Lars Göran Wallgren

The impact of motivation on perceived stress: a study among information technology consultants

Number 3 Volume 38 2008
The impact of motivation on perceived stress: a study among information technology consultants

Lars Göran Wallgren

Department of Psychology, University of Gothenburg, Sweden

Wallgren L. G. The impact of motivation on perceived stress: a study among information technology consultants. Göteborg Psychological Reports, 2008, 38, No 3. The aim of the study was to test the relationship between job characteristics (job demands, job control) and perceived stress (e.g., stressed, pressured, tense) with “motivators” (e.g., recognition, achievement, the work itself and the possibility for growth) as the mediating variable. In this cross-sectional study a web-based questionnaire survey was conducted among information technology (IT) consultants in Sweden (N=380). The results show that motivators mediate the relationship between job control and perceived stress. The results point to the importance of motivators among IT consultants in the framework of job stress and performance. The managers’ impact on the work characteristics in the work environment is also discussed.

Keywords: IT consultants, motivation, job demand, job control, stress

It is generally believed that knowledge firms, for example, consultant firms in the IT (information technology) sector, symbolize the future of business and working life, a belief that implies their strong dependence on the latest technology and on a qualified workforce. Furthermore, IT consultancy firms act in an increasingly competitive global market, requiring them to have a great many well-educated and highly motivated employees who continuously devote themselves to skills development.

There are numerous theoretical or conceptual models that deal with the association between the psychosocial work environment and motivation and stress (e.g., De Jonge, van Breukelen, Landeweerd & Nijhuis, 1999). As the IT consultant occupation is a relatively
new one, it is therefore of great interest to examine whether “old” findings are relevant to this occupation. However, few studies have investigated the relationship between the psychosocial work environment and motivation and stress among IT consultants. The main objective of this study is to contribute to research in the area of motivation and stress among (IT) consultants. More specifically, this study focuses on structural models of the longitudinal relationship between job demands, control and perceived stress with motivators as the proposed mediating variable.

According to a report from the European Foundation (2000), the number of knowledge workers in the USA between 1990-1998 rose by 2.5 million, or 18 per cent of the net employment gain of that period. Additionally, according to a 2005 report from the European Foundation, the area of knowledge-intensive business services is one of the fastest growing areas of the European economy. Furthermore, the IT sector grew rapidly during the last decade of the twentieth century and will probably continue to expand in the twenty-first (Ivergård, 2000).

According to Alvesson (2003), the concept “knowledge-intensive” can be used in at least three contexts: knowledge-intensive firms, knowledge-intensive work and knowledge-intensive workers. Knowledge-intensive firms claim they produce qualified products and/or services, and also generate new and unique knowledge. In addition, knowledge-intensive firms are typically engaged in complex and difficult tasks that cannot easily be converted into standardized work procedures (Kärreman, Sveningsson & Alvesson, 2003). Examples of knowledge-intensive firms are legal and accounting firms and management and IT consultancy companies. In knowledge-intensive firms, the work is mainly intellectual, and
most people in the workforce (the knowledge workers) are well-educated and well-qualified (Alvesson, 2000).

The IT consultants’ work exhibits many characteristics of knowledge work. IT consultants have to deal continuously with non-standard problems that originate with the customer (Docherty & Huzzard, 2003). This work is often performed in co-operation with the customers who make intense demands on the knowledge workers. This environment requires the knowledge workers to have strong social and communication skills. Hence, the IT consultants’ work is filled with ambiguity and, as a result, may be very stressful.

