomously. Some forms of extrinsic motivation represent very low self-determined states of motivation, but others represent active, energized states. As represented in Figure 2.2, listed on a continuum from high to low levels of self-determination, these extrinsic motivations are integration, identification, introjection, and external regulation.

The most autonomous form of extrinsic motivation is integrated regulation. Integration occurs when "identified regulations have been fully assimilated to the self... through self-examination and bringing new regulations into congruence with one's other values and needs" (Ryan & Deci, 2000, p. 62). For example, a nurse who is highly motivated to perform his/her job well, as the idea of helping others fits with his/her life goals, is motivated in this way. Being both autonomous and unconflicted, integrated forms of motivation share many qualities with intrinsic motivation. However, even though it is volitional and valued by the self, the behaviour is done for its value with respect to an outcome that is separable from the behaviour. For this reason, the motivation is still extrinsic.

Identification is an autonomous or self-determined form of extrinsic motivation, where "the person has identified with the personal importance of a behavior and has thus accepted its regulation as his or her own" (Ryan & Deci, 2000, p. 62). For example, a high-school student who memorizes spelling lists because he or she sees it relevant to writing and a future career as a journalist, is motivated in this way.

Figure 2.1: The Three Categories of Motivation According to Self-Determination Theory

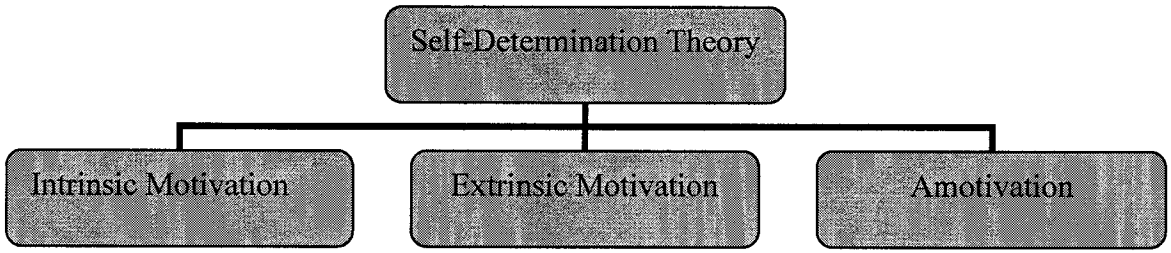
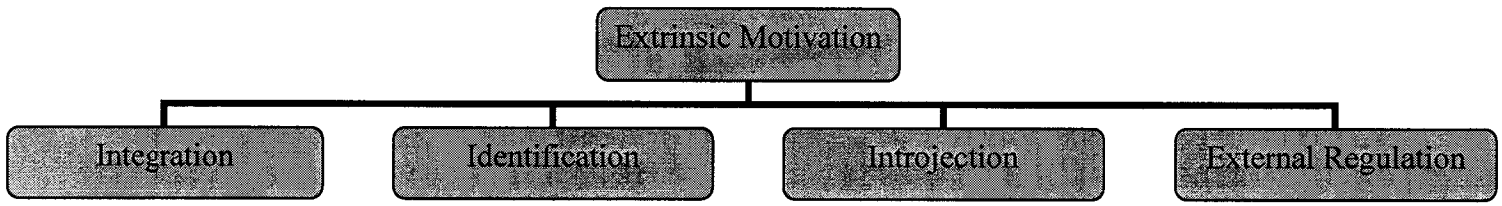


Figure 2.2: The Four Different Forms of Extrinsic Motivation According to Self-Determination Theory



Introjection is "a type of internal regulation that is still quite controlling because people perform such actions with the feeling of pressure in order to avoid anxiety or to attain ego-enhancements or pride" (Ryan & Deci, 2000, p. 62). Introjection occurs when an individual's reasons for performing an action are partly internalized, but not fully accepted as one's own. Introjection is often considered the regulation of behaviour by contingent self-esteem or ego-involvement. An individual performs the action in order to enhance or maintain self-esteem or self-worth. An example would be the CEO of a company whose feelings of worth are dependent on the company's financial performance.

External regulation is a motivational state where "behaviors are performed to satisfy an external demand or obtain an externally imposed reward contingency" (Ryan & Deci, 2000, p. 61). Such externally regulated behaviours are typically experienced as controlled or alienated. For example, when an employee performs because he or she is threatened with dismissal, the employee's motivation to comply with his/her supervisor's requests is highly externally regulated.

Amotivation is the state of lacking an intention to act, when a person's behaviour lacks intentionality and a sense of personal causation (Ryan & Deci, 2000). Amotivation results when an individual does not value an activity, does not feel competent to perform it, or does not believe that it will yield a desired outcome. Amotivated behaviours are neither intrinsically nor extrinsically motivated; indeed they are associated with a complete lack of behaviour on the part of the individual (Ryan & Deci, 2000). They are the least self-determined because there is no sense of purpose, no expectations of rewards, and no expectation of changing the course of events (Guay et al., 2000).

According to Self-Determination Theory, there is no developmental continuum underlying the types of extrinsic motivations (Ryan & Deci, 2000). An individual does not have to proceed through each phase of internalization. Instead, motivations may begin at any stage and develop in any way, depending on personal experiences and situational factors. A person might originally be exposed to an activity due to external regulation, such as a reward. Such exposure, if not perceived as too controlling, might allow the person to experience the activity's intrinsically interesting properties, resulting in a change in motivation. On the other hand, a person who has identified the value of an activity might lose this value under a controlling supervisor, and regress towards external regulation.

Additional evidence for the ordering of motivations as proposed by Self-Determination Theory stems from the inherent quasi-simplex pattern (Ryan & Connell, 1989). In examining the different motivations for acting in both the achievement and social domains, Ryan and Connell found evidence of the ordered simplex-like structure and an underlying continuum of autonomy. As Ryan and Connell noted, a simplex-like structure describes ordered relations between correlated variables; variables are ordered by complexity or conceptual similarity. Specifically, Ryan and Connell found that if the forms of motivation are arranged from the lowest level of self-determination (amotivation) to increasing levels of self-determination (the extrinsic forms of motivation) all the way to the highest level of self-determination (intrinsic motivation), the following pattern will emerge: variables with similar levels of self-determination will be more highly correlated than those that have different levels. Therefore, Ryan and Connell's results suggested a number of relationships, as follows.

Intrinsic motivation will display a high positive correlation with identified regulation. Amotivation will display a high positive correlation with external regulation. Intrinsic motivation will display a high negative correlation with amotivation.

Ryan and Connell (1989) argued that such a "simplex" model offers several advantages. The integrity of various categories of reasons for action is preserved while their interconnections are highlighted. Each category has unique characteristics, and the different categories are hypothesized to lie along a continuum of autonomy (Ryan & Connell, 1989). Ryan and Connell's approach also offers significant improvements over traditional approaches where the ends of a continuum are contrasted while ignoring the middle "motives" that have relevance to the continuum. Another advantage of the simplex structure is that it allows for a Relative Autonomy Index (RAI; Grolnick & Ryan, 1987) to be calculated. The controlled forms of motivation are subtracted from the self-determined forms to create an index of relative self-determined motivation, which can be used as a single readily-interpretable score. Related to situational motivation, the degree to which the individual is relatively self-determined in their motivation is the construct of interest, which is assessed by the RAI. In the hypotheses that follow later in this chapter, I refer to this as "self-determined motivation" for simplicity.

Over three decades of research has shown that intrinsic and extrinsic motivation lead to very different performance and affective outcomes (Ryan & Deci, 2000). In Management, research has shown that intrinsic motivation leads to better performance and attitudinal outcomes than extrinsic motivation (Deci et al., 1989; Deci, Ryan, Gagné, Leone, & Kornazheva, 2001; Gagné, Senécal, & Koestner, 1997). These authors concluded that enhancing intrinsic task motivation and self-determination is extremely

valuable for organizations, as a number of desirable behaviours and outcomes have been associated with intrinsic motivation and self-determination. These outcomes include: increased levels of employee performance and conscientiousness, more positive job attitudes, increased trust and loyalty in the organization, less absenteeism, and lower rates of burnout. Increased satisfaction, increased psychological and physical well-being, greater conceptual learning, and higher self-esteem are other outcomes that have been found. Finally, employee flexibility, creativity, initiative, resilience, self-regulation, activity, and concentration have been shown by these same authors to be related to intrinsic motivation.

Deci et al. (1989) suggested that promoting self-determination requires that the significant other take the individual's frame of reference. For example, a supervisor must understand and acknowledge the employee's feelings, needs, and attitudes with respect to the situation at hand. As a result, the employee will be more trusting and will believe that suggestions and initiatives will be openly received. Supporting individual autonomy, non-controlling positive feedback, and acknowledging the other's perspective are all critical factors in promoting self-determination. Offering opportunities for choice and encouraging individual initiative have also been shown to be important (Deci et al., 2001). As well, these factors increase the chances that an interpersonal context will be viewed as informational rather than controlling.

Any event can also be viewed as controlling, thus pressuring the individual to think or behave in specified ways (Deci et al., 1989). Experiencing an input as informational promotes self-determination, whereas experiencing it as controlling diminishes self-determination. Choice and positive feedback have been shown to be

viewed as informational, whereas task-contingent rewards, deadlines, threats of punishment, surveillance, and evaluations tend to be viewed as controlling. Deci et al. also showed that the interpersonal contexts of such events had tremendous influence on their functional significance.

Based on Self-Determination Theory, Gagné et al. (2000) have shown that acceptance of organizational change can be facilitated by supporting individual autonomy. Gagné et al.'s study at a large Canadian telecommunications company revealed that autonomy support was achieved by providing employees with a rationale for change, providing choice, and acknowledging employee feelings about the change. Gagné et al. suggested that these critical factors are considered to be important in promoting self-determination and parallel quite closely the prescriptions suggested in the organizational change research, such as participative decision-making, communication, and empathy.

Deci et al. (1989) examined the degree to which managers' interpersonal orientations supported employee self-determination, choice, and initiative. In this study, Deci et al. trained managers to be autonomy supportive, and found that subordinates' perceptions (particularly trust) and satisfaction were influenced by their manager's support for employee self-determination.

Deci et al. (2001) tested Self-Determination Theory cross-culturally, by examining employees of state-owned companies in Bulgaria. Using responses from 431 employees from ten companies in Bulgaria, and 128 employees from an American firm as a comparison sample, the model derived from Self-Determination Theory was found to be largely supported across two very different cultures and types of organizations. Work

climates where employees perceived that their autonomy was being supported (e.g., by their supervisor) facilitated satisfaction of three psychological needs: competence, autonomy, and relatedness (Deci et al., 2001). Satisfaction of these needs in turn predicted work engagement, and psychological well-being on the job. Gagné and Koestner (2002) argued that specific motivational styles and corresponding autonomy levels are related to organizational commitment. Initial autonomous motivation to work in a Canadian telecommunications organization was found to be correlated with increased levels of organizational commitment thirteen months later.

Based on the literature reviewed, I argue that self-determined motivation will be related to IT usage, attitudes toward IT, and acceptance of an organizational IT change. I now propose and justify each of these relationships, in turn.

Self-determined motivation and IT usage. Individuals who perceive activities involving computers as enjoyable will likely use the IT more extensively (Igbaria et al., 1996). A link between motivation to use IT and actual IT usage has been proposed to complement the organizational innovation and IT implementation literatures (Howard & Mendelow, 1991; Thompson et al., 1994).

Intrinsic motivation was one of the factors shown to be important in IT usage (Igbaria et al., 1996). Indeed, employees who had a more enjoyable experience in training showed a higher level of intrinsic motivation, which was associated with sustained IT usage (Venkatesh, 1999). Intrinsic motivation was also identified as a factor that influenced IT usage intentions (Davis et al., 1992). Providing employees with opportunities to experience computer playfulness and enjoyment in training, thereby enhancing intrinsic motivation, has also been suggested as one method to increase

employee usage of new IT (Venkatesh, 2000). Thus the first hypothesis involving the dependent variables, linking self-determined motivation to IT usage, is as follows:

H5: Self-determined motivation is positively related to IT usage.

Self-determined motivation and attitudes toward IT. Self-Determination Theory has shown that high levels of self-determined motivation have been associated with high levels of interest and enjoyment, high levels of perceived competence, and low levels of felt pressure and tension, experienced by individuals while engaging in an activity (Deci, 1995). Therefore, the following three hypotheses relating self-determined motivation to employee attitudes toward IT are proposed:

H6a: Self-determined motivation is positively related to the interest and enjoyment experienced while using IT.

H6b: Self-determined motivation is positively related to the perceived competence experienced while using IT.

H6c: Self-determined motivation is negatively related to the pressure and tension experienced while using IT.

Self-determined motivation and acceptance of an organizational IT change. The organizational change literature has identified employee willingness to participate in a planned organizational change as a critical success factor (Miller et al., 1994; Sagie & Koslowsky, 1994, 1996; Wanberg & Banas, 2000). Furthermore, participative decision-making, allowing an employee some control and choice, providing a rationale,

and empathy, the same type of behaviours considered to be important in promoting self-determined motivation (Gagné et al., 2000), have been shown to promote organizational change acceptance (Appelbaum & Wohl, 2000; Sagie & Koslowsky, 1994, 1996). Sagie and Koslowsky (1994, 1996) also argued that change acceptance involves personal involvement and motivation. Therefore, in considering an IT implementation as a specific form of organizational change (Wanberg & Banas, 2000), the following direct relationship between self-determined motivation and acceptance of an organizational IT change is proposed:

H7: Self-determined motivation is positively related to employee acceptance of an organizational IT change.

In the studies that I have discussed above, the importance of promoting an environment of autonomy support has been highlighted in the context of enhancing individual motivation. Building on these ideas, the next sections will examine four key variables that provide an evaluation of organizational work climate: perceived organizational support, distributive justice, supervisor reward behaviour, and supervisor punishment behaviour.

Antecedents of Motivation

Perceived Organizational Support

Eisenberger, Huntington, Hutchison and Sowa (1986) defined perceived organizational support as the global beliefs developed by employees "concerning the extent to which the organization values their contributions and cares about their

well-being" (p. 501). Organizational support theory (as reviewed by Rhoades & Eisenberger, 2002) suggests that employees personify the organization, and infer the extent to which the organization values them.

Eisenberger et al. (1986) suggested that employee feelings of perceived organizational support (POS) are influenced by a variety of factors. An employee evaluates various aspects of their treatment by their organization. This includes the frequency, degree, and sincerity of praise and approval. Other organizational rewards such as pay, rank, and personal influence over organizational policy also influence employee feelings of organizational support, to the extent that they signify an evaluation of the employee by the organization. Supervisor behaviour has greater influence on POS than organizational policies (Eisenberger et al., 1986).

Various aspects of an employee's treatment by the organization, such as the organization's likely reactions to the employee's mistakes, suggestions, and performance, influence employee perceptions of organizational support (Wayne, Shore, Bommer, & Tetrick, 2002). Thus, POS is influenced by variables that communicate organizational value and trust in the employee. As Wayne et al. noted, discretionary rewards that are perceived by the employee as the organization investing in them or that symbolize appreciation or recognition contribute to POS. POS is also influenced by social comparison processes, such as distributive justice and personal recognition (Wayne et al., 2002).

POS can be viewed as a valuable social exchange between the employee and the organization that contributes to important outcomes (Eisenberger et al., 1986; Wayne et al., 2002). More than seventy empirical studies have been conducted on POS (Rhoades

& Eisenberger, 2002), and consequently it has been associated with a variety of job outcomes. High levels of POS will result in greater efforts on the part of the employee to fulfill organizational goals through work-related behaviour (Eisenberger et al., 1986). POS strengthens affective commitment, defined as an "emotional attachment to, identification with, and involvement in the organization" (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989, p. 152). POS also raises the effort-outcome expectancy of employees, in that greater effort towards meeting organizational goals will lead to material and symbolic organizational rewards (Eisenberger et al., 1986). In this way, based on a social exchange framework, Eisenberger et al. argued that employees are more likely to feel obliged to "repay" their organization. The employee's level of POS influences their interpretation of the organizational motives that underlie current and future treatment. Examples of such organizational motives, suggested by Eisenberger et al., include the desire to pay employees a fair salary and provide interesting and meaningful work, as well as the organization's likely reaction to future employee performance.

POS has also been shown to be related to conscientiousness in carrying out conventional job responsibilities and innovation on behalf of the organization in the absence of anticipated material or social rewards (Eisenberger, Fasolo & Davis-LaMastro, 1990). Pay and promotion are examples of material rewards, while approval and recognition are examples of social rewards. Eisenberger et al. also found that POS was related to job attendance, involvement, and performance, as well as employee loyalty and affiliation to the organization. They argued that this provides further evidence that based on POS, employees alter their efforts to meet organizational

goals based on the norm of reciprocity in employee-employer relationships. Thus, employees reciprocate perceived support of their organization with increased commitment, loyalty, and performance (Eisenberger et al., 1990; Rhoades & Eisenberger, 2002; Wayne et al., 2002). Creating a work climate where employees report a high level of POS is very desirable for organizations, as POS leads to a number of successful organizational outcomes. For example, POS has been shown to predict organizational citizenship behaviours (Shore & Wayne, 1993; Wayne et al., 2002) or extra-role behaviours that are generally not considered part of the traditional job description or a required part of the job (Smith, Organ, & Near, 1983).

Rhoades and Eisenberger (2002) conducted a meta-analysis of seventy-three independent empirical studies and concluded that several factors were strongly related with POS. Antecedents of POS included: fairness of treatment, supervisor support, and organizational rewards and job conditions. In the same study, strong relationships were demonstrated between POS and several outcomes, such as affective commitment, job satisfaction, positive mood at work, desire to remain with the organization, and an inverse relationship with turnover intentions. Less pronounced relationships were demonstrated between POS and the following consequences: job involvement, extra-role behaviour directed toward the organization, an inverse relationship with job strains, and an inverse relationship with withdrawal behaviours excluding turnover (e.g., absenteeism and tardiness). Thus, employees with high levels of POS are generally in a better mood at work, find their jobs more pleasurable, and suffer fewer strain symptoms such as burnout, anxiety, and fatigue. Rhoades and Eisenberger's results are directly relevant to my study; their results show direct relationships between POS and work climate variables similar to

those that I use in my research model (distributive justice and supervisor behaviour). Furthermore, by demonstrating the direct relationships between POS and a number of important work outcomes, Rhoades and Eisenberger's results highlight the importance of the POS construct as a key indicator of organizational work climate. To my knowledge, POS has not been directly linked to motivation.

I argue that perceived organizational support is related to self-determined motivation, as follows. Supporting individual autonomy and acknowledging the employee's perspective are both critical factors in promoting self-determined motivation (Deci et al., 1989). Work climates where employees perceive that their individual autonomy and self-determination are being supported have been shown to predict motivation, work engagement, psychological adjustment, well-being on the job, organizational commitment, trust, and satisfaction (Deci et al., 1989; Deci et al., 2001; Gagné & Koestner, 2002). Employees' evaluation of the extent to which their organization values their contributions and cares about their well-being, defined as POS (Eisenberger et al., 1986), is quite similar to the level of autonomy-support perceived by employees.

Furthermore, many of the same positive employee outcomes associated with POS have also been associated with high-levels of self-determined motivation and autonomy support. POS has been associated with effort to fulfill organizational goals, affective commitment, positive mood at work, job satisfaction, conscientiousness in carrying out conventional job responsibilities, innovation on behalf of the organization, attendance, loyalty, performance, involvement, and organizational citizenship behaviour (Eisenberger et al., 1990; Eisenberger et al., 1986; Rhoades & Eisenberger, 2002; Shore & Wayne,

1993; Wayne et al., 2002). POS has also been associated with decreased turnover intentions and decreased job strain (Rhoades & Eisenberger, 2002). These same outcomes have been associated with high levels of self-determined motivation, such as increased levels of: employee performance, conscientiousness, trust and loyalty in the organization, satisfaction, psychological and physical well-being, flexibility, creativity, initiative, resilience, self-regulation, activity, more positive job attitudes, as well as less absenteeism and lower rates of burnout (Deci et al., 1989; Deci et al., 2001; Gagné et al., 1997). Thus the following relationship between POS and self-determined motivation is proposed:

H1: Perceived organizational support is positively related to self-determined motivation.

Distributive Justice

Price and Mueller (1986) defined distributive justice as "the degree to which rewards and punishments are related to performance inputs" (p. 122). They suggested that common types of performance inputs in a work setting include effort, experience, and education. Definitions stemming from Price and Mueller's work, by other authors, are more specific. DeConinck, Stilwell and Brock (1996) defined distributive justice as "the degree of perceived fairness in the distribution of rewards such as pay compensation" (p. 1027).

If, for example, effort is rewarded and lack of effort is not rewarded, distributive justice in the organization is said to be high. Distributive justice does not refer to the quantity of rewards and punishments dispensed by the organization; the level of

distributive justice in the organization is determined irrespective of the total rewards divided among the employees. It is the equity of distribution, rather than the quantity, that is the critical element in assessing distributive justice (Price & Mueller, 1986).

As DeConinck et al. (1996) noted in their review, distributive justice is based on Adam's equity theory (e.g., Adams, 1963), as follows. Employees bring education, effort, and experience to their jobs; these are their "inputs". Employees receive outcomes, such as pay and promotions, as a result of their work; these are their "outputs". The perceived ratio of outputs to inputs, in comparison with the ratios of other employees, determines job satisfaction. Perceived equity leads to employee satisfaction while perceived inequity leads to dissatisfaction.

Distributive justice has been shown to be significantly and positively related to POS (Wayne et al., 2002), as well as pay satisfaction and general job satisfaction (reviewed by DeConinck et al., 1996). This suggests that the establishment and adherence to fair procedures is very effective for organizations aiming to enhance perceptions of support. Furthermore, management can increase perceptions of support by using rewards that enhance feelings of trust, recognition, and equity.

Low distributive justice in an organization has been shown to be associated with detrimental outcomes (Greenberg, 1990). Equity theory (e.g., Adams, 1963) suggested that workers who feel unfairly underpaid may respond by attempting to raise their outcomes. In other words, if employees believe that the rewards that they are receiving relative to their contributions are less than they should be, they will attempt to raise their own level of rewards. Employee theft has been shown to be a specific reaction to underpayment inequity; it is an attempt to bring outcomes into line with accepted

standards of fair pay (Greenberg, 1990). This direct relationship between low levels of distributive justice and detrimental work outcomes highlights the importance for organizations in achieving a high level of perceived distributive justice. As such, it is directly relevant to my research. To my knowledge, distributive justice has not been studied in the context of intrinsic and extrinsic motivation.

Distributive justice has been shown to be related to POS (Wayne et al., 2002). Much in the same way that employees' evaluations of POS and autonomy support can be argued to impact on employees' levels of self-determined motivation, so too can distributive justice, employees' perceptions of the degree of fairness in the distribution of their organizational rewards (DeConinck et al., 1996). Distributive justice has been shown to be related to satisfaction (DeConinck et al., 1996), which has also been associated with self-determined motivation and autonomy support (Deci et al., 1989; Deci et al., 2001). Therefore, I propose the following relationship between distributive justice and self-determined motivation:

H2: Distributive justice is positively related to self-determined motivation.

Supervisor Reward and Punishment Behaviour

In this section, I discuss the final work climate variables of my study: supervisor reward and punishment behaviours. The full implications of reward and punishment behaviours are quite complex. Furthermore, incompatibilities exist between several current theories in the literature. This section begins with a review of the literature on leader reward and punishment behaviour. It is followed by a review of the Self-Determination Theory literature on rewards. There has been a long-standing

controversy in the Psychology and Management literatures: do rewards increase or decrease individual motivation? Is rewarding employee excellence truly a double-edged sword?

Podsakoff, Todor, Grover, and Huber (1984) argued that rewards and punishments play a critical role in many approaches to human motivation. Furthermore, leaders' structuring of reward and punishment contingencies is central to many theories of leadership. Following Podsakoff et al. (1984), leaders who administer contingent rewards "provide praise, commendation, and acknowledgement to subordinates when they perform at high levels or improve their performance" (p. 26). These leaders thereby establish a close link or contingency between rewards and performance. Leaders who administer contingent punishment "reprimand their subordinates or show their disapproval when subordinates perform poorly or at low levels" (Podsakoff et al., 1984, p. 27).

Non-contingent rewards are "rewards which are administered independently of subordinate performance" (Podsakoff et al., 1984, p. 27). A leader who demonstrates non-contingent reward behaviour will administer praise and approval without regard to subordinate performance. This results in little impact on subordinate performance or satisfaction. Non-contingent punishment by leaders occurs when "supervisors punish their subordinates indiscriminately, or for no apparent reason at all" (Podsakoff et al., 1984, p. 28).

Podsakoff et al. (1984) found that employees respond much more favourably to supervisors who administer rewards contingently on the basis of performance, than to supervisors who administer them non-contingently (i.e., indiscriminately) or not at all.

Controlling for other leader behaviours, contingent rewards by leaders was found to contribute significantly to the variance explained in subordinate performance and satisfaction with work, supervision, co-workers, pay, and advancement opportunities (Podsakoff et al., 1984).

Podsakoff and his colleagues (Podsakoff et al., 1984; Podsakoff, Todor, & Skov, 1982) did not find leader contingent punishment behaviour to be related to subordinate performance or satisfaction. However, in the same studies, leader non-contingent punishment behaviour was shown to be associated with employee dissatisfaction, decreased employee performance, and reduced levels of organizational citizenship behaviour. Also in the same studies, leader non-contingent reward behaviour was shown to be unrelated to subordinate performance, and negatively related to subordinate satisfaction at work.

Leader non-contingent punishment behaviour also erodes trust in the leader, and therefore harms the basis of the exchange relationship (Wayne et al., 2002). Based on social exchange theory, Wayne et al. argued that a high-quality exchange will likely create a sense of obligation on the part of the employee to reciprocate in terms of behaviours valued by the supervisor. In this way, they suggested that high-quality exchanges are associated with employee behaviour benefiting the supervisor and extending beyond formal job responsibilities. Social exchange theory is directly relevant to leader reward behaviour, as it proposes that employees will perform at a high level or engage in organizational citizenship behaviours to reciprocate rewards and support from their supervisor, in this way maintaining an equitable or balanced social exchange (Wayne et al., 2002).

Very similar yet more specific than social exchange theory, leader-member exchange theory focuses on the quality of the employee-manager exchange and is based on the degree of emotional support and exchange of valued resources, such as organizational rewards distributed by the supervisor (Wayne et al., 2002). In this way, leader-member exchange theory is directly relevant to my study of supervisor reward and punishment behaviours, POS, and distributive justice. Similar to the theoretical framework underlying POS, employees who have a high-quality exchange relationship with their supervisor feel a sense of indebtedness due to the norm of reciprocity to reciprocate with attitudes and behaviours that benefit the exchange partner (Wayne et al., 2002). Thus, as in employee-organization relationships, creating a sense of obligation in employee-supervisor relationships leads to beneficial outcomes. Wayne et al. suggested that it is the employee-supervisor relationship, and not the employee-organization relationship, that is a key determinant of work performance; good supervisor-employee relationships are critical in enhancing employee performance.

Moving now to a review of the Self-Determination Theory literature on rewards, a much more cautious perspective on the effects of rewards is espoused. Deci (1995) suggested that rewards may indeed increase target behaviours; however this may occur at the expense of intrinsic motivation. Furthermore, "rewards may increase the likelihood of behaviors, but only so long as the rewards keep coming" (Deci, 1995, p. 18). As the needs for autonomy and competence underlie intrinsic motivation, the effects of a reward depend on how it affects perceived self-determination and perceived competence (reviewed by Deci, Koestner, & Ryan, 1999). Deci et al. argued that rewards or other events can be perceived as informational indicators of competence, and allow for need

satisfaction and increased intrinsic motivation. I suggest that an "employee of the month" program, if administered in a non-competitive and fair manner, is an example. Deci et al. also argued that such events can be perceived as controllers of behaviour, and thus prevent need satisfaction and decrease intrinsic motivation (e.g., the same "employee of the month" program administered in a very competitive manner). Rewards may often have conflicting effects of being both controlling and informational (Deci et al., 1999). Deci et al. argued that in such situations, the context largely becomes the deciding factor.

Deci (1972) suggested that when individuals are experiencing a high level of intrinsic rewards, the addition of extrinsic rewards, such as a contingent monetary payment for good performance, may cause a decrease in motivation. This phenomenon can be explained in the following way. Initially, the individual is performing because of intrinsic rewards or intrinsic feelings of satisfaction. Once extrinsic rewards are introduced, the feelings of satisfaction are diminished as performance is now thought to be due to the extrinsic rewards. Thus, Deci argued that the addition of extrinsic rewards reduces the extent to which the individual experiences intrinsic rewards from their involvement in the activity.

While task-contingent rewards undermine intrinsic motivation, task non-contingent rewards do not (Ryan & Deci, 1996). A recent meta-analysis of 128 studies of children and college students examined the effects of extrinsic rewards on intrinsic motivation (Deci et al., 1999). The meta-analysis confirmed that almost all types of expected tangible rewards made contingent on task performance undermined intrinsic motivation. Rewards made contingent upon engaging in a task, completing a task, and attaining a given level of task performance all significantly undermined intrinsic

motivation (with effect sizes of -0.40, -0.36, and -0.28 respectively on intrinsic motivation) as did tangible rewards and expected rewards. In experimental research, the effect size refers to the magnitude of the impact that an independent variable has on a dependent variable (Whitley, 2002, p. 431). Engagement-contingent and completion-contingent rewards also significantly undermined self-reported interest (with effect sizes of -0.15 and -0.17 respectively) as did tangible rewards and expected rewards (Deci et al., 1999). Positive feedback enhanced self-reported interest. Rewards that are not expected while an individual is working on a task are suggested not to affect intrinsic motivation (Deci et al., 1999). The reason for this is that the individual is not likely to experience the task behaviour as being controlled by rewards. Furthermore, Deci et al. argued that threats, deadlines, directives, and competitive pressure diminish intrinsic motivation. Self-Determination Theory argues that individuals experience such events as controllers of their behaviour.

Organizational reward systems have also been shown to influence individual levels of motivation, at times in undesirable ways. Shirom, Westman, and Melamed (1999) investigated a performance-contingent pay system by surveying 2747 blue-collar employees in 21 factories in Israel. In comparison with a compensation system based solely on hours worked, they found that performance-contingent pay was associated with higher levels of depression and health complaints. Deckop and Cirka (2000) investigated employee motivation before and after the implementation of a merit pay system. In this non-profit organization, they found that merit pay was associated with a decrease in intrinsic motivation for employees that were initially highly intrinsically motivated. Organizational justice factors also had an impact, as the effect was more pronounced

when employees believed that their performance was being evaluated unfairly after indicating a preference for merit pay (Deckop & Cirka, 2000).

In this section, I have reviewed the rather different perspectives put forward in the literature on the effects of supervisor reward and punishment behaviour. The nature of the differences do not allow for integration. Rather, I adopt the perspective put forward by Self-Determination Theory, which forms the basis of my theoretical research model. I argue that supervisor contingent-reward behaviour is related to self-determined motivation in the following way. As Self-Determination Theory argues that contingent rewards will decrease intrinsic motivation (Deci et al., 1999; Deckop & Cirka, 2000; Ryan & Deci, 1996), I suggest that:

H3a: Supervisor contingent-reward behaviour is negatively related to intrinsic motivation.

Contingent rewards tend to be viewed as controlling, and events experienced by the individual as controlling diminishes self-determined motivation (Deci et al., 1989). Therefore, in considering identified regulation, a more self-determined form of extrinsic motivation (Ryan & Deci, 2000), I suggest that:

H3b: Supervisor contingent-reward behaviour is negatively related to identified regulation.

As discussed earlier in this chapter, external regulation is a motivational state where "behaviors are performed to satisfy an external demand or obtain an externally imposed reward contingency" (Ryan & Deci, 2000, p. 61). Therefore, I argue that

employees who perceive a high level of supervisor contingent-reward behaviour will show a high level of external regulation in their motivation:

H3c: Supervisor contingent-reward behaviour is positively related to external regulation.

Amotivation is the least self-determined form of motivation and results when an individual has no sense of purpose, no expectations of rewards, and no expectation of changing the course of events (Guay et al., 2000). Thus, I suggest that upon recognizing that a high effort-outcome expectancy exists (i.e., supervisor contingent-reward behaviour), an employee's level of amotivation will subside. Therefore, I propose that:

H3d: Supervisor contingent-reward behaviour is negatively related to amotivation.

I also argue that supervisor contingent-punishment behaviour is related to self-determined motivation, as follows. Threats of punishment, surveillance, deadlines, directives, and competitive pressure diminish self-determined motivation as individuals experience such events as controllers of their behaviour (Deci et al., 1989; Deci et al., 1999). Self-Determination Theory further argues that punishment behaviour, such as performance-contingent punishment, is counter to creating an environment which promotes self-determination and fosters intrinsic motivation and high levels of self-determined motivation (Deci, 1995). Thus, in the hypotheses that follow, I suggest that supervisor punishment behaviour will be related to motivation in the following manner:

H4a: Supervisor contingent-punishment behaviour is negatively related to intrinsic motivation.

H4b: Supervisor contingent-punishment behaviour is negatively related to identified regulation.

H4c: Supervisor contingent-punishment behaviour is negatively related to external regulation.

H4d: Supervisor contingent-punishment behaviour is positively related to amotivation.

Summary

The importance of promoting an environment of autonomy support has been discussed in the context of enhancing self-determined motivation. I have argued that the effects of work climate can be studied by using employees' feelings of support, trust, and equity, i.e., the constructs of perceived organizational support and distributive justice (DeConinck et al., 1996; Eisenberger et al., 1990; Eisenberger et al., 1986; Price & Mueller, 1986; Rhoades & Eisenberger, 2002), to represent autonomy support. I have also discussed how supervisor reward and punishment behaviours have been found in past research to be negatively associated with self-determined motivation (e.g., Deci, 1995; Deci et al., 1999). Furthermore, intrinsic motivation was one of the factors shown to be important in IT usage (Igbaria et al., 1996; Venkatesh, 1999, 2000), as well as in IT

acceptance (Davis et al., 1992; Venkatesh, 1999, 2000). Motivation has also been linked to employee acceptance of organizational change (Miller et al., 1994; Sagie & Koslowsky, 1994, 1996). In light of these relationships, I propose that self-determined motivation will mediate the relationships between the work climate variables and IT acceptance and usage. The research model, as discussed in the following chapter, illustrates these proposed relationships in greater depth.

CHAPTER 3: RESEARCH MODEL

In investigating the relationship between work climate, motivation, and attitudes toward IT and also use of new IT in organizations, the following research questions are posed. What are the effects of perceived organizational support, distributive justice, and supervisor reward and punishment behaviour on employee motivation to use IT? What type of motivation is most conducive to actual IT usage, beyond the basic system functions? Does motivation influence employee acceptance of an organizational IT change, or employee attitudes toward IT?

One of the severe limitations of previous research in intrinsic motivation, as well as in IT acceptance and usage, has been that extrinsic motivation has been narrowly defined as an external motivational force. One of the central aims of the present study is to expand the definition of extrinsic motivation, using Self-Determination Theory, by including more self-determined forms of extrinsic motivation.

In Chapter Two, the importance of promoting an environment of autonomy support was discussed in the context of enhancing individual self-determined motivation. In the present study, the effects of work climate were studied by operationalizing autonomy support in terms well-known in the field of organizational behaviour. The constructs of perceived organizational support and distributive justice were used to represent employees' feelings of support, trust, and equity (DeConinck et al., 1996; Eisenberger et al., 1990; Eisenberger et al., 1986; Price & Mueller, 1986; Rhoades & Eisenberger, 2002; Shore & Wayne, 1993; Wayne et al., 2002). The constructs of supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour

were used to represent employees' perceptions of their supervisory behaviour (Deci, 1995; Deci et al., 1989; Podsakoff et al., 1984; Podsakoff et al., 1982).

