INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

**Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600**

UMI[®]

**The Effects of Work and Workplace Control on
Employee Satisfaction and Performance**

by

Steffan J. Jones, B.Sc.

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of
Master of Arts**

Department of Psychology

**Carleton University
Ottawa, Ontario
May 10, 1999
© copyright
1999, Steffan Jones**

National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-43309-9

Canada

**The undersigned recommend to the
Faculty of Graduate Studies and Research
Acceptance of the thesis:**

“The Effects of Work and Workplace Control on Employee Satisfaction and Performance”

submitted by

Steffan Jones

in Partial fulfillment of the requirements for

the degree of Master of Arts

Chair

Thesis Supervisor

**Carleton University
May, 1999**

Abstract

Workplace outcomes such as absenteeism and job satisfaction have been extensively studied over the years in relation to organizational predictors. However, by limiting the scope of their studies, previous researchers have left variance unexplained. This study has combined aspects of two sub-disciplines of psychology: environmental psychology and industrial/organizational psychology to study important work related outcomes. Borrowing from Person-Environment Fit theory, the fit between employees' perceived and desired levels of physical environmental control and job autonomy were hypothesized to explain significant amounts of variance in job satisfaction, environmental satisfaction, job competence, environmental competence, self-rated job performance, absenteeism, intent to turnover and job stress. In this cross sectional study, approximately 90 employees were recruited from an educational setting. Participants were asked to answer a questionnaire and multiple regression analysis was used to analyze results. Although final results were mixed, findings suggested that the application of PE fit theory to workplace control should be examined further and that linkages between environmental psychology and industrial/organizational psychology should continue to be explored.

Acknowledgements

As I write these acknowledgements, I can't help but think that the completion of this thesis has taken me down a long and winding road. Along the way, many people (too many to mention individually!), have provided me with direction, advice and encouragement. However, a few special people need to be singled out.

First and foremost, I must thank my supervisor, Dr. Jennifer Veitch. Jennifer, without your patience and understanding this paper would never have been finished. You taught me the value of quality research and holding ourselves as researchers to a higher standard. Thank you for everything.

Thanks must also go to my thesis committee, Dr. Kim Matheson, Dr. Bill Petrusic and Dr. Lorraine Dyke, for their valuable advice and comments. Extra thanks must go to Kim - you believed in me when nobody else seemed to.

I also want to thank my family and friends for all their love and support. Whenever I needed some encouragement you were there. I know I couldn't have finished this if it wasn't for all of you.

And finally, I want to dedicate this paper to my soulmate, Leanne. Your unconditional love was the inspiration for seeing this adventure through. You picked me up when I was down, put up with me when I became moody, and can celebrate with me now that it's over. Thank you and I love you.

Thanks again to everyone - it took awhile, but we made it!!

Table of Contents

List of Tables	vi
List of Figures	vii
List of Appendices	viii
THE EFFECTS OF WORK AND WORKPLACE CONTROL ON EMPLOYEE	
SATISFACTION AND PERFORMANCE	1
Defining Control: Perceived Control vs. Exercised Control	4
Perceived Control: Good or Bad?	6
Environmental Control	9
Job Autonomy	12
Control Discrepancy	18
Hypotheses and Design	25
Method	31
Subjects	31
Measures	32
Procedure	38
Results	39
Discussion	59
REFERENCES	74
Footnotes	81
Glossary of Acronyms	82

List of Tables

Table 1	41
Table 2	43
Table 3	52
Table 4	53
Table 5	54
Table 6	55
Table 7	57
Table D1	106
Table D2	108
Table D3	110
Table D4	111
Table D5	112
Table D6	113
Table D7	115

List of Figures

Figure 1	Three hypothetical shapes of the relationship between PE fit and strain.	.22
Figures 2a - h	Schematic representation of hypotheses.	.29
Figures 3a - h	Schematic representation of expected and actual relationships found between JAD and outcome variables.	.46
Figures 4a - h	Schematic representation of expected and actual relationships found between ECD and outcome variables.	.48

List of Appendices

APPENDIX A		83
APPENDIX B		102
APPENDIX C		104
APPENDIX D		105
APPENDIX E		116

The Effects of Work and Workplace Control on Employee Satisfaction and Performance

Each year all types of industries lose millions of dollars to high rates of employee turnover, sub-par performance by employees, and employee absenteeism. For example, in the United States it is estimated that each year over 400 million work days are lost because of employee absenteeism. In 1980, Kuzmits estimated this number of days translated to more than \$20 billion lost per year. Poor employee job satisfaction is also a problem. It is the primary purpose of this study to examine some possible predictors of these types of work related outcomes.

The effects of job autonomy on job satisfaction, absenteeism and employee turnover have been well documented (Spector, 1986). However, most work environment research has considered the social environment, and rarely the physical. Carlopio (1996) underscored the importance of considering the effects of satisfaction with the physical work environment by validating the existence of a physical work environment satisfaction construct, which predicted intent to turnover and job satisfaction. Perhaps by approaching workplace outcomes such as employee job satisfaction and performance, absenteeism and staff turnover from a broader perspective, a better understanding of the work context will be developed and lead to more useful interventions for both employees and employers.

Stress theory has been used to identify environmental characteristics that may lead to poor physiological and psychological outcomes (Evans & Cohen, 1987). Baum, Singer, and Baum (1982) emphasized the role of individual interpretation of stressors in the stress

response by suggesting this response is determined by the degree to which events are seen as threatening or harmful. If these events surpass one's ability to adapt, then they are likely to be deemed as stressful. One's attitude towards the stressor, prior experience with it, knowledge of its consequences, and evaluations of its costs also help determine how a stressor is viewed.

In identifying the various types of environmental stressors, Evans and Cohen (1987) outlined eight dimensions along which they can be categorized. These dimensions are the degree to which the stressor(s) are perceptually salient, the type of adjustment required by the environmental condition, the value to the individual of the events, the degree of controllability over the stressor, the predictability of the stressor, the necessity and importance of the source of the stressor, whether the source of the stressor is due to human behaviour, and finally the duration and periodicity of the stressor. Upon closer examination, it is apparent that among these eight dimensions there is one aspect of the environment that could be considered important to each of them: the notion of control. As Becker (1991) has pointed out, control is arguably the most important and pervasive aspect of the environment facing researchers.

The following research concerns the issue of control. During the last 30 years, control has been debated extensively in the fields of environmental psychology and industrial/organizational psychology. In the environmental literature, control has been operationalized as environmental control, the control an employee has over his/her immediate physical work environment. In industrial/organizational circles control is often referred to as job control or job autonomy, the control an employee has over in what

order, how and when various tasks he/she may have are completed. As noted, in both cases the importance of control has primarily been linked to its effects on stress: how environmental control moderates the effects of various physical environmental stressors (Evans & Cohen, 1987), most commonly in the workplace (Sundstrom, 1987), and how job autonomy moderates the effects of job demands (Karasek, 1979).

These definitions of environmental control and job autonomy indicate a natural and obvious link between environmental psychology and industrial/organizational psychology. However, the possibility of combining aspects of these two psychological sub-disciplines to better understand workplace outcomes has been ignored by researchers. It is generally acknowledged that in the past, the various psychological sub-disciplines have drawn lines in the sand to identify their territory. As Howell (1997) has pointed out, “we have become so specialized and turf-conscious that we ignore other kinds of psychologists or worry about them trying to encroach on our hard-won territory” (p. 18).

In addition to not unifying their research efforts, previous environmental and industrial/organizational researchers have focused almost exclusively on the absolute relationships between environmental control and job autonomy and the outcomes of interest. Evans, Shapiro, and Lewis (1993) attempted to explain the effects of control further by utilizing the theory of Person-Environment (PE) fit (see Glossary). Given some of the positive results that have been generated using Person-Environment fit theory (Bazerman, 1982; Edwards, 1991), it is surprising to find that research exploring the

effects of person-environmental control fit and person-job autonomy fit on outcomes such as job satisfaction has been minimal. This is the focus of the present study.

Based on a review of the literature, a number of hypotheses were generated concerning the relationships between person-environmental control fit and person-job autonomy fit and various outcomes including job satisfaction, environmental satisfaction, job performance, absenteeism, intent to turnover and job stress. A field study was then conducted in an educational setting to test the hypotheses using a cross sectional design.

Defining Control: Perceived Control vs. Exercised Control

Researchers have had difficulty in defining control clearly. Averill (1973) distinguished between three different types of control. Behavioural control refers to “the availability of a response which may directly influence or modify the objective characteristics of a threatening event” (p.287). Turning off a light that was too bright could be considered a form of behavioural control. A second type of personal control is cognitive control. This refers to the “way in which an event is interpreted, appraised, or incorporated into a cognitive plan” (p.287). This could be thought of as a type of informational control; one collects information to form an idea or plan of how one’s immediate environment operates. The final type of personal control, as defined by Averill, is decisional control or the “opportunity to choose among various courses of action” (p.287).