Alvesson (2003) states that the increased interest in knowledge-intensive firms can probably be explained by their increased growth rate and their overall importance in the economy. When researchers study the phenomenon of knowledge management, they prefer to study knowledge-intensive firms because of the rapid expansion of management and IT consultancy firms. However, despite the increasing interest in knowledge-intensive firms, there are relatively few studies that describe the working conditions of IT consultants in terms of their psychosocial work environment, such as job demands, job control, workload and stress. Moreover, Steers, Mowday and Shapiro (2004) argue that in the new economy, as well as in the more traditional manufacturing and service areas, highly motivated employees are frequently cited as a characteristic of competitive advantage. As recent research shows that work motivation may predict job performance (e. g., Locke & Latham, 2002; Pritchard & Payne, 2003), it is interesting to include work motivation as a variable in the study of the psychosocial work environment of IT consultants.
Psychosocial factors, work motivation and stress

Job stress has become a major issue among employees in advanced industrial societies. Such stress often results from high job demands in relationship to the workers' abilities, frustrated aspirations and dissatisfaction with valued goals (Kalimo & Mejman, 1987). A basic hypothesis in stress theory is that psychosocial stressors in the work environment, such as quantitative overload, qualitative underload, lack of control and lack of social support, and the interaction of such conditions, may have harmful effects on an individual's health and well-being (Karasek & Theorell, 1990; Levi, Frankenheuser & Gardell, 1986; Melin & Lundberg, 1997). Yet De Jonge et al. (1999) found that a work situation with both high job demands and job control was related to a high degree of work motivation and job satisfaction. Moreover, Sargent and Terry (2000) found that high levels of job control and job demands had a positive effect on work satisfaction.

One of the most prominent motivation theories on organizational individual behaviour and job satisfaction is Herzberg’s two-factor theory (“Motivation-Hygiene Theory”) (Herzberg, Mausner, & Snyderman, 1959). Herzberg and colleagues suggest that certain factors (“motivators”, “satisfiers”) motivate while others are preventive and remove the hindrances to forming positive job attitudes (“hygiene factors”, “hygienes”). According to this theory, true motivators come from achievement, recognition, the work itself, responsibility, advancement and the possibility for personal growth. In general, motivation comes from workers’ desire or need to perform to the best of their ability. Most motivation theories and definitions describe causal relationships as a process that starts with needs/goals and ends with satisfaction. According to Katzell and Thompson (1990), work
motivation is a broad construct pertaining to the conditions and processes that account for the arousal, direction, magnitude and maintenance of effort in an individual’s job. Pritchard and Payne (2003) define motivation as a resource allocation process that determines how energy is used to satisfy needs.

Generally speaking, the total effects of the work environment on health are supported by complex associations between psychosocial stressors by means of direct, indirect and moderation effects (Cox & Ferguson, 1994). Le Blanc, De Jonge and Schaufeli (2000) argue there are cognitive, evaluative and motivational processes that intervene between stressful stimuli and the reaction. The model in this study is a mediational one where I propose that job demands and job control have an indirect rather than a direct effect on perceived stress. Cox and Ferguson (1994, p. 101) state, “A mediator variable is one that is responsible for the transmission of an effect, but does not alter the nature of that effect”.

Few studies examine motivation as a mediator in the psychosocial work environment and health relationship, and thus my model is exploratory.

Information technology

IT consultants are pioneers in their use of new technology in the industrial and public sectors (Caplen Jensen, Netterström, & Borg, 2003) that employ the latest technology and technologically qualified workers (e.g., programmers, systems architects, IT solutions advisors, etc.) (Davies & Mathieu, 2005). It is interesting to investigate the IT sector, not only the interrelationship of IT with the organization, but more specifically IT’s relationship to the psychosocial work environment. In general, individual job control is a
central concept in the understanding of relationships between stressful experiences, behaviour and health (Karasek & Theorell, 1990; Melin & Lundberg, 1997; Poussette & Johansson Hanse, 2002). To the best of my knowledge, very little research has been published pertaining to the work conditions, work motivation and health of IT consultants (Lim & Teo, 1999). Nevertheless, some studies are interesting in this context. For example, the results of a study among IT consultants (N=521) in Sweden imply that motivational orientation may play a differentiating role in the “burnout” process and furthermore indicate that motivational frameworks may add to the understanding of the associations between involvement in work and negative outcomes, such as burnout (Eriksson Hallberg, 2005).