Based on the Self-Determination Theory framework, situational motivation is proposed as the mediator variable. Guay et al. (2000) defined situational motivation as "the motivation individuals experience when they are currently engaging in an activity" (p. 176). Four types of situational motivation are investigated: intrinsic motivation, identified regulation, external regulation, and amotivation. Only these four subscales are included in the Situational Motivation Scale (Guay et al., 2000) that was used in the present studies (see Chapter Four). Two additional types of extrinsic motivation, integration and introjection, were therefore excluded. A given variable functions as a mediator variable to the extent that it accounts for the relation between the independent variable and the dependent variable (Baron & Kenny, 1986). It is important to distinguish mediator variables from moderator variables. Moderator variables affect the strength and/or direction of the relation between an independent variable and a dependent variable (Baron & Kenny, 1986).

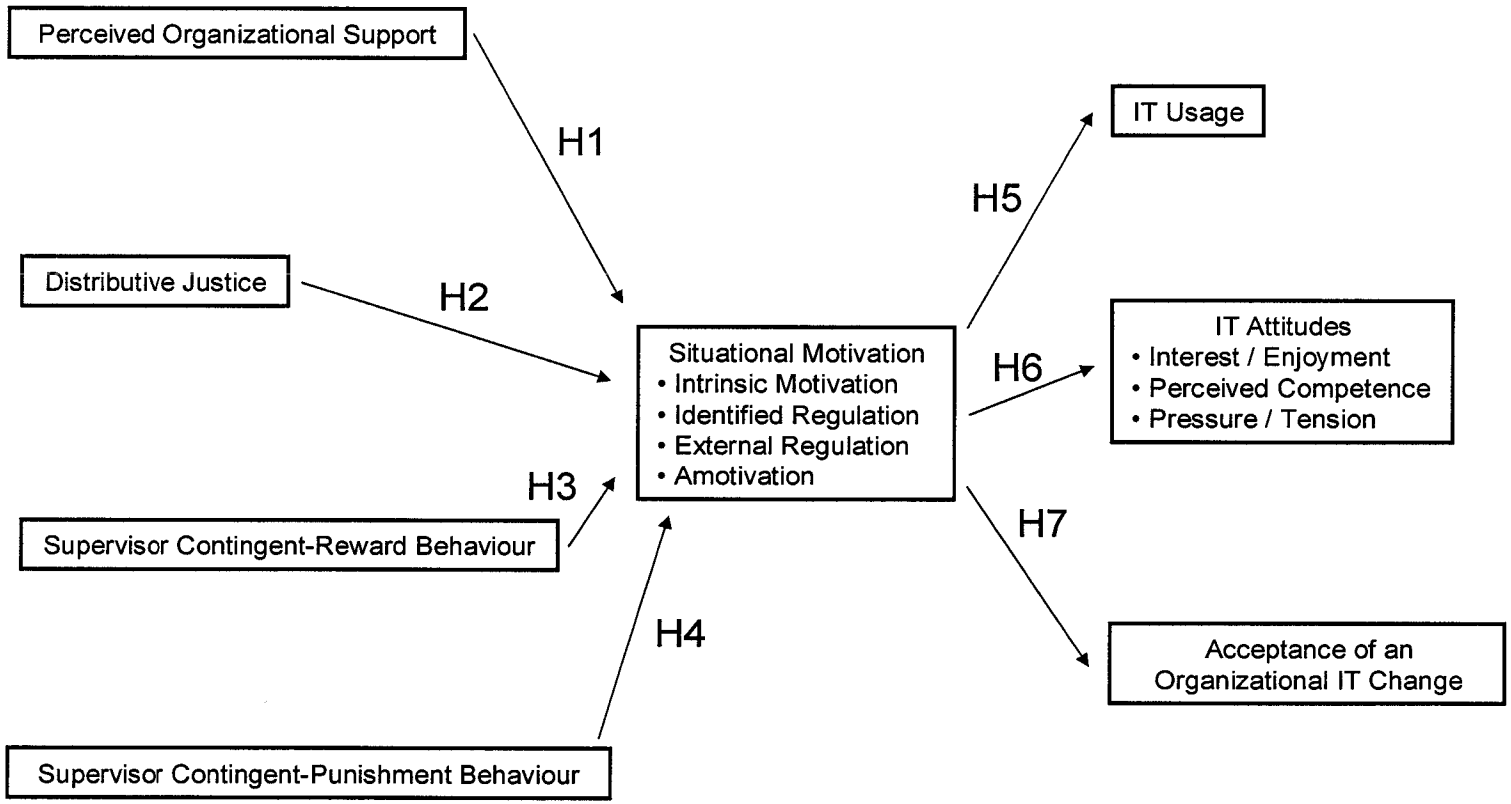
There are three dependent variables in this research model. The first variable is IT usage. The second variable is IT attitudes, the individual employee attitudes resulting from using the IT: interest/enjoyment, perceived competence, and pressure/tension. The third variable is employee acceptance of an organizational IT change.

In their review of mediator variables in social psychological research, Baron and Kenny (1986) argued that it is imperative to consider the direct relationship between the independent and dependent variables, when assessing if a third variable mediates this relationship. This is especially important considering my research model, as in the

literature reviewed in Chapter Two several direct relationships have been found between the independent variables and the dependent variables: organizational support and IT usage (Howard & Mendelow, 1991); organizational support and enjoyment of IT (Igbaria et al., 1996); and supervisory behaviour and IT usage (Thompson et al., 1991). Therefore, in each of the hypotheses that follow, I hypothesize only partial mediation by situational motivation. Therefore, in Figure 3.1, although complete mediation is shown for simplicity, partial mediation is hypothesized.

In the next chapter, I describe the methodology used to test the research model.

Figure 3.1: The Research Model



CHAPTER 4: RESEARCH METHODOLOGY

This chapter describes the research setting and the respective systems, the research methodology that was used, and how the research model constructs were operationalized and measured.

Research Setting

The setting for this research was five partner hospitals (henceforth referred to as Hospitals A through E) in a large metropolitan city in Canada. Having merged into one health care organization several years earlier, each hospital was located at a physically distinct site in the city. According to information provided by the Associate Director of Human Resources (Research and Development Group on Work Organization), the network of five hospitals (henceforth referred to as the Hospital Centre) had over 9900 employees; 1700 physicians, dentists, and residents; and 1400 employees at affiliated organizations. The 9900 employees included 1500 professional and technical employees, 2900 nurses, and 4400 clerical and auxiliary employees. The Hospital Centre had a combined operating budget of close to five hundred million dollars, and 980 000 ambulatory visits annually.

One of the five partner hospitals, Hospital C, specialized in the health-care of children. While being located at a physically different site, Hospital E became an Institute of Hospital B in 1994.

Study One: Patient Scheduling and Appointment Management

The first study examined acceptance and use of a new IT implemented across the five partner hospitals for patient scheduling and appointment management. The primary users of this system were clerical and secretarial staff. According to the implementation team, approximately three million appointments were booked every year using this IT. Nurses, technicians, other multi-disciplinary professionals (such as dieticians and social workers), and several administrators used the system as well, and were included in the present sample. At Hospital C, five doctors had user accounts; however as their use of the system was very limited at best, in consultation with management at the Hospital Centre, they were excluded from the current sample.

The implementation began in May 1998 at Hospital C, followed by the adult hospitals in January 2001. The implementation was done on a department-by-department basis. Consequently, when the data collection began in May 2003, the system had been implemented in the vast majority of all departments at the five partner hospitals. However, some employees had only recently begun using the system and others (who were not included in the present sample) had not yet had the system implemented in their departments.

Prior to using this system, appointments were largely scheduled using a paper appointment book in each separate hospital department or clinic. According to the Ambulatory Services Managers, at Hospitals A and B approximately 40% of employees were previously using paper appointment books prior to the introduction of this new system. At Hospitals A and B, approximately 60% of employees were using several different department-based systems which were old and had limited functions. At

Hospital C, approximately one third of employees were previously using paper appointment books, while the remaining two thirds were using systems installed in the 1980s. At Hospital D, all appointments were scheduled on paper. At Hospital E, all appointments were scheduled using a single system which was old and had limited functions.

While the use of the new IT was mandated by management, there had been some employee resistance (particularly at Hospital B). For example, some employees would still use paper appointment books in conjunction with the system or instead of using the IT. While the system's implementation was preceded by a public-relations campaign, there was limited involvement of senior management at the adult hospitals.

Operating in both English and French, the new Windows-based IT included search features for a specific appointment by several methods. Various types of appointments (such as single or repeated appointments) could also be booked. Cross-booking between hospitals and departments was allowed on this new system with customizable restrictions, providing a great advantage. Operating 24 hours - 7 days a week, the system was also used for recording clinic visit attendance, creating lists (such as waiting lists or a list of appointments to be confirmed), and statistical reports. The system had three user-levels: "view-only" users, users, and super-users. Some employees used the system as "view-only" users to check reports and appointment schedules only. Approximately 25% of all users were considered "super-users", as they used the more advanced features of the system such as scheduling new clinic times, and modifying the attributes of clinic appointments (such as appointment type, length and available dates). All system users (users of all three user-levels) had undergone a mandatory training

program of up to three days, depending on the degree to which they were expected to use this new system in their jobs. The training program was standardized across the adult hospitals, while Hospital C was responsible for training its own users.

Study Two: A Pharmacy Information System

This recently implemented pharmacy IT was a new version of a system that had been implemented approximately ten years earlier at the adult hospitals. Pharmacy technical assistants and pharmacists were the primary users. The use of this system was mandated by management and there was some employee resistance to this latest system (particularly at Hospital C). Hospital C had already changed pharmacy information systems twice before in the last twelve years.

The system allowed for the management of inventory and physician-prescribed doses at multiple hospital sites. The Windows-based system was used for entering and verifying pharmaceutical information and medication doses, and for generating various reports. Operating 24 hours – 7 days a week, further add-on functionalities were planned for the system including physician-keyed order entry; automated purchasing, pill-counting, and follow-up dose reminders; and web-based and Palm-Pilot interfaces.

While some pharmacy department employees worked at more than one hospital, Hospital D did not have a separate Pharmacy department. The Pharmacy department at Hospital B served Hospital D as they were situated in adjoining physical locations. The Pharmacy at Hospital E was very small with fewer than ten staff members, and Hospital B again served as the main Pharmacy for this location. Thus the three main Pharmacy sites at the Hospital Centre were Hospital A (consisting of approximately

55 employees), Hospital B (consisting of approximately 85 employees), and Hospital C (consisting of approximately 25 employees).

The implementation of this system took place at each hospital on a specific date: May 2002 for Hospital A; June 2002 for Hospitals B, D, and E; and October 2002 for Hospital C. Each system user underwent a training program; however the training program was not standardized across hospital sites. Training was approximately five hours at the adult hospitals and fourteen hours at Hospital C.

In discussions with management at the Hospital Centre, it became apparent that a web-survey would be most appropriate for this sample. A bilingual web-survey (see Appendix B) was prepared, hosted on the intranet of the Hospital Centre. The web-survey was similar to the questionnaire used for the first study, however a number of differences existed between the two as each was adapted to its appropriate sample. These differences are discussed later in this chapter. Links were set up to access the web-survey from the main Hospital Centre intranet page as well as from the main Pharmacy department intranet page. Respondents were not forced to answer all questions before they could submit their web-surveys. Based on the intranet software used at the Hospital Centre, the alternative was to force respondents to answer all questions, before allowing their web-surveys to be submitted. Following Whitley (2002), this decision was made as respondents should be free not to answer a given question. Furthermore, it is questionable whether respondents will actually give truthful information for any answers that are forced.

Construct Operationalization and Research Measures Used

While in general, the research instrument used in both studies was similar, the questions and measures of each questionnaire were tailored to each of the two specific samples. Unless stated otherwise, each of the following measures was used in both samples.

Perceived Organizational Support. Eisenberger et al.'s (1986) original short version of the Survey of Perceived Organizational Support (SPOS) was employed. Various possible evaluative judgments and possible organizational actions to benefit or harm the employee in different situations were presented, and employees were asked to answer using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). This measure consisted of 17 items with the highest factor loadings from Eisenberger et al.'s original study with 361 employees, from a minimum alpha coefficient of 0.69 to a maximum alpha coefficient of 0.84. As I discuss in Chapter Five, coefficient alpha (or Cronbach's alpha reliability index) assesses the reliability of the measurement scale and its constituent items (Whitley, 2002). Eisenberger et al.'s original SPOS items were adapted to the current context. The responses to the individual items of the final measure were aggregated for a total score for each employee.

Distributive Justice. Sorensen's (1985) 6-item version of Price and Mueller's (1986) Distributive Justice Index (DJI; alpha = 0.95) was adapted to the current context. The items in this measure assess the extent to which employees have been fairly rewarded given their job responsibilities, experience, effort, good performance, training, and stresses and strains of their job. The specific 5-point answer scale was retained for this measure (see Appendices A and B), from (1) rewards are not distributed at all fairly

to (5) rewards are very fairly distributed. The responses to the individual items of this measure were aggregated for a total score for each employee.

Supervisor contingent-reward and contingent-punishment behaviour. In the present study, Podsakoff et al.'s (1984) Performance Contingent Reward Behavior scale (CR) was used. This 10-item scale measures the degree to which a leader administers positive reinforcers such as recognition, acknowledgement, and commendations contingent upon high performance. Podsakoff et al.'s (1984) Performance Contingent Punishment scale (CP) was also used. This 5-item scale measures the degree to which a leader administers punitive events such as reprimands and disapproval contingent upon poor performance. Podsakoff et al. (1982) reported internal consistency reliabilities (alpha coefficients) of 0.93 for the CR scale and 0.84 for the CP scale. In the present study, employees rated the degree to which they received contingent rewards and punishment from their immediate supervisor using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The responses to the individual items of this measure were aggregated by subscale. In this way, a total score for each employee was computed for each of the two subscales.

Situational Motivation. The level of analysis used to assess the role of motivation, as a mediator variable in my theoretical framework, is quite specific to IT usage. The Situational Motivation Scale (SIMS; Guay et al., 2000) assessed situational or task-specific motivation. Rather than using motivational consequences (e.g., how an individual feels) and determinants as indices of intrinsic motivation, this measure assessed why an individual engages in a particular behaviour. As such, Guay et al. suggested that this multi-dimensional measure can be used in laboratory and field

settings, and assesses the motivations at play in a given situation. The SIMS' 16 items measure a diverse range of motivational styles postulated by Self-Determination Theory: intrinsic motivation, identified regulation, external regulation, and amotivation. Employees were asked to answer using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Guay et al. conducted five studies to develop and validate the SIMS. The results provided strong support for the psychometric properties of the SIMS. Exploratory and confirmatory factor analyses revealed a four-factor structure that reflected the theorized motivational constructs. Internal consistency values (alpha coefficients) for each subscale were satisfactory, ranging from 0.62 to 0.95, and the construct validity of the SIMS was supported.

In order to use the information provided by the SIMS as a single readily-interpretable score, I used a Relative Autonomy Index (RAI; Grolnick & Ryan, 1987). Self-determined forms of motivation are given positive weights and controlled forms are given negative weights. Then, the controlled scores are subtracted from the self-determined scores to create an index of relative self-determined motivation. The weighting of the different sub-scales as indicated below is justified by the quasi-simplex structure of the different forms of motivation (Grolnick & Ryan, 1987; Ryan & Connell, 1989). Thus, a Relative Autonomy Index (RAI) was computed in this study for each respondent as follows from the SIMS sub-scale scores:

$$\text{RAI} = (3 * \text{intrinsic motivation}) + (1 * \text{identified regulation}) - (1 * \text{external regulation}) - (3 * \text{amotivation})$$

Based on the mathematical formula to compute the RAI, the maximum possible value is 24 and the minimum possible value is -24. Positive values denote

self-determined forms of motivation, while negative values denote controlled forms of motivation.

IT usage. Lucas and Spitler (1999) suggested that for many multifunctional workstations, a base level of usage is required in order to perform one's job. Beyond this base level, employees have considerable discretion in using different functions and features. As a result, this type of system usage exhibits aspects of both voluntary and mandatory usage. Lucas and Spitler argued that for a complex system with many possible functions, self-report measures are the best possible measurement option.

Based on the system information and the detailed training manual used by the Hospital Centre, I developed a customized measure of IT usage for the patient scheduling and appointment management system. Following Lucas and Spitler (1999) and Doll and Torkzadeh (1998), I created a self-report measure of the extent of usage for this windowed multifunctional system. As basic system usage was mandated by management, the aim of this self-report measure was to assess the more advanced usage patterns that are left to the discretion of the individual employee. Thus, beyond the basic functions that are necessary (and thus mandated by management) for acceptable job performance, the aim was to measure to what extent each user of this system used the various system functions.

Six main system functions were identified: search features; booking appointments; recording visits and attendance; reports; managing appointments and schedules; and templates, schedules, and session generation. Each function, from the most basic to the most advanced, was broken down into its component actions, e.g., "I book single appointments", "I book coordinated appointments with other clinics", etc.

Employees were asked to answer to what extent they used each feature of the system on a 7-point Likert scale ranging from 0 (never) to 6 (always). Employees who did not have permission to access a given function were asked to mark "not applicable". In this way, a total score for each employee was calculated by summing their scores on each of the component actions, i.e., across all six main system functions.

Thus, the IT usage score was calculated for each user by summing their scores on the six sub-sections of the measure: search features (7 items); booking appointments (5 items); recording visits and attendance (4 items); reports (4 items); managing appointments and schedules (7 items); templates, schedules, and session generation (5 items). As users were asked to indicate a response from 0 to 6 for each item (see Appendix A), the maximum possible score for this 32-item measure was 192.

A similar measure was omitted from the pharmacy questionnaire. Based on discussions with the Chief Pharmacist of the Hospital Centre, no such variability in usage was expected for this pharmacy system; all employees generally used the same system functions depending on their particular job, and all these functions were generally necessary to achieve an acceptable level of job performance.

Attitudes toward IT. The Intrinsic Motivation Inventory (IMI; Ryan, 1982) was used to measure attitudinal reactions to the new IT. Three subscales were used (consisting of 16 items): interest/enjoyment, perceived competence, and felt pressure and tension. Employees were asked to answer using a 7-point Likert scale (1 = not at all true to 7 = very true). The responses to the individual items of this measure were aggregated by subscale. In this way, a total score for each employee was computed for each of the three subscales.

Employee acceptance of an organizational IT change. Miller et al.'s (1994) 8-item measure to assess employee willingness to support organizational change was used. Miller et al. reported a Cronbach alpha for this measure of 0.80. While all eight items loaded on the single factor, Miller et al. dropped items 5, 7, and 8 because of reliability concerns. The factor loadings of the remaining items ranged from 0.54 to 0.73. Wanberg and Banas (2000) used seven of the original eight items. This decision was based on the encouraging results of their factor analysis, which revealed a two-factor structure fit as follows: (1) willingness to accommodate or accept the specific changes (e.g., "I would consider myself to be "open" to the changes") and (2) a positive view of the changes for themselves and their organization (e.g., "the changes are for the better"). I adapted the original eight items to evaluate employee acceptance of an organizational IT change, specifically employee acceptance of the changes associated with the implementation of new IT. Employees were asked to answer using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Change-specific self-efficacy was assessed via a 4-item measure reported in Wanberg and Banas (2000), which was originally from Ashford (1988). The original alpha coefficient was reported as 0.61. These items were also adapted to the current context of an organizational IT change, however the resulting measure exhibited low reliability and was therefore not given further consideration.

Control variables. A number of employee demographic characteristics were recorded to potentially be used as control variables and considered statistically into the regression analyses to be performed. These variables included:

IT-user control variables. The following variables were controlled: the month and year when employees personally began using the systems, the hours of training, each employee's job and hospital, and whether employees were employed during the IT implementation.

Additional user control variables for the patient scheduling and appointment management system. The following variables were controlled: average number of appointments booked per week, frequency of use, month and date of training, user-level, prior use of a computer, and prior use of the Windows operating system.

Organizational tenure. Organizational tenure was reported by employees as the number of years that they had been employed with their hospital. Organizational tenure has been shown to be positively related to POS as it represents the duration of the exchange relationship (Wayne et al., 2002). Tenure has also been associated with more difficulty in adapting to organizational change (as reported in Wanberg & Banas, 2000).

Demographic control variables. The following variables were controlled: age, gender, full-time versus part-time employment status, and level of formal education completed. Older and less educated individuals may tend to be less positive about change (reported in Wanberg & Banas, 2000).

Pre-Testing the Questionnaire and Web-Survey

The questionnaire and associated letters were first reviewed by two Management professors and one MIS professor involved in this research. For the first study, the questionnaire and associated letters were then reviewed in detail by the Associate Director of Information Services (Project Management), the Ambulatory Services

manager of each hospital, and the implementation team in charge of the IT, which included the trainers. For the second study, the questionnaire and associated letters were reviewed in detail by the Associate Director of Information Services (Project Management) and the Chief Pharmacist of the Hospital Centre. The questionnaires and associated letters for both studies were then carefully reviewed by the Director of Human Resources of the Hospital Centre and the Associate Director of Human Resources (Research and Development Group on Work Organization). At each stage, changes were made to the questionnaire based on the suggestions that were made. The input from the Hospital Centre was particularly helpful in fine-tuning the context-dependent measures involving the systems and the organizational climate.

French Translation

The questionnaires and reminder letters for both studies were distributed in both English and French. The English material was translated into French by a professional translator. A second independent translator then back-translated the questionnaires using the French version. Based on the results of the back-translation, changes were made to the French version to ensure an identical meaning to the English version.

Data Collection

Study One: Patient Scheduling and Appointment Management

A total of 839 questionnaires was sent out to all users as follows: 185 users at Hospital A, 258 users at Hospital B, 293 users at Hospital C, 39 users at Hospital D, and 64 users at Hospital E. Questionnaires were delivered for distribution at each site by

internal mail on May 27, 2003 (Hospital C); May 28 (Hospital B); and May 29 (Hospitals A, D, and E).

The bilingual English and French questionnaires (see Appendix A) were distributed in sealed envelopes to employees by internal mail. An endorsement letter from the Hospital Centre was included with the questionnaire, signed by the Associate Director of Information Services, and the Manager of Ambulatory Services for their respective hospital. A return envelope was also included, and employees were asked to seal their completed questionnaires and return them to my attention by internal mail, care of the Associate Director of Information Services. The questionnaire cover letter guaranteed anonymity, as only aggregated results would be seen by the hospital's management and employees. Questionnaires were colour-coded to ascertain hospital source.

I visited the users to encourage their participation in the study approximately two weeks after they had received the questionnaire (Hospital A on June 11 & 12; Hospital B on June 5 & 13; Hospital C on June 11, 12, & 13; Hospital D on June 9; Hospital E on June 10). I was accompanied at each hospital by the Ambulatory Services Manager, and at Hospital C, I was accompanied by the Ambulatory Services Administrative Technician. These visits proved to be extremely valuable, as I was able to provide copies of the questionnaire to a number of employees who had not received their copy by internal mail, answer their questions or concerns, and give out questionnaires to users of this system who were not on the original list. (Details are given below.)

A number of questionnaires were returned uncompleted for a variety of reasons, including: these users were on sick leave, maternity leave, had quit, had retired, had

changed jobs, or did not use the system. Questionnaires were returned to me by internal hospital mail, by postal mail to the John Molson School of Business at Concordia University, and upon visiting the hospitals. Alternatively, upon visiting the hospitals in many cases I was told that the employees in question were no longer working there and as a result the questionnaires were undeliverable. At Hospital A, 10 possible respondents were added and 47 questionnaires were returned. At Hospital B, 3 possible respondents were added and 9 questionnaires were returned. At Hospital C, 12 possible respondents were added and 81 questionnaires were returned. At Hospital D, 2 possible respondents were added and 8 questionnaires were returned. At Hospital E, no respondents were added and 22 questionnaires were returned.

Thus, overall 27 possible respondents were added and 167 were excluded. The revised sample was therefore 699 system users: 148 users at Hospital A, 252 users at Hospital B, 224 users at Hospital C, 33 users at Hospital D, and 42 users at Hospital E.

Envelopes containing bilingual reminder letters for each participant were delivered to each hospital on June 16 for delivery by internal mail (see Appendix C). The letter thanked those employees who had already completed and returned the questionnaire and urged others to do the same in the coming days. Due to a mail-room error, all letters for Hospitals D and E were returned to the Associate Director of Information Services on June 23. I redelivered these letters on June 23 for distribution by internal mail.

Study Two: A Pharmacy Information System

On June 2, 2003, e-mails were sent out by the Pharmacy Department to all users of this system. A total of 175 e-mails were sent to 102 pharmacy technical assistants, 61 pharmacists, 7 administrators, and 5 pharmacy residents (students). The bilingual e-mail contained a link to the intranet web-survey, as well as an endorsement letter from the Associate Director of Information Services and the Chief Pharmacist of the Hospital Centre. The questionnaire cover letter guaranteed anonymity, as only aggregated results would be seen by management and employees. The identities of web-survey participants could also not be tracked.

I visited the users to encourage their participation in my study approximately three weeks after they had received the initial e-mail (Hospital A on June 26 & July 2; Hospital B on June 20 & July 2; Hospital C on June 25). I was accompanied at each hospital by a member of the Pharmacy department. These visits proved to be extremely valuable, as I was able to answer questions and concerns, remind those users who had not yet had the chance to fill out the web-survey and give them a reminder card with the intranet address, and make several corrections to the user list.

Upon visiting the pharmacy departments, I discovered that several potential respondents were on sick leave, maternity leave, had quit, or did not use the system. Nine pharmacy technical assistants and one pharmacist were therefore removed from the sample. Two pharmacy residents and two technical assistants were added as potential respondents. Thus, the revised sample was 169 system users: 95 pharmacy technical assistants, 60 pharmacists, 7 administrators, and 7 pharmacy residents.

A reminder e-mail was sent to all system users on June 17 by the Pharmacy department, which consisted of a forward of the previous e-mail. On June 18, I was notified that the web-survey had been switched to a different server after respondents had reported problems submitting their responses. As a result, only one response had been recorded prior to June 17. Therefore, I sent out an e-mail to all users on June 18, giving them the correct (updated) hyperlinks for the web-survey.

During my visit to Hospital C, I became aware that many users were unable to access the web-survey as the intranet hyperlink would not launch from their e-mail program on certain hospital computers. Therefore, on June 25, I sent a further e-mail to the system users telling them how to get around this problem and access the web-survey.

On July 3, I sent a reminder e-mail to each system user. The letter (see Appendix D) was very similar to that used in the first study. The letter thanked those employees who had already completed the web-survey and urged others to do the same in the coming days.

CHAPTER 5: DATA ANALYSIS AND RESULTS FOR STUDY ONE: PATIENT SCHEDULING AND APPOINTMENT MANAGEMENT

All data were analyzed using SPSS 10.0. Reliability analyses of the measures were conducted, as were correlation analyses of the different research constructs. The research model and its related hypotheses were tested using multiple regression analysis.

Preparation of the Data for Analysis

All completed questionnaires were used in the data analysis with the exception of one partially-completed questionnaire. It was indicated on the questionnaire that it was completed by the individual responsible for the training at Hospital C. These data were not used in the regression analyses as it did not seem appropriate to group this respondent with the other users of this system, to prevent any possible bias in the results. Furthermore, the individuals responsible for training at the other hospitals did not complete questionnaires.

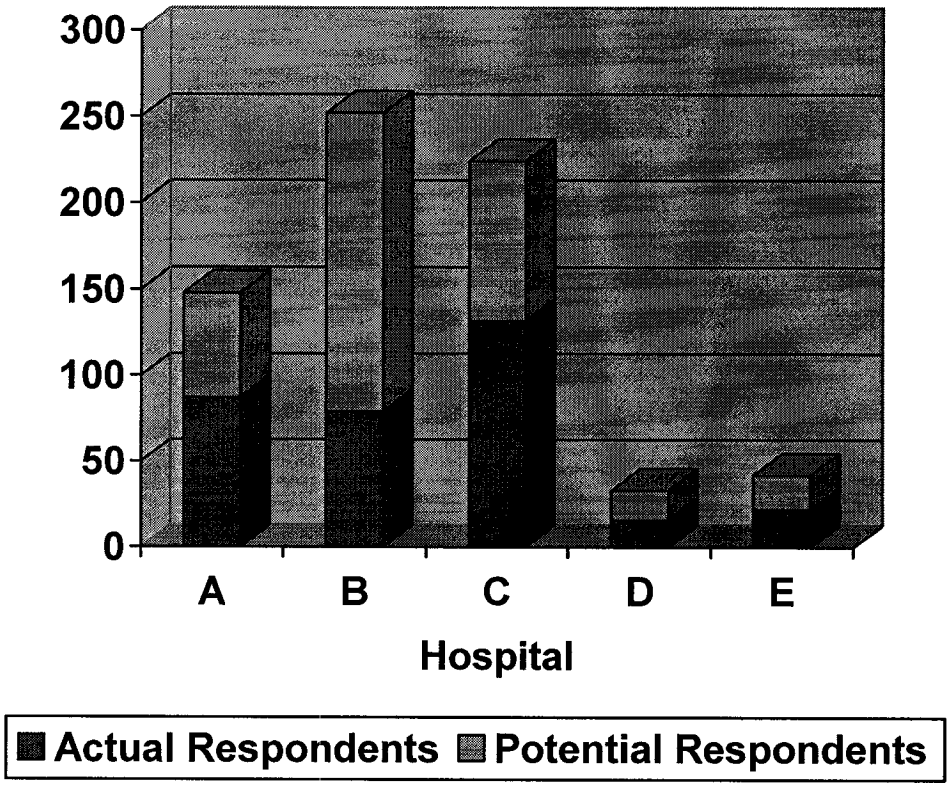
Mean-substitution was used across the full sample to salvage incomplete respondent cases from being rejected from the regression analyses. Mean-substitution was only performed when the percentage of missing data in a given measure allowed for substitution of these missing values. For example, in the 17-item POS measure, mean-substitution was performed for up to and including four missing entries. Beyond this point, the respondent's answers for the sub-section of the questionnaire were rejected from the regression analyses.

Demographic Characteristics of the Respondents

A total of 336 completed questionnaires was received out of a revised sample size of 699 system users for a response rate of 48.1%. As shown in Figure 5.1, the questionnaires were received from the five different hospitals as follows. At Hospital A, 87 completed questionnaires out of a possible 148 were received for a response rate of 58.8%. At Hospital B, 79 completed questionnaires out of a possible 252 were received for a response rate of 31.3%. At Hospital C, 132 completed questionnaires out of a possible 224 were received for a response rate of 58.9%. At Hospital D, 16 completed questionnaires out of a possible 33 were received for a response rate of 48.5%. At Hospital E, 22 completed questionnaires out of a possible 42 were received for a response rate of 52.4%.

It is noteworthy that of the total 336 completed questionnaires, 39.3% of these questionnaires were received from Hospital C, 25.9% from Hospital A, 23.5% from Hospital B, 6.5% from Hospital E, and 4.8% from Hospital D.

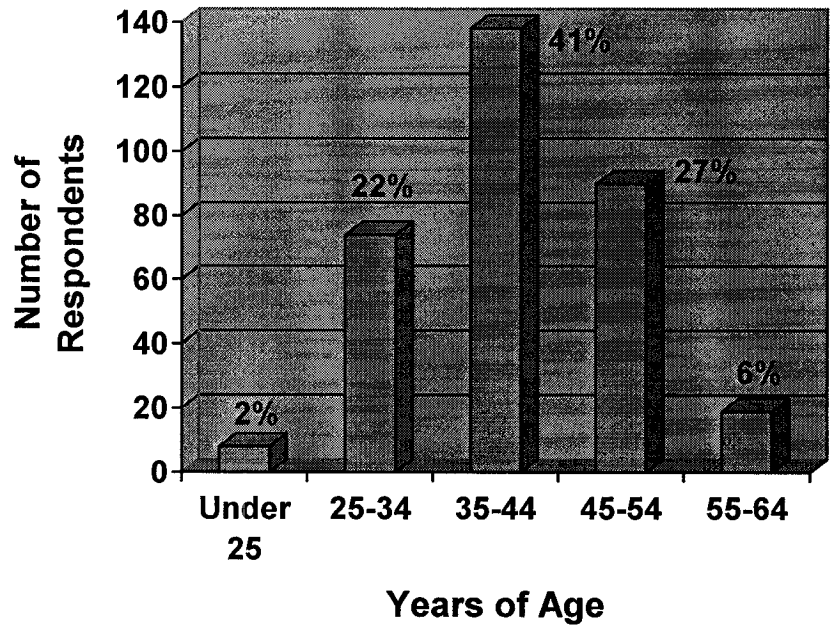
Figure 5.1: Completed Questionnaires Received By Hospital Source



Three hundred and fifteen users (93.8% of respondents) were female, 17 users (5.1% of respondents) were male, and 4 users (1.2% of respondents) did not provide this information. Based on the information provided by management at the Hospital Centre, the gender breakdown of actual respondents was representative of the user population for this IT. As can be seen in Figure 5.2, 8 users (2.4% of respondents) reported their age as under 25 years of age, 74 users (22.0% of respondents) 25 to 34 years of age, 138 users (41.1% of respondents) 35 to 44 years of age, 90 users (26.8% of respondents)

45 to 54 years of age, 19 users (5.7% of respondents) 55 to 64 years of age, and 7 users (2.1%) did not provide this information.

Figure 5.2: Age of Respondents

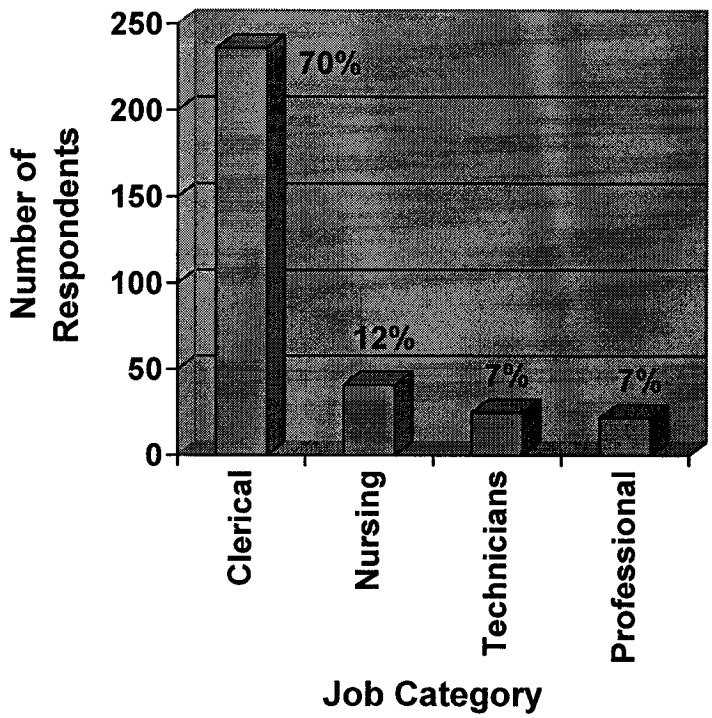


Fifty-seven employees (17.0% of respondents) reported that their highest level of formal education was high school, 157 employees (46.7% of respondents) College or CEGEP, 69 employees (20.5% of respondents) Undergraduate degree, 24 employees (7.1% of respondents) Graduate degree, 21 employees (6.3% of respondents) Professional Designation, and 8 employees (2.4% of respondents) did not provide this information. A total of 247 respondents (73.5%) answered in English, while 89 respondents (26.5%) answered in French.

As can be seen in Figure 5.3, 236 users (70.2% of respondents) reported their job category as clerical or administrative, 41 users (12.2% of respondents) nursing,

25 users (7.4% of respondents) technicians, and 22 users (6.5% of respondents) multi-disciplinary professionals (dieticians, social workers, etc.). Twelve persons (3.6%) opted not to provide this information. Two hundred and sixty three persons (78.3% of respondents) reported that they were full-time employees, while 54 persons (16.1% of respondents) reported that they were part-time employees. Nineteen persons (5.7%) did not provide this information.