Although on the surface Averill’s (1973) definitions of the three types of control appear to be more than adequate, and the work of Cornelius and Averill (1980) does indeed support the existence of several control types, it is apparent there are fine lines

between what could be considered behavioural control, cognitive control, or decisional control. If individuals are given the information that they can control the temperature by either adjusting the thermostat or opening and closing the window, this appears to be decisional control. However, by providing people with this information, their level of cognitive control has been increased. They now know that they can alter temperature by taking a number of different actions. To complicate matters even further, if those individuals were to take direct action to alter the temperature (by opening the window), behavioural control has now also been introduced. This definition of control becomes even more complex and inevitably problematic when, as Averill (1973) noted, one considers the effects each of these types of control has on stress: sometimes reducing it, sometimes increasing it, and sometimes having no effect at all.

It is obvious that defining control is no easy task. Perhaps the problem in defining control is that researchers such as Averill (1973), in attempting to clarify the definition of control by defining it as specifically as possible, have inadvertently confused matters even more. The best possible way of defining control may be to distinguish between exercised control (actual control) and something that has generally been referred to as perceived control.

According to Burger (1989), perceived control can be defined as the perceived ability to significantly change or alter events. It is not necessary that a person actually be able to alter an event, but rather to perceive that they can. For example, informing a person that they can turn a light on or off at their discretion should be enough for that

person to perceive that they have control over the light. Informing that person that they also can decide when and how to do a certain task will increase their perceived level of job autonomy. These perceptions of control then determine subsequent actions and responses (Hackman & Lawler, 1971). Regardless of the amount of control a worker actually has over their physical environment or in their work, it is how much they perceive they have that will affect their reactions.

Perceived Control: Good or Bad?

In general, perceptions of control result in positive reactions (Adelman, 1987; Burger, 1989; Langer & Rodin, 1976; Sherrod, 1974; Spector, 1986). Increasing an individual's level of perceived control can satisfy a need to feel competent and masterful (Perlmutter & Monty, 1977). As Barnes (1981) has stated, if there is one absolute that can be arrived at from the literature, it is that restricting a person's level of perceived control leads to negative consequences. The classical work of Seligman (1975) on learned helplessness and Glass and Singer (1972) on the result of exposure to unpredictable and uncontrollable noise clearly illustrate this.

However, there are exceptions to the general case. Burger (1989) outlined three features of increased perceptions of control that may actually decrease its desirability. Firstly, perceived control will be seen as less desirable and could possibly lead to negative outcomes when it leads to an uncomfortable level of concern for self-presentation. Schaeffer, Street, Singer, and Baum (1988) examined the effects of control on the stress reactions of commuters. Control was operationalized as control over the internal environment of the car (single versus car pool driver) and choice over routes taken to get

to work, and commuting stress was measured as a response to variations in how difficult it was for commuters to travel from home to work (impedance). As expected, the stress of commuting under high impedance conditions was reduced for single drivers (control) relative to car pool drivers (no control). Unexpectedly, however, having the choice between a number of different routes to get to work appeared to be more stressful than having only one route. Schaeffer et al. argued that providing commuters with a choice of routes introduces the possibility of a driver selecting the “wrong” route. Suffering the consequences of making such a decision may have been more stressful than the alternative of having only one route.

A second situation where perceived control may be seen as less desirable occurs when the perception of control decreases the likelihood that the person will be able to achieve the desired outcomes. If a person believes the likelihood of a poor outcome is greater than the likelihood of a good outcome when he/she perceives control, then it makes sense that person would find the perception of control to be less desirable. Burger, McWard, and LaTorre (1986; cited in Burger, 1989) demonstrated this by giving undergraduates the option of pricking their own finger or having the experimenter do it for them. They discovered that between 75% and 90% of undergraduates chose to have the experimenter perform the finger prick for them. It was apparent the subjects perceived control to be less desirable in this situation because they believed the more qualified experimenter was less likely to cause them pain.

The third situation in which perceived control may be seen as less desirable occurs when the perception of control leads to an increase in predictability that draws the person's attention to the aversive aspects of the situation. Often this increase in awareness of a particular stressor leads to an increase in aversiveness that may outweigh the benefits of maintaining a perception of control. Averill, O'Brien and DeWitt (1977), found that subjects who declined a warning signal for an uncontrollable electric shock reported that the shock was less painful and displayed lower levels of tension than did subjects who chose to have a warning signal.

Nonetheless, human beings strongly prefer to feel they have control over their actions and their fate (Baron, 1994). Langer and Rodin (1976) assessed the effects of enhanced personal responsibility and choice on a group of nursing home residents. They had hypothesized that the poor health of many of the residents was due, at least partially, to living in a restricted, decision-free environment, and could therefore be reversed. When residents were provided with an increased freedom to make choices, significant improvements were found in alertness, active participation and a general sense of well-being. Similarly, Perlmutter, Scharff, Karsh, and Monty (1980) showed that participants who reported greater perceptions of control performed significantly better on a paired-associate task.

Sherrod (1974) investigated the aftereffects of crowding on two post-experimental measures assessing frustration tolerance and proofreading performance. Participants were split up into three conditions of crowding in which they were to perform a number of simple performance tasks: (1) noncrowded, (2) crowded, (3) crowded with perceived

control. Immediately afterwards they were moved to a noncrowded condition to complete the two post-crowding measures. The crowded with perceived control condition was created by giving participants the instructions that although the experimenters would prefer they complete the performance tasks in the room they had been assigned to, they could return to the main waiting room to finish the tasks if they wished. As expected, significant negative behavioural aftereffects were observed for the crowded groups, but these effects were ameliorated in the crowded with perceived control group.

It appears that the likelihood of failure following the exercise of control, influences the desirability of perceived control (Burger, 1989). Averill (1973) suggested that the stress-inducing or stress-reducing properties of perceived control depend upon the meaning of having such control to the individual and the consequences of acting on those perceptions. I will now focus more specifically on two common forms of workplace control: perceived environmental control and perceived job autonomy.

Environmental Control

People strive to have control over the physical aspects of their work settings (Baron, 1994). They want to be able to turn the lights on or off at their discretion, adjust the temperature when they feel uncomfortable, or close a door or window when necessary to shut out unwanted noise. When individuals lack perceived control over such factors they may experience a negative state called reactance (Brehm, 1966) in which they believe their personal control and freedom is in jeopardy. Often they will take action to try to reassert it.

The impact of having such perceived control over the physical environment on relevant outcomes is evident in two studies by O'Neill (1994; 1996). In both cases, he was interested in developing a conceptual model of the relationships between perceived work space adjustability and other dependent variables with various outcome measures of satisfaction and performance. Perceived work space adjustability could operationally be considered to be a form of perceived control in the workplace. Results indicated that increased perceptions of adjustability contributed directly to increased levels of environmental satisfaction and self-rated performance.

Paciuk (1989) investigated the effects of perceived and exercised control over the thermal environment and their relationships to thermal satisfaction and comfort. Her results supported a path model in which the perception of thermal control contributed directly to thermal satisfaction. Exercised control, however, was found to decrease thermal satisfaction. This phenomenon illustrates the relationship between exercised control and the perception of control (given that the environmental conditions require action). The success or failure of a control response will inevitably have an impact on the perceptions of control from which it came. If the control response is successful, then the perception of control will be reinforced; if the control response fails, then the perception of control will be weakened or perhaps even eliminated. Although this type of effect would be difficult to measure (would require a longitudinal study), it conceptually represents the consequences of acting on perceptions of control.

Steele (1973) defined this relationship between exercised control and perceptions of control as reflecting the level of environmental competence a person possesses. In the

preceding section, it was suggested that increasing a person's perceived level of control will satisfy a need to feel competent and masterful (Perlmutter & Monty, 1977). Steele suggested, however, that this will only be true if one has both the ability to be aware of one's physical environment and its impact and the ability to use or change that environment to suit one's needs. As soon as the consequences of a control response are negative, then a person's level of environmental competence will be suspect. This process could explain the negative results Paciuk (1989) found with regard to exercised control. If participants found unsatisfactory results after altering the thermal environment, then their perceptions of control would have been reduced, perhaps resulting in decreased thermal satisfaction.

Although the results of Veitch and Gifford (1996a) differ from the findings of Paciuk (1989) and O'Neill (1994; 1996), they do highlight the negative consequences of perceived environmental control in certain situations. Veitch and Gifford were interested in whether subjects who had a choice of lighting condition or who were in preferred lighting conditions would perform better on several intellectual and creativity tasks than subjects who did not have either. As expected, subjects in the choice and preference conditions reported more perceived control than those under the no choice and no preference conditions. Surprisingly, however, subjects given a choice (increased perceptions of control) performed more poorly and more slowly on the creativity task than subjects given no choice. Because subjects knew they were participating in an experiment supervised by a superior, these results might have been due to some of the processes

outlined by Burger (1989). Perhaps subjects were concerned about making the “wrong” choice; or having control might have drawn their attention to the fact that they were being observed.

Job Autonomy

Hackman and Oldham (1975) defined job autonomy as the amount of freedom a worker has to schedule his/her work and to determine the procedures to be used in carrying it out. Participative decision-making has sometimes been included with job autonomy, but whereas job autonomy means that the worker has some control over specific work tasks and processes, participative decision-making means only that the worker has been consulted on broader workplace issues. It does not necessarily mean the worker will have control over any specific aspect of the job (Evans & Fischer, 1992). I chose to focus exclusively on the effects of perceived job autonomy, excluding participative decision-making.