Previous research indicates there are some inappropriate working conditions in the psychosocial work environment in the IT sector (e.g., Aziz, 2004; Lim & Teo, 1999; Moore, 2000). In a study of a group of IT consultants in the USA, Brown (2002) found that a job that provides autonomy, challenge, feedback and the ability to use skills was important in promoting job satisfaction and work motivation. However, this study had some limitations because of its small sample size (N=21) and a low response rate (49 per cent). In a cross-sectional study among Swedish IT consultants (N=167), Wallgren and Johansson Hanse (2007) found that motivators might act as a partial mediator in the relationship between job control and perceived stress.

As said before, consultant firms in the IT sector symbolize the future of business and working life and compare to the traditional white-collar work the work environment differ for the IT consultants. The work context in the IT business is characterized by e.g.
globalisation, client interaction in work, fast technical and work method changes, flexible labour market and business logic. In the light of this it’s important to study the psychosocial work environment for this occupation.

As noted previously, the IT consultant occupation, with its work environment that is far different from that of the traditional white collar worker, represents the future of business and work life. The nature of work in the IT sector is characterized by globalisation, client interaction, rapid changes in technology and in ways of working, a flexible labour market and business logic. The psychosocial work environment of the IT consultant is therefore an important area for research.

**Aim of the study**

The lack of empirical data on IT consultants’ working conditions and specifically the relationship between job characteristics and “work reactions” are the motivations for this study where the aim is to test a structural model of the relationship between job control, job demands, motivators and perceived stress in a sample of IT consultants. The hypothesized model as tested uses full structural equation modelling (SEM).

**Model specification (SEM)**

The model consists of the independent (exogenous) latent variables of job demands and job control, and the dependent (endogenous) latent variable of perceived stress. Support for the suggested covariance and path relationships in the structural model is justified by prior
research findings. This study is consistent with previous research that assumes job demands are positively associated with perceived stress (e.g., Karasek & Theorell, 1990; Larsman, Sandsjö, Klipstein, Vollenbroek-Hutten, & Christensen 2006) and job control (job autonomy) is negatively related to perceived stress (e.g., Karasek & Theorell, 1990; Melin & Lundberg, 1997).

A full structural model used in the study is presented in Figure 1. This process model consists of the independent latent variables of job demands and job control, motivators that are treated as the mediating (intervening) variables, and perceived stress that is considered as a dependent (endogenous) variable. Consistent with the model, job demands is hypothesized to be positively associated with perceived stress (p1) and job control negatively associated with perceived stress (p2). Moreover, job demands is hypothesized to be negatively related to motivators (p3), job control is positively related to motivators (p4), and finally, motivators are negatively related to perceived stress (p5) (e.g., Levy, 2003; Moorhead & Griffin, 2004).

Figure 1. Specification of the full structural equation model tested in this study, with the mediating effect of motivators. Only latent variables and their relations have been depicted, where p = paths (regression weights).
Method

Sample

A questionnaire survey was conducted among IT consultants in Sweden in this cross-sectional study. The questionnaire was addressed to 422 respondents who were employed at ten IT consultancy companies. The overall response rate was approximately 90 per cent (N=380).

At the time of the questionnaire, the IT consultants worked full time, mainly with assignments for external customers in the industrial and the public sectors. The IT consultants were hired by customers for specific tasks with deadlines and often worked in a project-oriented work organization. Approximately one per cent of the respondents were below the age of 26, approximately 90 per cent were between ages 26 and 50 and approximately nine per cent were older than 51 years. Approximately 55 per cent of the respondents had more than ten years of IT work experience, 33 per cent between six and ten years and 12 per cent fewer than six years. Eighty per cent of the respondents were males.