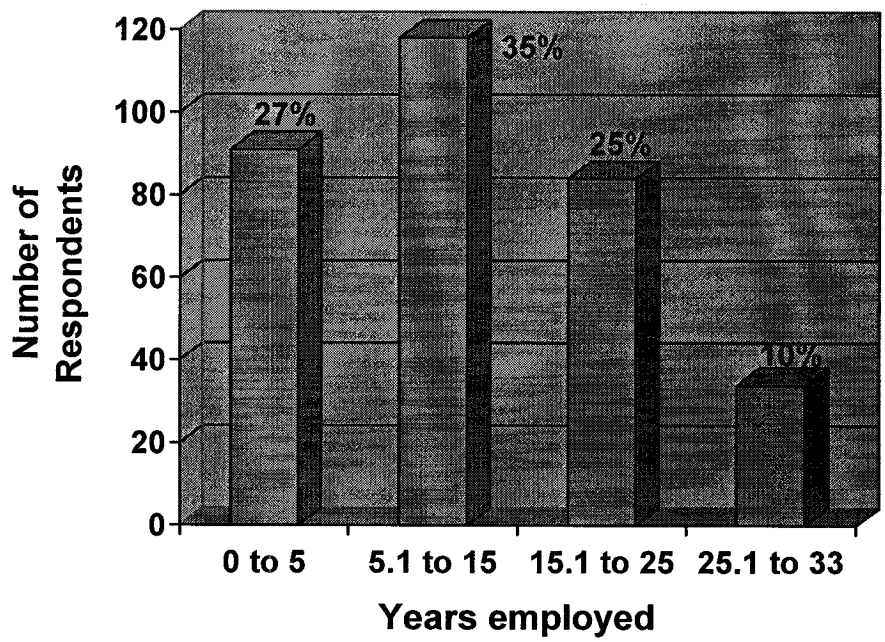
Figure 5.3: Breakdown of Respondents by Job Category



The average number of years that employees reported being employed at their hospital (i.e., organizational tenure) was 12.89 years (n = 327), with a standard deviation of 8.79 years. As is shown in Figure 5.4, 91 respondents (27.1%) indicated that they had been employed at their hospital for five years or less. One hundred and eighteen

respondents (35.1%) indicated that they had been employed at their hospital over five years and up to and including fifteen years. Eighty-four respondents (25.0%) indicated they had been employed at their hospital over fifteen years and up to and including twenty-five years. Thirty-four respondents (10.1%) indicated that they had been employed at their hospital over twenty-five years up to a maximum of thirty-three years. Nine respondents (2.7%) did not report this information.

Figure 5.4: Breakdown of Respondents by Organizational Tenure



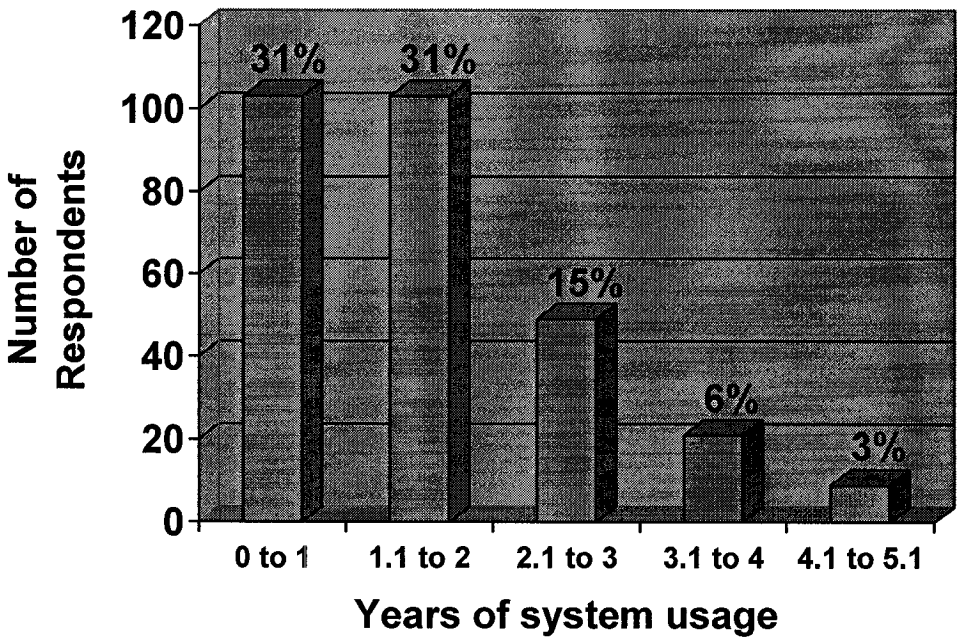
Several respondents indicated in their responses that they had been using the system for a longer period than was possible based on the earliest system implementation date. Implementation dates were reconfirmed with the Ambulatory Services Managers and such cases were back-dated to the earliest possible dates at the hospital in question. As the earliest implementation dates were not recent, such "errors" are not in any way

surprising. There are individual differences in the accuracy of information retrieved from memory, and memory biases may influence certain individuals more than others (Medin & Ross, 1997).

As the data collection occurred over a period of three months, data that involved a calculation of months (e.g., months of system usage, months since training) was adjusted to reflect the month in which the questionnaire was completed. The delay in receiving the questionnaires by the internal mail system was taken into account in these adjustments.

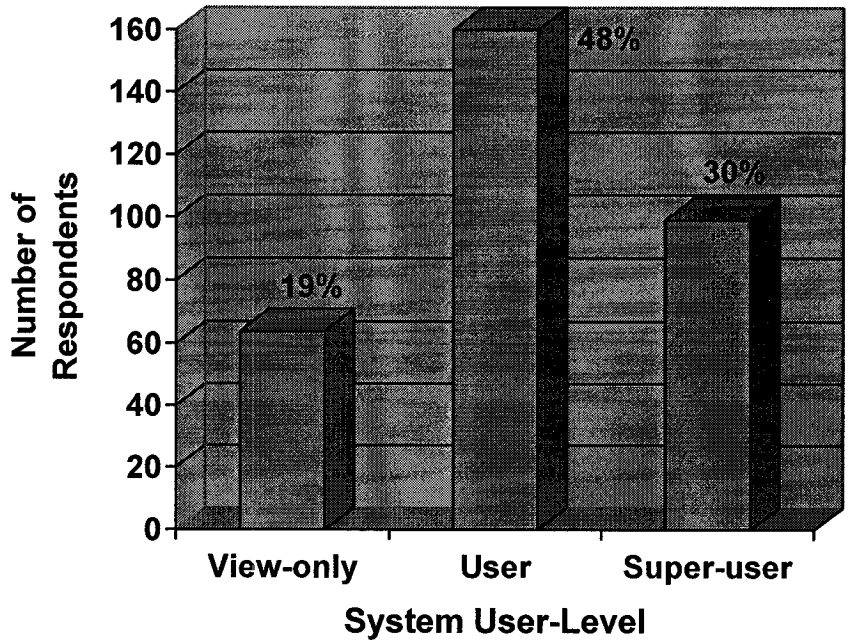
Users had been using the system, on average, for just over a year and a half. Specifically, the average number of months that users reported using the system was 20.17 ($n = 285$), with a standard deviation of 13.64 months. As shown in Figure 5.5, 103 respondents (30.7%) indicated that they had been using the system for one year or less. One hundred and three respondents (30.7%) indicated that they had been using the system for more than one year and up to two years. Forty-nine respondents (14.6%) indicated that they had been using the system for more than two years and up to three years. Twenty-one respondents (6.3%) indicated that they had been using the system for more than three years and up to four years. Nine respondents (2.7%) indicated that they had been using the system for more than four years and up to five years and one month (i.e., the earliest implementation date). Fifty-one respondents (15.2%) did not provide full information to this question.

Figure 5.5: Breakdown of Respondents by Years of System Usage



Users of all three user-levels (as discussed in Chapter Four) responded to the questionnaire. As can be seen in Figure 5.6, there were 64 view-only users (19.0% of respondents), 160 users (47.6% of respondents), 99 super-users (29.5% of respondents), and 13 employees (3.9% of respondents) did not indicate a user-level.

Figure 5.6: Breakdown of Respondents by System User-level



Respondents who indicated their user-level as a super-user booked an average of 112 appointments per week (n = 79, standard deviation (SD) = 99). In comparison with the total number of appointments that they booked per week, super-users on average reported that they "always" booked appointments using the system (coded as 6 on a scale of 0 (never) to 6 (always)) (n = 93, mean (M) = 5.70, SD = 0.73). Respondents who indicated their user-level as a regular system user booked an average of 41 appointments per week (n = 131, SD = 49). In comparison with the total number of appointments that they booked per week, users on average reported that they "almost always" booked appointments using the IT (coded as 5 on the same scale of 0 (never) to 6 (always)) (n = 151, M = 4.64, SD = 1.71). The high variance in these statistics indicates that in addition to user-level, other factors impact a great deal on the number of appointments

booked per week and the frequency of system use. An example of such factors would be the differing number of appointments booked per week across various hospital departments. Respondents who indicated their user-level as a "view-only" user did surprisingly indicate that they booked several appointments per week, an average of three appointments ($n = 54$, $SD = 8$). In comparison with the total number of appointments that they booked per week, view-only users on average reported that they booked appointments "some of the time" using the system (coded as 2 on the same scale of 0 (never) to 6 (always)) ($n = 53$, $M = 1.70$, $SD = 2.02$). A further discussion of these self-reported user-levels and their resulting concerns follows later in this chapter.

One would normally expect users of such an IT not to additionally schedule appointments using a paper-based appointment book. However, as previously discussed, it was indicated to me by the Hospital Centre that such was indeed the pattern of users who resisted the implementation of this IT. Of all system users, 229 users (68.2% of respondents) indicated that they did not record appointments using a paper-based appointment book, while 86 users (25.6% of respondents) indicated that they still used a paper-based appointment book. Twenty-one users (6.3% of respondents) did not answer this question.

Two hundred and fifty system users (74.4% of respondents) indicated that they were employed in their current job at their hospital before the IT implementation took place in their department. Eighty users (23.8% of respondents) were not employed before the implementation, and 6 users (1.8% of respondents) did not provide this information. Three hundred and five users (90.8% of respondents) had used a computer before using the system, 25 users (7.4% of respondents) had not, and 6 users (1.8% of

respondents) did not provide this information. Two hundred and seventy-two users (81.0% of respondents) had used the Windows operating system before using the IT, 47 users (14.0% of respondents) had not, and 17 users (5.1% of respondents) did not provide this information.

With respect to training, respondents were asked to indicate the length of the system training program that they had received. Based on information provided by the Hospital Centre, users were asked to indicate whether they had received half a day, one day, or three days of training. Despite this, some users indicated that they had received less than half a day of training. I note that the true number of users that received less than half a day of training is likely under-represented in the following statistics as those categories were not provided as answer choices in the questionnaire. The results to this question were as follows. Sixteen users (4.8% of respondents) reported that they had received no system training. Twelve users (3.6% of respondents) indicated that they had received less than one hour of system training. Ninety-three users (27.7% of respondents) reported that they had received half a day of system training, 118 users (35.1% of respondents) reported that they had received one day of system training, and 82 users (24.4% of respondents) reported that they had received three days of system training. Fifteen users (4.5% of respondents) opted not to provide this information.

Respondents were also asked to indicate the month and year in which they were given their system training. By subtracting the respondent's months of use of the system from this training date, the interval by which system training preceded actual system use was determined. I included in the calculation only those 178 respondents who provided full and definite information to these questions. The results of this calculation indicated

that 87 of these 178 respondents (48.9%) received their system training in the same month that they started using the system, 24 respondents (13.5%) in the month before they started using the system, 19 respondents (10.7%) two months before they started using the system, 23 respondents (12.9%) between three and five months before they started using the system, 7 respondents (3.9%) between seven and twelve months before they started using the system, and 1 respondent (0.6%) seventeen months before he/she started using the system. Additionally, 17 users (9.6%) indicated that they started using the system before they were trained: 8 respondents (4.5%) were trained in the month following their first use of the system, 4 respondents (2.2%) two months after they started using the system, and 5 respondents (2.9%) between five and twelve months after they started using the system.

Descriptive Statistics

The descriptive statistics for the main constructs of the research model are presented in Table 5.1. All scales used a seven-point Likert scale with the exception of the distributive justice measure, which used a very anchor-specific five-point scale. This decision was intentional in that seven-point scales have shown increased reliability and advantage over five-point scales in that they allow respondents to illustrate finer distinctions in their responses (reviewed by Whitley, 2002). Decimal values can be found in the maximum values presented in Table 5.1 as a result of the mean-substitution procedure previously discussed.

Mean-substitution was performed within each user-level for the IT usage score. Responses of "not applicable" were not included in the user-level mean calculations;

however they were considered as the user "never" uses this function (i.e., coded as zero). In ten cases, respondents IT usage scores totaled zero due to answers of zero, not applicable, or a combination thereof. These cases were not used in the IT usage analyses.

An IT usage score could only be computed where the six sub-sections had full data or, where applicable, full data after mean-replacement. It was not appropriate in this situation to directly compare IT usage scores with IT usage scores where sub-components of the score were missing. The descriptive statistics for the components of the system usage measure are presented in Table 5.2.

The main research model variables were tested for skewness and kurtosis. All variables were found to be satisfactory: statistics ranged from a minimum of -1.00 to a maximum of 1.17 for skewness, and from a minimum of -0.89 to a maximum of 2.02 for kurtosis.

Table 5.1: Descriptive Statistics for the Research Model Constructs

Construct	n	Minimum Recorded Response	Maximum Recorded Response	Mean	Standard Deviation
Perceived Organizational Support	326	1.00	7.00	3.90	1.08
Distributive justice	303	1.00	5.00	2.66	1.01
Supervisor contingent-reward behaviour	324	1.00	7.00	4.02	1.58
Supervisor contingent-punishment behaviour	315	1.00	7.00	4.64	1.31
Intrinsic motivation	323	1.00	7.00	4.41	1.33
Identified regulation	324	1.00	7.00	4.72	1.13
External regulation	324	1.00	7.00	5.09	1.54
Amotivation	323	1.00	7.00	2.77	1.44
RAI	323	-24.00	24.00	4.56	9.13
IT usage	290	3.00	192.00	69.95	42.11
Interest / enjoyment	324	1.00	7.00	4.61	1.43
Perceived competence	324	1.00	7.00	4.97	1.39
Pressure / tension	324	1.00	6.40	2.20	1.09
Acceptance of an organizational IT change	320	1.00	7.00	5.32	1.10

Table 5.2: Descriptive Statistics for the IT Usage Measure

Component	Number of component items	Number of cases	Minimum	Maximum	Mean	Standard Deviation
Search features	7	311	0.00	42.00	17.17	8.61
Booking appointments	5	306	0.00	30.00	10.40	7.44
Recording visits and attendance	4	313	0.00	24.00	8.23	7.35
Reports	4	322	0.00	24.00	10.10	7.01
Managing appointments and schedules	7	319	0.00	42.00	13.62	12.25
Templates, schedules, and session generation	5	321	0.00	30.00	9.79	10.34

Reliability Analysis

In the questionnaire (see Appendix A), some questions were posed positively and others negatively. Therefore, scores for scale items were reversed where appropriate. The reliability of the measurement scales used in the questionnaire was accomplished using Cronbach's alpha reliability index. As discussed by Whitley (2002), this index assesses the internal consistency of all items in a measure or the degree to which item responses are similar. Such a reliability analysis could not be performed on the system-specific measure of IT usage that I developed. As the individual questions were asking about different functions of a specific system, no consistency across these questions could be expected. As such, the results of a reliability analysis of this measure would have little value or meaning. The results of the reliability analyses are given in Table 5.3.

Table 5.3: Results of Cronbach Alpha Reliability Analyses

Measure	Number of items in the measure	Number of cases in the reliability analysis	Cronbach's Alpha
Perceived Organizational Support	17	322	0.93
Distributive justice	6	302	0.95
Supervisor contingent-reward behaviour	10	320	0.96
Supervisor contingent-punishment behaviour	5	310	0.90
Intrinsic motivation	4	323	0.89
Identified regulation	4	323	0.71
External regulation	4	323	0.85
Amotivation	4	323	0.89
Interest / enjoyment	6	322	0.93
Perceived competence	5	322	0.91
Pressure / tension	5	323	0.71
Acceptance of an organizational IT change	8	316	0.90

Following current practice in the social sciences, an internal consistency coefficient of at least 0.70 is suggested (Whitley, 2002). Based on the results of the reliability analyses in Table 5.3, all measurements scales were found to show high reliability.

Correlation Analysis

Pearson's correlation coefficient (2-tailed) was computed for all variables included in the research model. The correlation matrix between all the variables can be found in Table 5.4. The number of cases (n) varied from a minimum of 263 cases to a maximum of 324 cases.

Correlations among the Different Forms of Motivation

The results in Table 5.4 demonstrate the expected quasi-simplex pattern for the different forms of motivations that has been identified in Self-Determination Theory. Intrinsic motivation exhibits a highly significant positive correlation with identified regulation, $r = 0.75, p < 0.001$; a highly significant negative correlation with external regulation, $r = -0.36, p < 0.001$; and an even more highly significant negative correlation with amotivation, $r = -0.59, p < 0.001$. Identified regulation shows a highly significant negative correlation with external regulation, $r = -0.44, p < 0.001$; and a more highly significant negative correlation with amotivation, $r = -0.69, p < 0.001$. External regulation displays a highly significant positive correlation with amotivation, $r = 0.39$, $p < 0.001$.

Table 5.4: Correlation Matrix for all Variables in the Research Model

	POS	DJ	SCR	SCP	IM	IREG	EREG	AMOT	IT USAGE	ENJOY	COMP	PRESS	OCHANGE
POS	1.00	.56***	.45***	-.14*	.23***	.23***	-.27***	-.18***	-.08	.22***	-.03	-.09	.16**
DJ		1.00	.37***	-.07	.18***	.14*	-.15*	-.16**	-.13*	.18**	-.04	.00	.13*
SCR			1.00	-.14*	.12*	.08	-.08	-.07	-.02	.12*	.04	-.10†	.10†
SCP				1.00	.00	-.02	.04	-.03	.00	.01	-.01	.06	.02
IM					1.00	.75***	-.36***	-.59***	.16**	.82***	.24***	-.37***	.64***
IREG						1.00	-.44***	-.69***	.01	.68***	.19***	-.37***	.67***
EREG							1.00	.39***	.21***	-.35***	.06	.16**	-.30***
AMOT								1.00	-.02	-.61***	-.17**	.35***	-.70***
IT USAGE									1.00	.14*	.51***	-.25***	.10†
ENJOY										1.00	.37***	-.46***	.71***
COMP											1.00	-.60***	.33***
PRESS												1.00	-.48***
OCHANGE													1.00

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$ † $p < 0.10$

POS = Perceived Organizational Support; DJ = Distributive justice; SCR = Supervisor contingent-reward behaviour; SCP = Supervisor contingent-punishment behaviour; IM = Intrinsic motivation; IREG = Identified regulation; EREG = External regulation; AMOT = Amotivation; ENJOY = Interest/enjoyment; COMP = Perceived competence; PRESS = Pressure/tension; OCHANGE = Acceptance of an organizational IT change.

Correlations between the Work Climate Variables and Motivation

Hypothesis 1 suggests that POS is positively related to self-determined motivation. Supportive evidence is provided by the highly-significant, largely-decreasing pattern of correlations between POS and the forms of motivations, from the most self-determined type to the least: intrinsic motivation, $r = 0.23, p < 0.001$; identified regulation, $r = 0.23, p < 0.001$; external regulation, $r = -0.27, p < 0.001$; and amotivation, $r = -0.18, p < 0.001$. A similar pattern of significant decreasing correlation coefficients can be found between distributive justice and the different forms of motivation, supporting hypothesis 2: intrinsic motivation, $r = 0.18, p < 0.001$; identified regulation, $r = 0.14, p < 0.05$; external regulation, $r = -0.15, p < 0.05$; and amotivation, $r = -0.16$, $p < 0.01$.

There is only one significant relationship in the correlation matrix between supervisor contingent reward and punishment behaviour and motivation. There is a significant positive relationship between supervisor contingent-reward behaviour and intrinsic motivation, $r = 0.12, p < 0.05$, which provides evidence that contradicts hypothesis 3a.

Correlations between Motivation and the Outcome Variables

Employee use of the system is significantly positively correlated with both intrinsic motivation, $r = 0.16, p < 0.01$; and external regulation, $r = 0.21, p < 0.001$. This evidence does not support hypothesis 5.

Supportive evidence for hypothesis 6a is provided by the highly significant decreasing pattern of correlations between interest and enjoyment in using the system and

motivation, from the most self-determined type to the least: intrinsic motivation, $r = 0.82$, $p < 0.001$; identified regulation, $r = 0.68$, $p < 0.001$; external regulation, $r = -0.35$, $p < 0.001$; and amotivation, $r = -0.61$, $p < 0.001$. A similar pattern of decreasing correlation coefficients can be found between perceived competence in using the system and the different forms of motivation. The following relationship between perceived competence and the different forms of motivation supports hypothesis 6b: intrinsic motivation, $r = 0.24$, $p < 0.001$; identified regulation, $r = 0.19$, $p < 0.001$; external regulation, $r = 0.06$, *ns*; and amotivation, $r = -0.17$, $p < 0.01$. Supportive evidence for hypothesis 6c is provided by the highly significant increasing pattern of correlations between pressure and tension in using the system and motivation, from the most self-determined type to the least: intrinsic motivation, $r = -0.37$, $p < 0.001$; identified regulation, $r = -0.37$, $p < 0.001$; external regulation, $r = 0.16$, $p < 0.01$; and amotivation, $r = 0.35$, $p < 0.001$.

Supportive evidence for hypothesis 7 is provided by the highly significant, largely decreasing pattern of correlations between employee acceptance of an organizational IT change and motivation, from the most self-determined type to the least: intrinsic motivation, $r = 0.64$, $p < 0.001$; identified regulation, $r = 0.67$, $p < 0.001$; external regulation, $r = -0.30$, $p < 0.001$; and amotivation, $r = -0.70$, $p < 0.001$.

Correlations between the Work Climate Variables and the Outcome Variables

As only partial mediation by situational motivation was proposed in my research model, I also examine the direct relationships between the independent variables and the dependent variables. There is a significant positive correlation between POS and both

interest and enjoyment in using the IT, $r = 0.22, p < 0.001$; and employee acceptance of an organizational IT change, $r = 0.16, p < 0.01$. There is also a significant positive correlation between distributive justice and both interest and enjoyment in using the IT, $r = 0.18, p < 0.01$; and employee acceptance of an organizational IT change, $r = 0.13$, $p < 0.05$. A low, yet significant negative correlation was also found between distributive justice and employee usage of the IT, $r = -0.13, p < 0.05$. Finally, there is also a significant positive correlation between supervisor contingent-reward behaviour and interest and enjoyment in using the IT, $r = 0.12, p < 0.05$. As a whole, the correlation patterns provide preliminary support for the hypothesized mediational relationships.

Correlations among the Different Work Climate Variables

In Table 5.4, it can be seen that the work climate (i.e., independent) variables are highly and significantly correlated with each other. This provides evidence that each variable is tapping different elements of a common construct, namely the overall organizational work climate. There is a significant positive correlation between perceived organizational support and both distributive justice and supervisor contingent-reward behaviour. There is a significant positive correlation between distributive justice and supervisor contingent-reward behaviour. There is also a significant negative correlation between supervisor contingent-punishment behaviour and POS indicating that supervisor punishment behaviour is associated with lower levels of employee POS. Supervisor contingent-punishment behaviour also exhibits a significant negative correlation with supervisor contingent-reward behaviour. One possible

explanation of this result is that supervisors tend to use either punishment or rewards, but not both in combination.

Correlations among the Different Outcome Variables

The outcome (i.e., dependent) variables are also highly correlated. Employee usage of the system exhibits significant correlations with the following variables: a positive correlation with interest and enjoyment in using the system, a positive correlation with perceived competence in using the system, and a negative correlation with the pressure and tension experienced in using the system. Employee perceived competence in using the system displays a significant positive correlation with interest and enjoyment in using the system. The pressure and tension experienced by employees in using the system exhibits a significant negative correlation with interest and enjoyment in using the system as well as with perceived competence in using the system. Employee acceptance of an organizational IT change exhibits significant correlations with the following variables: a positive correlation with interest and enjoyment, a positive correlation with perceived competence, and a negative correlation with pressure and tension.

Control Variables Used in the Regression Analyses

As discussed below, the numerous control variables included in the questionnaire were evaluated as appropriate control variables, to be considered statistically into the regression analyses to be performed. One-way ANOVAs revealed a significant difference in IT usage scores based on user-level, $F(2, 284) = 139.57, p < 0.001$; as well

as significant differences in each of the six sub-scores of the IT usage measure. In each case, a higher user-level was associated with higher average usage of that system sub-function. Furthermore, one-way ANOVAs revealed a significant difference in perceived competence in using the system based on user-level, $F(2, 313) = 46.48$, $p < 0.001$; pressure and tension experienced in using the system based on user-level, $F(2, 313) = 12.35$, $p < 0.001$; and interest and enjoyment in using the system based on user-level, $F(2, 313) = 3.75$, $p < 0.05$. A higher user-level was associated with increased system interest and enjoyment, increased perceived system competence, and decreased pressure and tension in using the system. Thus, user-level was used as a control variable in the regression analyses. As user-level constituted three separate categories, this variable was dummy-coded for use in the regression analyses.

One-way ANOVAs revealed a significant difference in RAI scores based on hospital site, $F(4, 318) = 3.82$, $p < 0.01$; as well as a significant difference in IT usage scores based on hospital site, $F(4, 285) = 4.92$, $p < 0.001$. Thus, hospital site was used as a control variable in the regression analyses. As hospital site constituted five separate categories, this variable was dummy-coded for use in the regression analyses. A one-way ANOVA also revealed a significant difference in RAI scores based on whether the employees were employed during the system implementation or not, $F(1, 316) = 9.00$, $p < 0.01$. Thus this control variable was also used as a control variable in the regression analyses. Employees who were only employed after the IT implementation had higher RAI scores than employees who were employed during the implementation.

A Pearson correlation (2-tailed) revealed that months of system usage exhibited a significant negative correlation with pressure and tension experienced while using the

system, $r = -0.13$, $p < 0.05$, $n = 280$. Months of system usage also showed significant positive relationships with competence, $r = 0.20$, $p < 0.001$, $n = 280$; employee acceptance of an organizational IT change, $r = 0.14$, $p < 0.05$, $n = 279$; and IT usage scores, $r = 0.17$, $p < 0.01$, $n = 254$. Thus, length of system usage was the fourth control variable used in the regression analyses.

A one-way ANOVA revealed a significant difference in system usage based on the language in which the questionnaire was completed, $F(1, 288) = 26.33$, $p < 0.001$. Further analyses revealed that users who answered in French tended to be view-only users and thus used the system to a lesser degree. As user-level was included as a control variable, these language differences were not considered further. Furthermore, significant differences in some of the research constructs were found based on full-time versus part-time employment status, job category, hours of training, average number of appointments booked per week, frequency of system use, organizational tenure, highest level of formal education completed, and age. Further analyses revealed that these differences were largely subsumed in that of the four control variables previously discussed and as such, these variables were not further considered as possible control variables.

No significant differences in the research model constructs were found based on gender. As well, no significant differences in the research model constructs were found based on prior use of computers and prior use of the Windows operating system. In order to evaluate whether early respondents differed from late respondents, a tertiary split of the data by date in which the questionnaires were received was done but revealed no significant differences of any kind in any of the research model constructs.

In summary, the four control variables to be used in the regression analyses were: user-level, hospital site, length of system usage, and whether or not employees were employed during the implementation.

Regression Analyses

Regression analyses were performed following Baron and Kenny's (1986) approach for statistical analysis with mediator variables. Their approach involves three steps of regression analyses in order to test for mediation, by considering the following relationships between the research model variables. A variable functions as a mediator if the following three conditions or steps are satisfied. In step one, variations in levels of the independent variable significantly account for variations in levels of the mediator variable. In step two, variations in levels of the independent variable significantly account for variations in levels of the dependent variable. In step three, when the relationship between the mediator and the dependent variable is controlled for, a previously significant relationship between the independent and dependent variables is no longer significant (or is zero in the strongest demonstration of mediation).

In order to maximize the number of cases used in the regression analyses, a fixed set of cases is not defined and used across all regression analyses. A number of respondents did not fully complete each measure of the questionnaire. Even with mean-substitution, certain data (i.e., respondent) cases were incomplete for some measures. If a fixed set of data cases had been used, one measure left uncompleted by a respondent would have caused all sections of that data case to be rejected. Instead, in each regression, the maximum number of available cases is used in that analysis.

Consequently, the number of cases (i.e., n) varies across regression analyses, from a minimum of 226 cases to a maximum of 272 cases.

When testing the effects on the dependent variables, the four control variables were entered in step one, the independent variable was entered in step two, and the mediator variable was entered in step three. Separate analyses were done with each independent variable, rather than entering them together, in order to avoid multicollinearity issues.

Independent Variables to Mediator: Analyses

Regression analyses were first performed to examine the impact of each independent variable on situational motivation, as assessed by the RAI score, and are presented in Table 5.5. These regressions represent the first step in testing for mediation. The results of the POS regression analysis demonstrate that the control variables alone account for 8.4% of the variance (i.e., $R^2 = 0.084$) in the RAI score. The addition of the POS construct accounts for an additional 6.5% of the variance in the RAI score. POS exhibited a significant positive relationship with the RAI score, $\beta = 0.27$, $p < 0.001$. These results support hypothesis 1. As can be seen in subsequent rows of Table 5.5, distributive justice also exhibited a significant positive relationship with the RAI score (supporting hypothesis 2), while supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour did not exhibit significant relationships with the RAI score.

The results of the regression analysis for the four independent variables in combination demonstrate that the control variables alone account for 8.8% of the

variance in the RAI score. The addition of the four independent variables account for an additional 7.4% of the variance in the RAI score. POS displayed a significant positive relationship with the RAI score, $\beta = 0.20$, $p < 0.05$. Distributive justice displayed a marginally significant positive relationship with the RAI score, $\beta = 0.15$, $p < 0.10$. The decrease in Beta coefficients for POS and distributive justice and their respective significance levels as compared to the previous regressions when POS and distributive justice were entered separately indicates that these two variables are borrowing strength from each other in the combined regression, as POS and distributive justice are highly correlated. Supervisor contingent-reward behaviour was not significantly related to the RAI score, $\beta = -0.07$, nor was supervisor contingent-punishment behaviour, $\beta = 0.04$.

In order to evaluate the validity of hypotheses 3 and 4, it was necessary to break down the RAI score into its component forms of situational motivation and conduct separate regression analyses. As seen in the first row of Table 5.6, supervisor contingent-reward behaviour was not significantly related to intrinsic motivation, $\beta = 0.09$. As can be seen in subsequent rows of Table 5.6, supervisor contingent-reward behaviour did not exhibit significant relationships with the other forms of situational motivation. Similarly, as can be seen in Table 5.7, supervisor contingent-punishment behaviour did not exhibit significant relationships with the different forms of situational motivation.

Table 5.5: The Impact of the Independent Variables on Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
POS → RAI	8.4%	$\beta = 0.27, p < 0.001$, 6.5%	Hypothesis 1 supported
distributive justice → RAI	8.7%	$\beta = 0.23, p < 0.001$, 4.7%	Hypothesis 2 supported
supervisor contingent-reward behaviour → RAI	8.7%	$\beta = 0.08$, *ns*, 0.7%	see Table 5.6
supervisor contingent-punishment behaviour → RAI	8.5%	$\beta = 0.03$, *ns*, 0.1%	see Table 5.6

Table 5.6: The Impact of Supervisor Contingent-Reward Behaviour on the Different Forms of Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
supervisor contingent-reward behaviour → intrinsic motivation	5.4%	$\beta = 0.09$, *ns*, 0.8%	Hypothesis 3a is not supported
supervisor contingent-reward behaviour → identified regulation	8.8%	$\beta = 0.04$, *ns*, 0.1%	Hypothesis 3b is not supported
supervisor contingent-reward behaviour → external regulation	15.5%	$\beta = -0.07$, *ns*, 0.5%	Hypothesis 3c is not supported
supervisor contingent-reward behaviour → amotivation	12.4%	$\beta = -0.05$, *ns*, 0.2%	Hypothesis 3d is not supported

Table 5.7: The Impact of Supervisor Contingent-Punishment Behaviour on the Different Forms of Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
supervisor contingent-punishment behaviour → intrinsic motivation	5.6%	$\beta = 0.01$, *ns*, 0.0%	Hypothesis 4a is not supported
supervisor contingent-punishment behaviour → identified regulation	8.5%	$\beta = 0.01$, *ns*, 0.0%	Hypothesis 4b is not supported
supervisor contingent-punishment behaviour → external regulation	15.0%	$\beta = 0.04$, *ns*, 0.1%	Hypothesis 4c is not supported
supervisor contingent-punishment behaviour → amotivation	12.5%	$\beta = -0.06$, *ns*, 0.3%	Hypothesis 4d is not supported

Acceptance of an Organizational IT Change

As seen in the first row of Table 5.8, the results of the regression analysis between POS and acceptance of an organizational IT change demonstrate that the control variables alone account for 6.4% of the variance in the acceptance of an organizational IT change. In step 2, the addition of the POS construct accounts for an additional 3.2% of the variance in the acceptance of an organizational IT change. The addition of both the POS and RAI constructs in step 3 accounts for an additional 48.7% of the variance in the acceptance of an organizational IT change over step 2. The POS construct by itself exhibited a significant positive relationship with acceptance of an organizational IT change, $\beta = 0.19, p < 0.01$. The addition of RAI as a mediator variable between POS and acceptance of an organizational IT change showed a significant positive effect, $\beta = 0.75$, $p < 0.001$.

As can be seen in subsequent rows of Table 5.8, distributive justice exhibited a significant positive relationship with acceptance of an organizational IT change, while supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour did not exhibit significant relationships with acceptance of an organizational IT change.

Situational Motivation as a Mediator Variable

As noted previously, mediation may only occur if the relationships shown in Table 5.8 (for each work climate variable) were found to be significant. For each work climate variable as follows, it was determined whether situational motivation acted as a mediator variable in the case of acceptance of an organizational IT change.

Table 5.8: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Employee Acceptance of an Organizational IT Change: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	6.4%	$\beta = 0.19, p < 0.01$, 3.2%
(step 3): POS	-	$\beta = -0.01$, *ns*
RAI	-	$\beta = 0.75, p < 0.001$, 48.7%
(step 2): distributive justice	6.9%	$\beta = 0.19, p < 0.01$, 3.2%
(step 3): distributive justice	-	$\beta = 0.03$, *ns*
RAI	-	$\beta = 0.73, p < 0.001$, 47.2%
(step 2): supervisor contingent-reward behaviour	6.9%	$\beta = 0.06$, *ns*, 0.4%
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.00$, *ns*
RAI	-	$\beta = 0.74, p < 0.001$, 49.6%
(step 2): supervisor contingent-punishment behaviour	7.6%	$\beta = 0.07$, *ns*, 0.5%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = 0.72, p < 0.001$, 47.3%

POS. The standardized Beta coefficient for POS in the third step dropped to -0.01 and a non-significant *p*-value, which means that RAI completely mediates the relationship between POS and acceptance of an organizational IT change.

Distributive justice. The standardized Beta coefficient for distributive justice in the third step dropped to 0.03 and a non-significant *p*-value, which means that RAI completely mediates the relationship between distributive justice and acceptance of an organizational IT change.