Breaugh (1985) argued that research on perceived job autonomy has been hindered by the way it has been defined by researchers. He suggested that to further theory development and improve organizational intervention it was necessary to distinguish between three different facets of perceived autonomy. Work method autonomy, he argued, is the degree of discretion or choice that individuals have regarding the procedures they utilize in going about their work. Work scheduling autonomy refers to the extent to which workers feel they can control the scheduling, sequencing, or timing of their work activities. Work criteria autonomy represents the degree to which workers have the ability to modify or choose the criteria used for evaluating their performance. In validating his

definitions of the three job autonomy facets, Breugh demonstrated that each of the facets was significantly positively correlated with job satisfaction (.26, .23, .23, $p < .05$, respectively) and performance (.26, .32, .18, $p < .05$, respectively), and two of the autonomy facets (method autonomy and scheduling autonomy) were significantly negatively correlated with absenteeism (-.21, -.31, $p < .05$, respectively). In addition, Breugh conducted a hierarchical multiple regression analysis to determine whether his work autonomy scales explained any unique variance over and above a global autonomy questionnaire (Job Diagnostic Survey (JDS) autonomy measure). For each outcome the JDS was entered first followed by Breugh's work autonomy scales. The work autonomy scales were found to explain additional variance (R^2) in the magnitude of 17%, 11%, and 18% ($p < .05$) for job satisfaction, absenteeism and performance respectively.

Spector (1986) conducted a meta-analysis of 88 studies relating perceived job autonomy to nineteen employee outcome variables. To be included in the analysis, prospective studies must have met three criteria: each study must have included a measure of perceived job autonomy; each study must have measured at least one employee outcome variable that was shared by at least four other studies; data must have been reported in the form of correlations or a statistic that could be transformed into a correlation (i.e. chi-square). For all studies combined it was found that high levels of perceived job autonomy were associated with high levels of job satisfaction and performance, and low levels of absenteeism and intent to turnover.

It has been well documented that bus driving is an extremely stressful career mostly due to the fact that bus drivers have little say over when or how they perform their jobs (Evans, 1994). Evans and Carrère (1991) investigated the link between the high traffic congestion that public transit operators often encounter and the high levels of on the job stress they often report. A number of questionnaires were administered to 60 male bus drivers while controlling for factors such as job seniority, age and smoking. In accordance with previous research, results indicated that traffic congestion was positively related to high levels of stress and that this association was partially explained by the restriction in perceived job autonomy that bus drivers experience. Similarly, a recent literature review has indicated that the absence of job autonomy in the bus driving profession does lead to negative consequences (Kompier & Di Martino, 1995).

Tetrick and LaRocco (1987) were interested in how control on the job influenced the effects of stress from job demands on job satisfaction. Using a sample of 206 physicians, dentists, and nurses, job control was found to reduce the negative relationship between job stress and satisfaction. As job control increased, job stress was found to have less of a negative influence on job satisfaction. More importantly for the purposes of this study, further analysis revealed job control had a significant direct relationship with job satisfaction. Increased perceived job autonomy was associated with increased levels of job satisfaction.

As part of a larger study, Ross and Reskin (1992) investigated how education influenced job autonomy and in turn how job autonomy affected job satisfaction. Using a representative sample of 557 employed persons interviewed by telephone, they found that

job autonomy was positively correlated with job satisfaction. Although the effect was slightly larger for the well- educated, results were consistent across all education levels.

Kroesser, Meckley, and Ranson (1991) were interested in determining the factors related to sick leave use in the West Virginia Department of Education. Questionnaires assessing a number of variables, including job autonomy, were administered to 215 full time employees. Results were consistent with previous research. A negative relationship was found between job autonomy and sick leave use. Employees reporting higher levels of perceived job autonomy took significantly fewer sick leave days per annum.

Perceived job autonomy has generally been associated with positive effects. These results should be approached with caution, however. Job autonomy is a form of control; the three situations outlined by Burger (1989) where control may be viewed as undesirable still apply. For example, with increased job autonomy usually comes increased responsibility. Some individuals may not desire such responsibility (concern for self-preservation) and therefore would rather not be provided with increased job autonomy (Sainfort, 1990).

Three models have been suggested to explain how job autonomy contributes to the positive outcomes discussed above: the job characteristics model (Hackman & Oldham, 1975), the demand/control model of worker strain (Karasek, 1979), and the person-environment fit model (Caplan, Cobb, French, Van Harrison & Pinneau, 1980). The job characteristics model considers autonomy to be one of five core job characteristics that

lead to positive effects by means of increased motivation and experienced responsibility by workers for work outcomes.

Hackman and Oldham (1975) developed a technique for estimating the potential of a job to motivate its holder. Employees are given a series of questions tapping the five core job dimensions, from which it is possible to calculate a motivating potential score (MPS). A job high on the five dimensions will have a high MPS and a job that is low on the five dimensions will have a low MPS (job autonomy is of such importance in this model that if it is zero, then the overall MPS will also be zero). However, a high MPS job will only be motivating to those individuals who are also high on growth need strength (GNS). Growth need strength is an indicator of how motivated a person is to grow and learn. It is similar to need hierarchy theory (see Maslow, 1943); a person high in GNS would be comparable to a person trying to achieve self-actualization; a person low in GNS would indicate a person who finds satisfying their security needs important.

It is here that Hackman and Oldham's theory breaks down. Little evidence has been found to support the interaction of the five job characteristics and their relationships to GNS. Moreover, as Landy (1985) pointed out, the theory only specifies how to motivate workers high on GNS. The five core job characteristics may have been good places to start, but it appears researchers have been more interested in using the model than in testing it. Serious concerns have been raised about the underlying theory of the model (i.e. need theory), the instruments used to measure the components of the model, and the way in which the MPS is calculated (Landy, 1985).

The demand/control model of worker strain (Karasek, 1979), suggests that job strain is a result of the joint effects of high job demands and low worker control (low job decision latitude). Job stress would be reduced as worker control is increased. Interestingly, it is not that job demands also have to be decreased. Karasek concluded that when job demands and worker control are both high, workers will experience the highest level of motivation to perform. Because few empirical tests of the predictions made by Karasek's model have been conducted in work settings, its accuracy is unclear.

The final model, the model of person-environment fit (Caplan et al., 1980), posits that worker distress is a function of the congruence between objective job demands and subjective worker needs. This model emphasizes the importance of individual perceptions of workplace stressors (i.e. job demands). These perceptions require estimates of the demands being made by the work environment as well as estimates by the individual of his/her capability and motivation to meet those demands. Control is the central feature of this model which predicts that with more control on the job, workers can structure their work to minimize discrepancies between their job demands and their needs and abilities. As a result, worker strain will be reduced.

The most interesting aspect of the person-environment fit model is its emphasis on individual perceptions of workplace stressors. The job-characteristics model and the demand/control model of worker strain are primarily concerned with job design with little regard for individual perceptions. This is probably one reason why results have been so poor. Although Landy (1985) concluded support for the person-environment fit model

has been mixed, Caplan (1983) also suggested that findings have been encouraging.

Perhaps by applying it in a slightly different context, more positive results can be obtained.

Control Discrepancy

Person-Environment (PE) fit theory suggests that control is a mechanism for allowing individuals to improve their PE fit (O'Neill, 1996). By altering their environment, people are able to bring their environments more in line with their specific needs and abilities. However, it can also be said that people differ in their needs for and abilities to control itself. For example, the perception that one risks failure if one exercises control is part of assessing one's abilities; in some cases this perception may lead to giving up control (Burger, 1989). Perhaps by assessing the fit between the amount of control a person has and the amount of control a person wants, additional variance in workplace outcomes could be explained.

In a study of person-control fit, Conway, Vickers, and French (1992) applied PE fit theory to the concept of generalized control. They noted that most previous research on control had focused on the perception of control one has and how it relates to various outcome measures. Conway et al. were interested in the effects of desired control relative to perceived control; specifically, does incongruence between the control one has and what one wants account for additional variance in various psychological outcomes than that which can be attributed to perceived or desired control independently? Control over three sources (internal, others, chance) in two domains (personal life and emotions/feelings) was measured for 622 men and women. Too much or too little perceived control relative to the amount desired was found to be associated with increased psychological strain.

Lowest strain was seen when there was a perfect fit between perceived control and desired control. In addition, misfit on all three sources of control explained significant additional variance in psychological strain beyond that explained by either perceived or desired control alone.

Although positive results have been found relating both environmental control and job autonomy to outcomes such as job satisfaction, job performance and absenteeism, the evidence has not been conclusive. The majority of studies have examined either environmental control or job autonomy independently and have simply attempted to determine how increasing or decreasing them affects various outcomes. Like Conway, Vickers, and French (1992), I believe that more conclusive and definitive results could be found if instead, the fit between employees' levels of perceived environmental control and job autonomy and employees' desired or ideal levels of environmental control and job autonomy are considered jointly. The fits between perceived and desired levels of environmental control and job autonomy, will be called environmental control discrepancy (ECD) and job autonomy discrepancy (JAD) respectively. These terms are an adaptation of the concepts used in Person-Environment fit theory.