Procedure of collecting data

This study was web-based and accessible via Internet. Each potential subject in the study was sent an e-mail with information about the study and an Internet link to the web page where the questionnaire was available. The e-mail explained the purpose of the survey and guaranteed strict confidentiality. When subjects logged in on the web page, an
authorization check was made and data was stored about which subjects had answered the questionnaire. These responding subjects were not sent reminders. The questionnaire was constructed so that each question had to be answered in order for the questionnaire to be considered complete, ensuring there were no missing data. The questionnaire was accessible for a period of four weeks, and three reminder emails were sent.

**Questionnaire**

All participants responded to a questionnaire concerning background variables, job characteristics (job demands, job control), motivators and perceived stress.

*Background variables.* This section of the questionnaire asked questions about age (a nine-point response scale) and years of employment in the IT sector (a five-point response scale).

*Job demands.* Workers’ attitudes toward their job demands were assessed using a Swedish version (Theorell et al., 1988; Åkerstedt et al., 2002) of a questionnaire developed by Karasek (1979). This job characteristic includes four manifest variables: whether it was necessary to work fast, hard and with high effort, and whether the participant has enough time to do the job (reversed score). The questionnaire uses a four-point response scale for each question and frequency-based grading (never, seldom, sometimes and often). High values (scores) for job demands indicate high demands.
Job control (influence on and control over work, job autonomy). Workers’ attitudes toward their jobs were assessed using the PAK questionnaire (Rubenowitz, 1997). Job control was measured using a short version of PAK, consisting of three manifest variables. Each manifest variable has five fixed response alternatives that were assigned points from 1 (very unsatisfactory) to 5 (very satisfactory). The manifest variables are: influence on the rate of work, influence on working methods and influence on the allocation of tasks.

Motivators were operationalized by four job factors designated by Hertzberg and his colleagues as “motivators” (Herzberg et al., 1959, p. 114): recognition, achievement, the work itself (variety) and the possibility for growth. The first three factors were assessed using items (facets) from the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England & Lofquist, 1967), and the fourth job factor by my own question. In this study, respondents used a five-point Likert scale to rate the importance of these four job factors. The questionnaire began with a general question about the rate of satisfaction regarding these job factors: “How satisfied am I with this aspect of my job?” In this study, measures spanned the four job factors as described above, with one question on each dimension: work itself/variety (“The possibility to do different things from time to time”); recognition (“The praise I get for doing a good job”); achievement (“The feeling of accomplishment I get from the job”); “possibility for growth” (“The possibility of learning new skills so I develop and grow as a person”). The questionnaire used the following five response alternatives: very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied.
Perceived stress. Perceived stress was operationalized using a mood adjective checklist (Kjellberg Johansson Hanse, Franzon, & Holmgren, 2000; Kjellberg & Wadman, 2002; Wallgren & Johansson Hanse, 2007). This checklist, constructed to measure mood at work, contains two mood dimensions: stress and energy. Only the stress dimension was considered in this study and was measured using the manifest variables “rested” (reversed score), “relaxed” (reversed score), “calm” (reversed score), “tense”, “stressed” and “pressured”. The respondents were instructed to think about how they usually feel at the end of a normal workday. There were six fixed response alternatives ranging from “not at all” to “high degree/great extent”. The six manifest variables were aggregated in pairs into three parcels. The technique used to build the parcels was a combination of an Item-to-Construct Balance (Little, Cunningham & Shahar, 2002) and A Priori Questionnaire Construction (Little, Oettingen & Baltes, 1995). The three positively worded manifest variables were coupled with the three negatively worded manifest variables that were reversely coded. The manifest variable with the highest factor loading from the negatively worded items was matched with the item with the lowest factor loading from the positively worded items. The procedure continued until no manifest variables remained.

Statistical analysis

Input data to SEM consisted of the raw data stored in SPSS version 12.01. This study had no internal missing values. Structural equation modelling, in which the measurement (CFA) and the structural aspects of the model are tested simultaneously, was carried out using the
maximum likelihood methods of AMOS version 5.0 (Arbuckle & Wothke 1999; Arbuckle 2003).