Supervisor contingent-reward behaviour. While RAI and acceptance of an organizational IT change were significantly related, RAI did not mediate the relationship between supervisor contingent-reward behaviour and acceptance of an organizational IT change.

Supervisor contingent-punishment behaviour. While RAI and acceptance of an organizational IT change were significantly related, RAI did not mediate the relationship between supervisor contingent-punishment behaviour and acceptance of an organizational IT change.

Evaluation of hypotheses. The results of the regression analyses presented in this section support hypothesis 7 as the RAI score exhibited significant positive relationships with acceptance of an organizational IT change in all regression cases.

Enjoyment and Interest

As can be seen in Table 5.9, both POS and distributive justice exhibited significant positive relationships with enjoyment and interest in using IT. Furthermore, supervisor contingent-reward behaviour exhibited a marginally significant positive

relationship with IT enjoyment and interest, while supervisor contingent-punishment behaviour did not exhibit a significant relationship with IT enjoyment and interest.

Situational Motivation as a Mediator Variable

POS. The standardized Beta coefficient for POS in the third step dropped to 0.08 and a marginally-significant p-value, $p < 0.10$; which means that RAI mediates the relationship between POS and enjoyment and interest experienced.

Distributive justice. The standardized Beta coefficient for distributive justice in the third step dropped to 0.09, $p < 0.05$; which means that RAI mediates the relationship between distributive justice and enjoyment and interest experienced.

Supervisor contingent-reward behaviour. While RAI and enjoyment and interest experienced were significantly related, RAI did not mediate the relationship between supervisor contingent-reward behaviour and enjoyment and interest experienced.

Supervisor contingent-punishment behaviour. While RAI and enjoyment and interest experienced were significantly related, RAI did not mediate the relationship between supervisor contingent-punishment behaviour and enjoyment and interest experienced.

Evaluation of hypotheses. The results of the regression analyses presented in this section support hypothesis 6a as the RAI score exhibited significant positive relationships with interest and enjoyment experienced while using IT in all regression cases.

Table 5.9: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Enjoyment and Interest in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	5.0%	$\beta = 0.29, p < 0.001$, 7.5%
(step 3): POS	-	$\beta = 0.08, p < 0.10$
RAI	-	$\beta = 0.79, p < 0.001$, 52.7%
(step 2): distributive justice	7.5%	$\beta = 0.27, p < 0.001$, 6.6%
(step 3): distributive justice	-	$\beta = 0.09, p < 0.05$
RAI	-	$\beta = 0.78, p < 0.001$, 52.7%
(step 2): supervisor contingent-reward behaviour	5.1%	$\beta = 0.12, p < 0.10$, 1.3%
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = 0.79, p < 0.001$, 57.0%
(step 2): supervisor contingent-punishment behaviour	5.5%	$\beta = 0.03$, *ns*, 0.1%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.01$, *ns*
RAI	-	$\beta = 0.79, p < 0.001$, 56.7%

Pressure and Tension

As can be seen in Table 5.10, POS exhibited a marginally significant negative relationship with IT pressure and tension. Distributive justice, supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour did not exhibit significant relationships with IT pressure and tension.

Situational Motivation as a Mediator Variable

POS. The standardized Beta coefficient for POS in the third step dropped to -0.03 and a non-significant *p*-value, which means that RAI mediates the relationship between POS and pressure and tension experienced.

Distributive justice. While RAI and pressure and tension experienced were significantly related, RAI did not mediate the relationship between distributive justice and pressure and tension experienced.

Supervisor contingent-reward behaviour. While RAI and pressure and tension experienced were significantly related, RAI did not mediate the relationship between supervisor contingent-reward behaviour and pressure and tension experienced.

Supervisor contingent-punishment behaviour. While RAI and pressure and tension experienced were significantly related, RAI did not mediate the relationship between supervisor contingent-punishment behaviour and pressure and tension experienced.

Table 5.10: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Pressure and Tension Experienced in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	8.9%	$\beta = -0.12, p < 0.10$, 1.3%
(step 3): POS	-	$\beta = -0.03$, *ns*
RAI	-	$\beta = -0.33, p < 0.001$, 9.0%
(step 2): distributive justice	7.8%	$\beta = -0.08$, *ns*, 0.6%
(step 3): distributive justice	-	$\beta = 0.00$, *ns*
RAI	-	$\beta = -0.34, p < 0.001$, 10.1%
(step 2): supervisor contingent-reward behaviour	8.5%	$\beta = -0.08$, *ns*, 0.6%
(step 3): supervisor contingent-reward behaviour	-	$\beta = -0.06$, *ns*
RAI	-	$\beta = -0.32, p < 0.001$, 9.3%
(step 2): supervisor contingent-punishment behaviour	8.6%	$\beta = 0.03$, *ns*, 0.1%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.04$, *ns*
RAI	-	$\beta = -0.28, p < 0.001$, 7.2%

Evaluation of hypotheses. The results of the regression analyses presented in this section support hypothesis 6c as the RAI score exhibited significant negative relationships with the pressure and tension experienced while using IT in all regression cases.

Perceived Competence

As can be seen in Table 5.11, POS, distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour did not exhibit significant relationships with perceived IT competence.

Situational Motivation as a Mediator Variable

As seen in Table 5.11, in the cases of POS, distributive justice, and supervisor contingent-reward behaviour, RAI and perceived IT competence were significantly related. In the case of supervisor contingent-punishment behaviour, RAI and perceived IT competence were marginally related. However, in all of the cases, RAI did not mediate the relationship between the work climate variable and perceived IT competence. The results of the regression analyses presented in this section largely support hypothesis 6b as the RAI score exhibited significant positive relationships with perceived competence in three regression cases, and a marginally significant positive relationship in a fourth case.

Table 5.11: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Perceived Competence Experienced in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	28.1%	$\beta = 0.08$, *ns*, 0.5%
(step 3): POS	-	$\beta = 0.04$, *ns*
RAI	-	$\beta = 0.15, p < 0.01$, 2.0%
(step 2): distributive justice	27.4%	$\beta = 0.07$, *ns*, 0.4%
(step 3): distributive justice	-	$\beta = 0.04$, *ns*
RAI	-	$\beta = 0.15, p < 0.01$, 2.0%
(step 2): supervisor contingent-reward behaviour	28.3%	$\beta = 0.05$, *ns*, 0.3%
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.04$, *ns*
RAI	-	$\beta = 0.15, p < 0.01$, 2.1%
(step 2): supervisor contingent-punishment behaviour	30.6%	$\beta = -0.01$, *ns*, 0.0%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = -0.01$, *ns*
RAI	-	$\beta = 0.10, p < 0.10$, 0.8%

IT Usage

As can be seen in Table 5.12, POS, distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour did not exhibit significant relationships with IT usage.

Situational Motivation as a Mediator Variable

As seen in Table 5.12, in the case of POS, RAI and IT usage showed a marginally significant positive relationship. In the case of distributive justice, RAI and IT usage were significantly and positively related. In the cases of supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour, RAI and IT usage were not significantly related. The results of the regression analyses presented in this section are therefore insufficient to fully support hypothesis 5. In all of the cases, RAI did not mediate the relationship between the work climate variable and IT usage.

Table 5.12: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and IT Usage: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	54.8%	$\beta = 0.00$, *ns*, 0.0%
(step 3): POS	-	$\beta = -0.02$, *ns*
RAI	-	$\beta = 0.09$, $p < 0.10$, 0.7%
(step 2): distributive justice	54.8%	$\beta = -0.02$, *ns*, 0.0%
(step 3): distributive justice	-	$\beta = -0.04$, *ns*
RAI	-	$\beta = 0.10$, $p < 0.05$, 0.9%
(step 2): supervisor contingent-reward behaviour	55.2%	$\beta = 0.01$, *ns*, 0.0%
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.00$, *ns*
RAI	-	$\beta = 0.08$, *ns*, 0.5%
(step 2): supervisor contingent-punishment behaviour	55.0%	$\beta = 0.02$, *ns*, 0.0%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.02$, *ns*
RAI	-	$\beta = 0.07$, *ns*, 0.5%

Additional Analyses using the Different Forms of Situational Motivation

As no significant relationship was found between each of the work climate variables and IT usage, motivational mediation is not possible between these variables. However, in order to gain a better understanding of how the different forms of situational motivation were related to IT usage, I performed further regression analyses. These analyses consisted of substituting the different forms of situational motivation for the RAI score previously used in the regressions. The results of these additional analyses are shown in Table 5.13. Intrinsic motivation was significantly and positively related to IT usage in the cases of POS, distributive justice, supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour. Identified regulation exhibited marginally significant positive relationships with IT usage in the cases of POS, distributive justice, and supervisor contingent-reward behaviour. Only those forms of situational motivation that exhibited significant effects are shown in Table 5.13.

I performed an additional set of regression analyses in order to understand how the different forms of situational motivation were related to IT usage, irrespective of the work climate variables. These general two-step regressions examined the impact of each form of situational motivation on IT usage. As can be seen in Table 5.14, intrinsic motivation and identified regulation were significantly and positively related to IT usage, while external regulation and amotivation were not significantly related to IT usage. In these regression analyses, the control variables alone accounted for 55.0% of the variance in IT usage.

Table 5.13: The Different Forms of Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and IT Usage: Regression Analyses

Variables Entered	Regression Statistics (β, p, % of additional variance accounted for)
(step 3): POS	$\beta = -0.03$, *ns*
intrinsic motivation	$\beta = 0.12, p < 0.01$, 1.3%
(step 3): POS	$\beta = -0.02$, *ns*
identified regulation	$\beta = 0.09, p < 0.10$, 0.6%
(step 3): distributive justice	$\beta = -0.05$, *ns*
intrinsic motivation	$\beta = 0.13, p < 0.01$, 1.6%
(step 3): distributive justice	$\beta = -0.03$, *ns*
identified regulation	$\beta = 0.09, p < 0.10$, 0.7%
(step 3): supervisor contingent-reward behaviour	$\beta = 0.00$, *ns*
intrinsic motivation	$\beta = 0.11, p < 0.05$, 1.1%
(step 3): supervisor contingent-reward behaviour	$\beta = 0.00$, *ns*
identified regulation	$\beta = 0.08, p < 0.10$, 0.6%
(step 3): supervisor contingent-punishment behaviour	$\beta = 0.02$, *ns*
intrinsic motivation	$\beta = 0.11, p < 0.05$, 1.1%

Table 5.14: The Impact of the Different Forms of Situational Motivation on IT Usage: Regression Analyses

Relationship	Regression Statistics (β, p, % of additional variance accounted for)
intrinsic motivation → IT usage	$\beta = 0.12, p < 0.01$, 1.4%
identified regulation → IT usage	$\beta = 0.09, p < 0.05$, 0.8%
external regulation → IT usage	β = -0.01, *ns*, 0.0%
amotivation → IT usage	β = -0.04, *ns*, 0.2%

As a result of performing these additional regression analyses (as shown in Table 5.13 and Table 5.14), those that included work climate variables in the regression model and those that did not, it can be seen that intrinsic motivation exhibited a slightly stronger relationship with IT usage than identified motivation. As opposed to these more self-determined forms of motivation, in all cases the controlled form of situational motivation, i.e., external regulation, and amotivation did not exhibit significant relationships with IT usage.

Additional Analyses using Assigned User-Levels

The full IT usage regressions were performed a second time using different user-levels, assigned based on employees self-reported IT usage. The detailed rationale for this re-analysis, the regression results, and a comparison of the two sets of regressions can be found in Appendix E.

These regression analyses provided additional information on the nature of the relationship between situational motivation and IT usage (these differences over the self-reported user-level analyses are highlighted below in *italics*). Hypothesis 5 suggested that self-determined motivation was positively related to IT usage. *Using the new "assigned" user-levels, RAI scores and IT usage scores showed significant positive relationships in all four cases of the work climate variables. These regression results therefore support hypothesis 5.* Intrinsic motivation exhibited, by far, the strongest relationship with IT usage as the relationships were significant and positive in all cases. Identified regulation also exhibited positive relationships with IT usage *in all cases*, however the relationship was weaker. As opposed to these more self-determined forms

of motivation, in all cases the controlled form of situational motivation, i.e., external regulation, did not exhibit significant relationships with IT usage. *Amotivation also exhibited a negative relationship with IT usage, but the relationship was weaker and not altogether significant in all cases.*

A Summary of the Regression Analyses

Independent variables to mediator: analyses. The RAI provided an evaluation of the degree to which employees are self-determined in their motivation to use IT. Both perceived organizational support and distributive justice were found to be positively related to the RAI. This indicates that employees' evaluation of the degree of organizational support provided to them is directly related to the level of their motivation to use IT. Furthermore, employees' evaluation of the equitability of the organizational rewards that they receive is also directly related to the level of their motivation to use IT.

Acceptance of an organizational IT change. Perceived organizational support and distributive justice were both positively related to employee acceptance of an organizational IT change. To use POS and employee acceptance of an organizational IT change as an example, a positive relationship means that higher levels of POS are associated with higher levels of employee acceptance of an organizational IT change (while lower levels of POS are associated with lower levels of employee acceptance of an organizational IT change).

Employee situational motivation to use IT completely mediated (i.e., completely accounted for) the following relationships: (1) POS and employee acceptance of an organizational IT change, and (2) distributive justice and employee acceptance of an

organizational IT change. In both cases, the mediating effect of RAI was a positive one; higher RAI scores were associated with higher levels of employee acceptance of an organizational IT change.

Enjoyment and interest. Perceived organizational support, distributive justice, and supervisor contingent-reward behaviour were all positively related to employee enjoyment and interest in using IT. Employee situational motivation to use IT mediated (i.e., accounted for) the following relationships: (1) POS and employee enjoyment and interest in using IT, and (2) distributive justice and employee enjoyment and interest in using IT. In both cases, the mediating effect of RAI was a positive one; higher RAI scores were associated with higher levels of employee enjoyment and interest in using IT.

Pressure and tension. POS was negatively related to the pressure and tension experienced by employees in using IT. A negative relationship means that higher levels of POS are associated with lower levels of pressure and tension (while lower levels of POS are associated with higher levels of pressure and tension). Employee situational motivation to use IT mediated (i.e., accounted for) the relationship between POS and pressure and tension experienced by employees in using IT. The mediating effect of RAI was negative; this means that in addition to higher levels of POS being associated with less IT pressure and tension, higher levels of situational motivation were associated with less IT pressure and tension.

Perceived IT competence. The work climate variables were not significantly related to the level of IT competence perceived by employees. This suggests that employees derive their evaluations of perceived IT competence from sources other than POS, distributive justice, supervisor contingent-reward behaviour, and supervisor

contingent-punishment behaviour. Employee situational motivation to use IT and perceived IT competence were positively related in all cases.

IT usage. The work climate variables were not significantly related to IT usage. Thus POS, distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour were not found to be important factors in determining employees' IT usage in this sample. However, the control variables (user-level, hospital-site, length of system usage, and whether or not employees were employed during the implementation) seemed to be exceptionally important in determining IT usage, explaining approximately 55% of the variance in IT usage.

Using the additional information provided by the assigned user-level regressions, employee situational motivation to use IT and IT usage were positively related in all cases. Intrinsic motivation was positively related with IT usage, as was identified regulation (though the relationship was weaker). Amotivation was largely negatively related with IT usage.

Post-Hoc Analyses

Differences in Supervisor Reward Behaviour for Physician Supervisors

The majority of system users were clerical employees, as discussed. Some employees worked directly for a physician, and as such a question to this effect was included in the questionnaire. The results revealed that 83 respondents (24.7%) indicated that their supervisor was a physician, 210 respondents indicated that their supervisor was not a physician (62.5%), and 43 respondents (12.8%) opted not to provide this information. A one-way ANOVA revealed that while there was no significant difference

in the two groups for supervisor contingent-punishment behaviour, a highly significant difference existed in the two groups for supervisor contingent-reward behaviour, $F(1, 289) = 14.88, p < 0.001$. Employees supervised by a physician indicated a higher level of supervisor contingent-reward behaviour ($M = 4.58$, $SD = 1.57$, $n = 83$) than did employees supervised by a non-physician ($M = 3.80$, $SD = 1.55$, $n = 208$).

Differences in Motivation based on the Timing of Training

Differences in levels of self-determined motivation were shown for users who received their training close in time to their first use of the system, compared to those users that did not. Specifically, the 178 respondents who provided this information were divided into two groups: employees who received training in the same month as they started using the system, and employees who did not receive their training in the same month as they started using the system. The results of a one-way ANOVA revealed a significant difference in RAI scores, $F(1,171) = 5.87, p < 0.05$. Users who had their training dates and system start dates coincide (i.e., in the same month) showed higher RAI scores ($M = 6.30$, $SD = 6.86$, $n = 85$) than did users whose training dates and system start dates did not coincide ($M = 2.99$, $SD = 10.66$, $n = 88$).

Correlations with Length of Training Program

A two-tailed Pearson correlation showed a significant positive correlation between length of system training and perceived IT competence, $r = 0.30, p < 0.001$, $n = 313$. A two-tailed Pearson correlation also showed a significant positive correlation between length of system training and IT usage, $r = 0.53, p < 0.001, n = 283$.

Length of Time taken by Employees to Switch from Paper to the IT

In the questionnaire, respondents were asked to indicate the month and year in which they stopped using a paper-based appointment system. By subtracting this figure from the respondent's months of use of the system, I determined how long it took each respondent to stop using the paper-based system. I considered only those respondents who went directly from a paper-based appointment book to this new IT, and only those respondents who provided full information to these questions. This gave a total of 68 respondents. The results of this calculation indicated that 76.5% of these 68 respondents (52 employees) stopped using a paper-based book in their first month of system use, 10.3% (7 respondents) stopped prior to two months of system use, 4.4% (3 respondents) stopped prior to four months of system use, and the remaining 8.8% (6 respondents) stopped after sixteen months of system use up to a maximum of 3.5 years for one respondent.

Respondents' Additional Comments: A Qualitative Discussion

Additional comments were not expressly solicited in the questionnaire from respondents, however approximately fifteen percent of the questionnaires were returned with additional comments. In this section, I review those comments in an effort to provide a richer description of the results over and above the quantitative research methodology employed. This section is not intended to be a rigorous or coded qualitative analysis, but rather to shed additional light on the quantitative results discussed. In order to ensure the confidentiality of those respondents who included additional comments, I refer to all respondents as female employees.

Work climate. A number of comments were made regarding the general work climate. These comments are important to consider in view of the significant relationships that were found between work climate, situational motivation, and attitudes toward IT. As I mentioned, perceived organizational support in this sample had a mean of 3.90 out of 7.00 ($n = 326$, $SD = 1.08$). The mean indicates an overall evaluation of organizational support as just below neutral (i.e., the middle value is four on a seven-point scale). Eight respondents noted that it was not their hospital or organization that cared about their satisfaction at work and provided them with feedback and support; rather it was their department or supervisor. Two of these employees indicated that they therefore could not answer the POS section of the questionnaire. Four of these employees (that did complete this section) indicated that if the same questions would have been asked about the support they perceived from their department or their supervisor, their answers would have been much higher.

Distributive justice in this sample had a mean of 2.66 out of 5.00 ($n = 303$, $SD = 1.01$). The mean indicates an overall evaluation of distributive justice as somewhat below neutral (i.e., the middle value is three on a five-point scale). In the introduction to this part of the questionnaire, I had indicated that "recognition, pay, and physical facilities are examples of rewards" (see Appendix A). Despite this, nine clerical employees indicated that, in their opinion, there were no rewards provided to them in their jobs. With one exception, these respondents did not answer the measure of distributive justice in the questionnaire and as such their perceptions could not be included in the data analysis. Seven respondents indicated that their administrative supervisors were very rarely aware of their daily job performance due to the limited

contact that they had. Another respondent indicated that she received no feedback whatsoever from her supervisor.

The system. A number of comments were made concerning the specific patient scheduling and appointment management system itself. Comments were mixed. Two users described the system as user-friendly for their limited purposes, and another user commented that while she would not describe it as fun to use, it is a useful system. One user commented that it is a good tool for compiling statistics, and it is very easy to see patient appointments in other clinics using the system. Another user indicated that the system is a very good patient database system, very user-friendly and efficient, and makes her job easier. One system user indicated that she enjoys using the system in general but is frustrated because it is very slow.

Other users had a more negative evaluation of the system. Two users indicated that the IT was not user-friendly, as booking appointments was now a long and cumbersome process. A third clerical employee indicated that her computer frequently crashed while running the software which resulted in increased feelings of tension while using the system, and at work in general. Another user indicated that she did not use the system regularly because she did not find it to be useful.

Two users indicated that they largely used the system because they were required to use it, as the system was too inflexible in some ways. They mentioned, for example, that too many steps are involved in booking an appointment. Patients often needed to be fit in, which can only be determined by seeing exactly which patients are booked on a particular day. The main booking screen simply indicates whether a time slot is taken or not. As a result, the user has to preview the schedule for each day until a short

appointment is found. As the times required for the appointments vary by patient, allocating a fixed appointment time leads to difficulty. Furthermore, once an appointment is reserved using the system, if the patient changes his/her mind, this involves many more steps, i.e., essentially starting the process from the beginning.

Other system inflexibilities reported by these two users included difficulty in printing patient demographic information, and the inability to print the messages or comments in the day's schedule. These messages therefore need to be re-written on the printout or typed by computer, which is a tedious, complicated process that often leads to omissions. Similarly, additional comments (e.g., the doctor was on service, on vacation, the clinic was cancelled) are not permitted in statistical reports. These comments must again be handwritten; otherwise the statistics do not give accurate information. One user suggested that the IT is deficient in the case where a doctor has non-clinical appointments and meetings, as well as administrative and teaching responsibilities, to be scheduled within his/her clinical activities. Furthermore, in the case where a doctor works together with a technician in a clinic, their schedules must be viewed and printed separately. It is not possible to generate a combined schedule sorted by time. This leads to booking errors. For example, patients may be booked with the technician and the doctor too close together. Another user indicated that she must still use a paper-based appointment book as the doctors and technicians require seeing their full schedule of appointments for the whole day.

Training. A number of user comments concerned training. One user indicated that she would need additional system and Windows training to be able to use the system properly. Another user indicated that while she had received one day of training, she felt

that all users would have benefited greatly from the full three days of training. To illustrate this point, one clerical employee indicated that as a result of the system implementation, she was concerned that she now performed her job too slowly. Another user expressed feelings of apprehension in making mistakes using the new IT, and hoped that these feelings would dissipate once she had mastered the features of the system more fully. One user noted that her system training preceded her actual use of the system by one month, which became a problem as she had forgotten much of the technical information in the intervening month. Another user noted that it was a problem to have employees of such diverse computer competencies in the same training group. Some employees had never before used the Windows operating system or a mouse. This led to apprehension for some trainees, as well as boredom for the more advanced trainees, as basic computer features were explained in detail.

Two users commented that in the case of this system implementation, hospital employees were switched to a new job without participating in necessary information sessions and formal training to perform an adequate and personally-satisfying job. This creates a situation where users are relegated only to partial system usage, without being able to fully appreciate the true potential of the system. One user commented that after two years of using the system, she still did not understand all the system capabilities due to a lack of training and a lack of time to explore the software in her clinic. Another clerical employee indicated that having a computer at home to practice would allow her to become much more comfortable with computers in general. In her opinion, such a purchase was not altogether possible within the confines of her salary. As such, she felt that the system training provided to her was insufficient.

In summary, while some employees perceived greater support from their supervisors compared to their organization, other employees indicated that they had limited contact with their supervisors. Some employees had positive comments about the system; other employees were frustrated by its limitations. Several employees communicated that they would benefit from additional system training and made suggestions for improving the delivery of training.

CHAPTER 6: DATA ANALYSIS AND RESULTS FOR STUDY TWO: A PHARMACY INFORMATION SYSTEM

The same procedure was employed with this data set as with the data from Study One. Using SPSS, reliability analyses of the measures and correlation analyses of the research constructs were conducted. The research model and its related hypotheses were tested using multiple regression analysis.

Preparation of the Data for Analysis

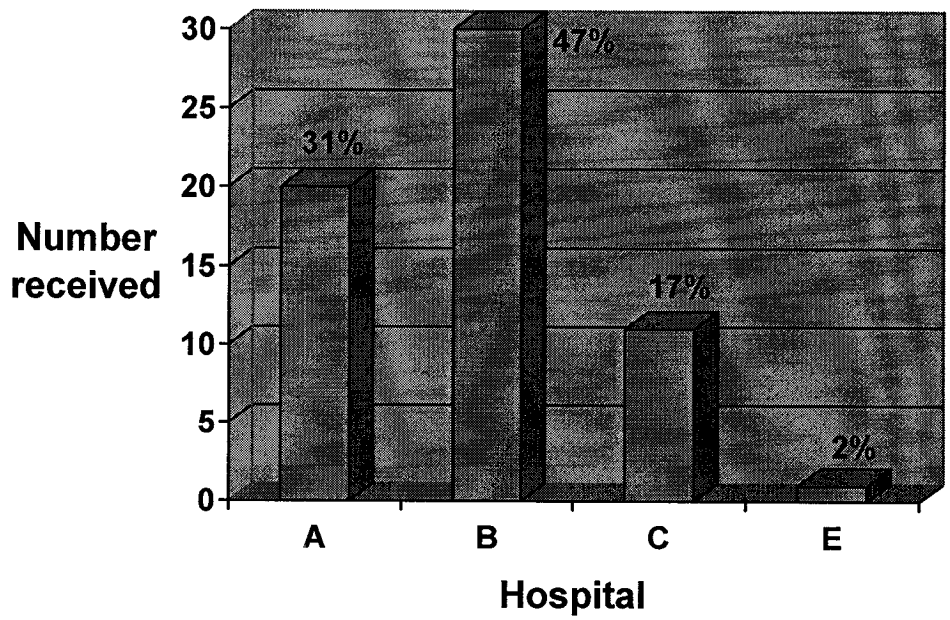
All completed questionnaires were used in the data analysis. As in Study One, mean-substitution was used across the full sample to salvage incomplete respondent cases from being rejected from the regression analyses.

Demographic Characteristics of the Respondents

A total of 64 completed web-surveys was received out of a revised sample size of 169 system users for a response rate of 37.9%. As shown in Figure 6.1, the web-surveys were mainly received from the three hospitals with the main pharmacy departments as follows. At Hospital A, 20 completed web-surveys were received (31.3% of respondents). At Hospital B, 30 completed web-surveys were received (46.9% of respondents). At Hospital C, 11 completed web-surveys were received (17.2% of respondents). No web-surveys were received from Hospital D as its pharmaceutical services are provided by Hospital B. At Hospital E, which has fewer than ten pharmacy staff members, one completed web-survey was received (1.6% of respondents). Two respondents did not specify their hospital site (3.1% of respondents). As some Pharmacy employees worked at more than one hospital site, employees were asked to indicate their

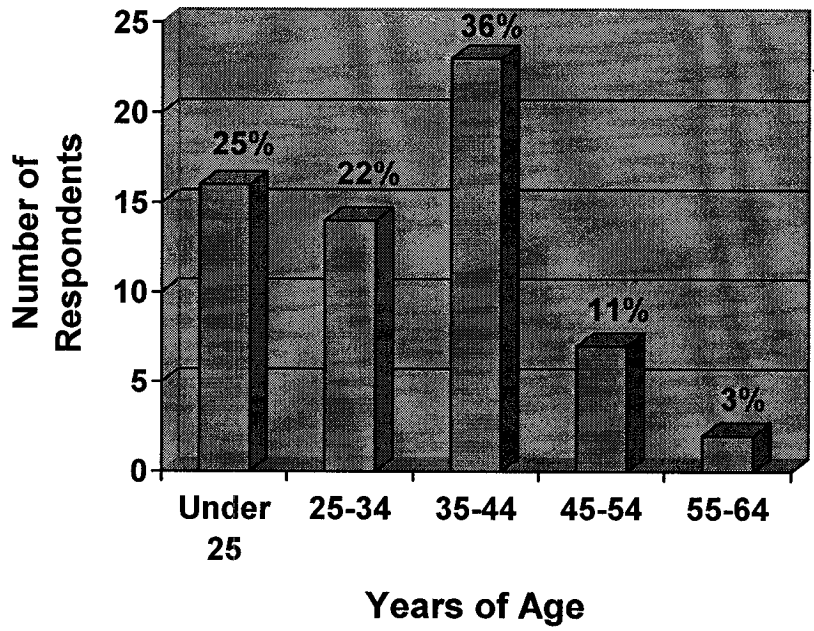
principal site when answering the web-survey. Therefore, potential respondents for each hospital site could not be calculated and is therefore not indicated in Figure 6.1.

Figure 6.1: Completed Web-Surveys Received By Hospital Source



Forty-six users (71.9% of respondents) were female, 16 users (25.0% of respondents) were male, and 2 users (3.1% of respondents) did not provide this information. As can be seen in Figure 6.2, 16 users (25.0% of respondents) reported their age as under 25 years of age, 14 users (21.9% of respondents) 25 to 34 years of age, 23 users (35.9% of respondents) 35 to 44 years of age, 7 users (10.9% of respondents) 45 to 54 years of age, 2 users (3.1% of respondents) 55 to 64 years of age, and 2 users (3.1% of respondents) did not provide this information.

Figure 6.2: Age of Respondents

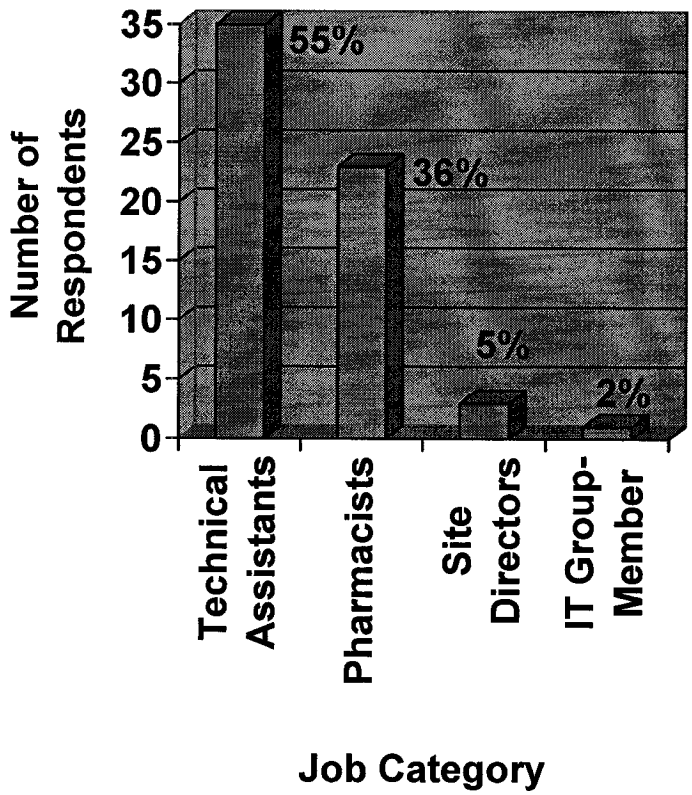


Four employees (6.3% of respondents) reported that their highest level of formal education was high school, 14 employees (21.9% of respondents) College or CEGEP, 9 employees (14.1% of respondents) Undergraduate degree, 18 employees (28.1% of respondents) Graduate degree, 16 employees (25.0% of respondents) Professional designation, and 3 employees (4.7% of respondents) did not provide this information. A total of 15 respondents (23.4%) answered in English, while 49 respondents (76.6%) answered in French.

As can be seen in Figure 6.3, 35 users (54.7% of respondents) were pharmacy technical assistants, 23 users (35.9% of respondents) were pharmacists, 3 users (4.7% of respondents) were assistant directors or site managers, and one user (1.6% of respondents) was a member of the system's IT group. Two persons (3.1% of

respondents) opted not to provide this information. Fifty persons (78.1% of respondents) reported that they were full-time employees, while 12 persons (18.8% of respondents) reported that they were part-time employees. Two persons (3.1% of respondents) did not provide this information.

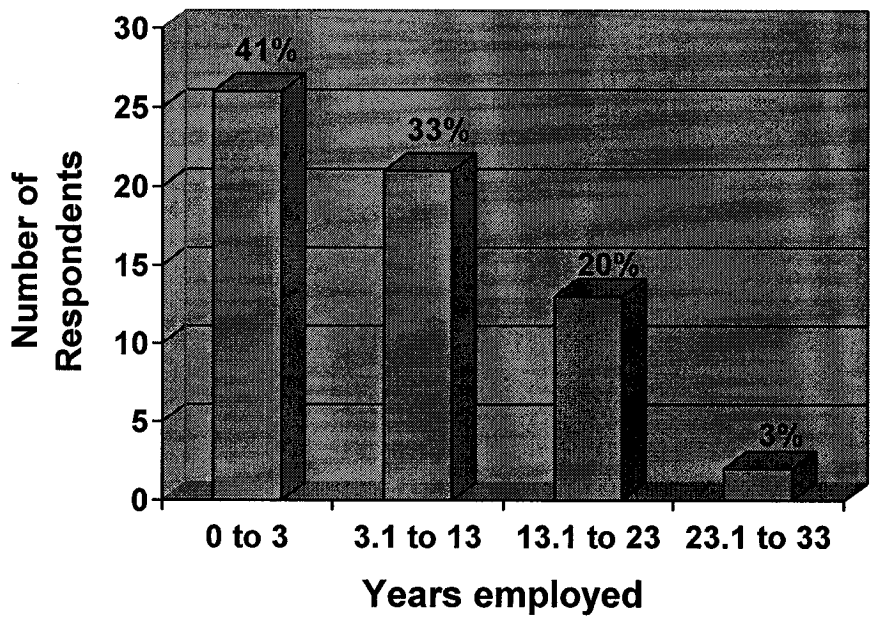
Figure 6.3: Breakdown of Respondents by Job Category



The average number of years that employees reported being employed at their hospital (i.e., organizational tenure) was 8.28 years ($n = 62$, $SD = 7.62$ years). As is shown in Figure 6.4, 26 respondents (40.6%) indicated that they had been employed at their hospital for three years or less. Twenty-one respondents (32.8%) indicated that they had been employed at their hospital over three years and up to and including thirteen

years. Thirteen respondents (20.3%) indicated they had been employed at their hospital over thirteen years and up to and including twenty-three years. Two respondents (3.1%) indicated that they had been employed at their hospital over twenty-three years up to a maximum of thirty-three years. Two respondents (3.1%) did not report this information.

Figure 6.4: Breakdown of Respondents by Organizational Tenure

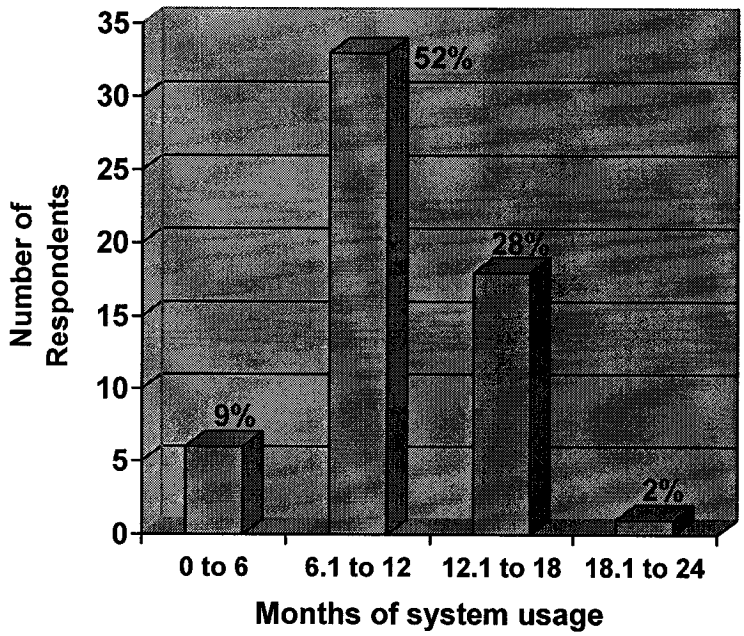


Employees' self-reported months of system usage were used rather than assigning a value based on the implementation dates provided to me by hospital site. For those employees that were employed before the system implementation, the self-reported values did not differ very much from the calculated values. Furthermore, the self-reported information is preferable in this case as it would include possible vacation periods (the implementation at certain sites occurred in the summer) and job transfers to a different pharmacy site within the Hospital Centre. As the data collection occurred over

a period of three months, data that involved a calculation of months (e.g., months of system usage) was adjusted to reflect the month in which the questionnaire was completed.