Person-Environment ¹ fit theory, as developed and tested by Caplan, Cobb, French, Van Harrison, & Pinneau (1980), consists of two main elements. Firstly, the theory emphasizes that the attributes of the person and the environment must be considered jointly when examining any person-environment relationship (Conway, Vickers, & French, 1992). In the current study, the attributes of the person correspond to employees' desired

(DC) levels of control (environmental or job) or how much control they would like to have. The attributes of the environment correspond to employees' perceived (PC) levels of control (environmental or job) or how much control they perceive their work environment to be providing. Research has demonstrated that PE fit consistently explains greater variance in outcomes than either person attributes or environmental attributes alone (Caplan et al., 1980; Conway et al., 1992).

Secondly, these attributes interact to produce three basic types of PE fit relationships (Caplan, 1983). Figure 1 illustrates these three possible relationships as they could exist in the current study. Curve A depicts a U-shaped relationship where either excesses in employees' perceived levels of control ($DC < PC$, negative environmental control discrepancy (ECD)/job autonomy discrepancy (JAD)) as well as deficits in employees' perceived levels of control ($DC > PC$, positive ECD/JAD) lead to higher levels of strain as compared to the case where $DC = PC$, or ECD/JAD is zero. Bazerman (1982) defined these two incongruent environments further using job control (autonomy). When more job control is provided than an employee desires ($DC < PC$, negative ECD/JAD), an employee is in a state of overcontrol; when less job control is provided than an employee desires ($DC > PC$, positive ECD/JAD), a person is in a state of undercontrol. Overcontrol could potentially lead to feelings of incompetence, whereas undercontrol could lead to feelings of boredom. Although Bazerman was specifically referring to job control, it is logical to assume that these notions of overcontrol/undercontrol could extend to other forms of control as well (i.e. environmental control).

Figure Caption

Figure 1. Three hypothetical shapes of the relationship between PE fit and strain. Curves B and C can also be drawn as their mirror images to depict functions which are their respective reverse opposites.

Note. From Person-environment fit: Past, present, and future (p. 39), by R. D. Caplan. In Stress Research, C. L. Cooper (Ed.), 1983, London: Wiley. Copyright 1983 by Wiley.

Adapted with permission.

Desired Control (DC) - Perceived Control (PC) Fit

Curves B and C illustrate two less common PE fit relationships. Curve B depicts an asymptotic relationship where either an excess of desired control ($DC > PC$), but not a deficit, or an excess of perceived control ($DC < PC$), but not a deficit, can lead to increased strain (for clarity, the figure only shows the first of these possibilities). Curve C represents the situation where the absolute amount of one component (e.g., DC) relative to the other component (e.g., PC) has a linear effect on strain. In other words, continuing to increase DC relative to PC, or continuing to increase PC relative to DC, continues to lead to lower levels of strain. These misfits could be viewed as stressors with measurable negative outcomes. The work of Evans, Shapiro, and Lewis (1993) and Bazerman (1982) on control fit illustrates these relationships further.

Evans et al. (1993) suggested that in general, control could be viewed as negative when a mismatch exists between control dimensions present within a person's surroundings and personal variables such as behavioural competencies, control cognitions, and control motivation. If any of these personal variables are more or less than the opportunities or demands present around the person, then control could become problematic. This definition of negative control illustrates either the $P > E$ ($DC > PC$) or $P < E$ ($DC < PC$) misfits described by Caplan (1983).

More specifically, Bazerman (1982) attempted to provide a theoretical model that examined the congruence between the task control provided to 80 undergraduate students and the students' ability to utilize that control on task performance. Based on the three general PE fit relationships, he hypothesized that an optimal control state would exist

when an individual's abilities to use job control are congruent with the job control provided by the environment. As expected, results indicated congruent job control led to significantly greater levels of performance than either undercontrol or overcontrol.

Caplan (1983) suggested that the findings of previous PE fit studies have been encouraging, with PE fit consistently doubling the amount of variance explained. For example, Caplan et al. (1980) hypothesized that the goodness of the PE fit would produce stronger effects on various measures of strain than would either the attributes of the work environment or the person alone. The results of a stratified sample of 318 employees from 23 occupations supported their hypothesis. For example, E and P (with regard to job complexity) were found to explain 14% (ns) and 19% (ns) of the variance in depression scores respectively, as compared to 26% ($p < .002$) explained variance when using PE fit alone. A follow-up set of multiple regression analyses (not published) further confirmed that PE fit predicted significant amounts of variance in strain even after the predictive power of P and E had been accounted for.

The clearest example of the encouraging results yielded by PE fit theory can be seen in a narrative review of the PE fit literature conducted by Edwards (1991). Ninety-two published studies that had focused on person-job fit were included. Misfit between the person and various job characteristics was found to have a negative effect on job satisfaction, absenteeism and turnover. As misfit between the employee and the job increased, employees were more likely to display decreased job satisfaction and increased absenteeism and were more likely to express intentions to turnover. Results with regard to job performance were found to be mixed.

To assess organizational effectiveness within 29 schools, Ostroff (1993) assessed PE congruence among 581 teachers. As expected, PE congruence was found to be generally related to organizational effectiveness. More specifically, and more importantly with regard to its relevance to the present research, congruent job autonomy was found to be negatively related to teacher turnover intentions. The better the fit between the teachers' perceived levels of job autonomy and their desired levels of job autonomy, the lower their intentions to turnover.

I believe that by measuring ECD and JAD, significant amounts of variance in outcomes such as job satisfaction, job performance, absenteeism and intent to turnover can be explained, over and above the variance accounted for by perceived and desired levels of environmental control and job autonomy alone. In doing so, a successful link will have been made between the sub-disciplines of environmental psychology and industrial/organizational psychology.

Hypotheses and Design

Based on the literature presented above, a number of predictions were made. Independent variables consisted of ECD, JAD, and their respective commensurate measures of perceived and desired levels of environmental control and job autonomy. Dependent variables consisted of job satisfaction, environmental satisfaction, self-rated job performance, self-rated absenteeism, and intent to turnover. Given the nature of the outcomes, this study necessitated collecting data in a field setting. Participants were recruited from a post-secondary educational institution. Considering the constraints of

time and participant availability that limited the size of this research, the current study used a cross-sectional design.

Competency has been defined as the feelings that individuals have about their abilities and reflects their confidence resulting from their cumulative interactions with their environments through past experiences (Wagner & Morse, 1975). Steele (1980) suggested that competence consisted of three elements: the ability to be aware of one's skills, abilities, needs and values; the individual's knowledge about the surroundings; and the practical skills a person possesses that enable one to search out appropriate environments, adjust settings to match one's needs, and personalize a setting. If these three elements are met, then competence will be high. Steele was principally concerned with environmental competence. Few researchers have examined his ideas empirically (Gifford, 1997).

The fact that control and individual skills, abilities, needs and values are integral elements of both the definition of competence and our two types of fit clearly suggests that measures of job competence and environmental competence should be related to our measures of ECD and JAD. Measures of job competence and environmental competence were therefore added as dependent variables.

In addition, a measure of general job stress was also included as a dependent variable. Throughout the preceding sections, numerous references have been made to the issue of stress, and how it is stress in the workplace that is predominantly responsible for strain and poor outcomes. Including such a measure will allow us to assess whether job

stress acts as a mediating variable between our independent and dependent variables, or whether it is an end outcome in itself.

Conceptually, it is possible that employees could believe they have good JAD, but poor ECD. For example, it may be that their perceived job autonomy and desired job autonomy are well matched, whereas their perceived environmental control is much less than what they desire. Therefore, participants' ECD and JAD were measured separately.

The following hypotheses were tested using multiple regression analyses (a schematic representation of hypotheses can be seen in Figures 2a-h):

1. JAD is related to job competence. Negative JAD (overcontrol) leads to lower levels of job competence. Zero (perfect fit) and positive JAD (undercontrol) lead to higher levels of job competence. ECD has no effect.
2. ECD is related to environmental competence. Negative ECD leads to lower levels of environmental competence. Zero and positive ECD lead to higher levels of environmental competence. JAD has no effect.
3. JAD is related to job satisfaction through an inverted U relationship. Negative and positive JAD lead to lower levels of job satisfaction. Zero JAD leads to higher levels of job satisfaction. ECD has no effect.
4. ECD is related to environmental satisfaction through an inverted U relationship. Negative and positive ECD lead to lower levels of environmental satisfaction. Zero ECD leads to higher levels of environmental satisfaction. JAD has no effect.

Figure Caption

Figures 2a - d. Schematic representations of hypotheses one through four (relationships between JAD and ECD and job competence (2a), environmental competence (2b), job satisfaction (2c), and environmental satisfaction (2d)).

Figures 2e - h. Schematic representations of hypotheses five through eight (relationships between JAD and ECD and job performance (2e), absenteeism (2f), intent to turnover (2g), and job stress (2h)).

LEGEND: JAD: ———
ECD: - - -

2e) Hypothesis 5

2f) Hypothesis 6

2g) Hypothesis 7

2h) Hypothesis 8

LEGEND: JAD: ———
ECD: - - - -

5. JAD and ECD are related to self-rated job performance. Negative JAD and ECD lead to lower self-rated job performance. Zero and positive JAD and ECD lead to higher self-rated job performance.