The focal point in analysing structural equation models is the extent to which the hypothesized model adequately describes or fits the sample data. In accordance with the classification of recommended fit indices, a number of fit indices were considered (Arbuckle & Wothke 1999; Schumacker & Lomax, 1996). The Chi-square value statistic is a goodness-of-fit measure that assesses the magnitude of the discrepancy between the sample (the observed) covariance matrix and the estimated (fitted) covariance matrix (Hu & Bentler, 1995). Jöreskog and Sörbom (1993) propose that the Chi-square value statistic should be regarded as a measure of fit rather than as a test statistic, i.e., a measure of overall fit of the model to the data. A large, statistically significant value relative to the degrees of freedom indicates a poor model fit. The Chi-square value statistic is sensitive to sample size, and with a large sample size even trivial differences may result in the rejection of the specified model (Hu & Bentler, 1995). The normed Chi-square measure is the ratio of the Chi-square value to its degrees of freedom, where ratios in the range of 2 to 1 are indicative of an acceptable fit between the hypothetical model and the sample data. Values below 1.0 indicate an “overfitted” model (Schumacker & Lomax, 1996), and values larger than 2.0, or the more liberal limit of 5.0, indicate that the model does not fit the observed data and needs improvement. However, there is no consensus on what precisely represents a good fit (Bollen, 1989). The root mean square error of approximation (RMSEA) is a measure of the discrepancy per degree of freedom for the model (Browne & Cudeck, 1993).
Values of about 0.05 or less indicate a close fit of the model to the data, and values of about 0.08 or less indicate a reasonable error of approximation (Browne & Cudeck, 1993).

The hypothesis of mediation was tested using structural equation modelling as proposed by Brown (1997), estimating direct, indirect and total effects. According to Brown, the direct effect is the influence a variable has on another variable in a direct relation, and an indirect effect is the sum of all paths from one variable to another that are mediated by one or more additional variables. Furthermore, the total effect is the sum of the direct and indirect effects. In this study, direct, indirect and total effects were estimated using AMOS 5, and their standard errors were estimated using the bootstrap function of AMOS 5.

Results

The model of job characteristics and perceived stress

Structures for relationships between the latent variables were specified and analyzed. Direct effects for the model are reported in Figure 2.

The three latent variables model of job characteristics and perceived stress showed acceptable overall fit indices. The modification indices in AMOS, however, indicated that a significant improvement in model fit would occur with two correlated errors (the respective correlated error was found in the same latent variable). After the modification, the normed values for $\chi^2$ and RMSEA for the model indicated good overall fit indices (Chi-square=81.76; Normed Chi-square=2.72; RMSEA=.067). All paths (factor loadings) in the measurement models were significant. In the structural part, the path between job demands
and perceived stress and the path between job control and perceived stress were both significant in the expected direction. High job demands (statistically) predicted high perceived stress and high job control predicted low perceived stress among the IT consultants.

![Figure 2. Structural equation model with no mediator among IT consultants (N=380). Measurement and structural components with standardized estimates.](image)

** *p < .001.

The model of job characteristics, motivators and perceived stress

The second proposed model, that is, the full structural model with motivators as a mediator showed acceptable overall fit indices. The modification indices in AMOS, however, indicated that a significant improvement in model fit would occur with two correlated errors (the respective correlated error was found in the same latent variable). After the modification, the normed values for $\chi^2$ and RMSEA for the model indicated good overall fit indices (Chi-square=164.64; Normed Chi-square=2.03; RMSEA=.052). Direct effects are presented in Figure 3 and indirect and total estimates in Tables 1 and 2.
In the model, five of six paths were significant and were also in the expected direction (when controlling for other latent variables). In accordance with the model of job characteristics and perceived stress, the paths between job demands and perceived stress and between job control and perceived stress were significant. The job control latent variable was significantly related to motivators, which means that high job control (statistically) predicted high scores in the latent variable (“motivators”). Moreover, the job demands latent variable was significantly related to motivators, signifying that high job demands (statistically) predicted high scores in the latent variable (“motivators”). Furthermore, motivators were significantly, although negatively (i.e., expected direction), related to perceived stress. Therefore, job control and job demands were found to be significantly related to changes in motivators, which in turn affected perceived stress.