Users had been using the system, on average, for just under one year. Specifically, the average number of months that users reported using the system was 10.62 ($n = 58$, $SD = 3.88$ months). As shown in Figure 6.5, six respondents (9.4%) indicated that they had been using the system for six months or less. Thirty-three respondents (51.6%) indicated that they had been using the system for more than six months and up to one year. Eighteen respondents (28.1%) indicated that they had been using the system for more than one year and up to eighteen months. One respondent (1.6%), a member of the system's IT team, indicated use of the system for 23 months. Six respondents (9.4%) did not provide full information to this question.

Figure 6.5: Breakdown of Respondents by Months of System Usage



Forty-nine system users (76.6% of respondents) indicated that they were employed in their current job at their hospital before the IT implementation took place. Thirteen users (20.3% of respondents) were not employed before the implementation, and 2 users (3.1% of respondents) did not provide this information.

With respect to training, respondents were asked to indicate the number of hours of system training that they received. Two users indicated that they had received 120 and 200 hours respectively of system training, which was not possible based on the information provided by the Hospital Centre. Their responses to this question were therefore treated as missing. As such, the average length of training that users reported was 5.29 hours ($n = 57$, $SD = 4.82$ hours, minimum = 0.50 hours, maximum = 30.00 hours). Two users (3.1% of respondents) reported that they received one hour or less of

training. Eighteen users (28.1% of respondents) reported that they had received two or three hours of system training. Twenty users (31.3% of respondents) reported that they had received four or five hours of system training. Eight users (12.5% of respondents) reported that they had received six or seven hours of system training. Four users (6.3% of respondents) reported that they had received eight hours of system training. Two users (3.1% of respondents) reported that they had received ten hours of system training. Three users (4.7% of respondents) reported that they had received twelve hours or more of system training. Seven employees (10.9% of respondents) opted not to provide this information.

Descriptive Statistics

The descriptive statistics for the main constructs of the research model are presented in Table 6.1. All scales used a seven-point Likert scale with the exception of the distributive justice measure, which used a very anchor-specific five-point scale. Decimal values can be found in the values presented in Table 6.1 as a result of the mean-substitution procedure previously discussed.

The main research model variables were tested for skewness and kurtosis. All variables were found to be satisfactory: statistics ranged from a minimum of -0.88 to a maximum of 0.92 for skewness, and from a minimum of -0.89 to a maximum of 1.00 for kurtosis.

Table 6.1: Descriptive Statistics for the Research Model Constructs

Construct	n	Minimum Recorded Response	Maximum Recorded Response	Mean	Standard Deviation
Perceived Organizational Support	64	1.00	6.35	4.26	1.09
Distributive justice	62	1.00	5.00	2.98	0.95
Supervisor contingent-reward behaviour	64	1.00	6.10	3.67	1.35
Supervisor contingent-punishment behaviour	64	1.20	7.00	4.48	1.08
Intrinsic motivation	63	1.50	6.25	4.07	1.15
Identified regulation	63	1.50	6.25	4.57	1.03
External regulation	63	2.25	7.00	5.58	0.99
Amotivation	62	1.00	6.25	2.75	1.25
RAI	62	-19.25	16.50	2.82	7.55
Interest / enjoyment	60	1.33	7.00	4.39	1.26
Perceived competence	61	1.60	7.00	4.84	1.40
Pressure / tension	61	1.00	5.40	2.51	1.06
Acceptance of an organizational IT change	62	2.88	6.75	5.11	0.94

Reliability Analysis

Scores for scale items were reversed where appropriate. As in Study One, the reliability of the measurement scales used in the questionnaire was accomplished using Cronbach's alpha reliability index. The results of the reliability analyses are given in Table 6.2.

Table 6.2: Results of Cronbach Alpha Reliability Analyses

Measure	Number of items in the measure	Number of cases in the reliability analysis	Cronbach's Alpha
Perceived Organizational Support	17	63	0.94
Distributive justice	6	62	0.92
Supervisor contingent-reward behaviour	10	63	0.95
Supervisor contingent-punishment behaviour	5	63	0.92
Intrinsic motivation	4	62	0.87
Identified regulation	4	63	0.75
External regulation	4	63	0.67
Amotivation	4	62	0.88
Interest / enjoyment	6	60	0.88
Perceived competence	5	60	0.91
Pressure / tension	5	60	0.63
Acceptance of an organizational IT change	8	61	0.84

Following current practice in the social sciences, an internal consistency coefficient of at least 0.70 is suggested (Whitley, 2002). Based on the results of the reliability analyses in Table 6.2, the measurements scales were found to show high reliability with the exception of external regulation and pressure/tension. However, the corresponding alpha coefficients for these measures in Study One, as discussed in the previous chapter, indicated that these two measures were reliable. Specifically, the values in Study One were 0.85 for external regulation and 0.71 for pressure/tension. The reliability analyses indicated that these alpha coefficients in Study Two could be increased by dropping a specific item for each measure (Alpha = 0.69 upon dropping item "Why do you use the *Pharmacy Assistant* system: because I am supposed to use it"; Alpha = 0.72 upon dropping item "I feel pressured about using the *Pharmacy Assistant* system"; see Appendix B). Despite this fact, the full number of items was retained for each measure in this study. In this way, the results of Studies One and Two are directly

comparable. Furthermore, the acceptable reliabilities for these two measures based on a much larger sample size in Study One suggest that with a larger sample size in Study Two, the reliability analyses would also be within acceptable limits.

Correlation Analysis

Pearson's correlation coefficient (2-tailed) was computed for all variables included in the research model. The correlation matrix between all the variables in this study can be found in Table 6.3. In all correlations, the number of cases (n) varied slightly from a minimum of 60 cases to a maximum of 64 cases.

Correlations among the Different Forms of Motivation

The results in Table 6.3 demonstrate the expected quasi-simplex pattern for the different forms of motivations that has been identified in Self-Determination Theory and that was found in Study One. Intrinsic motivation exhibits a highly significant positive correlation with identified regulation, $r = 0.67, p < 0.001$; a significant negative correlation with external regulation, $r = -0.30, p < 0.05$; and an even more highly significant negative correlation with amotivation, $r = -0.54, p < 0.001$. Identified regulation shows a significant negative correlation with external regulation, $r = -0.39$, $p < 0.01$; and a more highly significant negative correlation with amotivation, $r = -0.69$, $p < 0.001$. External regulation displays a significant positive correlation with amotivation, $r = 0.30, p < 0.05$.

Table 6.3: Correlation Matrix for all Variables in the Research Model

	POS	DJ	SCR	SCP	IM	IREG	EREG	AMOT	ENJOY	COMP	PRESS	OCHANGE
POS	1.00	.73***	.64***	-.01	.34**	.50***	-.25†	-.53***	.45***	.21	-.26*	.25*
DJ		1.00	.65***	.02	.32*	.49***	-.26*	-.50***	.37**	.12	.00	.29*
SCR			1.00	-.04	.33**	.41***	-.23†	-.44***	.41***	.15	-.05	.13
SCP				1.00	.13	.19	-.04	-.06	.19	-.03	.22†	.05
IM					1.00	.67***	-.30*	-.54***	.78***	.05	-.14	.57***
IREG						1.00	-.39**	-.69***	.71***	.24†	-.22†	.68***
EREG							1.00	.30*	-.38**	-.06	.18	-.20
AMOT								1.00	-.65***	-.32*	.16	-.64***
ENJOY									1.00	.22†	-.33**	.62***
COMP										1.00	-.55***	.30*
PRESS											1.00	-.23†
OCHANGE												1.00

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$ † $p < 0.10$

POS = Perceived Organizational Support; DJ = Distributive justice; SCR = Supervisor contingent-reward behaviour; SCP = Supervisor contingent-punishment behaviour; IM = Intrinsic motivation; IREG = Identified regulation; EREG = External regulation; AMOT = Amotivation; ENJOY = Interest/enjoyment; COMP = Perceived competence; PRESS = Pressure/tension; OCHANGE = Acceptance of an organizational IT change.

Correlations between the Work Climate Variables and Motivation

Hypothesis 1 suggests that POS is positively related to self-determined motivation. Supportive evidence is provided by the significant and decreasing pattern of correlations between POS and the forms of motivations, from the most self-determined type to the least: intrinsic motivation, $r = 0.34, p < 0.01$; identified regulation, $r = 0.50$, $p < 0.001$; external regulation, $r = -0.25, p < 0.10$; and amotivation, $r = -0.53, p < 0.001$. A similar pattern of significant and overall decreasing correlation coefficients can be found between distributive justice and the different forms of motivation, supporting hypothesis 2: intrinsic motivation, $r = 0.32, p < 0.05$; identified regulation, $r = 0.49$, $p < 0.001$; external regulation, $r = -0.26, p < 0.05$; and amotivation, $r = -0.50, p < 0.001$.

There is a significant positive relationship between supervisor contingent-reward behaviour and intrinsic motivation, $r = 0.33, p < 0.01$; which provides evidence that contradicts hypothesis 3a. There is a significant positive relationship between supervisor contingent-reward behaviour and identified regulation, $r = 0.41, p < 0.001$; which provides evidence that contradicts hypothesis 3b. Supervisor contingent-reward behaviour and external regulation exhibit a marginally significant negative correlation with each other, $r = -0.23, p < 0.10$; which provides evidence that contradicts hypothesis 3c. There is a significant negative relationship between supervisor contingent-reward behaviour and amotivation, $r = -0.44, p < 0.001$; which provides evidence that supports hypothesis 3d. No significant relationships were found between supervisor contingent-punishment behaviour and the different forms of motivation.

Correlations between Motivation and the Outcome Variables

Supportive evidence for hypothesis 6a is provided by the highly significant decreasing pattern of correlations between interest and enjoyment in using the system and motivation, from the most self-determined type to the least: intrinsic motivation, $r = 0.78$, $p < 0.001$; identified regulation, $r = 0.71$, $p < 0.001$; external regulation, $r = -0.38$, $p < 0.01$; and amotivation, $r = -0.65$, $p < 0.001$.

The following relationships found between perceived competence and the different forms of motivation are insufficient to evaluate the validity of hypothesis 6b: intrinsic motivation, $r = 0.05$, *ns*; identified regulation, $r = 0.24$, $p < 0.10$; external regulation, $r = -0.06$, *ns*; and amotivation, $r = -0.32$, $p < 0.05$. No significant relationships were found in this study between pressure and tension experienced in using the system and the different forms of motivation.

Supportive evidence for hypothesis 7 is provided by the largely highly significant and decreasing pattern of correlations between employee acceptance of an organizational IT change and motivation, from the most self-determined type to the least: intrinsic motivation, $r = 0.57$, $p < 0.001$; identified regulation, $r = 0.68$, $p < 0.001$; external regulation, $r = -0.20$, *ns*; and amotivation, $r = -0.64$, $p < 0.001$.

Correlations between the Work Climate Variables and the Outcome Variables

As only partial mediation by situational motivation was proposed in the research model, the direct relationships between the independent variables and the dependent variables were also examined. POS exhibits significant correlations with the following variables: a positive correlation with interest and enjoyment in using the IT, $r = 0.45$,

$p < 0.001$; a positive correlation with acceptance of an organizational IT change, $r = 0.25$, $p < 0.05$; and a negative correlation with IT pressure and tension, $r = -0.26$, $p < 0.05$. There is also a significant positive correlation between distributive justice and both interest and enjoyment in using the IT, $r = 0.37$, $p < 0.01$; and employee acceptance of an organizational IT change, $r = 0.29$, $p < 0.05$. Finally, there is also a significant positive correlation between supervisor contingent-reward behaviour and interest and enjoyment in using the IT, $r = 0.41$, $p < 0.001$. As a whole, the correlation patterns provide preliminary support for the hypothesized mediational relationships.

Correlations among the Different Work Climate Variables

In Table 6.3 it can be seen that the work climate (i.e., independent) variables are highly and significantly correlated with each other, as was the case in Study One. This provides evidence that each variable is tapping different elements of a common construct, namely the overall organizational work climate. There is a significant positive correlation between perceived organizational support and both distributive justice and supervisor contingent-reward behaviour. There is a significant positive correlation between distributive justice and supervisor contingent-reward behaviour. Supervisor contingent-punishment behaviour was not significantly correlated with the other work climate variables in this study.

Correlations among the Different Outcome Variables

The outcome (i.e., dependent) variables are also highly correlated, as was the case in Study One. The pressure and tension experienced by employees in using the system

exhibits a significant negative correlation with interest and enjoyment in using the system as well as with perceived competence in using the system. Employee acceptance of an organizational IT change exhibits a significant positive correlation with interest and enjoyment in using the system as well as with perceived competence in using the system. Employee acceptance of an organizational IT change also displays a marginally significant negative correlation with IT pressure and tension.

Control Variables Used in the Regression Analyses

The numerous control variables included in the questionnaire were evaluated as appropriate control variables, to be considered statistically into the regression analyses to be performed. A concerted effort was made to analyze the data from this study in the same way as the data for Study One, in order that direct comparisons can be made. Thus, the four control variables used in the regression analyses in Study One (user-level, hospital site, length of system usage, and whether or not employees were employed during the IT implementation) were considered first.

This system did not have different user-levels. One-way ANOVAs revealed no significant differences in motivation or the dependent variables in the research model based on hospital site. Considering the small sample size in this study, hospital site was not used as a control variable. A Pearson correlation (2-tailed) revealed that months of system usage exhibited a significant positive relationship with both competence, $r = 0.30$, $p < 0.05$, $n = 57$; and employee acceptance of an organizational IT change, $r = 0.30$, $p < 0.05$, $n = 58$. Thus, length of system usage was used as a control variable in the regression analyses. One-way ANOVAs revealed no significant differences in

motivation or the dependent variables based on whether employees were employed at the time of the system implementation or not. However, a one-way ANOVA revealed a marginally significant difference in employee acceptance of an organizational IT change based on whether employees were employed at the time of the system implementation or not, $F(1, 60) = 3.05, p < 0.10$. Employees who were employed before the IT implementation displayed a higher acceptance of the change. Therefore, following the control variables used in Study One, "employed during the implementation" was used as a control variable in the regression analyses.

One-way ANOVAs revealed significant differences in the following variables based on job type: RAI, $F(3, 57) = 4.89, p < 0.01$; employee interest and enjoyment in using the system, $F(3, 56) = 4.88, p < 0.01$; and employee acceptance of an organizational IT change, $F(3, 58) = 3.66, p < 0.05$. Thus, job type was also used as a control variable in the regression analyses for Study Two. As job type constituted four separate categories, this variable was dummy-coded for use in the regression analyses. By job type, the highest mean scores for RAI and IT interest and enjoyment were as follows: assistant directors and site managers ($n = 3$), IT group-member ($n = 1$), pharmacy technical assistants ($n = 35$), and pharmacists (n for RAI = 22, n for interest/enjoyment = 21). By job type, the highest mean scores for acceptance of an organizational IT change were as follows: IT group-member ($n = 1$), assistant directors and site managers ($n = 3$), pharmacy technical assistants ($n = 35$), and pharmacists ($n = 23$).

A significant difference was found in employee acceptance of an organizational IT change based on full-time versus part-time employment status, $F(1, 60) = 4.78$,

$p < 0.05$. However, this difference was largely subsumed in that of the control variables previously discussed. As such, and in keeping with the control variables used in Study One, employment status was not used as a control variable.

One-way ANOVAs revealed no significant differences in the research model constructs based on the language in which the questionnaires were completed, age, gender, and highest level of formal education completed. In order to evaluate whether early respondents differed from late respondents, a tertiary split of the data by date in which the questionnaires were received was done but revealed no significant differences of any kind in any of the research model constructs. Pearson correlations (2-tailed) revealed that hours of training and organizational tenure did not exhibit any significant relationships with the research model constructs.

In summary, the three control variables to be used in the regression analyses were: length of system usage, whether or not employees were employed during the implementation, and job type.

Regression Analyses

As in Study One, in order to maximize the number of cases used in the regression analyses, a fixed set of cases is not defined and used across all regression analyses. Instead, in each regression, the maximum number of available cases is used in that analysis. Consequently, the number of cases (i.e., *n*) varies slightly across regression analyses, from a minimum of 55 cases to a maximum of 57 cases. When testing the effects on the dependent variables, the four control variables were entered in step one, the independent variable was entered in step two, and the mediator variable was entered in

step three. Separate analyses were done with each independent variable, rather than entering them together, in order to avoid multicollinearity issues.

Independent Variables to Mediator: Analyses

Regression analyses were first performed to examine the impact of each independent variable on situational motivation, as assessed by the RAI score, and are presented in Table 6.4. These regressions represent the first step in testing for mediation. The results of the POS regression analysis demonstrate that the control variables alone account for 24.7% of the variance in the RAI score. The addition of the POS construct accounts for an additional 32.7% of the variance in the RAI score. POS exhibited a significant positive relationship with the RAI score, $\beta = 0.65, p < 0.001$. These results support hypothesis 1. As can be seen in subsequent rows of Table 6.4, distributive justice and supervisor contingent-reward behaviour also exhibited significant positive relationships with the RAI score (supporting hypothesis 2 for distributive justice), while supervisor contingent-punishment behaviour did not exhibit a significant relationship with the RAI score.

In order to evaluate the validity of hypotheses 3 and 4, it was necessary to break down the RAI score into its component forms of situational motivation and conduct separate regression analyses. As seen in the first row of Table 6.5, supervisor contingent-reward behaviour exhibited a significant positive relationship with intrinsic motivation, $\beta = 0.33, p < 0.05$. As can be seen in subsequent rows of Table 6.5, supervisor contingent-reward behaviour exhibited a significant positive relationship with identified regulation, a marginally significant negative relationship with external

regulation, and a significant negative relationship with amotivation (supporting hypothesis 3d). As can be seen in Table 6.6, supervisor contingent-punishment behaviour did not exhibit significant relationships with the different forms of situational motivation.

Acceptance of an Organizational IT Change

As seen in the first row of Table 6.7, the results of the regression analysis between POS and acceptance of an organizational IT change demonstrate that the control variables alone account for 22.3% of the variance in the acceptance of an organizational IT change. In step 2, the addition of the POS construct accounts for an additional 14.2% of the variance in the acceptance of an organizational IT change. The addition of both the POS and RAI constructs in step 3 accounts for an additional 21.2% of the variance in the acceptance of an organizational IT change over step 2. The POS construct by itself exhibited a significant positive relationship with acceptance of an organizational IT change, $\beta = 0.43, p < 0.01$. The addition of RAI as a mediator variable between POS and acceptance of an organizational IT change showed a significant positive effect, $\beta = 0.71$, $p < 0.001$.

As can be seen in subsequent rows of Table 6.7, distributive justice exhibited a significant positive relationship with acceptance of an organizational IT change, while supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour did not exhibit significant relationships with acceptance of an organizational IT change.

Table 6.4: The Impact of the Independent Variables on Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
POS → RAI	24.7%	$\beta = 0.65, p < 0.001$, 32.7%	Hypothesis 1 supported
distributive justice → RAI	24.7%	$\beta = 0.51, p < 0.001$, 19.8%	Hypothesis 2 supported
supervisor contingent-reward behaviour → RAI	24.7%	$\beta = 0.39, p < 0.01$, 12.6%	see Table 6.5
supervisor contingent-punishment behaviour → RAI	24.7%	$\beta = 0.02$, *ns*, 0.0%	see Table 6.5

Table 6.5: The Impact of Supervisor Contingent-Reward Behaviour on the Different Forms of Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
supervisor contingent-reward behaviour → intrinsic motivation	17.1%	$\beta = 0.33, p < 0.05$, 9.1%	Hypothesis 3a is not supported
supervisor contingent-reward behaviour → identified regulation	18.1%	$\beta = 0.40, p < 0.01$, 13.6%	Hypothesis 3b is not supported
supervisor contingent-reward behaviour → external regulation	21.4%	$\beta = -0.23, p < 0.10$, 4.4%	Hypothesis 3c is not supported
supervisor contingent-reward behaviour → amotivation	13.7%	$\beta = -0.33, p < 0.05$, 9.1%	Hypothesis 3d is supported

Table 6.6: The Impact of Supervisor Contingent-Punishment Behaviour on the Different Forms of Situational Motivation: Regression Analyses

Relationship	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Support for Hypotheses?
supervisor contingent-punishment behaviour → intrinsic motivation	17.1%	$\beta = 0.06$, *ns*, 0.3%	Hypothesis 4a is not supported
supervisor contingent-punishment behaviour → identified regulation	18.1%	$\beta = 0.09$, *ns*, 0.8%	Hypothesis 4b is not supported
supervisor contingent-punishment behaviour → external regulation	21.4%	$\beta = 0.03$, *ns*, 0.1%	Hypothesis 4c is not supported
supervisor contingent-punishment behaviour → amotivation	13.7%	$\beta = -0.05$, *ns*, 0.2%	Hypothesis 4d is not supported

Table 6.7: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Employee Acceptance of an Organizational IT Change: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	22.3%	$\beta = 0.43, p < 0.01$, 14.2%
(step 3): POS	-	$\beta = -0.03$, *ns*
RAI	-	$\beta = 0.71, p < 0.001$, 21.2%
(step 2): distributive justice	22.3%	$\beta = 0.40, p < 0.01$, 12.4%
(step 3): distributive justice	-	$\beta = 0.07$, *ns*
RAI	-	$\beta = 0.65, p < 0.001$, 23.3%
(step 2): supervisor contingent-reward behaviour	22.3%	$\beta = 0.15$, *ns*, 1.7%
(step 3): supervisor contingent-reward behaviour	-	$\beta = -0.15$, *ns*
RAI	-	$\beta = 0.75, p < 0.001$, 35.1%
(step 2): supervisor contingent-punishment behaviour	22.3%	$\beta = 0.01$, *ns*, 0.0%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.00$, *ns*
RAI	-	$\beta = 0.69, p < 0.001$, 35.4%

Situational Motivation as a Mediator Variable

As noted previously, mediation may only occur if the relationships shown in Table 6.7 (for each work climate variable) were found to be significant. For each work climate variable as follows, it was determined whether situational motivation acted as a mediator variable in the case of acceptance of an organizational IT change.

POS. The standardized Beta coefficient for POS in the third step dropped to -0.03 and a non-significant *p*-value, which means that RAI completely mediates the relationship between POS and acceptance of an organizational IT change.

Distributive justice. The standardized Beta coefficient for distributive justice in the third step dropped to 0.07 and a non-significant *p*-value, which means that RAI completely mediates the relationship between distributive justice and acceptance of an organizational IT change.

Supervisor contingent-reward behaviour. While RAI and acceptance of an organizational IT change were significantly related, RAI did not mediate the relationship between supervisor contingent-reward behaviour and acceptance of an organizational IT change.

Supervisor contingent-punishment behaviour. While RAI and acceptance of an organizational IT change were significantly related, RAI did not mediate the relationship between supervisor contingent-punishment behaviour and acceptance of an organizational IT change.

Evaluation of hypotheses. The results of the regression analyses presented in this section support hypothesis 7 as the RAI score exhibited significant positive relationships with acceptance of an organizational IT change in all regression cases.

Enjoyment and Interest

As can be seen in Table 6.8, POS, distributive justice, and supervisor contingent-reward behaviour exhibited significant positive relationships with enjoyment and interest in using IT, while supervisor contingent-punishment behaviour did not exhibit a significant relationship with IT enjoyment and interest.

Situational Motivation as a Mediator Variable

POS. The standardized Beta coefficient for POS in the third step dropped to 0.15 and a non-significant *p*-value, which means that RAI mediates the relationship between POS and enjoyment and interest experienced.

Distributive justice. The standardized Beta coefficient for distributive justice in the third step dropped to 0.05 and a non-significant *p*-value, which means that RAI completely mediates the relationship between distributive justice and enjoyment and interest experienced.

Supervisor contingent-reward behaviour. The standardized Beta coefficient for supervisor contingent-reward behaviour in the third step dropped to 0.11 and a non-significant *p*-value, which means that RAI mediates the relationship between supervisor contingent-reward behaviour and enjoyment and interest experienced.

Table 6.8: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Enjoyment and Interest in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	25.2%	$\beta = 0.58, p < 0.001, 27.1\%$
(step 3): POS	-	$\beta = 0.15$, *ns*
RAI	-	$\beta = 0.66, p < 0.001, 18.2\%$
(step 2): distributive justice	25.2%	$\beta = 0.42, p < 0.01, 13.8\%$
(step 3): distributive justice	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = 0.74, p < 0.001, 30.7\%$
(step 2): supervisor contingent-reward behaviour	25.2%	$\beta = 0.39, p < 0.01, 12.9\%$
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.11$, *ns*
RAI	-	$\beta = 0.72, p < 0.001, 32.3\%$
(step 2): supervisor contingent-punishment behaviour	25.2%	$\beta = 0.07$, *ns*, 0.4%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = 0.77, p < 0.001, 44.2\%$

Supervisor contingent-punishment behaviour. While RAI and enjoyment and interest experienced were significantly related, RAI did not mediate the relationship between supervisor contingent-punishment behaviour and enjoyment and interest experienced.

Evaluation of hypotheses. The results of the regression analyses presented in this section support hypothesis 6a as the RAI score exhibited significant positive relationships with interest and enjoyment experienced while using IT in all regression cases.

Pressure and Tension

As can be seen in Table 6.9, POS exhibited a significant negative relationship with IT pressure and tension, while supervisor contingent-punishment behaviour exhibited a significant positive relationship with IT pressure and tension. Distributive justice and supervisor contingent-reward behaviour did not exhibit significant relationships with IT pressure and tension.

Table 6.9: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Pressure and Tension Experienced in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	4.4%	$\beta = -0.41, p < 0.01$, 13.4%
(step 3): POS	-	$\beta = -0.38, p < 0.10$
RAI	-	$\beta = -0.05$, *ns*, 0.1%
(step 2): distributive justice	4.4%	$\beta = -0.12$, *ns*, 1.1%
(step 3): distributive justice	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = -0.34, p < 0.10$, 6.3%
(step 2): supervisor contingent-reward behaviour	4.4%	$\beta = -0.16$, *ns*, 2.1%
(step 3): supervisor contingent-reward behaviour	-	$\beta = -0.05$, *ns*
RAI	-	$\beta = -0.29, p < 0.10$, 5.4%
(step 2): supervisor contingent-punishment behaviour	4.4%	$\beta = 0.31, p < 0.05$, 8.8%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = 0.32, p < 0.05$
RAI	-	$\beta = -0.32, p < 0.05$, 7.7%

Situational Motivation as a Mediator Variable

As seen in Table 6.9, RAI and IT pressure and tension were not significantly related in the case of POS. RAI and IT pressure and tension exhibited marginally significant negative relationships in the cases of distributive justice and supervisor contingent-reward behaviour. RAI and IT pressure and tension exhibited a significant negative relationship in the case of supervisor contingent-punishment behaviour. The results of the regression analyses presented in this section therefore provide only limited support for hypothesis 6c. In all of the cases, RAI did not mediate the relationship between the work climate variable and the pressure and tension experienced.

Perceived Competence

As can be seen in Table 6.10, POS exhibited a marginally significant positive relationship with perceived IT competence, while distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour did not exhibit significant relationships with perceived IT competence.

Table 6.10: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and Perceived Competence Experienced in Using IT: Regression Analyses

Variables Entered	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)
(step 2): POS	11.9%	$\beta = 0.26, p < 0.10$, 5.4%
(step 3): POS	-	$\beta = 0.05$, *ns*
RAI	-	$\beta = 0.32$, *ns*, 4.1%
(step 2): distributive justice	11.9%	$\beta = 0.18$, *ns*, 2.6%
(step 3): distributive justice	-	$\beta = 0.01$, *ns*
RAI	-	$\beta = 0.35, p < 0.05$, 6.8%
(step 2): supervisor contingent-reward behaviour	11.9%	$\beta = 0.22$, *ns*, 3.9%
(step 3): supervisor contingent-reward behaviour	-	$\beta = 0.09$, *ns*
RAI	-	$\beta = 0.31, p < 0.10$, 6.1%
(step 2): supervisor contingent-punishment behaviour	11.9%	$\beta = -0.02$, *ns*, 0.0%
(step 3): supervisor contingent-punishment behaviour	-	$\beta = -0.03$, *ns*
RAI	-	$\beta = 0.35, p < 0.05$, 9.5%

Situational Motivation as a Mediator Variable

As seen in Table 6.10, in the case of POS, RAI and perceived IT competence were not significantly related. In the cases of distributive justice and supervisor contingent-punishment behaviour, RAI and perceived IT competence exhibited significant positive relationships. RAI and perceived IT competence exhibited a marginally significant positive relationship in the case of supervisor contingent-reward behaviour. However, in all of the cases, RAI did not mediate the relationship between the work climate variable and perceived IT competence. The results of the regression analyses presented in this section support largely hypothesis 6b as the RAI score exhibited significant positive relationships with perceived IT competence in two regression cases, a marginally significant positive relationship in one case, and no significant relationship in a fourth case.

A Summary of the Regression Analyses

Independent variables to mediator: analyses. The RAI provided an evaluation of the degree to which employees are self-determined in their motivation to use IT. Perceived organizational support, distributive justice and supervisor contingent-reward behaviour were all found to be positively related to the RAI. This indicates that employees' evaluation of the degree of organizational support provided to them is directly related to the level of their motivation to use IT. Furthermore, employees' evaluation of the equitability of the organizational rewards that they receive is also directly related to the level of their motivation to use IT. Finally, the praise provided by

supervisors, when employees perform at high levels, is also directly related to the level of employee motivation to use IT.

Acceptance of an organizational IT change. Perceived organizational support and distributive justice were both positively related to employee acceptance of an organizational IT change. Employee situational motivation to use IT completely mediated (i.e., completely accounted for) the following relationships: (1) POS and employee acceptance of an organizational IT change, and (2) distributive justice and employee acceptance of an organizational IT change. In both cases, the mediating effect of RAI was a positive one; higher RAI scores were associated with higher levels of employee acceptance of an organizational IT change.

Enjoyment and interest. Perceived organizational support, distributive justice, and supervisor contingent-reward behaviour were all positively related to employee enjoyment and interest in using IT. Employee situational motivation to use IT mediated (i.e., accounted for) the following relationships: (1) POS and employee enjoyment and interest in using IT, (2) distributive justice and employee enjoyment and interest in using IT (complete mediation) and (3) supervisor contingent-reward behaviour and employee enjoyment and interest in using IT. In all cases, the mediating effect of RAI was a positive one; higher RAI scores were associated with higher levels of employee enjoyment and interest in using IT.

Pressure and tension. POS was negatively related to the pressure and tension experienced by employees in using IT. A negative relationship means that higher levels of POS are associated with lower levels of pressure and tension (while lower levels of POS are associated with higher levels of pressure and tension). Supervisor

contingent-punishment behaviour was positively related to the pressure and tension experienced by employees in using IT. Employee situational motivation to use IT and IT pressure and tension were negatively related in the cases of distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour.

Perceived IT competence. The work climate variables were largely not significantly related to the level of IT competence perceived by employees; the exception being the marginal positive relationship found between POS and perceived IT competence. This suggests that employees derive their evaluations of perceived IT competence from sources other than distributive justice, supervisor contingent-reward behaviour, supervisor contingent-punishment behaviour, and POS. Employee situational motivation to use IT and perceived IT competence were positively related in the cases of distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour.

CHAPTER 7: DISCUSSION AND CONCLUSION

The goal of this research was to explore the key relationships between work climate, motivation, and the attitudes toward IT and use of new IT in an organizational setting. Specifically, the aim was to provide answers to the following questions. What are the effects of perceived organizational support, distributive justice, and supervisor reward and punishment behaviour on employee motivation to use IT? How does motivation affect actual IT usage, beyond the basic system functions? Does motivation influence employee acceptance of an organizational IT change and attitudes toward the IT, in terms of interest, enjoyment, perceived competence, pressure, and tension?

Several main relationships were found across both studies between the work climate variables and the dependent variables. Perceived organizational support and distributive justice were both positively related to employee acceptance of an organizational IT change. Perceived organizational support, distributive justice, and supervisor contingent-reward behaviour were all positively related to employee enjoyment and interest in using IT. Perceived organizational support was negatively related to the pressure and tension experienced by employees in using IT.

Using Self-Determination Theory as a theoretical framework, a Relative Autonomy Index was used to combine the different forms of situational motivation into a single readily-interpretable score. This score provided an evaluation of the degree to which employees are self-determined in their motivation to use IT. The first set of hypotheses concerned the relationships between the work climate variables and self-determined motivation. A summary of the results from the major hypotheses can be seen in Table 7.1. As hypothesized, in both studies perceived organizational support was

shown to be positively related to the Relative Autonomy Index. This indicates that employees' evaluation of the degree of support provided to them by their organization is directly related to the level of their motivation to use newly implemented IT. As hypothesized, distributive justice was also shown to be positively related to the Relative Autonomy Index in both studies. This indicates that employees' evaluation of the equity of the organizational rewards that they receive is also directly related to the level of their motivation to use new IT.

Table 7.1: A Summary of the Results from the Major Hypotheses

Hypothesis	Hypothesized Relationship (Positive / Negative)	Support for Hypothesis in Study One?	Support for Hypothesis in Study Two?	For which Independent Variables Did RAI Act as a Mediator Variable?
H1	POS → RAI (+)	Supported	Supported	N/A
H2	distributive justice → RAI (+)	Supported	Supported	N/A
H3a, H3b, H3c, H3d	supervisor contingent-reward behaviour → the different forms of self-determined motivation	Not supported	Support for H3d only: supervisor contingent-reward behaviour → amotivation (-)	N/A
H4a, H4b, H4c, H4d	supervisor contingent-punishment behaviour → the different forms of self-determined motivation	Not supported	Not supported	N/A
H5	RAI → IT usage (+)	Partial Support	N/A	-
H6a	RAI → IT interest and enjoyment (+)	Supported	Supported	POS distributive justice (complete mediation in Study Two) supervisor contingent-reward behaviour (Study Two only)
H6b	RAI → perceived IT competence (+)	Supported	Partial support	-
H6c	RAI → IT pressure and tension (-)	Supported	Partial support	POS (Study One only)
H7	RAI → acceptance of an organizational IT change (+)	Supported	Supported	POS (complete mediation) distributive justice (complete mediation)

The second set of hypotheses concerned the relationships between self-determined motivation and the dependent variables. A summary of these results from the major hypotheses can also be seen in Table 7.1. In both studies, self-determined motivation was found to act as a mediator variable in several cases. Self-determined motivation to use new IT completely mediated the relationship between POS and employee acceptance of an organizational IT change, as well as the relationship between distributive justice and employee acceptance of an organizational IT change. Self-determined motivation also mediated the relationships between POS and employee enjoyment and interest in using IT, as well as distributive justice and employee enjoyment and interest in using IT (exhibiting complete mediation in Study Two). In all of these cases, the mediating effect of self-determined motivation was a positive one; higher self-determined motivation scores were associated with higher levels of employee acceptance of an organizational IT change and employee enjoyment and interest in using IT. Furthermore, the relationships found were highly significant in that they explained a very high proportion of the variation in employee interest and enjoyment in using IT and employee acceptance of an organizational IT change. In the majority of cases, over fifty or sixty percent of the variance was explained using the full model when motivation was added as a mediator. In several cases, the percentages surpassed seventy percent of the explained variance.