6. JAD and ECD are related to absenteeism through a U relationship. Negative and positive JAD and ECD lead to higher levels of absenteeism. Zero JAD and ECD lead to lower levels of absenteeism.

7. JAD and ECD are related to intentions to turnover. Negative JAD and ECD lead to higher levels of intent to turnover. Zero JAD and ECD lead to lower levels of intent to turnover. Positive JAD and ECD lead to intermediate levels of intent to turnover.

8. JAD and ECD are related to job stress through a U relationship. Negative and positive JAD and ECD lead to higher levels of job stress. Zero JAD and ECD lead to lower levels of job stress.

In addition, it is believed that by using both job autonomy measures and environmental control measures to predict various organizational outcomes, increased amounts of variance will be explained than if one of these types of measures is used alone.

Method

Subjects

Participants were recruited from employees at a post-secondary educational institution. Given the importance of this field of work and the demands often placed on its employees, this appears to be a prime setting for workplace research. Participation was voluntary.

Although Edwards (1991) noted that the relationship between measures of fit and various outcomes is usually sufficiently robust to overcome the methodological issue of limiting participant recruitment to one job type, he did acknowledge that limiting samples in such a way can restrict variability. For the current study, considering its unique and somewhat ambitious goals, it was ultimately decided that increased variability was important and that participants should not be limited to one job type. Job type was included as a covariate.

Given that I did not expect the majority of our dependent variables to be overly skewed, that I was reasonably confident in the measures, and that based on the literature a small to medium effect size was expected (5% to 15% of the variance in outcomes explained), 15 participants for each of the six independent variables were recruited (Tabachnick & Fidell, 1983). The target sample size was, therefore, 90 participants; a total of 93 individuals volunteered to participate.

To allow for adequate sample description, demographics including age, sex, marital status, level of education, job title, years in current job (minimum of one) and years at current company were collected.

Measures

A number of existing measures as well as some newly developed ones were combined to form the questionnaire used in this study (Appendix A).

Absenteeism. Absenteeism was measured using a single open-ended item: "People have many reasons for missing work. Most people are occasionally away from work. How many times have you missed work in the last 12 months? A half-day or longer

counts as a single day. Count two or more consecutive days as one time. For example, if you missed three consecutive days, count this as one time. Exclude holidays.” Johns (1994) noted that numerous studies have used self-report absence data, yet very little research has examined the reliability and validity of such measures. Ideally, researchers should obtain self-report and organizational absenteeism records to allow for the checking of reliability and validity. However, when this is impossible, Johns makes a number of suggestions for improving the accuracy of self-report absence items: make time intervals for the item long enough to enhance reliability but short enough to avoid the effects of memory loss; be sure to define what constitutes absenteeism carefully; use an open-ended response format; and understand that asking for absenteeism data could be seen by employees as threatening. Try to reduce the intrusiveness of the item by making it appear as if being absent from work is common among all employees. These suggestions were taken into consideration when formulating the absenteeism item.

Job stress. Job stress was measured by a single item taken from a study by Kroesser et al. (1991). The item required participants to indicate how stressful they consider their job with responses ranging from 0 (not at all) to 4 (extremely stressful). The question asked respondents to give a general answer that reflected how they have felt about their jobs in the past year.

Job satisfaction. Job satisfaction was measured by a commonly used single item: “How satisfied are you with your job in general?” Responses ranged on a 7-point scale from -3 (extremely dissatisfied) to 3 (extremely satisfied). In a recent review of single item

measures of job satisfaction, Wanous, Reichers and Hudy (1997) concluded that when practical limitations (i.e. questionnaire length) suggest the use of a single item measure, research has shown that the reliability and validity of such a measure are acceptable.

Environmental satisfaction. This scale consisted of three items drawn from a study conducted by Brill, Margulis, Konar, and BOSTI (1984-1985). It was designed to measure employees' satisfaction with the physical aspects of their workspace. Responses were made on a 5-point Likert scale ranging from -2 (strongly disagree) to 2 (strongly agree). Responses were then averaged to obtain an overall environmental satisfaction score - the higher the score, the higher the level of environmental satisfaction. The scale's face validity appears to be acceptable, and it has demonstrated good internal consistency reliability (Cronbach's $\alpha = .88$).

Environmental control discrepancy. ECD was measured using a slightly modified version of the Survey of Personal Influence in Common Environments (SPICE) (Gifford & Eso, 1988). This 42-item scale asks respondents to indicate on a 5-point scale how much influence they have over various physical features of their workplace (perceived environmental control) and how important this influence is to them (desired environmental control). The first 40 items refer to specific aspects of the workplace (e.g. temperature, colours, noise, lighting). The last two items ask respondents to indicate their overall influence over the physical features in their workplace and the overall importance of having this influence. These can be used as a validity check. Three aspects of the physical environment were dropped from the questionnaire because they were judged to be either irrelevant or obsolete (e.g. smoke from cigarettes). Veitch and Gifford (1996b) have

reported that both sections of the scale have excellent reliability (Cronbach's $\alpha = .95$ and $.92$ respectively).

This scale is an example of a measure that uses commensurate items. Caplan et al. (1980) suggested that to measure the degree of fit between respondents' perceptions of certain aspects of their surroundings and of themselves, respondents should be asked to rate the extent to which a characteristic is present in their surroundings (i.e. perceived environmental control) and the amount of that characteristic they would prefer to have (i.e. desired environmental control). Responses should be marked on identical Likert scales. To determine fit, a difference score is calculated between the two commensurate items. A negative fit occurs when the perceived characteristic is greater than the desired characteristic, and a positive fit occurs when the perceived characteristic is less than the desired characteristic.

For the current study, an ECD score was calculated by subtracting perceived environmental control scores from desired environmental control scores. The better the fit, the smaller the differences between items. An overall measure of fit was then obtained by averaging the 34 resulting fit scores.

Job autonomy discrepancy. Perceived job autonomy was measured using a nine item scale devised by Breugh (1985). The scale measures three different facets of job autonomy: work method autonomy, work scheduling autonomy, and work criteria autonomy. Three items were used to measure each type of job autonomy. Responses ranged on a 7-point continuum from -3 (strongly disagree) to 3 (strongly agree). The

higher the overall score, the greater the amount of freedom employees perceive they have to complete tasks when and how they want. This scale has been demonstrated to be both reliable (Cronbach's $\alpha = .85$) and valid (Breugh, 1985).

As with environmental control, desired job autonomy was measured using nine commensurate items adapted from Breugh's (1985) perceived job autonomy scale. An overall JAD score was then calculated by averaging the differences between the perceived and the desired responses.

Job performance. Self-rated job performance was measured using a nine item scale that was originally used by Brill, Margulis, Konar, and BOSTI (1984-1985). The first eight items measure performance on specific dimensions of the job (i.e. frequency of errors). The final item is a rating of overall performance. Responses ranged on a scale of 0 (absolutely unacceptable) to 10 (absolutely ideal). Responses were then averaged to give a single job performance score. This scale has demonstrated adequate face validity and its internal consistency reliability has been found to be excellent (Cronbach's $\alpha = .90$).

Intent-to-turnover. Intent to turnover was measured using an intention to turnover scale originally devised by Carlopio (1996). This scale consists of four items that assess employees' desire to leave the company, their interest in finding another job, and their desire to transfer to another department or to another job within their current department. Responses ranged on a 5-point scale from -2 (disagree strongly) to 2 (agree strongly) with higher scores indicating a greater intent to turnover. An overall intent to turnover score was obtained by averaging the individual item scores. The scale has demonstrated

adequate reliability (Cronbach's $\alpha = .76$), adequate convergent validity, and good face validity.

Job competence. Job competency was measured using a modified version of a 23 item scale devised by Wagner and Morse (1975). Seven items were dropped because they were judged to be repetitive or confusing. The 16 remaining items measure the general sense of competence and accomplishment employees perceive at their jobs. Responses ranged on a 9 point scale from 4 (very strong agreement) to -4 (very strong disagreement). To calculate a total sense of competence score, participants' responses on negatively scored items were reversed and then an average of the items was taken. According to Wagner and Morse, the scale has demonstrated good predictive validity and internal reliability has been found to be excellent (Kuder-Richardson = .96).

Environmental competence. No scale currently exists to assess employees' environmental competence. Therefore, a scale was constructed specifically for this study. Using the job competency scale as a model, five items were generated to assess perceived environmental competence in the workplace. Responses ranged on the same 9-point scale used to measure job competence. After reverse scoring one of the items, an overall perceived environmental competence score was calculated by averaging the five responses. The higher the score, the higher the level of perceived environmental competence. The questionnaire was reviewed by several colleagues to assess its face validity. The scale's reliability was calculated post-hoc.

Procedure

An initial phone call was made to the Vice-President of the Human Resources and Staffing Department at the prospective educational institution. During the ensuing telephone conversation, the purpose of the current study and its goals were outlined and permission to recruit their employees as participants was obtained. The investigator also asked whether, if employees agreed, it was possible to access any organizational records concerning employee absenteeism and/or performance. Unfortunately, no such records were kept or were accessible.

The institution electronically generated a stratified randomly selected pool of employees. From this list, the investigator randomly selected prospective participants who were contacted by telephone. This call included an introduction by the investigator, a brief description of the study's objectives, as well as an initial outline of participant rights and responsibilities.