Table 1

*Indirect effects for the relationships between job demands, control and perceived stress with motivators as a proposed mediating variable*

<table>
<thead>
<tr>
<th></th>
<th>Demand on perceived stress through motivators</th>
<th>Control on perceived stress through motivators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate (^{a})</td>
<td>-.054</td>
<td>-.150</td>
</tr>
<tr>
<td>C.R. (^{b})</td>
<td>-1.32</td>
<td>-1.97*</td>
</tr>
</tbody>
</table>

\(^{a}\) Standardized parameter  
\(^{b}\) The ratio of the unstandardized parameter to its standard error  
\(^{*}\) \(p < .05\)
Table 2
Total effects for the relationships between job demands, control and perceived stress with motivators as a proposed mediating variable

<table>
<thead>
<tr>
<th></th>
<th>Demand on perceived stress through motivators</th>
<th>Control on perceived stress through motivators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate (^a)</td>
<td>1.356</td>
<td>-.206</td>
</tr>
<tr>
<td>C.R. (^b)</td>
<td>7.62***</td>
<td>-1.44</td>
</tr>
</tbody>
</table>

\(^a\) Standardized parameter  
\(^b\) The ratio of the unstandardized parameter to its standard error

*** \(p < .001\).

The test of the indirect effect (i.e., mediation) showed that the effect of control on perceived stress through motivators was statistically significant, see Table 1. The indirect effect of job demands on perceived stress through motivators was not significant.

Fig. 3. Full structural equation model with motivators as mediator among IT consultants (N=380). Measurement and structural components with standardized estimates. The non-significant paths are marked as dotted lines.

* \(p < .05\). *** \(p < .001\).
Discussion

This study examines the impact of specific job characteristics and motivators on perceived stress for IT consultants. This particular group of workers constitutes an interesting population to study within the knowledge-intensive sector. The focus in the study is on IT consultants who perform knowledge-intensive work in a project-oriented work organisation.

*Job demands, job control and stress*

This study contributes to the evidence of causality in the relationships between psychological job demands, job control and the perception of stress among IT consultants. These results indicate good consistency with a previous cross-sectional study among IT consultants (N=167) (Wallgren & Johansson Hanse, 2007). This consistency speaks in favor of causality. In general, in a work situation characterised by prolonged exposure to high job demands and low job control, the IT consultant may be unable to reduce his or her stress level (high activation is sustained), resulting in tension (Melin & Lundberg, 1997), difficulties in decision making (cognitive), headaches and musculoskeletal symptoms (Karasek & Theorell, 1990). On the organizational level, such results may lead to poor work performance and declined productivity (Le Blanc, De Jonge & Schaufeli, 2000). The way in which IT consultants respond to their job demands depends in part on their roles in the company and their mental and physical capacities. The results from this study show that
No. 3: 38, 19

job demands have a significant impact on perceived stress, confirming earlier research results (e.g., Jacobsson, Pousette & Thylefors, 2001).

According to Ivancevich, Napier and Wetherbe (1983), information systems personnel have particularly stressful occupations as the result of voracious user demands, tight deadlines, newly acquired skills and the constant threat of obsolescence. IT consultancy firms also operate in a global and highly competitive market where motivated employees must continuously devote themselves to skills development. Moreover, according to Caplen Jensen et al. (2003), the daily work of IT consultants is characterized by projects with strict deadlines where there is often no time for important recovery between overlapping projects. It is not unusual that a new IT task starts before the last one is completed. Since these job demands are expected to be related to perceived stress, it is consequently interesting to study this relationship. Job stress may cause suffering for the IT consultant (stress may impair health) and may also affect a firm’s costs in the long run, for example, by decreasing work productivity (Boles, Pelletier & Lynch, 2004; Pelletier, Boles & Lynch, 2004).