A number of differences existed between the results of the two studies. In the patient scheduling study, self-determined motivation acted as a mediator in the negative relationship between POS and the pressure and tension experienced by employees in using IT. In the pharmacy study, supervisor contingent-punishment behaviour was

shown to be positively related to the pressure and tension experienced by employees in using IT. Significant positive relationships were found between supervisor contingent-reward behaviour and both intrinsic motivation and identified regulation in the pharmacy study, contrary to the negative relationships that were hypothesized. Finally, in the pharmacy study, self-determined motivation acted as a mediator in the positive relationship between supervisor contingent-reward behaviour and the enjoyment and interest experienced by employees in using IT.

To summarize the main results of this study (see Table 7.1), perceived organizational support and distributive justice were positively related to employee acceptance of an organizational IT change and employee enjoyment and interest in using IT. Perceived organizational support was also negatively related to the pressure and tension experienced by employees in using IT. Supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour were also related to certain employee attitudes toward IT. Situational autonomous motivation to use new IT was shown to mediate (i.e., to account for) several of the found relationships.

Supervisor behaviour. As seen in Table 7.1, the results related to supervisor contingent reward and punishment behaviour did not generally follow the hypothesized relationships based on Self-Determination Theory. Self-Determination Theory suggests that contingent rewards will decrease intrinsic motivation. Furthermore, punishment behaviour is counter to creating a work environment which promotes self-determination and fosters intrinsic motivation. However, no significant relationships were found in either study between supervisor contingent-reward behaviour and the different forms of employee situational motivation. The exception was the significant positive relationships

found between supervisor contingent-reward behaviour and both intrinsic motivation and identified regulation in the pharmacy study, contrary to the negative relationships that were hypothesized. No significant relationships were found in either study between supervisor contingent-punishment behaviour and the different forms of employee situational motivation.

As I reviewed in Chapter Two, two contrasting points of view exist in the Management and Psychology literatures regarding the effects of rewards. The first perspective is that of Self-Determination Theory, which suggests that contingent rewards and punishment behaviour in general decrease self-determined motivation. The present results are more in keeping with the second perspective, following the results of Podsakoff et al. (1982, 1984). Podsakoff et al. (1982, 1984) found that leader-contingent rewards were positively related to subordinate performance and satisfaction, while leader-contingent punishment behaviour was not related to subordinate performance or satisfaction. In the present study, supervisor contingent-punishment behaviour was not significantly related to the different forms of situation motivation, interest and enjoyment in using IT, perceived IT competence, or employee acceptance of an organizational IT change. In Study Two, supervisor contingent-punishment behaviour was positively related to IT pressure and tension. Supervisor contingent-reward behaviour was significantly and positively related to interest and enjoyment in using IT, and was unrelated to perceived IT competence, IT pressure and tension, or acceptance of an organizational IT change.

One explanation for these results might lie in the fact that employees only perceived moderate levels of distributive justice. In the patient scheduling study

(see the additional comments section), nine employees indicated that, in their opinion, there were no rewards provided to them in their job. It is worthy of mention that in recent years Canadian hospitals have suffered from a lack of government funding. Thus, funding has been directed not towards supplementing employee compensation or upgrading physical facilities, but rather towards the more critical goal of improving patient care. The results therefore suggest that the supervisor contingent-rewards in this study were not highly valued by the employees, which has important implications for the supervisor contingent-reward and punishment behaviour. Rewards outside the leader's control and subordinates' indifference toward organizational rewards have been identified as two important moderators of the relationship between (1) leader rewards and (2) subordinate performance and satisfaction (Kerr & Jermier, 1978; Podsakoff et al., 1984). Specifically, rewards are only effective if they are valued by the recipient. The performance and satisfaction of subordinates who are indifferent to the rewards controlled by the supervisor or who value organizational rewards outside the supervisor's control will thus be much less influenced by their supervisor's rewards (Kerr & Jermier, 1978; Podsakoff et al., 1984).

In Study One, seven respondents also indicated that their administrative supervisors were very rarely aware of their daily job performance due to the limited contact that they had. Another respondent indicated that she received no feedback whatsoever from her supervisor. While eight respondents would have little impact on the results, their comments may be representative of the full sample. As such, these comments have implications for supervisor contingent reward and punishment behaviour. The relationship between leader contingent-reward behaviour and subordinate

performance and satisfaction is weaker for subordinates who are separated from their supervisors, than for subordinates who work in close proximity to their supervisors (Kerr & Jermier, 1978; Podsakoff et al., 1984). As the distance between supervisor and subordinate increases, the supervisor's ability to evaluate the subordinate's performance accurately and effectively establish a performance-reward contingency will diminish (Podsakoff et al., 1984).

Furthermore, during one of my visits to the Pharmacy departments, one respondent indicated that she had difficulty answering the questions in the supervisor behaviour section of the questionnaire as she had more than one supervisor (the Chief Pharmacist of her hospital, the Chief Pharmacist of the Hospital Centre). She indicated that none of these individuals were aware of her job performance on a daily basis or rewarded her accordingly. The rewards were more general in nature, e.g., a thank-you letter from the Chief Pharmacist for her years of continued service. The respondent indicated that she performed her job responsibilities at a standard of excellence dictated by a professional and personal concern for delivering superior patient care, and not to receive rewards or avoid punishments. Looking at both samples together, a significant proportion of the respondents were professionals. It is possible that this lack of supervisor contingent reward and punishment behaviour is indeed not problematic; instead it illustrates a desired and appropriate situation where employees display both personal and professional goals to deliver outstanding patient care. In such a situation, however, supervisor reward and punishment behaviour may be much less important. In this way, examining the moderating effects of organizational size and characteristics

(e.g., a health-care organization versus a company) would provide an interesting direction for future research.

Additionally, these comments from nine employees might indicate a tendency that employees did not receive immediate feedback based on their performance and behaviour. The supervisors were often not working in close proximity to the employees. This suggests that the supervisors provided more general and sporadic feedback, based on employee performance over a longer period of time. Thus, the supervisor reward and punishment behaviours cannot be considered truly contingent, and this may be a large part of the reason why the hypothesized relationship based on Self-Determination Theory did not hold. It is also possible that the contingent feedback received may have been perceived by employees as informational, which could explain the positive relationship found between supervisor contingent-reward behaviour and interest/enjoyment.

As some supervisors did not work in close proximity with their subordinates, it is likely that only exceptionally high or low levels of job performance would be noticed by such supervisors. Smaller changes in subordinate behaviour likely did not bring about an impact in the reward or punishment behaviour of the supervisor. Thus it would appear that the research setting likely had an impact on the lack of hypothesized relationships with respect to supervisor behaviour in the research model. This line of thinking is supported by the fact that a positive relationship between supervisor reward behaviour and some forms of situational motivation was found only in the pharmacy study. Future research should revisit such questions in a different setting, where supervisors and subordinates work in close proximity to one another to explore these relationships in greater depth. For example, an industrial setting where a supervisor and his or her

subordinates work together in the same work team might provide a more appropriate setting to investigate such hypothesized relationships.

In Study One, employees supervised by a physician indicated a higher level of supervisor contingent-reward behaviour than did employees supervised by a non-physician. One possible explanation of these results is that those employees who worked directly for a physician enjoyed a closer relationship with their supervisor, which included a higher level of supervisor rewards. This may also have affected the hypothesized relationships in the research model related to supervisor behaviour. A second possible explanation of these results is that the supervisor-subordinate relationships may have differed based on the position or job of the supervisor in the surveyed sample. Further research is needed to investigate the nature of supervisor-subordinate relationships, and to determine if job or position disparities between supervisors and subordinates impact on supervisor behaviour.

Alternatively, it may also be that in order to adequately explain the relationship between supervisor behaviour and situational motivation, an additional moderator variable is necessary. While further research is needed in order to answer this question, analogous results were found in prior research that examined the relationship between supervisor behaviour and employee satisfaction and performance. Kerr and Jermier (1978) suggested that the types of tasks performed by subordinates may moderate the relationship between leader behaviour and outcomes. Podsakoff et al. (1984) noted that the relationship between supportive leader behaviour and subordinate satisfaction is heightened when subordinates perform routine or unambiguous tasks. The relationship is reduced when subordinates perform intrinsically interesting or satisfying tasks.

Podsakoff et al. also found that leader contingent-reward behaviour leads to higher work satisfaction when subordinates perceive their organizations to be more formalized and their jobs to provide little feedback. Organizational formalization, organizational commitment, group cohesiveness, job ambiguity, and job variety were among the other moderator variables identified. Similarly, future research may identify both individual and organizational factors that moderate the supervisor behaviour relationships as hypothesized in my research model.

Perceived competence. As none of the independent variables were significantly related to perceived employee competence in using IT, this indicates that employees are deriving their evaluations of their levels of IT competence from other sources; the work climate factors measured in this study are not influencing this evaluation. Examples of these other sources were revealed by the positive, highly significant Pearson correlations in both studies between perceived IT competence and length of system usage, as well as with the IT usage scores in Study One. Additionally, a number of system-specific factors seem highly important as evidenced by the highly significant Pearson correlations (in Study One only) between perceived IT competence and number as well as proportion of appointments booked per week using the system, length of training, user-level, and IT enjoyment and interest. Thus it appears that levels of perceived IT competence are highly system-specific and are therefore better explained by system-specific factors rather than general work climate variables.

Pressure and tension. POS was negatively related to IT pressure and tension, and supervisor contingent-punishment behaviour was positively related to IT pressure and tension in Study Two. However, both distributive justice and supervisor

contingent-reward behaviour were not significantly related to the pressure and tension experienced by employees in using IT. As with perceived IT competence, significant negative Pearson correlations were found in Study One between IT pressure and tension and length of system usage, IT usage, frequency of system usage, and user-level. In both studies, significant negative Pearson correlations were found between IT pressure and tension and IT interest and enjoyment, as well as between IT pressure and tension and perceived IT competence. Significant positive Pearson correlations were found in Study One between IT pressure and tension and both organizational tenure and age. These correlations suggest that system-specific factors as well as individual factors are important in explaining IT pressure and tension. Explaining perceived IT competence and IT pressure and tension using system-specific, group-specific, as well as individual and personality characteristics provide an interesting avenue for further research. Such research would be well-suited to contribute to existing research in competence motivation and achievement motivation (e.g., Koestner & McClelland, 1990).

IT usage. No significant relationships were found between the work climate variables and IT usage. However, self-determined motivation and IT usage were positively related. Intrinsic motivation exhibited a significant positive relationship with IT usage. Identified regulation also exhibited a significant but weaker positive relationship with IT usage. Amotivation exhibited a generally negative relationship with IT usage.

Despite these interesting relationships, the results do not provide strong support for the research model as it pertains to IT usage. It is unlikely that these results were due to a measurement problem. The overall reliability of the questionnaire measures was

quite good. The system-specific measure of IT usage was reviewed in detail by the system implementation team and the Ambulatory Services managers at the different hospitals. This measure could not have been made more specific. It is furthermore unlikely that these results were due to the specific decisions that were made in the data analysis. As discussed in Chapter Five, the IT usage regressions were recalculated using "assigned" user-levels, which arguably constituted a radical re-conceptualization of the data. The results of these regressions were similar using these different user-levels.

The control variables in the IT usage regressions explained in all cases approximately 55% of the variance in IT usage. This rather high percentage indicates that user-level, hospital site, length of system usage, and whether or not employees were employed during the implementation seemed to be exceptionally important in determining IT usage, much more so than the work climate variables or motivation. As such, in this situation, work climate and motivation explained a comparatively insignificant amount.

IT usage was significantly and positively correlated with both employee interest and enjoyment in using IT and perceived IT competence, and in the negative direction with IT pressure and tension. This indicates that IT usage remains an important construct in explaining different employee attitudes toward IT. It is entirely possible that the present theoretical framework and relationships with IT usage hold in general. Future research is needed to investigate these relationships in settings more conducive to exposing the effects of work climate and motivation. Such optimal settings would be those in which system usage is not mandated by management, and users have a choice of using the system or not. A further interesting direction for future research would be to

investigate whether IT usage acts as a predictor of these important employee attitudes toward IT.

Theoretical Contributions of the Research Model

This research is the first to provide strong empirical evidence that organizational work climate factors are related to employee motivation to use a new IT and important employee attitudes toward the IT, including employee acceptance of an organizational IT change, employee interest and enjoyment in using IT, and employee pressure and tension experienced in using IT. The majority of hypothesized relationships related to perceived organizational support and distributive justice were supported as postulated in my research model.

This study has also shown the value of using a motivational framework, specifically Self-Determination Theory, in examining employee attitudes toward IT and usage of IT at work. Specifically, one of the severe limitations of previous research in intrinsic motivation, as well as in IT acceptance and usage, has been that extrinsic motivation has been narrowly defined as an external motivational force. This research has shown the value of expanding the definition of extrinsic motivation through Self-Determination Theory by including more self-determined forms of extrinsic motivation. As such, this study illustrates the value of merging two fields of research, namely Organizational Behaviour and MIS. Furthermore, this research provides a contribution to the body of research that supports the tenets of Self-Determination Theory by validating the Situational Motivation Scale in two organizational studies.

General Limitations of this Study

This study had several limitations. First, as this study was cross-sectional, causality cannot be inferred. Second, all data in the present study were self-reported. Thus, future studies may wish to investigate the present relationships using other data as well, such as system usage data collected by the organization or data collected from the employees' supervisors. Third, Study Two consisted of a small sample. Fourth, two measures in Study Two had low reliabilities.

Future Research Directions

Gender. In the patient scheduling study, 94% of the respondents were female. In the pharmacy study, 72% of the respondents were female. Venkatesh and Morris (2000) have found differences between men and women related to IT usage; they suggested that gender is a moderator in the TAM framework. Their results indicated that men's IT usage decisions were more strongly influenced by perceptions of usefulness. Women were more influenced by perceptions of ease of use, as well as social norms in the early stages of an IT implementation. Venkatesh and Morris suggested that while men only consider productivity-related factors, women consider inputs from a number of sources including productivity assessments, when making decisions to accept and use new IT. Thus, it is important for future studies to revisit these relationships with a gender-balanced sample in order to be able to assess gender as a moderator variable.

Computer anxiety and computer self-efficacy. The two systems that were the focus of this research study were critical and core systems at the Hospital Centre. As such, the implementation affected a whole range of employees. Some were older senior

employees who had never used a computer before. Other younger employees had prior experience in using computers. In the patient scheduling study, prior to the use of this system, some employees managed appointments using other basic IT; others scheduled appointments using a paper-based appointment book. As discussed, 24% of employees continued to use a paper-based appointment book following their first month of system usage, up to a maximum of several years for some employees. This illustrates, as initially indicated by the Hospital Centre, that a proportion of users did resist the system implementation by continuing to use the older paper-based appointment books.

While my study looked at how organizational work climate factors impact upon individual motivation, IT usage, and IT acceptance, a further promising direction for future research would be to examine how individual characteristics interact with situational motivation to affect IT acceptance and usage. In Study One, prior use of computers and prior use of the Windows operating system had no significant effects on the research model constructs. However, other individual characteristics have been identified in the literature. Computer anxiety is a particular negative phenomenon associated with some individuals' computer interaction which substantially reduces individual effectiveness in mastering and using computers (Compeau & Higgins, 1995; Doronina, 1995; McInerney, Marsh, & McInerney, 1999). Computer self-efficacy is an individual's judgment of their overall computer ability (Venkatesh & Davis, 1996), which was found to have an important role in shaping individual feelings and behaviours toward IT, employee attitudes and acceptance of IT, and employee use of computers (Compeau & Higgins, 1995; Venkatesh & Davis, 1996). Thus, these two constructs might begin to explain the resistance identified on the part of some system users.

Work motivation. This study assessed the impacts of work climate and situational motivation on employee attitudes toward IT and usage of IT. An interesting direction for future research would be, in turn, to assess the impact of IT attitudes on employees' overall work motivation, and not solely their motivation to use IT. Previous research has validated a measure of general work motivation using Self-Determination Theory as a framework (Blais, Brière, Lachance, Riddle, & Vallerand, 1993).

Implications for Practice

In this section, I discuss what practitioners can do to increase acceptance of an organizational IT change, IT interest and enjoyment, perceived IT competence, IT usage, and situational motivation to use new IT, as well as decrease IT pressure and tension, in light of the relationships found in this study with the work climate variables (perceived organizational support, distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour). The results of this research indicate that perceived organizational support and distributive justice are the two most important work climate factors that influence situational motivation, and in turn employee attitudes toward IT. As such, the following recommendations are focused on perceived organizational support and distributive justice.

In the recommendations that follow, it is important to keep in mind that Canadian Hospital Centres, in comparisons with other organizations, remain under increased constraints, both financial and otherwise, in implementing measures to improve their organizational work climates. For example, whereas some organizations may be at liberty to close complete departments on a given afternoon to have all employees

participate in a much-needed IT training program, such a course of action would not be possible at a hospital. Nevertheless, there are a number of measures that can be adopted within the imposed constraints to improve the success of an organizational IT implementation.

Perceived organizational support. Perceived organizational support was highly related to levels of situational motivation, acceptance of an organizational IT change, enjoyment and interest in using IT, and lower levels of pressure and tension experienced by employees in using IT. Thus, organizations wishing to achieve success and high levels of employee acceptance of organizational change would be well advised to take measures to increase perceived organizational support at each available opportunity. The majority of such actions must stem from a well-established organizational culture. Constantly working to maintain a high level of organizational support will be rewarded by employees in turn when they are asked to cooperate in an organizational IT change.

The results of the present study indicated that levels of self-determined motivation completely mediated (completely accounted for) the positive relationships between POS and acceptance of an organizational IT change, and between distributive justice and acceptance of an organizational IT change. In the instructions for the organizational support and distributive justice sections in both of my questionnaires, respondents were asked to consider the recent system implementation in answering the questions. As the additional comments in the patient scheduling study indicated, some respondents did not see how the recent system implementation was related to such questions. However, it is very much the case that specific organizational actions related to an IT change can communicate increased levels of organizational support to employees. For example, top

management can endorse the change at the very beginning. They can communicate to all employees their support of the change and the organizational benefits that it will bring. Indeed, Appelbaum and Wohl (2000) argued that the main way to create readiness for change is by delivery of the message for change. Igbaria et al. (1997) have identified management support as one of the key factors affecting system success, necessary to ensure sufficient allocation of resources, and to act as a change agent in creating an environment conducive for IT success. Lack of management support is a critical barrier to the effective utilization of the IT by employees. The literature on organizational change has also suggested that employees will usually resist change when the change comes as a surprise, when employees are unfamiliar with the relevant facts, when the consequences are not seen to directly benefit employees, or when the change was not planned in consultation with employees (reviewed by Appelbaum & Wohl, 2000).

Igbaria et al. (1996) suggested that organizational programs aimed at promoting more extensive use of IT must emphasize not only system capabilities and contributions to job productivity, but also the features that make the IT enjoyable to use. The effect of social pressure on usage, as shown by their results, indicated that by having employees demonstrate the IT to other potential users and by disseminating usage data, wider use could be encouraged. Igbaria et al. argued that user skills promote IT usage and play a significant role in reducing perceived IT complexity, thereby enhancing employee motivation to use IT. Also, individuals who perceive activities involving computers as enjoyable are likely to use the IT more extensively. In this way, training programs, and creating opportunities for employees to gain experience with IT in non-threatening environments, such as with computer gaming simulations, may greatly enhance

perceptions of ease of use and enjoyment. Igbaria et al. suggested that this will, in turn, encourage IT usage.

One way to increase levels of POS, as advocated by Self-Determination Theory, is for managers to be autonomy supportive. This will help cultivate more self-determined motivation. Punishment behaviour is generally not conducive to creating a supportive work climate. In the present study, supervisor punishment behaviour was shown to be positively related to the pressure and tension experienced by employees in using IT. In Study One, higher supervisor punishment behaviour was also shown to be significantly correlated with lower levels of employee POS. When being introduced to new IT, employees must be allowed to explore, make mistakes, and learn from these mistakes without fear of organizational repercussions such as demotion. When confronting unknown changes such as those associated with new IT, failure leads to effective organizational learning and adaptation, as well as employee resilience (Sitkin, 1992).

Appropriate and adequate organizational practices should be prepared to deal with potential questions or problems that users may have with the new IT. Such measures will further serve to communicate high levels of organizational support. Employees should not need a serious reason to consult with members of the IT staff, nor should they largely be directed to the system's user manual. Igbaria et al. (1997) argued that organizational user support services, such as the creation of an organizational information centre, are key to the success of user computing. In a hospital setting, simply having a time every week where a member of the IT staff is available to meet with users individually or in a group may be quite helpful. This allows for users' questions to be answered and their

concerns to be addressed without the need for a more formal appointment, which might appeal to many users.

Other users may be unable to leave their offices to seek help for an IT issue. Therefore, the selection of a given employee as the department "expert" in using a given IT, and directing all related questions to him or her, may be quite effective while keeping perceived levels of organizational support high. By ensuring that the employee willingly accepts such a position, these "expert" employees will likely appreciate such recognition, further increasing their perceived levels of distributive justice. Informal opportunities for users to share their experiences, as well as encouragement from supervisors and co-workers, will also serve to strengthen feelings of organizational support.

Distributive justice. Distributive justice was the second key work climate factor found in this study to be highly related to situational motivation, acceptance of an organizational IT change, and enjoyment and interest in using IT. While financial constraints may indeed make it rather difficult for organizations in the health-care sector to increase levels of employee pay or improve physical facilities, there are a number of avenues that can be pursued.

Informal departmental recognition of valued employees, or even more formalized departmental recognition programs in a variety of areas, may go a long way towards supplementing employee perceptions of received outcomes. Without being unduly competitive, as previously discussed one can recognize that a given employee is the "expert" in using a given IT in the department, for example, and all related questions can be directed to him or her. In the same way, token rewards that enhance recognition and trust have a positive effect on perceptions of justice and organizational support.

Organizational adherence to fair procedures, leading to a perception of fair employee treatment, has a large impact on perceptions of justice. Even very small distinctions made at work will tend to be carefully evaluated by employees. As evidenced in Study One by the discrepancy between the self-reported user-levels and the assigned user-levels based on IT usage, some employees who were "users" indicated that they were "super-users" based on their booking of hundreds of appointments per week using the IT. In this way, "super-users" were seen as better than "users" by some employees. It was not at all the Hospital Centre's intention to convey such an impression. Therefore in general, more descriptive distinctions such as referring to "users" as "appointment managers" and "super-users" as "clinic managers" and avoiding distinctions wherever possible may alleviate negative perceptions of fairness or justice.

Increasing employee rewards as a means of increasing employee perceptions of received outcomes can be effective without involving increased pay or large monetary expenditures. Small promotions of rank, such as even from a "user" to a "super-user", and employee perceptions of personal influence over organizational policy can be particularly effective. For example, inviting valued employees to represent their department at an organization-wide planning meeting for a new IT, or soliciting the opinions of as many employees as possible to shape a future IT implementation may definitely be perceived by employees as a reward, or at the very least will communicate organizational support. Small improvements in the physical work environment may go a long way towards increasing employee perceptions of the organizational outcomes received, and thus in turn their evaluations of organizational justice. It may be possible for one small change to affect a whole department, such as redecorating a common work

room or air conditioning a common room on a floor that is very hot in the summer months.

Several of these suggestions for improving employee perceptions of distributive justice will also have positive effects on employee perceptions of organizational support. As discussed in Chapter Two, fairness of treatment, supervisor support, praise and approval, personal recognition, and organizational rewards all additionally impact positively upon employee perceptions of organizational support.

Situational motivation. This study has shown that higher levels of self-determined motivation increased (i.e., mediated in a positive way) the relationships between both POS and distributive justice and acceptance of an organizational IT change, as well as the relationships between each of POS, distributive justice, (and at times supervisor reward behaviour) and employee enjoyment and interest in using IT. Higher levels of self-determined motivation were associated with lower levels of employee pressure and tension in using IT, given, for example, low perceptions of organizational support.

Self-Determination Theory suggests that individual levels of self-determined motivation can be increased by allowing employees to satisfy their intrinsic needs for competence, autonomy, and relatedness (Deci et al., 2001; Guay et al., 2000). Competence is the need for having an effect in one's interactions with the environment. Autonomy is a sense of feeling free from pressures, and having the freedom to make choices from among several courses of action. Relatedness refers to the interpersonal attachments and bonds developed between individuals that result from the fundamental need for contact with others. Individuals will be motivated in a self-determined way to

the extent that these three universal psychological needs are satisfied within their work organization (Deci et al., 2001).

Satisfying the need for autonomy can be accomplished by allowing employees a genuine sense of choice whenever possible, and allowing employees to be free from feelings of pressure such as threats or punishments. Satisfying the need for competence can be accomplished by providing employees with timely and constructive feedback and evaluations, and by having supervisors maintain close, positive relationships with their subordinates. Indeed, rewards, feedback, communication, as well as providing employees with challenging work matched to their abilities, if done in such a way so as to communicate feelings of competence and autonomy, will lead to increased levels of self-determined motivation (Ryan & Deci, 2000). Satisfying the need for relatedness can be accomplished by promoting a positive and warm work environment, with high levels of organizational support, distributive justice, and supervisor support.

Each instance that top management, supervisors, and trainers communicate with system users represents an important opportunity to secure high levels of self-determined motivation. For example, Gill (1996) found that successful systems changed users' job tasks in ways that motivated use, by offering users greater facility in assessing the impact of performing a task, greater control, and greater variety in their jobs.

Organizations might find other ways to increase self-determined motivation besides securing a positive work climate. For example, self-determined motivation can be increased through appropriate training. Training offers an opportunity for an organization to convince employees about what the new IT can do for them, thereby increasing identified motivation.

Training can also encourage playful behaviour and enjoyment while using the system, as well as experiences of mastery and competence, in this way increasing intrinsic motivation. Such a recommendation is also directly in keeping with Bandura's Social Cognitive Theory of Self-Regulation (e.g., Bandura, 1991), which suggests that guided mastery is the strongest source of communicating competence information to the individual.

Conclusion

This research has explored the key relationships between work climate, motivation, and IT attitudes and also use of new IT in an organizational setting. These relationships are among the factors that influence the success of organizational IT implementations. As the role of IT in today's organizations continues to increase in importance, so too will this investigation of its critical success factors. Armed with current knowledge in this field, organizations implementing new IT stand to benefit greatly. Indeed, organizations will be able to achieve high success in their IT implementations initiated in the work environment.

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APPENDIX A

QUESTIONNAIRE FOR STUDY ONE:

A PATIENT SCHEDULING AND APPOINTMENT MANAGEMENT INFORMATION SYSTEM

Note: This questionnaire has been modified from its original version. The original bilingual questionnaires (8 pages in English and 9 pages in French) were printed recto-verso; however in this appendix the 10-page French version follows the 10-page English version to conform to the thesis page format guidelines. This results in several minor changes to the layout of the questionnaire. For the purposes of this appendix, the information system is referred to as the "Appointment Assistant" system and the organization is referred to as the "Hospital Centre", for both the English and French versions. All changes are indicated in italics. Information specific to the organization was removed and is so indicated by [...] and ***.

John Molson
School of Business
Concordia University

May / June 2003

Dear *Appointment Assistant* user,

You may have completed a Hospital Centre questionnaire about [...] ***in the past weeks. As users of the Appointment Assistant system, your opinion would again be very much appreciated! We are conducting a survey to examine the factors that affect the use and acceptance of information technology at work.***

We are asking for your help in filling out this questionnaire about your job and the *Appointment Assistant* system. The survey will take about 15 minutes to complete and is voluntary.

We are excited about the possibilities for this research to enhance future information technology implementations at the *Hospital Centre* and at your hospital, and to help us better understand the conditions under which people are motivated to use new information technology systems at work. As such, this is your opportunity to tell us about your experience with the *Appointment Assistant* system. The information you provide will be **completely confidential and anonymous**; only the researchers from Concordia University will open your sealed envelope and have access to the individual questionnaires. Only a summary of the overall results will be released; your individual answers will never be seen by any of your co-workers or managers. For this reason, we ask you to be as open as possible when you answer the questionnaire. **Please return your completed questionnaire by sealing it in the return envelope provided and putting it in the internal *Hospital Centre* mail.**

This project has been fully approved following the ethical review that is required at the John Molson School of Business of Concordia University and the *Hospital Centre* Research and Development Group on Work Organization. Please do not hesitate to get in touch with us if you have any questions or comments about this research. We thank you in advance for your help and participation in our study.

Yours sincerely,

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(Français au verso)

MY USE OF THE APPOINTMENT ASSISTANT SYSTEM: Please indicate to what extent you use the following features of the *Appointment Assistant* system using the following scale. If you do not have permission to access a given function, or if a function is not available in your department please mark "not applicable" (N/A).

0	1	2	3	4	5	6	N/A
never			about half of the time			always	not applicable

SEARCH FEATURES

I search for patients: Using a chart (MRN) number.	0	1	2	3	4	5	6	N/A
By name.	0	1	2	3	4	5	6	N/A
By phonetic search.	0	1	2	3	4	5	6	N/A
By medicare number.	0	1	2	3	4	5	6	N/A
By birth date.	0	1	2	3	4	5	6	N/A
By main phone number.	0	1	2	3	4	5	6	N/A
I merge duplicate patient records.	0	1	2	3	4	5	6	N/A

BOOKING APPOINTMENTS

I book: Single appointments.	0	1	2	3	4	5	6	N/A
Appointments using the "requested delay" option.	0	1	2	3	4	5	6	N/A
Appointments using the "start at a given date" option.	0	1	2	3	4	5	6	N/A
Appointments using the "patient preferences" option, e.g. certain days and/or times.	0	1	2	3	4	5	6	N/A
Coordinated appointments with other clinics.	0	1	2	3	4	5	6	N/A

RECORDING VISITS AND ATTENDANCE

I record statistics: One patient at a time.	0	1	2	3	4	5	6	N/A
By reversing the negative attendance indicator and confirming the attendance of patients who were present.	0	1	2	3	4	5	6	N/A
For patients without appointments (walk-ins).	0	1	2	3	4	5	6	N/A
I merge temporary patient files with the permanent patient record.	0	1	2	3	4	5	6	N/A

0	1	2	3	4	5	6	N/A
never			about half of the time			always	not applicable

REPORTS

I print "client characteristics" lists.	0	1	2	3	4	5	6	N/A
I print appointment lists.	0	1	2	3	4	5	6	N/A
I print other operational reports (appointments to reschedule, waiting lists, lists of records to be pulled).	0	1	2	3	4	5	6	N/A
I check incomplete attendances before submitting my statistics.	0	1	2	3	4	5	6	N/A

MANAGING APPOINTMENTS AND SCHEDULES

I delete scheduled sessions (i.e. cancel clinics).	0	1	2	3	4	5	6	N/A
I re-schedule patients whose clinics were cancelled.	0	1	2	3	4	5	6	N/A
I create new single clinic days.	0	1	2	3	4	5	6	N/A
I use the "edit session" function to modify the structure of individual clinic days.	0	1	2	3	4	5	6	N/A
I use: The waiting list function.	0	1	2	3	4	5	6	N/A
The confirmation list function.	0	1	2	3	4	5	6	N/A
The earlier appointments list function.	0	1	2	3	4	5	6	N/A

TEMPLATES, SCHEDULES, AND SESSION GENERATION

I create new templates.	0	1	2	3	4	5	6	N/A
I modify existing templates.	0	1	2	3	4	5	6	N/A
I create new schedules for particular clinics.	0	1	2	3	4	5	6	N/A
I modify existing schedules.	0	1	2	3	4	5	6	N/A
I generate sessions (i.e. create a series of dates for the clinics).	0	1	2	3	4	5	6	N/A

MY HOSPITAL: Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your feelings about the recent *Appointment Assistant* implementation at the hospital where you work, please indicate the degree of your agreement or disagreement with each statement by circling one of the seven following alternatives:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

The hospital values my contribution to its well-being.	1	2	3	4	5	6	7
If the hospital could hire someone to replace me at a lower salary it would do so.	1	2	3	4	5	6	7
The hospital fails to appreciate any extra effort from me.	1	2	3	4	5	6	7
The hospital strongly considers my goals and values.	1	2	3	4	5	6	7
The hospital would ignore any complaint from me.	1	2	3	4	5	6	7
The hospital disregards my best interests when it makes decisions that affect me.	1	2	3	4	5	6	7
Help is available from the hospital when I have a problem.	1	2	3	4	5	6	7
The hospital really cares about my well-being.	1	2	3	4	5	6	7
The hospital is willing to extend itself in order to help me perform my job to the best of my ability.	1	2	3	4	5	6	7
Even if I did the best job possible, the hospital would fail to notice.	1	2	3	4	5	6	7
The hospital is willing to help me when I need a special favor.	1	2	3	4	5	6	7
The hospital cares about my general satisfaction at work.	1	2	3	4	5	6	7
If given the opportunity, the hospital would take advantage of me.	1	2	3	4	5	6	7
The hospital shows very little concern for me.	1	2	3	4	5	6	7
The hospital cares about my opinions.	1	2	3	4	5	6	7
The hospital takes pride in my accomplishments at work.	1	2	3	4	5	6	7
The hospital tries to make my job as interesting as possible.	1	2	3	4	5	6	7

MY REWARDS: Fairness in the following questions means the extent to which a person's contributions to the hospital are related to the rewards received. Recognition, pay, and physical facilities are examples of rewards. Considering the *Appointment Assistant* system in your current job, please indicate the degree of your agreement or disagreement with each statement by circling one of the five following alternatives:

1	2	3	4	5
rewards are not distributed at all fairly	very little fairness	some fairness	rewards are quite fairly distributed	rewards are very fairly distributed

To what extent are you fairly rewarded:

• considering the *responsibilities* that you have?	1 2 3 4 5
• taking into account the amount of *training* that you have had?	1 2 3 4 5
• in view of the *amount of experience* that you have?	1 2 3 4 5
• for the *amount of effort* that you put forth?	1 2 3 4 5
• for *work that you have done well*?	1 2 3 4 5
• for the *stresses and strains* of your job?	1 2 3 4 5

MY ADMINISTRATIVE SUPERVISOR: Please answer the following questions about your administrative supervisor. If you do not have an administrative supervisor where you work, please answer the following questions as they apply to the physician that you work with.

Is your supervisor a physician? ☐ **yes** ☐ **no**

Please indicate the degree of your agreement or disagreement with each statement by circling one of the seven following alternatives:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

My supervisor always gives me positive feedback when I perform well.	1	2	3	4	5	6	7
My supervisor gives me special recognition when my work performance is especially good.	1	2	3	4	5	6	7
My supervisor would quickly acknowledge an improvement in the quality of my work.	1	2	3	4	5	6	7
My supervisor commends me when I do a better than average job.	1	2	3	4	5	6	7
My supervisor personally pays me a compliment when I do outstanding work.	1	2	3	4	5	6	7
My supervisor informs his boss and/or others in the organization when I do outstanding work.	1	2	3	4	5	6	7
If I do well, I know my supervisor will reward me.	1	2	3	4	5	6	7
My supervisor would do all that (s)he could to help me go as far as I would like to go in this organization if my work was consistently above average.	1	2	3	4	5	6	7
My good performance often goes unacknowledged by my supervisor.	1	2	3	4	5	6	7
I often perform well in my job and still receive no praise from my supervisor.	1	2	3	4	5	6	7
If I performed at a level below that which I was capable of, my supervisor would indicate his/her disapproval.	1	2	3	4	5	6	7
My supervisor shows his/her displeasure when my work is below acceptable standards.	1	2	3	4	5	6	7
My supervisor lets me know about it when I perform poorly.	1	2	3	4	5	6	7
My supervisor would reprimand me if my work was below standard.	1	2	3	4	5	6	7
When my work is not up to par, my supervisor points it out to me.	1	2	3	4	5	6	7

WHY AM I CURRENTLY USING THE APPOINTMENT ASSISTANT SYSTEM? Using the scale below, for each statement please circle the number that best describes why you are currently using the *Appointment Assistant* system.