Prospective participants were informed that participation was voluntary and involved taking approximately 30 minutes to answer a questionnaire. Anonymity and confidentiality were assured. In addition, they were informed they were free to withdraw from the study at any time and were entitled to a copy of the same results as their employer would receive. If participants agreed to answer the questionnaire, they were informed that they would receive a package in the mail during the next few days.

As well as the questionnaire, the research package consisted of an information letter, a consent form and a self-addressed stamped envelope (Appendix B).

The information letter again introduced the investigator and described the purpose of the current investigation. Participant rights and responsibilities were also repeated and participants were asked to read and sign the consent form before filling out the questionnaire.

The consent form reassured participants that results would be kept anonymous and confidential, that they could withdraw from the study at any time, and that they were entitled to a copy of the results at its conclusion (participants were to indicate on the consent form if they wished to have a final copy of the results sent to them). The phone number and electronic mail address of the investigator was also included in case participants had any questions or concerns at a later date.

Participants could then proceed to complete the questionnaire. Instructions on the questionnaire asked respondents to answer the questions as accurately, honestly and completely as possible and to answer questions with their initial responses.

At the conclusion of the study each participant received a debriefing form (Appendix C) outlining the purpose of the study and the expected results.

Results

Descriptive Statistics

Sample. A total of 93 individuals participated in the study, of which 38 were males and 54 were females (one did not answer). The age of participants ranged from 22 to 63 years old with a mean age of 48.2 years (SD = 7.4). Participants had been employed in their current jobs for an average of 10.7 years (SD = 7.7) and had been at their current

workplaces for an average of 16.1 years ($SD = 7.8$). Ten of the participants were single, 67 indicated they were married or living common-law, 12 were divorced, and 2 were widowed. Two participants elected not to provide their marital status. Nine participants said that high school was their highest completed level of education, 22 had community college diplomas, 26 had completed a university degree, and 36 participants had completed some form of graduate degree. The large number of participants completing higher levels of education was manifested in participant job types. Seventy-four participants were classified as having a professional designation while only 18 were classified as having an administrative type job (one participant missing).

Outcome variable scale reliabilities. Table 1 presents the means, standard deviations, medians, actual ranges, possible ranges, and coefficient alphas (where appropriate) for each self-report variable. Reliabilities were acceptable for all scales, the lowest being .72. Raw data are in Appendix E.

All outcome variables except job stress, environmental satisfaction and job competence were found to be either positively or negatively skewed. In addition, response ranges were generally restricted (see Table 1). To avoid complicating data interpretation, no transformations were used to normalize the outcome variables.

The analysis followed conventional practice in assuming that, although all the scales are ordinal scales, for these analyses they would be considered to have interval scale properties. For example, it was assumed that the same degree of perceived job autonomy was represented by the difference between 0 and 1 as was represented by the difference between 1 and 2.

Table 1

Descriptive Statistics for All Variables

Variable	M	SD	Median	Actual Range	Possible Range	Cronbach's α
JAD	0.72	.88	0.56	-0.9 to 4.0	-6 to 6	.88
ECD	1.36	1.09	1.47	-3.9 to 3.9	-4 to 4	.83
Perceived J.A.	1.30	.94	1.44	-1.7 to 3.0	-3 to 3	.87
Desired J.A.	2.02	.59	2.00	0.2 to 3.0	-3 to 3	.83
Perceived E.C.	1.25	.80	1.00	0.0 to 3.8	0 to 4	.90
Desired E.C.	2.60	.63	2.53	0.0 to 4.0	0 to 4	.89
Job Satisfaction	1.56	1.31	2.00	-3.0 to 3.0	-3 to 3	-
Job Competency	1.39	.81	1.38	-0.8 to 3.2	-4 to 4	.72
Env. Satisfaction	-.07	1.16	.00	-2.0 to 2.0	-2 to 2	.91
Env. Competency	1.70	1.13	1.75	-1.5 to 4.0	-4 to 4	.73*
Absenteeism	1.53	1.65	1.00	0.0 to 11	0 to ?	-
Job Stress	2.29	.76	2.00	1.0 to 4.0	0 to 4	-
Intent to Turnover	-.82	.94	-1.00	-2.0 to 1.5	-2 to 2	.72
Performance	8.06	1.13	8.25	3.6 to 9.8	0 to 10	.87

Note. * Coefficient alpha of scale after dropping item 3. Single-item measures have no scores for Cronbach's alpha.

Developing and Examining Predictor Variables

Calculation of JAD and ECD. Based on a technique used by Caplan et al. (1980), both JAD and ECD were calculated by subtracting the perceived response from the desired response for each pair of commensurate items. These differences were then averaged to arrive at overall measures of fit. Perceived and desired environmental control items were reverse scored before differences were calculated. This reverse scoring created measures of perceived and desired environmental control that were in the same direction as measures of perceived and desired job autonomy. The greater the response (i.e. from 0 to 4), the greater the level of control.

Shape of the relationships between JAD/ECD and outcome variables. Several relationships between the measures of JAD and ECD and the outcome variables were predicted. Bivariate relationships were tested and examined to identify which of the relationships were significant. In addition, Caplan et al. (1980) suggested that the linearity or curvilinearity of a relationship could be determined using multiple regression techniques. By comparing the variance predicted by a linear relationship (JAD or ECD) between the variables (i.e. $Y = a + bx$) with the variance predicted by a parabolic relationship (JAD^2/ECD^2) between the variables (i.e. $Y = a + bx + cx^2$) it is possible to determine whether the relationship in question is linear or curvilinear. If the parabolic relationship accounts for a significant amount of variance over and above that accounted for by the linear relationship, then the relationship is parabolic.

Table 2 illustrates the changes in R^2 's when the linear and parabolic JAD and ECD relationships are entered into the hierarchical regression equation for each outcome

Table 2

Changes in R^2 's When JAD/ECD and JAD²/ECD² are Regressed Onto the Outcome Variables

Outcome Variable	Step 1: JAD	Step 2: JAD ²	Relationship
Performance	.003	.002	Linear
Turnover	.022	.010	Linear
Stress	.021	.007	Linear
Absenteeism	.007	.000	Linear
Job Satisfaction	.063*	.005	Linear
Job Competency	.040	.000	Linear
<i>Environmental Satisfaction</i>	.012	.006	<i>Linear</i>
<i>Environmental Competency</i>	.002	.006	<i>Linear</i>

Outcome Variable	Step 1: ECD	Step 2: ECD ²	Relationship
Performance	.001	.034	Linear
Turnover	.000	.067*	Curvilinear
Stress	.018	.006	Linear
Absenteeism	.004	.001	Linear
Environmental Satisfaction	.129**	.079**	Curvilinear
Environmental Competency	.000	.155**	Curvilinear
<i>Job Satisfaction</i>	.029	.036	<i>Linear</i>
<i>Job Competency</i>	.022	.078**	<i>Curvilinear</i>

Note. * $p < .05$, ** $p < .01$. Significance of step 2 indicates relationships are curvilinear (parabolic).

variable respectively. Table 2 also indicates whether the actual relationships were linear or parabolic. As can be seen, all relationships between JAD and the outcome variables were linear. However, only the relationship between JAD and job satisfaction was statistically significant. Four of the relationships between ECD and the outcome variables (environmental satisfaction, environmental competence, job competence and intent to turnover) were found to be curvilinear and statistically significant.

Figures 3 a-h illustrate schematically the relationships that were hypothesized and the actual relationships that were found. Although it was possible for JAD scores to range from -6 to 6, sample responses ranged from -1 to 6. This accounts for the truncated nature of the actual relationships between JAD and the outcome variables in figures 3a-h. However, for all outcome variables except absenteeism, the actual relationships that were observed between JAD and the outcome variables generally followed the trends or patterns of the predicted relationships. Because of the restricted sample responses, it was not possible to tell whether actual relationships followed the predicted relationships across the entire JAD response range.

Figures 4 a-h illustrate schematically that sample responses for ECD covered the entire range of -4 to 4. Anticipated relationships were found for environmental satisfaction, environmental competence and intent to turnover. The actual relationships between ECD and job performance, absenteeism, and job stress failed to match the shape of the predicted relationships. In addition, unexpected relationships were found between ECD and job satisfaction and job competence.

Figure Caption

Figures 3a-d. Schematic representations of the expected and actual relationships found between JAD and outcome variables for hypotheses one through four (relationships between JAD and job competence, environmental competence, job satisfaction, and environmental satisfaction).

Figures 3e-h. Schematic representations of the expected and actual relationships found between JAD and outcome variables for hypotheses five through eight (relationships between JAD and job performance, absenteeism, intent to turnover and job stress).

Figures 4a-d. Schematic representations of the expected and actual relationships found between ECD and outcome variables for hypotheses one through four (relationships between ECD and job competence, environmental competence, job satisfaction, and environmental satisfaction).

Figures 4e-h. Schematic representations of the expected and actual relationships found between ECD and outcome variables for hypotheses five through eight (relationships between ECD and job performance, absenteeism, intent to turnover and job stress).