This study also shows that job control has an impact on stress, as Spector (1986) found in a meta-analysis of studies on autonomy and participation at work. According to Van der Doef and Maes (1999), job control has an impact on stress reduction only if the person has control over the factors that create the demands or stress in the workplace.

At the beginning of the twentieth century, Frederick Taylor (1911) proposed a new concept for the work environment for what was, at that time, a growing industry: automobile manufacturing. The “Taylorism” concept implied that workers lose control over work procedures and the speed of work. Based on their considerable research in knowledge
workplaces, Kärreman et al. (2003) claim that, to some degree, we have returned to this kind of work. They conclude that these modern workplaces can be quite bureaucratic in the sense that they have a centralized management, a clear hierarchy and a formalized rules structure. Work freedom is restricted by rules of this kind and by standards for performance. Thus, it is expected that control relates to motivators, a relationship that is consequently an area that is interesting to study in this context.

Motivators as mediator

To motivate an individual, a job itself must be challenging, have scope for enrichment and be of interest to the employee. Motivation is a major component of any theory that attempts to predict and explain organizational behaviour and performance, and this central role is reflected in the literature.

Besides the earlier known antecedent conditions of job demands and job control (e.g., Le Blanc, De Jonge & Schaufeli, 2000), this study states that motivators also have an impact on perceived stress. The condition of job demands is related to workload and is examined in this study in terms of the necessity of having to work fast, hard and with high effort against time pressures. The condition of job control, sometimes called decision latitude, refers to the individual’s ability to control his or her work activities. The results from the full structural equation model with motivators as the mediator (Figure 3) show that the relationship between job control and perceived stress is mediated by motivators (antecedent conditions that presumably lead to motivation). This result in this study agrees with
Karasek and Theorell’s (1990) conclusion that the degree of motivation is a consequence of the level of job demands and of the degree of job control.

This study shows that job control and job demands have a significant impact on motivators. In an exploratory study of job satisfaction and work motivation among IT consultants, Brown (2002) reached a similar result. She found the strongest correlation between motivation, measured with Hackman and Oldham’s (1980) Motivating Potential Score (MPS), and “autonomy”. According to Hackman and Oldham (1980), autonomy is the degree to which the job provides substantial freedom and independence and can be compared with job control in this study. However, possibly Brown's result is unreliable, in part because autonomy is a part of the calculation of MPS that gives a high inter-correlation, and in part due to a low response rate.

This study shows that in order to better understand how certain job characteristics influence motivators and stress, it is important to examine their specific occupational context. In general, Pousette and Johansson Hanse (2002) reach the same conclusion in their study that compares a generic model with occupation-specific (i.e., multiple-sample) models across occupations (e.i., industrial white-collar workers, blue-collar workers). Pousette and Johansson Hanse found that values of model parameters vary across occupations, a finding which has important implications for the differentiation of prevention and intervention in different occupational contexts.
Managers’ impact on the work characteristics

Alvesson (2006) identified a duality in management in which the general rhetoric deals with coaching, visions and other factors, while in ongoing, daily work, the manager is still the administrator who closely supervises the jobs assigned. According to Michie, Oughton and Bennion (2002), who state a large body of literature supporting their conclusion, increased motivation leads to increased productivity and profitability. Furthermore, for an IT consultancy firm to obtain new tasks and to survive, its consultants must do a good job for its clients. As recent research shows, work motivation may predict job performance (e.g., Locke & Latham, 2002; Pritchard & Payne, 2003), and job satisfaction may predict well-being (Faragher, Cass & Cooper, 2005). Therefore, it is important to include work motivation as a variable in the psychosocial work environment.