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

Why do you use the *Appointment Assistant* system?

Because I think that working with this system is interesting.	1	2	3	4	5	6	7
Because it is a useful system.	1	2	3	4	5	6	7
Because I am supposed to use it.	1	2	3	4	5	6	7
There may be good reasons for using *Appointment Assistant*, but personally I don't see any.	1	2	3	4	5	6	7
Because it is pleasant to work with this system.	1	2	3	4	5	6	7
Because I think that this system helps me do my work.	1	2	3	4	5	6	7
Because I am required to use it.	1	2	3	4	5	6	7
I use this system but I am not sure if it is worth it.	1	2	3	4	5	6	7
Because this system is fun to use.	1	2	3	4	5	6	7
By personal decision.	1	2	3	4	5	6	7
Because the hospital doesn't give me any choice.	1	2	3	4	5	6	7
I don't know; I don't see what *Appointment Assistant* brings me.	1	2	3	4	5	6	7
Because I enjoy using *Appointment Assistant.*	1	2	3	4	5	6	7
Because I believe that this system is important to do my job.	1	2	3	4	5	6	7
Because I feel that I am obliged to use it.	1	2	3	4	5	6	7
I use *Appointment Assistant*, but it is not useful to me and I would not use it if I had a choice.	1	2	3	4	5	6	7

MY EXPERIENCE WITH THE APPOINTMENT ASSISTANT SYSTEM: For each of the following statements, please indicate how true it is for you in your use of the *Appointment Assistant* system, using the following scale:

1	2	3	4	5	6	7
not at all true			somewhat true			very true

I do not feel at all nervous about using *Appointment Assistant.*	1	2	3	4	5	6	7
I think I am pretty good at using the *Appointment Assistant* system.	1	2	3	4	5	6	7
I find using *Appointment Assistant* to be very interesting.	1	2	3	4	5	6	7
I feel tense while using *Appointment Assistant.*	1	2	3	4	5	6	7
I feel that I have fully mastered the *Appointment Assistant* system.	1	2	3	4	5	6	7
Appointment Assistant is a fun system to work with.	1	2	3	4	5	6	7
I feel relaxed while using *Appointment Assistant.*	1	2	3	4	5	6	7
I enjoy using the *Appointment Assistant* system very much.	1	2	3	4	5	6	7
I am satisfied with my performance using *Appointment Assistant.*	1	2	3	4	5	6	7
I feel anxious when using *Appointment Assistant.*	1	2	3	4	5	6	7
I find using the *Appointment Assistant* system to be very boring.	1	2	3	4	5	6	7
I feel pretty skilled at using the *Appointment Assistant* system.	1	2	3	4	5	6	7
I think the *Appointment Assistant* system is very interesting.	1	2	3	4	5	6	7
I feel pressured about using *Appointment Assistant.*	1	2	3	4	5	6	7
Using the *Appointment Assistant* system is very enjoyable.	1	2	3	4	5	6	7
After working with *Appointment Assistant* for a while, I feel pretty competent.	1	2	3	4	5	6	7

CHANGES THAT AFFECT ME: Please indicate how you feel about the specific changes that you are currently facing in your job as a result of the *Appointment Assistant* system implementation. Please answer each of the items using the following scale:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

I would consider myself to be "open" to the changes the *Appointment Assistant* system brings to my work.	1	2	3	4	5	6	7
Right now, I am somewhat resistant to the *Appointment Assistant* system changes.	1	2	3	4	5	6	7
The changes in my job brought about by the *Appointment Assistant* system implementation have been positive.	1	2	3	4	5	6	7
In light of the changes due to the *Appointment Assistant* system, I was quite reluctant to change the way I do my work.	1	2	3	4	5	6	7
I think that the implementation of the *Appointment Assistant* system has had a positive effect on how I accomplish my work.	1	2	3	4	5	6	7
From my perspective, the *Appointment Assistant* changes are for the better.	1	2	3	4	5	6	7
The *Appointment Assistant* changes are for the worse in terms of the way that I have to get my work done.	1	2	3	4	5	6	7
I think that the *Appointment Assistant* changes have had a negative effect on how I perform my role in the hospital.	1	2	3	4	5	6	7
Wherever the *Appointment Assistant* system takes me, I'm sure I can handle it.	1	2	3	4	5	6	7
I get nervous that I am not able to do all that is demanded of me by the implementation of the *Appointment Assistant* system.	1	2	3	4	5	6	7
I have reason to believe that I do not perform as well in my job following the *Appointment Assistant* system implementation.	1	2	3	4	5	6	7
I have little doubt that I can perform well using the *Appointment Assistant* system.	1	2	3	4	5	6	7

GENERAL INFORMATION:

- What was the date (or the approximate date) when you personally started using the *Appointment Assistant* system on a regular basis? Month: _____ Year: _____

- On average, how many appointments do you book per week using the *Appointment Assistant* system? _____

- Comparing the number of appointments that you book per week using the *Appointment Assistant* system to the total number of appointments that you book per week, how often do you use the *Appointment Assistant* system? (please check one):

☐ never ☐ about half of the time ☐ almost always
☐ almost never ☐ most of the time ☐ always
☐ some of the time

- You are (please check one): ☐ a part-time employee ☐ a full-time employee

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- What is your professional discipline? (please check one):

☐ clerical ☐ nursing
☐ technician ☐ other multi-disciplinary professional (dietician, social worker, etc.)

- The length of your *Appointment Assistant* training was (please check one):

☐ half a day ☐ 1 day ☐ 3 days

- What was the date (or the approximate date) of your *Appointment Assistant* training? Month: _____ Year: _____

- Judging from your use of *Appointment Assistant*, your user-level is (please check one):

☐ view-only user ☐ user ☐ super-user

- Do you record appointments using a paper-based appointment book? ☐ yes ☐ no

---

- If you answered "no" in the previous question, what was the date (or the approximate date) when you stopped using a paper-based appointment book? Month: _____ Year: _____

- Were you employed in your current job at your hospital before the *Appointment Assistant* implementation took place in your department? ☐ yes ☐ no

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- Have you used a computer before using the *Appointment Assistant* system? ☐ yes ☐ no

---

- Have you used the Windows operating system before using the *Appointment Assistant* system?
  ☐ yes ☐ no

- How many years have you been employed at your hospital? _____

- What is your age?
  ☐ under 25 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 or over

- What is your gender? ☐ male ☐ female

- What is the highest level of formal education that you have completed? (please check one):
  ☐ Primary school ☐ College/CEGEP ☐ Graduate degree
  ☐ High school ☐ Undergraduate degree ☐ Professional designation

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THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

École de Gestion
John-Molson
Université Concordia

Mai / Juin 2003

Cher utilisateur, chère utilisatrice du système *Appointment Assistant*,

Peut-être avez-vous, au cours des dernières semaines, rempli un questionnaire du Hospital Centre portant sur [...]. ***À titre d'utilisateur du système Appointment Assistant, nous aimerions beaucoup obtenir à nouveau votre opinion! Nous avons entrepris de mener un sondage qui vise à examiner les facteurs qui ont une incidence sur l'utilisation et l'acceptation de la technologie de l'information, en milieu de travail.***

Nous faisons appel à votre collaboration pour remplir le présent questionnaire traitant de votre emploi et du système *Appointment Assistant*. Vous devrez prévoir environ 15 minutes pour répondre au sondage et votre participation est volontaire.

Nous croyons fermement que la présente étude permettra d'améliorer les futures implantations de technologies de l'information tant au *Hospital Centre* qu'au sein de votre hôpital. De plus, elle nous aidera à mieux comprendre les situations dans lesquelles les personnes concernées sont incitées à faire appel aux nouvelles technologies de l'information en milieu de travail. En cela, l'occasion vous est ainsi offerte de nous faire part de votre expérience avec le système *Appointment Assistant*. Les renseignements que vous nous fournirez demeureront **parfaitement confidentiels et anonymes**; seuls les chercheurs de l'Université Concordia ouvriront votre enveloppe scellée et auront accès aux questionnaires. Seul un résumé des résultats généraux sera publié et aucun de vos collègues ou gestionnaires ne pourra, dans quelque situation que ce soit, prendre connaissance de vos propres réponses. Pour cette raison, nous vous incitons à faire preuve du plus d'ouverture d'esprit possible en répondant au questionnaire. **Veuillez nous retourner le questionnaire dûment rempli en le glissant dans l'enveloppe–retour prévue à cette fin et en confiant celle-ci au service de courrier interne du *Hospital Centre*.**

Le présent projet a été entièrement approuvé au terme de l'examen sur le plan de l'éthique qu'exigent tant l'École de gestion John-Molson de l'Université Concordia que le groupe de recherche et développement sur l'organisation du travail du *Hospital Centre*. N'hésitez pas à communiquer avec nous si vous avez des questions ou des commentaires sur la présente étude. Nous vous remercions d'avance de votre aide et de votre participation.

Veuillez agréer l'expression de nos sentiments respectueux.

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Courriel: dyer@jmsb.concordia.ca

(Please turn over for English version)

MON UTILISATION DU SYSTÈME APPOINTMENT ASSISTANT: Veuillez indiquer dans quelle mesure vous avez recours aux fonctions suivantes du système *Appointment Assistant*, en vous référant à l'échelle appropriée. Si vous n'avez pas la permission d'accéder à une fonction en particulier, ou si l'une d'entre elles n'est pas disponible au sein de votre service, veuillez sélectionner l'option « sans objet » (s.o.).

0 jamais	1	2	3 à peu près la moitié du temps	4	5	6 toujours	s.o. sans objet

FONCTIONS DE RECHERCHE

Je recherche les patients: Au moyen d'un numéro de dossier médical (NDM).	0	1	2	3	4	5	6	s.o.
Au moyen du nom.	0	1	2	3	4	5	6	s.o.
Phonétiquement.	0	1	2	3	4	5	6	s.o.
Au moyen du numéro d'assurance-maladie.	0	1	2	3	4	5	6	s.o.
Au moyen de la date de naissance.	0	1	2	3	4	5	6	s.o.
Au moyen du numéro de téléphone principal.	0	1	2	3	4	5	6	s.o.
Je fusionne les dossiers de patients qui sont en double.	0	1	2	3	4	5	6	s.o.

PRISE DE RENDEZ-VOUS

Je réserve des rendez-vous: « ordinaires » ou « réguliers ».	0	1	2	3	4	5	6	s.o.
Au moyen de l'option « Délai demandé ».	0	1	2	3	4	5	6	s.o.
Au moyen de l'option « À partir d'une date donnée ».	0	1	2	3	4	5	6	s.o.
Au moyen de l'option « Préférences du patient », p. ex. certains jours et/ou heures.	0	1	2	3	4	5	6	s.o.
Coordonnés avec d'autres cliniques.	0	1	2	3	4	5	6	s.o.

ENREGISTREMENT DES VISITES ET DES PRÉSENCES

Je consigne des statistiques: Un patient à la fois.	0	1	2	3	4	5	6	s.o.
En inversant l'indicateur de présence négatif et en confirmant la présence des patients qui se sont présentés.	0	1	2	3	4	5	6	s.o.
Sur les patients sans rendez-vous (spontanés).	0	1	2	3	4	5	6	s.o.
Je fusionne les dossiers temporaires et permanents des patients.	0	1	2	3	4	5	6	s.o.

0	1	2	3	4	5	6	s.o.
jamais			à peu près la moitié du temps			toujours	sans objet

RAPPORTS

J'imprime:	Des listes de « caractéristiques des clients ».	0	1	2	3	4	5	6	s.o.
	Des listes de rendez-vous.	0	1	2	3	4	5	6	s.o.
	D'autres rapports opérationnels (rendez-vous à reporter, listes d'attente, liste des dossiers à extraire).	0	1	2	3	4	5	6	s.o.
Je vérifie les présences incomplètes avant de soumettre mes statistiques.		0	1	2	3	4	5	6	s.o.

GESTION DES RENDEZ-VOUS ET DES CALENDRIERS

Je supprime les sessions prévues (c.-à-d. annulation de cliniques).		0	1	2	3	4	5	6	s.o.
Je reporte les patients dont les cliniques ont été annulées.		0	1	2	3	4	5	6	s.o.
Je crée de nouvelles journées de soins cliniques.		0	1	2	3	4	5	6	s.o.
J'ai recours à la fonction « Éditer la session » pour modifier la structure des journées de soins cliniques.		0	1	2	3	4	5	6	s.o.
J'ai recours à:	La fonction de liste d'attente.	0	1	2	3	4	5	6	s.o.
	La fonction de liste de confirmation.	0	1	2	3	4	5	6	s.o.
	La fonction de liste des rendez-vous antérieurs.	0	1	2	3	4	5	6	s.o.

MODÈLES, CALENDRIERS ET GÉNÉRATION DE LA SESSION

Je crée de nouveaux modèles.	0	1	2	3	4	5	6	s.o.
Je modifie des modèles existants.	0	1	2	3	4	5	6	s.o.
Je crée de nouveaux calendriers pour certaines cliniques.	0	1	2	3	4	5	6	s.o.
Je modifie des calendriers existants.	0	1	2	3	4	5	6	s.o.
Je génère des sessions (c.-à-d. que je crée une série de dates, pour les cliniques).	0	1	2	3	4	5	6	s.o.

MON HÔPITAL: Vous trouverez ci-après une série d'énoncés qui correspondent à des sentiments que certaines personnes pourraient éprouver à l'égard de l'entreprise ou de l'organisation pour laquelle elles travaillent. Veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en encerclant l'une des sept réponses suivantes à l'égard de l'implantation récente du système *Appointment Assistant* au sein de l'hôpital dans lequel vous travaillez:

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

L'hôpital valorise ma contribution à son bien-être.	1	2	3	4	5	6	7
L'hôpital engagerait quelqu'un d'autre à salaire moindre s'il le pouvait.	1	2	3	4	5	6	7
L'hôpital ne sait pas apprécier mes surcroîts d'efforts.	1	2	3	4	5	6	7
L'hôpital prend réellement en considération mes objectifs et mes valeurs.	1	2	3	4	5	6	7
L'hôpital ignore les plaintes qui viennent de moi.	1	2	3	4	5	6	7
L'hôpital ne tient pas compte de mes intérêts quand vient le temps de prendre des décisions.	1	2	3	4	5	6	7
De l'aide est disponible par à l'hôpital lorsque j'ai un problème.	1	2	3	4	5	6	7
L'hôpital est réellement soucieux de mon bien-être.	1	2	3	4	5	6	7
L'hôpital est prêt à s'engager afin de m'aider à exécuter mon travail au meilleur de mes capacités.	1	2	3	4	5	6	7
Même si je fais le meilleur travail possible, l'hôpital ne le remarquerait pas.	1	2	3	4	5	6	7
L'hôpital est prêt à m'aider lorsque j'ai un service spécial à demander.	1	2	3	4	5	6	7
L'hôpital se soucie de ma satisfaction générale au travail.	1	2	3	4	5	6	7
S'il en avait l'opportunité, l'hôpital profiterait de moi.	1	2	3	4	5	6	7
L'hôpital se soucie très peu de moi.	1	2	3	4	5	6	7
L'hôpital prend mon opinion à coeur.	1	2	3	4	5	6	7
L'hôpital tire une certaine fierté de mes réalisations au travail.	1	2	3	4	5	6	7
L'hôpital cherche à rendre mon travail aussi intéressant que possible.	1	2	3	4	5	6	7

MES RÉCOMPENSES: Dans les questions suivantes, le concept d'« équité » fait référence à la correspondance entre l'apport d'une personne à l'hôpital et les récompenses qu'elle reçoit. La reconnaissance, la rémunération ainsi que les locaux constituent des exemples de récompenses. En tenant compte du système *Appointment Assistant* dans votre emploi actuel, veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en encerclant l'une des cinq réponses suivantes:

1	2	3	4	5
les récompenses ne sont absolument pas accordées équitablement	très peu d'équité	une certaine équité	les récompenses sont accordées de manière relativement équitable	les récompenses sont accordées de manière tout à fait équitable

Dans quelle mesure êtes-vous équitablement récompensé:

• Considérant les *responsabilités* qui sont les vôtres?	1 2 3 4 5
• En tenant compte de l'étendue de la *formation* que vous avez suivie?	1 2 3 4 5
• Au vu de *l'expérience* que vous possédez?	1 2 3 4 5
• Par rapport aux *efforts* que vous avez consacrés?	1 2 3 4 5
• Pour *du travail que vous avez bien accompli*?	1 2 3 4 5
• En rapport avec *les contraintes et les pressions* inhérentes à votre emploi?	1 2 3 4 5

MON SUPERVISEUR ADMINISTRATIF: Veuillez répondre aux questions suivantes au sujet de votre superviseur administratif. Si vous n'avez pas de superviseur administratif là où vous travaillez, veuillez répondre aux questions suivantes en vous référant au médecin avec qui vous travaillez.

Votre superviseur est-il un médecin? ☐ oui ☐ non

Veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en encerclant l'une des sept réponses suivantes:

1 fortement en désaccord	2 en désaccord	3 assez en désaccord	4 ni en accord ni en désaccord	5 assez en accord	6 en accord	7 fortement en accord

Mon superviseur me fait toujours des commentaires élogieux lorsque j'effectue du bon travail.	1	2	3	4	5	6	7
Mon superviseur souligne ma performance lorsque cela est particulièrement bonne.	1	2	3	4	5	6	7
Mon superviseur reconnaît rapidement une amélioration sur le plan de la qualité de mon travail.	1	2	3	4	5	6	7
Mon superviseur me félicite lorsque mon travail est mieux que la moyenne.	1	2	3	4	5	6	7
Mon superviseur me complimente personnellement lorsque mon travail est exceptionnel.	1	2	3	4	5	6	7
Mon superviseur avise son propre supérieur ainsi que d'autres personnes au sein de l'organisation lorsque mon travail est exceptionnel.	1	2	3	4	5	6	7
Si je fais un bon travail, je sais que mon superviseur me récompensera.	1	2	3	4	5	6	7
Si mon travail était constamment supérieur à la moyenne, mon superviseur ne ménagerait aucun effort pour m'aider à monter, au sein de cette organisation.	1	2	3	4	5	6	7
Il arrive fréquemment que mon superviseur ne reconnaisse pas mon bon rendement.	1	2	3	4	5	6	7
Il m'arrive souvent de faire du bon travail et de ne pas recevoir de compliments de la part de mon superviseur.	1	2	3	4	5	6	7
Si mon travail était d'un niveau inférieur à celui de mes capacités, mon superviseur me ferait part de sa désapprobation.	1	2	3	4	5	6	7
Mon superviseur manifeste son mécontentement lorsque mon travail se situe en deçà des normes acceptables.	1	2	3	4	5	6	7
Mon superviseur me laisse savoir lorsque mon travail est insatisfaisant.	1	2	3	4	5	6	7
Mon superviseur me réprimanderait si mon travail était inférieur aux normes.	1	2	3	4	5	6	7
Lorsque mon travail est insatisfaisant, mon superviseur me le signale.	1	2	3	4	5	6	7

POURQUOI AI-JE ACTUELLEMENT RECOURS AU SYSTÈME APPOINTMENT ASSISTANT? En vous référant à l'échelle suivante, encerclez, pour chacun des énoncés, le chiffre qui décrit le mieux la raison pour laquelle vous utilisez actuellement le système *Appointment Assistant*.

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

Pourquoi avez-vous recours au système *Appointment Assistant*?

Parce que je pense qu'il est intéressant de travailler avec ce système.	1	2	3	4	5	6	7
Parce qu'il s'agit d'un système utile.	1	2	3	4	5	6	7
Parce que je suis supposé(e) y avoir recours.	1	2	3	4	5	6	7
Peut-être existe-t-il de bonnes raisons justifiant l'utilisation du système *Appointment Assistant* mais, pour ma part, je n'en vois aucune.	1	2	3	4	5	6	7
Parce qu'il est agréable de travailler avec ce système.	1	2	3	4	5	6	7
Parce que je crois que ce système m'aide dans mon travail.	1	2	3	4	5	6	7
Parce que je suis tenu(e) d'y avoir recours.	1	2	3	4	5	6	7
J'ai recours à ce système mais je ne suis pas sûr(e) que cela en vaille la peine.	1	2	3	4	5	6	7
Parce qu'il est amusant d'utiliser ce système.	1	2	3	4	5	6	7
Par décision personnelle.	1	2	3	4	5	6	7
Parce que l'hôpital ne me donne pas le choix.	1	2	3	4	5	6	7
Je ne sais pas; je ne vois pas très bien ce que le système *Appointment Assistant* m'apporte.	1	2	3	4	5	6	7
Parce que j'ai du plaisir à utiliser le système *Appointment Assistant*.	1	2	3	4	5	6	7
Parce que je crois que ce système est important pour faire mon travail.	1	2	3	4	5	6	7
Parce que je me sens obligé(e) de l'utiliser.	1	2	3	4	5	6	7
J'ai recours au système *Appointment Assistant*, mais je ne crois pas qu'il me soit utile et, si j'avais le choix, je n'y aurais pas recours.	1	2	3	4	5	6	7

MON EXPÉRIENCE AVEC LE SYSTÈME APPOINTMENT ASSISTANT: Pour chacun des énoncés suivants, précisez, en vous référant à l'échelle suivante, dans quelle mesure celui-ci témoigne de votre sentiment à l'égard de l'utilisation du système *Appointment Assistant*:

1	2	3	4	5	6	7
pas du tout vrai			vrai dans une certaine mesure			tout à fait vrai

Je ne me sens pas nerveux(se) à l'idée d'utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
Je crois me tirer assez bien d'affaire en rapport avec l'utilisation du système *Appointment Assistant.*	1	2	3	4	5	6	7
Je trouve très intéressant d'utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
Je me sens tendu(e) lorsque j'utilise le système *Appointment Assistant.*	1	2	3	4	5	6	7
J'estime avoir parfaitement maîtrisé le système *Appointment Assistant.*	1	2	3	4	5	6	7
Le système *Appointment Assistant* est agréable à utiliser.	1	2	3	4	5	6	7
Je me sens détendu(e) lorsque j'utilise le système *Appointment Assistant.*	1	2	3	4	5	6	7
J'ai beaucoup de plaisir à utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
Je suis satisfait(e) de mon rendement, en rapport avec l'utilisation du système *Appointment Assistant.*	1	2	3	4	5	6	7
Je me sens angoissé(e) lorsque j'utilise le système *Appointment Assistant.*	1	2	3	4	5	6	7
J'estime qu'il est très ennuyant d'utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
J'estime maîtriser plutôt bien l'utilisation du système *Appointment Assistant.*	1	2	3	4	5	6	7
J'estime que le système *Appointment Assistant* est très intéressant.	1	2	3	4	5	6	7
Je m'estime contraint(e) d'utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
Il est très agréable d'utiliser le système *Appointment Assistant.*	1	2	3	4	5	6	7
Ayant utilisé le système *Appointment Assistant* depuis un certain temps, je m'estime plutôt compétent(e).	1	2	3	4	5	6	7

CHANGEMENTS QUI ONT UNE INCIDENCE SUR MOI: Veuillez préciser votre sentiment par rapport aux changements spécifiques auxquels vous êtes actuellement confronté dans votre emploi, suite à l'implantation du système *Appointment Assistant*. Veuillez répondre à chacune des questions en vous référant à l'échelle suivante:

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

Je m'estime relativement « ouvert(e) » par rapport aux changements que le système *Appointment Assistant* apporte à mon travail.	1	2	3	4	5	6	7
Pour le moment, je suis un peu réticent(e) par rapport aux changements inhérents au système *Appointment Assistant*.	1	2	3	4	5	6	7
Les changements qu'a suscité l'implantation du système *Appointment Assistant*, en rapport avec mon travail, se sont avérés positifs.	1	2	3	4	5	6	7
Au vu des changements inhérents au système *Appointment Assistant*, j'étais plutôt réticent(e) à changer la manière de faire mon travail.	1	2	3	4	5	6	7
J'estime que l'implantation du système *Appointment Assistant* a eu des répercussions positives sur la manière dont je m'acquitte de mon travail.	1	2	3	4	5	6	7
De mon point de vue, les changements inhérents au système *Appointment Assistant* sont positifs.	1	2	3	4	5	6	7
Les changements inhérents au système *Appointment Assistant* ont empiré la manière dont je dois m'acquitter de mon travail.	1	2	3	4	5	6	7
J'estime que les changements inhérents au système *Appointment Assistant* ont eu des répercussions négatives sur la manière dont je m'acquitte de mon rôle, au sein de l'hôpital.	1	2	3	4	5	6	7
Quelles que soient les répercussions inhérentes à l'utilisation du système *Appointment Assistant*, je suis sûr(e) que je pourrais y faire face.	1	2	3	4	5	6	7
Je m'inquiète de ne pas être en mesure d'être à la hauteur de la situation, suite à l'implantation du système *Appointment Assistant*.	1	2	3	4	5	6	7
J'ai des raisons de croire que je ne m'acquitte pas aussi bien de mon travail depuis l'implantation du système *Appointment Assistant*.	1	2	3	4	5	6	7
Je n'ai aucun doute que je m'en tire bien en ce qui concerne l'utilisation du système *Appointment Assistant*.	1	2	3	4	5	6	7

RENSEIGNEMENTS GÉNÉRAUX:

Pour chacune des questions suivantes, veuillez indiquer votre réponse par un crochet dans la case appropriée:

- À quelle date précise (ou approximative) avez-vous personnellement commencé à utiliser régulièrement le système *Appointment Assistant*? Mois: _____ Année: _____

- En moyenne, combien de rendez-vous prenez-vous par semaine, au moyen du système *Appointment Assistant*? _____

- Si l'on compare le nombre de rendez-vous hebdomadaires (par semaine) que vous prenez au moyen du système *Appointment Assistant* au nombre hebdomadaire total de rendez-vous que vous prenez, à quelle fréquence utilisez-vous le système *Appointment Assistant*?

  ☐ Jamais ☐ Environ une fois sur deux ☐ Pratiquement toujours
  ☐ Pratiquement jamais ☐ La plupart du temps ☐ Toujours
  ☐ Parfois

- Vous êtes:

  ☐ Employé à temps partiel ☐ Employé à plein temps

- Quelle est votre discipline professionnelle?

  ☐ Administration ☐ Soins infirmiers
  ☐ Technicien ☐ Autre professionnel multidisciplinaire (diététicien, travailleur social, etc.)

- Durée de votre formation en rapport avec *Appointment Assistant*:

  ☐ Une demi-journée ☐ 1 jour ☐ 3 jours

- Quelle est la date précise (ou approximative) de votre formation en rapport avec *Appointment Assistant*? Mois : _____ Année : _____

- Si vous vous fiez à l'utilisation que vous faites de *Appointment Assistant*, de quelle catégorie faites-vous partie?

  ☐ Utilisateur en mode de consultation uniquement ☐ Utilisateur ☐ Super-utilisateur

---

- Prenez-vous des rendez-vous au moyen d'un carnet de rendez-vous traditionnel (sur papier)?

  ☐ Oui ☐ Non

- Si vous avez répondu « Non » à la question précédente, à quelle date précise (ou approximative) avez-vous cessé d'avoir recours à un carnet de rendez-vous traditionnel?

  Mois : _____ Année : _____

- Occupiez-vous votre poste actuel, à l'hôpital, avant que le système *Appointment Assistant* ne soit implanté au sein de votre service? ☐ Oui ☐ Non

---

- Avez-vous eu recours à un ordinateur avant d'utiliser le système *Appointment Assistant*?

  ☐ Oui ☐ Non

- Avez-vous eu recours au système d'exploitation Windows avant d'utiliser le système *Appointment Assistant*? ☐ Oui ☐ Non

---

- Depuis combien d'années travaillez-vous au sein de votre hôpital? _____

- Quel est votre âge?

  ☐ Moins de 25 ans ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 ans ou plus

---

- Quel est votre sexe? ☐ Homme ☐ Femme

- Quel est votre niveau de scolarité?

  ☐ École primaire
  ☐ École secondaire
  ☐ Collège/CÉGEP
  ☐ Diplôme de premier cycle
  ☐ Diplôme d'études supérieures
  ☐ Titre professionnel

MERCI BEAUCOUP DE VOTRE PARTICIPATION!

APPENDIX B

WEB-SURVEY FOR STUDY TWO:

A PHARMACY INFORMATION SYSTEM

Note: This web-survey has been modified from its original version. The original bilingual web-survey (6 pages in English and 7 pages in French) first asked the respondent to choose a language; however in this appendix the 7-page French version follows the 7-page English version to conform to the thesis page format guidelines. This results in several minor changes to the layout of the questionnaire. For the purposes of this appendix, the information system is referred to as the "Pharmacy Assistant" system and the organization is referred to as the "Hospital Centre", for both the English and French versions. All changes are indicated in italics. Information specific to the organization was removed and is so indicated by [...] and ***.

June 2003

Dear *Pharmacy Assistant* user,

As users of the Pharmacy Assistant system, your opinion would be very much appreciated! We are conducting a survey to examine the factors that affect the use and acceptance of information technology at work.

We are asking for your help in filling out this questionnaire about your job and the *Pharmacy Assistant* system. The survey will take about 15 minutes to complete and is voluntary.

We are excited about the possibilities for this research to enhance future information technology implementations at the *Hospital Centre* and at your hospital, and to help us better understand the conditions under which people are motivated to use new information technology systems at work. As such, this is your opportunity to tell us about your experience with the *Pharmacy Assistant* system. The information you provide will be **completely confidential and anonymous**; only the researchers from Concordia University will have access to the individual questionnaires. Only a summary of the overall results will be released; your individual answers will never be seen by any of your co-workers or managers. For this reason, we ask you to be as open as possible when you answer the questionnaire.

This project has been fully approved following the ethical review that is required at the John Molson School of Business of Concordia University and the *Hospital Centre* Research and Development Group on Work Organization. Please do not hesitate to get in touch with us if you have any questions or comments about this research. We thank you in advance for your help and participation in our study.

Yours sincerely,

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MY HOSPITAL: Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your feelings about the recent *Pharmacy Assistant* implementation at the hospital where you work, please indicate the degree of your agreement or disagreement with each statement by selecting one of the seven following alternatives:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

The hospital values my contribution to its well-being.	1	2	3	4	5	6	7
If the hospital could hire someone to replace me at a lower salary it would do so.	1	2	3	4	5	6	7
The hospital fails to appreciate any extra effort from me.	1	2	3	4	5	6	7
The hospital strongly considers my goals and values.	1	2	3	4	5	6	7
The hospital would ignore any complaint from me.	1	2	3	4	5	6	7
The hospital disregards my best interests when it makes decisions that affect me.	1	2	3	4	5	6	7
Help is available from the hospital when I have a problem.	1	2	3	4	5	6	7
The hospital really cares about my well-being.	1	2	3	4	5	6	7
The hospital is willing to extend itself in order to help me perform my job to the best of my ability.	1	2	3	4	5	6	7
Even if I did the best job possible, the hospital would fail to notice.	1	2	3	4	5	6	7
The hospital is willing to help me when I need a special favor.	1	2	3	4	5	6	7
The hospital cares about my general satisfaction at work.	1	2	3	4	5	6	7
If given the opportunity, the hospital would take advantage of me.	1	2	3	4	5	6	7
The hospital shows very little concern for me.	1	2	3	4	5	6	7
The hospital cares about my opinions.	1	2	3	4	5	6	7
The hospital takes pride in my accomplishments at work.	1	2	3	4	5	6	7
The hospital tries to make my job as interesting as possible.	1	2	3	4	5	6	7

MY REWARDS: Fairness in the following questions means the extent to which a person's contributions to the hospital are related to the rewards received. Money, recognition, and physical facilities are examples of rewards. Considering the *Pharmacy Assistant* system in your current job, please indicate the degree of your agreement or disagreement with each statement by selecting one of the five following alternatives:

1	2	3	4	5
rewards are not distributed at all fairly	very little fairness	some fairness	rewards are quite fairly distributed	rewards are very fairly distributed

To what extent are you fairly rewarded:

• considering the *responsibilities* that you have?	1 2 3 4 5
• taking into account the amount of *training* that you have had?	1 2 3 4 5
• in view of the *amount of experience* that you have?	1 2 3 4 5
• for the *amount of effort* that you put forth?	1 2 3 4 5
• for *work that you have done well*?	1 2 3 4 5
• for the *stresses and strains* of your job?	1 2 3 4 5

MY SUPERVISOR: Please indicate the degree of your agreement or disagreement with each statement by selecting one of the seven following alternatives:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

My supervisor always gives me positive feedback when I perform well.	1	2	3	4	5	6	7
My supervisor gives me special recognition when my work performance is especially good.	1	2	3	4	5	6	7
My supervisor would quickly acknowledge an improvement in the quality of my work.	1	2	3	4	5	6	7
My supervisor commends me when I do a better than average job.	1	2	3	4	5	6	7
My supervisor personally pays me a compliment when I do outstanding work.	1	2	3	4	5	6	7
My supervisor informs his boss and/or others in the organization when I do outstanding work.	1	2	3	4	5	6	7
If I do well, I know my supervisor will reward me.	1	2	3	4	5	6	7
My supervisor would do all that (s)he could to help me go as far as I would like to go in this organization if my work was consistently above average.	1	2	3	4	5	6	7
My good performance often goes unacknowledged by my supervisor.	1	2	3	4	5	6	7
I often perform well in my job and still receive no praise from my supervisor.	1	2	3	4	5	6	7
If I performed at a level below that which I was capable of, my supervisor would indicate his/her disapproval.	1	2	3	4	5	6	7
My supervisor shows his/her displeasure when my work is below acceptable standards.	1	2	3	4	5	6	7
My supervisor lets me know about it when I perform poorly.	1	2	3	4	5	6	7
My supervisor would reprimand me if my work was below standard.	1	2	3	4	5	6	7
When my work is not up to par, my supervisor points it out to me.	1	2	3	4	5	6	7

WHY AM I CURRENTLY USING THE PHARMACY ASSISTANT SYSTEM? Using the scale below, for each statement please select the number that best describes why you are currently using the *Pharmacy Assistant* system.

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

Why do you use the *Pharmacy Assistant* system?