LEGEND: EXP: ———
ACT: - - -

3e) Hypothesis 5

3f) Hypothesis 6

3g) Hypothesis 7

3h) Hypothesis 8

LEGEND: EXP: ———
ACT: - - -

LEGEND: EXP: ———
ACT: - - -

4e) Hypothesis 5

4f) Hypothesis 6

4g) Hypothesis 7

4h) Hypothesis 8

LEGEND: EXP: ———
ACT: - - -

Effectiveness of Discrepancy Measures

Hierarchical multiple regressions were conducted to test the hypothesis that the fit measures of JAD/ECD explained more variance in the outcome variables than the separate measures of perceived and desired job autonomy and environmental control. For curvilinear relationships between the measures of fit and the outcome variables, the fit measures (see Table 2) were first recalculated using the following absolute value transformation originally developed by Caplan et al. (1980):

$$\text{Measure of fit} = \sum_{i=1}^N \left| (\text{desired control} - \text{perceived control}) \right|$$

JAD, perceived and desired job autonomy, ECD, and perceived and desired environmental control were then each regressed onto the outcome variables. Measures of perceived job autonomy and environmental control were entered into the equations before their respective desired measures, as has been the general practice in most prior research (Conway, Vickers, & French, 1992). Separate regressions were required because of multicollinearity between the measures of perceived and desired control and the measures of fit. Adjusted R^2 's were then compared to determine the relative predictive ability of the various independent variables.

Job type was to have been controlled for, but was missing for one case. Education data was available for all participants, and was highly related to job type (chi-square = 26.07, $p < .05$). Education, therefore, served as a proxy for job type and was entered first into all equations.

JAD vs. measures of job control. Table 3 illustrates the $\underline{R}^2$'s, $\Delta\underline{R}^2$'s, adjusted $\underline{R}^2$'s, and unstandardized and standardized betas for the hierarchical regressions of education and JAD on to the outcome variables. Only job satisfaction has a significant amount of variance explained ($\underline{R}^2 = .082$) by JAD. Table 4 presents the same results for the hierarchical regressions of education and perceived and desired job autonomy on to the outcome variables. Final model $\underline{R}^2$'s are significant for job satisfaction ($\underline{R}^2 = .084$), environmental satisfaction ($\underline{R}^2 = .125$), performance ($\underline{R}^2 = .105$) and absenteeism ($\underline{R}^2 = .133$) when perceived and desired job autonomy are predictors.

Regardless of significance, for the purposes of further analysis, final model adjusted $\underline{R}^2$'s were compared between outcome variables predicted by JAD and outcome variables predicted by perceived and desired job autonomy. Results generally suggested that for this particular sample, separate measures of perceived and desired job autonomy were better predictors than JAD. Adjusted $\underline{R}^2$'s for JAD were only greater than those for the measures of perceived and desired job autonomy when job satisfaction and intent to turnover were the outcome variables.

ECD vs. measures of environmental control. Similar analyses were conducted with ECD and perceived and desired environmental control as predictors. Table 5 illustrates the $\underline{R}^2$'s, $\Delta\underline{R}^2$'s, adjusted $\underline{R}^2$'s, and unstandardized and standardized betas for the hierarchical regressions of education and ECD on to the outcome variables. As can be seen, final model $\underline{R}^2$'s are significant for environmental satisfaction ($\underline{R}^2 = .207$), environmental competency ($\underline{R}^2 = .084$), and job competency ($\underline{R}^2 = .098$). Table 6 presents

Table 3

Summary of Hierarchical Regression of Education and JAD on Outcome Variables

Outcome Variable	Predictor	Step	R²	ΔR²	adj. R²	b	B
Performance	Education	1	.000	.000	-.011	-.0180	-.0160
	JAD	2	.003	.003	-.019	.0081	.0570
Turnover	Education	1	.033	.033	.023	.1610	.1720
	JAD	2	.051	.018	.030	.0158	.1330
Stress	Education	1	.005	.005	-.006	.0474	.0630
	JAD	2	.024	.019	.003	.0133	.1380
Absenteeism	Education	1	.043*	.043*	.033*	-.3320	-.2030
	JAD	2	.048	.005	.026	-.0140	-.0670
Job Satisfaction	Education	1	.026	.026	.015	-.1880	-.1440
	JAD	2	.082*	.056*	.062*	-.0390*	-.2380*
Job Competency	Education	1	.002	.002	-.009	-.0220	-.0270
	JAD	2	.041	.039	.019	-.0200	-.1980
<i>Env. Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.001</i>	<i>.001</i>	<i>-.010</i>	<i>.0526</i>	<i>.0460</i>
	<i>JAD</i>	<i>2</i>	<i>.014</i>	<i>.013</i>	<i>-.008</i>	<i>-.0160</i>	<i>-.1110</i>
<i>Env. Competency</i>	<i>Education</i>	<i>1</i>	<i>.000</i>	<i>.000</i>	<i>-.011</i>	<i>.0069</i>	<i>.0060</i>
	<i>JAD</i>	<i>2</i>	<i>.002</i>	<i>.002</i>	<i>-.020</i>	<i>-.0067</i>	<i>-.0470</i>

Note. * $p < .05$.

Table 4

Summary of Hierarchical Regression of Education and Perceived and Desired Job Autonomy on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.000	.000	-.011	-.0810	-.0730
	Perceived J.A.	2	.022	.022	.000	.0029	.0210
	Desired J.A.	3	.105*	.083**	.074*	.0670**	.3200**
Turnover	Education	1	.033	.033	.023	.1580	.1690
	Perceived J.A.	2	.042	.009	.021	-.0150	-.1360
	Desired J.A.	3	.051	.009	.019	.0191	.1080
Stress	Education	1	.005	.005	-.006	.0295	.0390
	Perceived J.A.	2	.006	.001	-.016	-.0100	-.1120
	Desired J.A.	3	.043	.037	.011	.0307	.2160
Absenteeism	Education	1	.043*	.043*	.033*	-.4140*	-.2530*
	Perceived J.A.	2	.096*	.053*	.076*	.0283	.1450
	Desired J.A.	3	.133**	.037	.103**	.0659	.2130
Job Satisfaction	Education	1	.026	.026	.015	-.1960	-.1500
	Perceived J.A.	2	.070*	.044*	.049*	.0407	.2610*
	Desired J.A.	3	.084*	.014	.053*	-.0320	-.1300
Job Competency	Education	1	.002	.002	-.009	-.0390	-.0480
	Perceived J.A.	2	.055	.053*	.034	.0231*	.2410*
	Desired J.A.	3	.055	.000	.024	-.0038	-.0250
<i>Env. Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.001</i>	<i>.001</i>	<i>-.010</i>	<i>-.0130</i>	<i>-.0110</i>
	<i>Perceived J.A.</i>	<i>2</i>	<i>.086*</i>	<i>.085**</i>	<i>.065*</i>	<i>.0278</i>	<i>.2020</i>
	<i>Desired J.A.</i>	<i>3</i>	<i>.125**</i>	<i>.039*</i>	<i>.096**</i>	<i>.0481*</i>	<i>.2210*</i>
<i>Env. Competency</i>	<i>Education</i>	<i>1</i>	<i>.000</i>	<i>.000</i>	<i>-.011</i>	<i>-.0390</i>	<i>-.0350</i>
	<i>Perceived J.A.</i>	<i>2</i>	<i>.034</i>	<i>.034</i>	<i>.012</i>	<i>.0148</i>	<i>.1100</i>
	<i>Desired J.A.</i>	<i>3</i>	<i>.060</i>	<i>.026</i>	<i>.029</i>	<i>.0386</i>	<i>.1820</i>

Note. *p < .05, **p < .01.

Table 5

Summary of Hierarchical Regression of Education and ECD on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.000	.000	-.011	-.0083	-.0070
	ECD	2	.001	.001	-.022	-.0013	-.0220
Turnover	Education	1	.033	.033	.023	.1460	.1560
	ECD	2	.059	.026	.038	.0108	.1640
Stress	Education	1	.005	.005	-.006	.0842	.1120
	ECD	2	.029	.024	.008	-.0065	-.1590
Absenteeism	Education	1	.043*	.043*	.033*	-.3350	-.2050
	ECD	2	.043	.000	.022	-.0011	-.0120
Env. Satisfaction	Education	1	.001	.001	-.010	.1270	.1110
	ECD	2	.207***	.206***	.189***	-.0370***	-.4590***
Env. Competency	Education	1	.000	.000	-.011	.0553	.0490
	ECD	2	.084*	.084**	.064*	-.0230**	-.2930**
<i>Job Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.026</i>	<i>.026</i>	<i>.015</i>	<i>-.1660</i>	<i>-.1280</i>
	<i>ECD</i>	<i>2</i>	<i>.045</i>	<i>.019</i>	<i>.023</i>	<i>-.0099</i>	<i>-.1400</i>
<i>Job Competency</i>	<i>Education</i>	<i>1</i>	<i>.002</i>	<i>.002</i>	<i>-.009</i>	<i>.0064</i>	<i>.0080</i>
	<i>ECD</i>	<i>2</i>	<i>.098**</i>	<i>.096**</i>	<i>.077**</i>	<i>-.0180**</i>	<i>-.3130**</i>

Note. *p < .05, **p < .01, ***p < .001.