This study highlights McGregor’s (1960) question: What knowledge does the management, with the greatest power and impact on the work characteristics of the work environment, actually have of subordinates’ motivation? In asking this question, McGregor suggested that the answer is essential in order to understand how managers should lead/control their employees. McGregor’s key idea concerning motivation was that managers must have a correct conception of employees’ motivation if they wish to increase their effectiveness. Building on his human relations research, McGregor named the fair conception Theory Y and offered advice on what management development is necessary to secure Theory Y values where employees are given opportunities to grow and become more motivated and more efficient. The organizational structure that dominated at the time of McGregor’s work (the 1950s and 1960s) was based on a very different conception of
motivation, labelled Theory X by McGregor. A premise of Theory X, among others, is that people have to be controlled. In a study of team leaders in an IT consultancy firm, Wallgren, Leijon and Malm Andersson (submitted) found that these managers had rather vague ideas about what motivates their subordinates. Wallgren and his colleagues conclude that, since the principal core of leadership in consulting firms is to ensure that consultants are never idle in jobs paid for by their customers, the consequence is that little time is devoted to learning and following up on what motivates subordinates. This conclusion supports Kovach’s (1987) study that found that workers and supervisors gave different answers when he compared the results of three surveys concerning employee and supervisory rankings of ten motivational items. Kovach concluded that management must understand what motivates employees in the context of the roles they perform and therefore advocates a Theory Y style of management.

This study shows the importance of motivators in the job stress framework and suggests stress interventions that would address both the stress experienced by individuals and the organizational origins of stress in the workplace. Since managers influence job characteristics, it is important to involve them in this matter. The practical implication of the study is that managers must find inventive ways to explore what motivates each employee and must create sustainable development and a healthy work organization.

Study methods and limitations

The hypotheses related to job demands, job control, motivators and perceived stress are theoretically based on earlier research and, as such, are considered plausible. However, the
proposed model is an “as if” model of causality (Kline, 1998). The data are cross-sectional, which implies that the relationships observed cannot be interpreted causally and will need to be replicated longitudinally within the IT sector.

The measures in this study were limited to self-reports. However, the validity of the self-reported work environment is based on the elementary principle that people know their own problems best and should be encouraged to speak for themselves (Levi, 1987; Rubenowitz, 1997). The individual's own perception of the working conditions must be considered if a good picture of how work influences his or her perceived stress is to be achieved. Jewell (1998) makes the same argument related to measuring experienced job satisfaction. Moreover, a deeper understanding of what motivates IT consultants should be beneficial to most industrial organizations. It would be fruitful to examine these issues from the IT consultants’ perspective. What is their motivation? What do they think their motivation should be?

The use of multiple measures (questions) of each construct (latent variables) tends to reduce the effect of measurement error (Kline, 1998). The constructs used in this study are based on earlier theoretical and empirical research by Hackman and Oldham (1980), Herzberg et al. (1959), Karasek and Theorell (1990), Kjellberg et al. (2000), Kjellberg and Wadman (2002) and Weiss et al. (1967). Generally speaking, it is possible to assess construct validity using confirmatory factor analysis when the underlying theory is accessible (Shadish, Cook & Campbell, 2002). This study shows good construct validity, thus confirming previous theoretical and empirical research.
Conclusion

It is reasonable to conclude that the characteristics of job demands and job control constitute important factors for illuminating the genesis of perceived stress among IT consultants. The results also point to the importance of motivators (e.g., responsibility, recognition, achievement and the possibility for growth) among IT consultants in the job stress and performance framework. The results show that motivators fully mediate the relationship between job control and perceived stress. Comprehensive stress interventions are suggested, which address both the stress experienced by IT consultants as well as the organisational origins of stress at work. Since managers have a substantial influence on the work organisation, it is important to involve and educate managers on the subject. To strengthen the results in this study, it is important to replicate the model with a longitudinal design in order to substantiate causality.

References