Because I think that working with this system is interesting.	1	2	3	4	5	6	7
Because it is a useful system.	1	2	3	4	5	6	7
Because I am supposed to use it.	1	2	3	4	5	6	7
There may be good reasons for using the *Pharmacy Assistant* system, but personally I don't see any.	1	2	3	4	5	6	7
Because it is pleasant to work with this system.	1	2	3	4	5	6	7
Because I think that this system helps me do my work.	1	2	3	4	5	6	7
Because I am required to use it.	1	2	3	4	5	6	7
I use this system but I am not sure if it is worth it.	1	2	3	4	5	6	7
Because this system is fun to use.	1	2	3	4	5	6	7
By personal decision.	1	2	3	4	5	6	7
Because the hospital doesn't give me any choice.	1	2	3	4	5	6	7
I don't know; I don't see what the *Pharmacy Assistant* system brings me.	1	2	3	4	5	6	7
Because I enjoy using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
Because I believe that this system is important to do my job.	1	2	3	4	5	6	7
Because I feel that I am obliged to use it.	1	2	3	4	5	6	7
I use the *Pharmacy Assistant* system, but it is not useful to me and I would not use it if I had a choice.	1	2	3	4	5	6	7

MY EXPERIENCE WITH THE PHARMACY ASSISTANT SYSTEM: For each of the following statements, please indicate how true it is for you in your use of the *Pharmacy Assistant* system, using the following scale:

1	2	3	4	5	6	7
not at all true			somewhat true			very true

I do not feel at all nervous about using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I think I am pretty good at using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I find using the *Pharmacy Assistant* system to be very interesting.	1	2	3	4	5	6	7
I feel tense while using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I feel that I have fully mastered the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
Pharmacy Assistant is a fun system to work with.	1	2	3	4	5	6	7
I feel relaxed while using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I enjoy using the *Pharmacy Assistant* system very much.	1	2	3	4	5	6	7
I am satisfied with my performance using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I feel anxious when using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I find using the *Pharmacy Assistant* system to be very boring.	1	2	3	4	5	6	7
I feel pretty skilled at using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I think the *Pharmacy Assistant* system is very interesting.	1	2	3	4	5	6	7
I feel pressured about using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
Using the *Pharmacy Assistant* system is very enjoyable.	1	2	3	4	5	6	7
After working with the *Pharmacy Assistant* system for a while, I feel pretty competent.	1	2	3	4	5	6	7

CHANGES THAT AFFECT ME: Please indicate how you feel about the specific changes that you are currently facing in your job as a result of the *Pharmacy Assistant* system implementation. Please answer each of the items using the following scale:

1	2	3	4	5	6	7
strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree

I would consider myself to be "open" to the changes the *Pharmacy Assistant* system brings to my work.	1	2	3	4	5	6	7
Right now, I am somewhat resistant to the *Pharmacy Assistant* system changes.	1	2	3	4	5	6	7
The changes in my job brought about by the *Pharmacy Assistant* system implementation have been positive.	1	2	3	4	5	6	7
In light of the changes in the *Pharmacy Assistant* system, I was quite reluctant to change the way I do my work.	1	2	3	4	5	6	7
I think that the implementation of the *Pharmacy Assistant* system has had a positive effect on how I accomplish my work.	1	2	3	4	5	6	7
From my perspective, the *Pharmacy Assistant* system changes are for the better.	1	2	3	4	5	6	7
The *Pharmacy Assistant* system changes are for the worse in terms of the way that I have to get my work done.	1	2	3	4	5	6	7
I think that the *Pharmacy Assistant* system changes have had a negative effect on how I perform my role in the hospital.	1	2	3	4	5	6	7
Wherever the *Pharmacy Assistant* system takes me, I'm sure I can handle it.	1	2	3	4	5	6	7
I get nervous that I am not able to do all that is demanded of me by the implementation of the *Pharmacy Assistant* system.	1	2	3	4	5	6	7
I have reason to believe that I do not perform as well in my job following the *Pharmacy Assistant* system implementation.	1	2	3	4	5	6	7
I have little doubt that I can perform well using the *Pharmacy Assistant* system.	1	2	3	4	5	6	7

GENERAL INFORMATION:

- What was the date (or the approximate date) when you personally started using the *Pharmacy Assistant* system on a regular basis? Month: _____ Year: _____

- The length of your *Pharmacy Assistant* system training was approximately _____ hours.

- You are a (please check one):
  - ☐ Pharmacy technical assistant
  - ☐ Pharmacist
  - ☐ IT group-member
  - ☐ Assistant director or site manager

- You are a (please check one): ☐ part-time employee ☐ full-time employee

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- Which hospital do you work at? (please indicate principal site):
  - ☐ *Hospital A*
  - ☐ *Hospital B*
  - ☐ *Hospital C*
  - ☐ *Hospital D*
  - ☐ *Hospital E*

- Were you employed in your current job at your hospital before the *Pharmacy Assistant* implementation took place? ☐ yes ☐ no

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- How many years have you been employed at your hospital? _____

- What is your age?

  ☐ under 25 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 or over

- What is your gender? ☐ male ☐ female

- What is the highest level of formal education that you have completed? (please check one):

  ☐ Primary school ☐ College/CEGEP ☐ Graduate degree
  ☐ High school ☐ Undergraduate degree ☐ Professional designation

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THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Juin 2003

Cher utilisateur, chère utilisatrice du système de pharmacie *Pharmacy Assistant*,

À titre d'utilisateur du système de pharmacie Pharmacy Assistant, nous aimerions beaucoup obtenir votre opinion! Nous avons entrepris de mener un sondage qui vise à examiner les facteurs qui ont une incidence sur l'utilisation et l'acceptation de la technologie de l'information, en milieu de travail.

Nous faisons appel à votre collaboration pour remplir le présent questionnaire traitant de votre emploi et du système *Pharmacy Assistant*. Vous devrez prévoir environ 15 minutes pour répondre au sondage et votre participation est volontaire.

Nous croyons fermement que la présente étude permettra d'améliorer les futures implantations de technologies de l'information tant au *Hospital Centre* qu'au sein de votre hôpital. De plus, elle nous aidera à mieux comprendre les situations dans lesquelles les personnes concernées sont incitées à faire appel aux nouvelles technologies de l'information en milieu de travail. En cela, l'occasion vous est ainsi offerte de nous faire part de votre expérience avec le système *Pharmacy Assistant*. Les renseignements que vous nous fournirez demeureront **parfaitement confidentiels et anonymes**; seuls les chercheurs de l'Université Concordia auront accès aux questionnaires. Seul un résumé des résultats généraux sera publié et aucun de vos collègues ou gestionnaires ne pourra, dans quelque situation que ce soit, prendre connaissance de vos propres réponses. Pour cette raison, nous vous incitons à faire preuve du plus d'ouverture d'esprit possible en répondant au questionnaire.

Le présent projet a été entièrement approuvé au terme de l'examen sur le plan de l'éthique qu'exigent tant l'École de gestion John-Molson de l'Université Concordia que le groupe de recherche et développement sur l'organisation du travail du *Hospital Centre*. N'hésitez pas à communiquer avec nous si vous avez des questions ou des commentaires sur la présente étude. Nous vous remercions d'avance de votre aide et de votre participation.

Veuillez agréer l'expression de nos sentiments respectueux.

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MON HÔPITAL: Vous trouverez ci-après une série d'énoncés qui correspondent à des sentiments que certaines personnes pourraient éprouver à l'égard de l'entreprise ou de l'organisation pour laquelle elles travaillent. Veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en sélectionnant l'une des sept réponses suivantes à l'égard de l'implantation récente du système *Pharmacy Assistant* au sein de l'hôpital dans lequel vous travaillez:

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

L'hôpital valorise ma contribution à son bien-être.	1	2	3	4	5	6	7
L'hôpital engagerait quelqu'un d'autre à salaire moindre s'il le pouvait.	1	2	3	4	5	6	7
L'hôpital ne sait pas apprécier mes surcroîts d'efforts.	1	2	3	4	5	6	7
L'hôpital prend réellement en considération mes objectifs et mes valeurs.	1	2	3	4	5	6	7
L'hôpital ignore les plaintes qui viennent de moi.	1	2	3	4	5	6	7
L'hôpital ne tient pas compte de mes intérêts quand vient le temps de prendre des décisions.	1	2	3	4	5	6	7
De l'aide est disponible par à l'hôpital lorsque j'ai un problème.	1	2	3	4	5	6	7
L'hôpital est réellement soucieux de mon bien-être.	1	2	3	4	5	6	7
L'hôpital est prêt à s'engager afin de m'aider à exécuter mon travail au meilleur de mes capacités.	1	2	3	4	5	6	7
Même si je fais le meilleur travail possible, l'hôpital ne le remarquerait pas.	1	2	3	4	5	6	7
L'hôpital est prêt à m'aider lorsque j'ai un service spécial à demander.	1	2	3	4	5	6	7
L'hôpital se soucie de ma satisfaction générale au travail.	1	2	3	4	5	6	7
S'il en avait l'opportunité, l'hôpital profiterait de moi.	1	2	3	4	5	6	7
L'hôpital se soucie très peu de moi.	1	2	3	4	5	6	7
L'hôpital prend mon opinion à coeur.	1	2	3	4	5	6	7
L'hôpital tire une certaine fierté de mes réalisations au travail.	1	2	3	4	5	6	7
L'hôpital cherche à rendre mon travail aussi intéressant que possible.	1	2	3	4	5	6	7

MES RÉCOMPENSES: Dans les questions suivantes, le concept d'« équité » fait référence à la correspondance entre l'apport d'une personne à l'hôpital et les récompenses qu'elle reçoit. L'argent, la reconnaissance et les locaux constituent des exemples de récompenses. En tenant compte du système *Pharmacy Assistant* dans votre emploi actuel, veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en sélectionnant l'une des cinq réponses suivantes:

1	2	3	4	5
les récompenses ne sont absolument pas accordées équitablement	très peu d'équité	une certaine équité	les récompenses sont accordées de manière relativement équitable	les récompenses sont accordées de manière tout à fait équitable

Dans quelle mesure êtes-vous équitablement récompensé:

• Considérant les *responsabilités* qui sont les vôtres?	1 2 3 4 5
• En tenant compte de l'étendue de la *formation* que vous avez suivie?	1 2 3 4 5
• Au vu de *l'expérience* que vous possédez?	1 2 3 4 5
• Par rapport aux *efforts* que vous avez consacrés?	1 2 3 4 5
• Pour *du travail que vous avez bien accompli*?	1 2 3 4 5
• En rapport avec *les contraintes et les pressions* inhérentes à votre emploi?	1 2 3 4 5

MON SUPERVISEUR: Veuillez préciser dans quelle mesure vous êtes en accord ou en désaccord avec chacun de ces énoncés, en sélectionnant l'une des sept réponses suivantes:

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

Mon superviseur me fait toujours des commentaires élogieux lorsque j'effectue du bon travail.	1	2	3	4	5	6	7
Mon superviseur souligne ma performance lorsque cela est particulièrement bonne.	1	2	3	4	5	6	7
Mon superviseur reconnaît rapidement une amélioration sur le plan de la qualité de mon travail.	1	2	3	4	5	6	7
Mon superviseur me félicite lorsque mon travail est mieux que la moyenne.	1	2	3	4	5	6	7
Mon superviseur me complimente personnellement lorsque mon travail est exceptionnel.	1	2	3	4	5	6	7
Mon superviseur avise son propre supérieur ainsi que d'autres personnes au sein de l'organisation lorsque mon travail est exceptionnel.	1	2	3	4	5	6	7
Si je fais un bon travail, je sais que mon superviseur me récompensera.	1	2	3	4	5	6	7
Si mon travail était constamment supérieur à la moyenne, mon superviseur ne ménagerait aucun effort pour m'aider à monter, au sein de cette organisation.	1	2	3	4	5	6	7
Il arrive fréquemment que mon superviseur ne reconnaisse pas mon bon rendement.	1	2	3	4	5	6	7
Il m'arrive souvent de faire du bon travail et de ne pas recevoir de compliments de la part de mon superviseur.	1	2	3	4	5	6	7
Si mon travail était d'un niveau inférieur à celui de mes capacités, mon superviseur me ferait part de sa désapprobation.	1	2	3	4	5	6	7
Mon superviseur manifeste son mécontentement lorsque mon travail se situe en deçà des normes acceptables.	1	2	3	4	5	6	7
Mon superviseur me laisse savoir lorsque mon travail est insatisfaisant.	1	2	3	4	5	6	7
Mon superviseur me réprimanderait si mon travail était inférieur aux normes.	1	2	3	4	5	6	7
Lorsque mon travail est insatisfaisant, mon superviseur me le signale.	1	2	3	4	5	6	7

POURQUOI AI-JE ACTUELLEMENT RECOURS AU SYSTÈME PHARMACY ASSISTANT? En vous référant à l'échelle suivante, pour chacun des énoncés, sélectionnez le chiffre qui décrit le mieux la raison pour laquelle vous utilisez actuellement le système *Pharmacy Assistant*.

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

Pourquoi avez-vous recours au système *Pharmacy Assistant*?

Parce que je pense qu'il est intéressant de travailler avec ce système.	1	2	3	4	5	6	7
Parce qu'il s'agit d'un système utile.	1	2	3	4	5	6	7
Parce que je suis supposé(e) y avoir recours.	1	2	3	4	5	6	7
Peut-être existe-t-il de bonnes raisons justifiant l'utilisation du système *Pharmacy Assistant* mais, pour ma part, je n'en vois aucune.	1	2	3	4	5	6	7
Parce qu'il est agréable de travailler avec ce système.	1	2	3	4	5	6	7
Parce que je crois que ce système m'aide dans mon travail.	1	2	3	4	5	6	7
Parce que je suis tenu(e) d'y avoir recours.	1	2	3	4	5	6	7
J'ai recours à ce système mais je ne suis pas sûr(e) que cela en vaille la peine.	1	2	3	4	5	6	7
Parce qu'il est amusant d'utiliser ce système.	1	2	3	4	5	6	7
Par décision personnelle.	1	2	3	4	5	6	7
Parce que l'hôpital ne me donne pas le choix.	1	2	3	4	5	6	7
Je ne sais pas; je ne vois pas très bien ce que le système *Pharmacy Assistant* m'apporte.	1	2	3	4	5	6	7
Parce que j'ai du plaisir à utiliser le système *Pharmacy Assistant*.	1	2	3	4	5	6	7
Parce que je crois que ce système est important pour faire mon travail.	1	2	3	4	5	6	7
Parce que je me sens obligé(e) de l'utiliser.	1	2	3	4	5	6	7
J'ai recours au système *Pharmacy Assistant*, mais je ne crois pas qu'il me soit utile et, si j'avais le choix, je n'y aurais pas recours.	1	2	3	4	5	6	7

MON EXPÉRIENCE AVEC LE SYSTÈME PHARMACY ASSISTANT: Pour chacun des énoncés suivants, précisez, en vous référant à l'échelle suivante, dans quelle mesure celui-ci témoigne de votre sentiment à l'égard de l'utilisation du système *Pharmacy Assistant*:

1	2	3	4	5	6	7
pas du tout vrai			vrai dans une certaine mesure			tout à fait vrai

Je ne me sens pas nerveux(se) à l'idée d'utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je crois me tirer assez bien d'affaire en rapport avec l'utilisation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je trouve très intéressant d'utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je me sens tendu(e) lorsque j'utilise le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'estime avoir parfaitement maîtrisé le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Le système *Pharmacy Assistant* est agréable à utiliser.	1	2	3	4	5	6	7
Je me sens détendu(e) lorsque j'utilise le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'ai beaucoup de plaisir à utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je suis satisfait(e) de mon rendement, en rapport avec l'utilisation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je me sens angoissé(e) lorsque j'utilise le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'estime qu'il est très ennuyant d'utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'estime maîtriser plutôt bien l'utilisation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'estime que le système *Pharmacy Assistant* est très intéressant.	1	2	3	4	5	6	7
Je m'estime contraint(e) d'utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Il est très agréable d'utiliser le système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Ayant utilisé le système *Pharmacy Assistant* depuis un certain temps, je m'estime plutôt compétent(e).	1	2	3	4	5	6	7

CHANGEMENTS QUI ONT UNE INCIDENCE SUR MOI: Veuillez préciser votre sentiment par rapport aux changements spécifiques auxquels vous êtes actuellement confronté dans votre emploi, suite à l'implantation du système *Pharmacy Assistant*. Veuillez répondre à chacune des questions en vous référant à l'échelle suivante:

1	2	3	4	5	6	7
fortement en désaccord	en désaccord	assez en désaccord	ni en accord ni en désaccord	assez en accord	en accord	fortement en accord

Je m'estime relativement « ouvert(e) » par rapport aux changements que le système *Pharmacy Assistant* apporte à mon travail.	1	2	3	4	5	6	7
Pour le moment, je suis un peu réticent(e) par rapport aux changements inhérents au système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Les changements qu'a suscité l'implantation du système *Pharmacy Assistant*, en rapport avec mon travail, se sont avérés positifs.	1	2	3	4	5	6	7
Au vu des changements inhérents au système *Pharmacy Assistant*, j'étais plutôt réticent(e) à changer la manière de faire mon travail.	1	2	3	4	5	6	7
J'estime que l'implantation du système *Pharmacy Assistant* a eu des répercussions positives sur la manière dont je m'acquitte de mon travail.	1	2	3	4	5	6	7
De mon point de vue, les changements inhérents au système *Pharmacy Assistant* sont positifs.	1	2	3	4	5	6	7
Les changements inhérents au système *Pharmacy Assistant* ont empiré la manière dont je dois m'acquitter de mon travail.	1	2	3	4	5	6	7
J'estime que les changements inhérents au système *Pharmacy Assistant* ont eu des répercussions négatives sur la manière dont je m'acquitte de mon rôle, au sein de l'hôpital.	1	2	3	4	5	6	7
Quelles que soient les répercussions inhérentes à l'utilisation du système *Pharmacy Assistant*, je suis sûr(e) que je pourrais y faire face.	1	2	3	4	5	6	7
Je m'inquiète de ne pas être en mesure d'être à la hauteur de la situation, suite à l'implantation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7
J'ai des raisons de croire que je ne m'acquitte pas aussi bien de mon travail depuis l'implantation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7
Je n'ai aucun doute que je m'en tire bien en ce qui concerne l'utilisation du système *Pharmacy Assistant.*	1	2	3	4	5	6	7

RENSEIGNEMENTS GÉNÉRAUX:

- À quelle date précise (ou approximative) avez-vous personnellement commencé à utiliser régulièrement le système *Pharmacy Assistant*? Mois: _____ Année: _____

- Durée approximative de votre formation sur le système *Pharmacy Assistant* : _____ heures.

- Vous êtes (prière de sélectionner l'une des réponses suivantes):

☐ Assistant technique en pharmacie
☐ Pharmacien
☐ Membre d'un groupe informatique
☐ Directeur adjoint ou gestionnaire de site

- Vous êtes (prière de sélectionner l'une des réponses suivantes):

☐ Employé à temps partiel ☐ Employé à plein temps

- Dans quel hôpital travaillez-vous? (Veuillez préciser le site principal):

☐ *L'Hôpital A*
☐ *L'Hôpital B*
☐ *L'Hôpital C*
☐ *L'Hôpital D*
☐ *L'Hôpital E*

- Occupiez-vous votre poste actuel, à l'hôpital, avant que le système *Pharmacy Assistant* ne soit implanté? ☐ Oui ☐ Non

---

- Depuis combien d'années travaillez-vous au sein de votre hôpital? _____

- Quel est votre âge?

☐ Moins de 25 ans ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 ans ou plus

---

- Quel est votre sexe? ☐ Homme ☐ Femme

- Quel est votre niveau de scolarité? (Prière de sélectionner l'une des réponses suivantes):

☐ École primaire
☐ École secondaire
☐ Collège/CÉGEP
☐ Diplôme de premier cycle
☐ Diplôme d'études supérieures
☐ Titre professionnel

MERCI BEAUCOUP DE VOTRE PARTICIPATION!

APPENDIX C

REMINDER LETTER FOR STUDY ONE:

A PATIENT SCHEDULING AND APPOINTMENT MANAGEMENT INFORMATION SYSTEM

Note: This letter has been modified from its original version. The original bilingual letters were printed recto-verso; however in this appendix the French version follows the English version. For the purposes of this appendix, the information system is referred to as the "Appointment Assistant" system and the organization is referred to as the "Hospital Centre", for both the English and French versions. All changes are indicated in italics. Information that was removed is so indicated by ***.

June 2003

Dear *Appointment Assistant* user,

As users of the Appointment Assistant system, your help is very much appreciated!

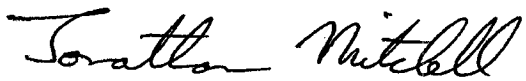
Two weeks ago you received a questionnaire concerning the factors that affect the use and acceptance of information technology at work. If you have already completed and returned this questionnaire about your job and the *Appointment Assistant* system, please accept my most sincere thanks.

If you have not yet had an opportunity to return the questionnaire, I would very much appreciate if you would complete and return it in the coming days. Your participation in this project is very important. By better understanding the conditions under which people are motivated to use new information technology at work, recommendations will be made to enhance future information technology implementations at the *Hospital Centre* and at your hospital. Your participation in this study will also allow me to complete my master's thesis.

If you have not received this questionnaire or no longer have a copy for any reason, please do not hesitate to contact me. It would be my pleasure to answer any questions that you may have or to send you the questionnaire.

Please accept my most sincere thanks for your participation in this project.

Yours sincerely,



Jonathan Mitchell
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John Molson School of Business
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Email: ji_mitch@jmsb.concordia.ca
Telephone: ***-***-****

(Français au verso)

École de Gestion
John-Molson
Université Concordia

Juin 2003

Cher utilisateur, chère utilisatrice du système *Appointment Assistant*,

À titre d'utilisateur du système Appointment Assistant, votre aide nous est extrêmement précieuse!

Vous avez reçu, il y a deux semaines, un questionnaire portant sur les facteurs qui ont une incidence sur l'utilisation et l'acceptation de la technologie de l'information, en milieu de travail. Si vous avez déjà rempli et retourné ce questionnaire traitant de votre emploi et du système *Appointment Assistant*, je vous prie d'accepter mes remerciements les plus sincères.

Si vous n'avez pas encore eu l'occasion de répondre au questionnaire, je vous serais extrêmement reconnaissant de le remplir et de nous le faire parvenir dans les prochains jours. Votre participation au présent projet est de la plus haute importance. En cernant mieux les situations dans lesquelles les personnes concernées sont incitées à faire appel aux technologies de l'information en milieu de travail, nous pourrons formuler des recommandations qui viseront à améliorer l'implantation future de tels systèmes, tant au *Hospital Centre* qu'au sein de votre hôpital. Votre participation à cette étude me permettra également de terminer ma thèse de maîtrise.

Si vous n'avez pas reçu ce questionnaire ou n'en avez plus d'exemplaire, pour une raison ou l'autre, n'hésitez pas à communiquer avec le soussigné. Je me ferai un plaisir de répondre à vos questions ou de vous faire parvenir une copie du questionnaire.

Je vous prie d'accepter mes remerciements les plus sincères pour votre participation au présent projet et d'agréer l'expression de mes sentiments respectueux.

Jonathan Mitchell

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(Please turn over for English version)

APPENDIX D

REMINDER E-MAIL FOR STUDY TWO:

A PHARMACY INFORMATION SYSTEM

Note: This e-mail message has been modified from its original version. In the original bilingual message the French version preceded the English version; however in this appendix the French version follows the English version. For the purposes of this appendix, the information system is referred to as the "Pharmacy Assistant" system and the organization is referred to as the "Hospital Centre", for both the English and French versions. All changes are indicated in italics. Information specific to the organization was removed and is so indicated by [...] and ***.

July 2003

Dear *Pharmacy Assistant* user,

As users of the Pharmacy Assistant system, your help is very much appreciated!

Three weeks ago you received an e-mail with a link to a web-survey concerning the factors that affect the use and acceptance of information technology at work. If you have already completed this questionnaire about your job and the *Pharmacy Assistant* system, please accept my most sincere thanks.

If you have not yet had an opportunity to complete the questionnaire, I would very much appreciate if you would complete it in the coming days. Your participation in this project is very important. By better understanding the conditions under which people are motivated to use new information technology at work, recommendations will be made to enhance future information technology implementations at the *Hospital Centre* and at your hospital. Your participation in this study will also allow me to complete my master's thesis.

The link to the web-survey is [...]. Please do not hesitate to contact me as it would be my pleasure to answer any questions that you may have about this study.

Please accept my most sincere thanks for your participation in this project.

Yours sincerely,

Jonathan Mitchell
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Email: ji_mitch@jmsb.concordia.ca
Telephone: ***-***-****

Juillet 2003

Cher utilisateur, chère utilisatrice du système de pharmacie *Pharmacy Assistant*,

À titre d'utilisateur du système de pharmacie Pharmacy Assistant, votre aide nous est extrêmement précieuse!

Vous avez reçu, il y a trois semaines, un courriel qui comprenait un lien menant à un sondage en ligne portant sur les facteurs qui ont une incidence sur l'utilisation et l'acceptation de la technologie de l'information en milieu de travail. Si vous avez déjà rempli ce questionnaire traitant de votre emploi et du système *Pharmacy Assistant*, je vous prie d'accepter mes remerciements les plus sincères.

Si vous n'avez pas encore eu l'occasion de compléter le questionnaire, je vous serais extrêmement reconnaissant de le compléter dans les prochains jours. Votre participation au présent projet est de la plus haute importance. En cernant mieux les situations dans lesquelles les personnes concernées sont incitées à faire appel aux technologies de l'information en milieu de travail, nous pourrons formuler des recommandations qui viseront à améliorer l'implantation future de tels systèmes, tant au *Hospital Centre* qu'au sein de votre hôpital. Votre participation à cette étude me permettra également de terminer ma thèse de maîtrise.

Le lien menant au sondage en ligne est [...]. Pour toute question au sujet de la présente étude, n'hésitez pas à communiquer avec le soussigné, je me ferai un plaisir de vous répondre.

Je vous prie d'accepter mes remerciements les plus sincères pour votre participation au présent projet et d'agréer l'expression de mes sentiments respectueux.

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APPENDIX E

SITUATIONAL MOTIVATION AS A MEDIATOR VARIABLE IN THE RELATIONSHIP BETWEEN WORK CLIMATE AND IT USAGE: ADDITIONAL REGRESSION ANALYSES USING ASSIGNED USER-LEVELS

Certain decisions had to be taken in the analysis of the IT usage measure, such as how to treat responses of "not-applicable" and how to treat incomplete system usage information. It was important to be certain of the results of the IT usage regression analyses, namely that the work climate variables are insufficient to explain IT usage in this sample. I therefore performed one additional set of regression analyses, which constituted a radical change in the data analysis. As such, these analyses provide a good indication of whether the results are a function of the method by which the IT usage measure was analyzed, or rather a function of the context or the underlying theory.

As discussed in Chapter Five, based on the results of the specific question asking users to indicate their user-level, there were 64 view-only users (19.0% of respondents), 160 users (47.6% of respondents), 99 super-users (29.5% of respondents), and 13 users (3.9% of respondents) did not indicate a user-level. Based on previous discussions at meetings at the Hospital Centre, and the system training manual, these self-reported user-levels did not conform to expected patterns of system usage. Furthermore, in discussions with managers at the Hospital Centre, I was told that some users felt slighted that they were not "super-users", despite the fact that they booked a very large number of appointments per week using this system. This opened the possibility that users had not indicated their appropriate user-level in the questionnaire. However, beyond the possibility that some employees had called themselves "super-users" inappropriately,

I wanted to evaluate the appropriateness of the self-reported user-levels for all system users (i.e., view-only users, users, and super-users).

I therefore re-divided respondents into user-levels based on their answers to the IT usage measure and the information provided to me by the Hospital Centre. The rationale for this further analysis was to determine if any self-reported user-level "misclassifications" impacted on the IT usage regression results. Users who had total scores of greater than zero for the "Templates, Schedules, and Session Generation" section were assigned a "super-user" level. Of the remaining users, those whose "Booking Appointments" score, "Recording Visits and Attendance" score, "Managing Appointment and Schedules" score, "Templates, Schedules, and Session Generation" score, "Search Features" item number seven, and "Reports" items numbers three and four were all equal to zero were assigned a "view-only" level. All remaining users were assigned a "user" level. This division resulted in 24 view-only users (7.1% of respondents), 112 users (33.3% of respondents), and 200 super-users (59.5% of respondents). The differences in IT usage scores between these two user-group divisions (for those users that provided full system usage information) are illustrated in Table E.1 and Table E.2.

Table E.1:

Descriptive Statistics for IT Usage based on Original Self-Reported User-Levels

User-level	Number of cases	Minimum	Maximum	Mean	Standard Deviation
View-only	53	3.00	117.00	23.70	20.55
User	144	6.00	148.00	63.04	33.13
Super-user	90	37.00	192.00	108.27	29.58

Table E.2: Descriptive Statistics for IT Usage based on Assigned User-Levels

User-level	Number of cases	Minimum	Maximum	Mean	Standard Deviation
View-only	24	3.00	29.00	13.02	6.33
User	83	6.00	140.15	38.04	22.41
Super-user	183	18.00	192.00	91.89	34.76

I then performed the IT usage regression analyses again using these new user-levels. The results, as presented below, are slightly more significant. The results of these regression analyses cannot be directly compared to the previous regression results as one of the control variables, user-level, was modified. However, these additional analyses indicate that for this sample as a whole, IT usage cannot be explained by the work climate constructs.

The results of these additional regressions do justify the use of the self-reported user-levels as an appropriate control variable. It is preferable to use the self-reported user-levels unless sufficient reason can be found to the contrary. As there was not sufficient evidence to indicate that this factor had considerable impact on the results, my analyses were performed and reported (as previously discussed in Chapter Five) using the self-reported user-levels. However, as also discussed in Chapter Five, the assigned user-level regression analyses do give additional information on the nature of the relationship between situational motivation and IT usage. In order to clearly show the difference in these results over the self-reported user-levels, in the result tables that follow I present the "conclusions" from the self-reported user-level regressions (as originally presented in Tables 5.12, 5.13, and 5.14). As discussed in Chapter Seven, these assigned user-level regression results were important to consider in assessing the validity and associated implications of my theoretical research model.

Using the new assigned user-levels, the results of the regression analyses between the work climate variables and IT usage can be found in Table E.3. The work climate variables were not significantly related to IT usage.

Situational Motivation as a Mediator Variable

As seen in Table E.3, in all four cases (POS, distributive justice, supervisor contingent-reward behaviour, and supervisor contingent-punishment behaviour), RAI and IT usage showed a significant positive relationship using the new "assigned" user-levels. The results of the regression analyses presented in this section therefore support hypothesis 5. However, RAI did not act as a mediator variable in any of the four cases. Furthermore, the work climate variables and RAI scores explained a very small percentage of the variance in IT usage, indicating that in the given sample, the research model was insufficient to explain IT usage.

Table E.3: Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and IT Usage: Regression Analyses using Assigned User-Levels

Variables Entered	Conclusion using Self-Reported User-Levels	Variance (%) accounted for by the Control Variables	Regression Statistics (β, p, % of additional variance accounted for)	Conclusion regarding Nature of Relationship
(step 2): POS	Not significant	55.5%	β = -0.02, *ns*, 0.0%	Not significant
(step 3): POS	N/A	-	β = -0.06, *ns*	N/A
RAI	Marginally significant & positive	-	$\beta = 0.15, p < 0.01$, 1.8%	Significant & positive
(step 2): distributive justice	Not significant	54.1%	β = -0.01, *ns*, 0.0%	Not significant
(step 3): distributive justice	N/A	-	β = -0.04, *ns*	N/A
RAI	Significant & positive	-	$\beta = 0.15, p < 0.01$, 1.9%	Significant & positive
(step 2): supervisor contingent-reward behaviour	Not significant	53.7%	β = -0.01, *ns*, 0.1%	Not significant
(step 3): supervisor contingent-reward behaviour	N/A	-	β = -0.02, *ns*	N/A
RAI	Not significant	-	$\beta = 0.12, p < 0.05$, 1.2%	Significant & positive
(step 2): supervisor contingent-punishment behaviour	Not significant	54.1%	β = 0.05, *ns*, 0.2%	Not significant
(step 3): supervisor contingent-punishment behaviour	N/A	-	β = 0.05, *ns*	N/A
RAI	Not significant	-	$\beta = 0.11, p < 0.05$, 1.2%	Significant & positive

Additional Analyses using the Different Forms of Situational Motivation

As no significant relationships were found between each of the work climate variables and IT usage, a mediator variable is not possible between these variables. However, in order to gain a better understanding of how the different forms of situational motivation were related to IT usage, I performed further regression analyses. These analyses consisted of substituting the different forms of situational motivation for the RAI score previously used in the regressions. The results of these additional analyses can be found in Table E.4. Intrinsic motivation and identified regulation were significantly and positively related to IT usage in the cases of POS, distributive justice, supervisor contingent-reward behaviour and supervisor contingent-punishment behaviour. Amotivation exhibited significant negative relationships with IT usage in the cases of POS and distributive justice. Only those forms of situational motivation that exhibited significant effects are shown in Table E.4.

I performed an additional set of regression analyses in order to understand how the different forms of situational motivation were related to IT usage, irrespective of the work climate variables. These general two-step regressions examined the impact of each form of situational motivation on IT usage. As can be seen in Table E.5, intrinsic motivation and identified regulation were significantly and positively related to IT usage. Amotivation exhibited a marginally significant negative relationship with IT usage, while external regulation was not significantly related to IT usage. In these regression analyses, the control variables alone accounted for 54.2% of the variance in IT usage.

As a result of performing these additional regression analyses (as shown in Table E.4 and Table E.5), those that included work climate variables in the regression

model and those that did not, it can be seen that intrinsic motivation exhibited, by far, the strongest relationship with IT usage as the relationships were significant and positive in all cases. Identified regulation also exhibited positive relationships with IT usage in all cases, however the relationship was weaker. As opposed to these more self-determined forms of motivation, in all cases the controlled form of situational motivation, i.e., external regulation, did not exhibit significant relationships with IT usage. Amotivation also exhibited a negative relationship with IT usage, but the relationships were weaker and not altogether significant in all cases.

Table E.4, Part 1 of 2: The Different Forms of Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and IT Usage: Regression Analyses using Assigned User-Levels

Variables Entered	Conclusion using Self-Reported User-Levels	Regression Statistics (β, p, % of additional variance accounted for)	Conclusion regarding Nature of Relationship
(step 3): POS	N/A	β = -0.06, *ns*	N/A
intrinsic motivation	Significant & positive	$\beta = 0.17, p < 0.001$, 2.6%	Significant & positive
(step 3): POS	N/A	β = -0.04, *ns*	N/A
identified regulation	Marginally significant & positive	$\beta = 0.12, p < 0.05$, 1.2%	Significant & positive
(step 3): POS	N/A	β = -0.04, *ns*	N/A
amotivation	Not significant	$\beta = -0.11, p < 0.05$, 0.9%	Significant & negative
(step 3): distributive justice	N/A	β = -0.04, *ns*	N/A
intrinsic motivation	Significant & positive	$\beta = 0.18, p < 0.001$, 3.0%	Significant & positive
(step 3): distributive justice	N/A	β = -0.03, *ns*	N/A
identified regulation	Marginally significant & positive	$\beta = 0.13, p < 0.01$, 1.4%	Significant & positive
(step 3): distributive justice	N/A	β = -0.03, *ns*	N/A
amotivation	Not significant	$\beta = -0.11, p < 0.05$, 1.0%	Significant & negative

Table E.4, Part 2 of 2: The Different Forms of Situational Motivation as a Mediator Variable in the Relationship between the Work Climate Variables and IT Usage: Regression Analyses using Assigned User-Levels

Variables Entered	Conclusion using Self-Reported User-Levels	Regression Statistics (β, p, % of additional variance accounted for)	Conclusion regarding Nature of Relationship
(step 3): supervisor contingent-reward behaviour	N/A	$\beta = -0.02$, *ns*	N/A
intrinsic motivation	Significant & positive	$\beta = 0.15$, $p < 0.001$, 2.1%	Significant & positive
(step 3): supervisor contingent-reward behaviour	N/A	$\beta = -0.02$, *ns*	N/A
identified regulation	Marginally significant & positive	$\beta = 0.10$, $p < 0.05$, 1.0%	Significant & positive
(step 3): supervisor contingent-punishment behaviour	N/A	$\beta = 0.05$, *ns*	N/A
intrinsic motivation	Significant & positive	$\beta = 0.14$, $p < 0.01$, 2.2%	Significant & positive
(step 3): supervisor contingent-punishment behaviour	N/A	$\beta = 0.05$, *ns*	N/A
identified regulation	Not significant	$\beta = 0.10$, $p < 0.05$, 1.1%	Significant & positive

Table E.5: The Impact of the Different Forms of Situational Motivation on IT Usage: Regression Analyses using Assigned User-Levels

Relationship	Conclusion using Self-Reported User-Levels	Regression Statistics (β, p, % of additional variance accounted for)	Conclusion regarding Nature of Relationship
intrinsic motivation → IT usage	Significant & positive	$\beta = 0.15, p < 0.001$, 2.2%	Significant & positive
identified regulation → IT usage	Significant & positive	$\beta = 0.11, p < 0.05$, 1.1%	Significant & positive
external regulation → IT usage	Not significant	$\beta = -0.02$, *ns*, 0.1%	Not significant
amotivation → IT usage	Not significant	$\beta = -0.08, p < 0.10$, 0.6%	Marginally significant & negative