Table 6

Summary of Hierarchical Regression of Education and Perceived and Desired Environmental Control on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.000	.000	-.011	-.0240	-.0210
	Perceived E.C.	2	.008	.008	-.015	.0080	.0970
	Desired E.C.	3	.015	.007	-.018	.0097	.0910
Turnover	Education	1	.033	.033	.023	.1680	.1800
	Perceived E.C.	2	.039	.006	.017	.0055	.0800
	Desired E.C.	3	.041	.002	.009	.0045	.0510
Stress	Education	1	.005	.005	-.006	.0668	.0890
	Perceived E.C.	2	.060	.055*	.039	.0136	.2440*
	Desired E.C.	3	.065	.005	.033	.0050	.0700
Absenteeism	Education	1	.043*	.043*	.033*	-.3270	-.2000
	Perceived E.C.	2	.043	.000	.022	-.0023	-.0190
	Desired E.C.	3	.045	.002	.013	-.0066	-.0430
Env. Satisfaction	Education	1	.001	.001	-.010	.1390	.1210
	Perceived E.C.	2	.139***	.138***	.120***	.0304***	.3580***
	Desired E.C.	3	.157**	.019	.129**	-.0150	-.1400
Env. Competency	Education	1	.000	.000	-.011	-.0260	-.0230
	Perceived E.C.	2	.026	.026	.005	.0156	.1880
	Desired E.C.	3	.065	.039	.033	.0217	.2040
<i>Job Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.026</i>	<i>.026</i>	<i>.015</i>	<i>-.1480</i>	<i>-.1140</i>
	<i>Perceived E.C.</i>	<i>2</i>	<i>.028</i>	<i>.002</i>	<i>.007</i>	<i>.0025</i>	<i>.0260</i>
	<i>Desired E.C.</i>	<i>3</i>	<i>.058</i>	<i>.030</i>	<i>.026</i>	<i>-.0220</i>	<i>-.1780</i>
<i>Job Competency</i>	<i>Education</i>	<i>1</i>	<i>.002</i>	<i>.002</i>	<i>-.009</i>	<i>-.0084</i>	<i>-.0100</i>
	<i>Perceived E.C.</i>	<i>2</i>	<i>.020</i>	<i>.018</i>	<i>-.002</i>	<i>.0077</i>	<i>.1300</i>
	<i>Desired E.C.</i>	<i>3</i>	<i>.023</i>	<i>.003</i>	<i>-.010</i>	<i>-.0042</i>	<i>-.0550</i>

Note. *p < .05, **p < .01, ***p < .001.

the same results for the hierarchical regressions of education and perceived and desired environmental control on to the outcome variables. Only environmental satisfaction was found to have a significant amount of variance explained ($R^2 = .157$) by separate measures of perceived and desired environmental control.

Contrary to the JAD/job autonomy results, when adjusted R^2 's were compared, greater variance was explained for five outcome variables (environmental satisfaction, environmental competence, job competence, absenteeism and intent to turnover) when ECD was the predictor as opposed to measures of perceived and desired environmental control. ECD was therefore the predictor of choice to be used in the remaining analyses.

Effectiveness of ECD. To test if environmental control explained a significant amount of variance in the outcome variables beyond that explained by job autonomy alone, further hierarchical regressions were performed. Based on the results described above, measures of perceived and desired job autonomy were entered into the equations, followed by ECD. This order of entry was chosen to explore how much additional variance could be explained by environmental variables over and above variables typically characterized as industrial in nature. Again, in all regressions education was entered first.

Table 7 illustrates the R^2 's, ΔR^2 's, and adjusted R^2 's for the hierarchical regressions of education, perceived and desired job autonomy and ECD on to the outcome variables. Final model R^2 's indicate that significant amounts of variance were explained in environmental satisfaction ($R^2 = .330$), environmental competency ($R^2 = .145$), job competency ($R^2 = .146$), performance ($R^2 = .105$) and absenteeism ($R^2 = .133$). ECD explains significant amounts of variance beyond that explained by measures of perceived

Table 7

Summary of Hierarchical Regression of Education, Perceived and Desired Job Autonomy and ECD on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.000	.000	-.011	-.0800	-.0720
	Perceived J.A.	2	.105*	.105*	.074*	.0028	.0210
	Desired J.A.					.0067**	.3200**
	ECD	3	.105*	.000	.064*	-.0002	-.0020
Turnover	Education	1	.033	.033	.023	.1360	.1450
	Perceived J.A.	2	.051	.018	.019	-.0140	-.1270
	Desired J.A.					.0177	.1000
	ECD	3	.075	.024	.033	.0103	.1570
Stress	Education	1	.005	.005	-.006	.0617	.0820
	Perceived J.A.	2	.043	.038	.011	-.0130	-.1420
	Desired J.A.					.0312	.2190
	ECD	3	.071	.028	.028	-.0071	-.1730
Absenteeism	Education	1	.043*	.043*	.033*	-.4240*	-.2590*
	Perceived J.A.	2	.133**	.090*	.103**	.0292	.1490
	Desired J.A.					.0657	.2130
	ECD	3	.133*	.000	.094*	.0022	.0250
Env. Satisfaction	Education	1	.001	.001	-.010	.0674	.0580
	Perceived J.A.	2	.125**	.124**	.096**	.0243	.1760
	Desired J.A.					.0530*	.2430*
	ECD	3	.330***	.204***	.299***	-.0370***	-.4590***
Env. Competency	Education	1	.000	.000	-.011	.0109	.0100
	Perceived J.A.	2	.060	.060	.029	.0126	.0940
	Desired J.A.					.0416	.1960
	ECD	3	.145**	.085**	.106**	-.0230**	-.2950**
Job Satisfaction	Education	1	.026	.026	.015	-.1620	-.1250
	Perceived J.A.	2	.084*	.058	.053*	.0379*	.2430*
	Desired J.A.					-.0310	-.1280
	ECD	3	.093	.009	.052	-.0074	-.1040
Job Competency	Education	1	.002	.002	-.009	-.0014	-.0020
	Perceived J.A.	2	.055	.053	.024	.0214*	.2240*
	Desired J.A.					-.0015	-.0100
	ECD	3	.146**	.091**	.107**	-.0017**	-.3050**

Note. *p < .05, **p < .01, ***p < .001.

and desired job autonomy for environmental satisfaction ($\Delta R^2 = .204$), environmental competence ($\Delta R^2 = .085$), and job competence ($\Delta R^2 = .091$). Although some results failed to reach statistical significance, additional variance was explained by ECD in the majority of outcome variables.

Partial Replication

A second sample was collected from a local high technology firm. An identical method was used to collect data except for the following procedural change: instead of recruiting participants by telephone and administering questionnaire packages by mail, participants were randomly recruited and given the questionnaire package by employees of the high technology firm. These employees were members of the company's Employee Satisfaction Group.

Combining the samples was considered. However, sample demographics and intuition suggested there were fundamental differences between the two samples. It is reasonable to assume that working for a high technology firm and working in an educational institution are two completely different lines of work. In addition, the second sample was generally younger, had a greater percentage of males, and participants had typically been employed at their workplace for a much shorter period of time. Instead, although the high technology sample was relatively small ($N = 42$), an attempt was made to replicate some of the primary analyses reported above. Like the education sample, measures of perceived and desired job autonomy and ECD were used to predict

organizational outcomes. Similar significant relationships were found between the job autonomy measures and job satisfaction. Please refer to appendix D for more details.

Discussion

There were two primary objectives. First, several relationships (shapes) between the measures of fit (JAD and ECD) and the outcome variables were tested against predicted relationships. Second, the fit measures were examined to see if they were better predictors than either perceived or desired measures alone. Because multicollinearity precluded examining the second objective directly, the amounts of variance explained in various workplace outcomes by the fit between perceived and desired levels of job autonomy or environmental control (JAD or ECD) were compared to the amounts of variance explained by separate measures of either perceived or desired job autonomy or environmental control alone. In addition, an attempt was made to combine the psychological sub-disciplines of industrial/organizational psychology and environmental psychology by examining how much additional variance in workplace outcomes was explained by environmental control over and above that accounted for by job autonomy. Although some encouraging results were found, results for the specific hypotheses were generally mixed.

Predicted Bivariate Relationships

Based on the findings of Caplan et al. (1980) and Bazerman (1982), several predictions were made about the shapes of the relationships between the two independent

variables (JAD and ECD) and the outcome variables. Very few of the relationships predicted were found to be significant, largely because of the truncated range (see below).

In general, the relationship between JAD and job satisfaction was expected to resemble an inverted U-shape. The relationships between JAD and job competence and JAD and job performance were expected to be positively sloped from negative fit to perfect fit (zero JAD) and then level off and remain high as fit became positive. The relationships between JAD and absenteeism, intent to turnover and job stress were expected to generally follow a U-shape. It was not expected that JAD would be related to either environmental competence or environmental satisfaction.

A significant linear relationship was found between JAD and job satisfaction over the -1 to +6 JAD response range. As misfit between desired and perceived job autonomy increased, job satisfaction was found to decrease. This finding supports Edwards' (1991) conclusion that person-environment misfit has a negative effect on job satisfaction and is consistent with the findings of Saks and Ashforth (1997) who found that as person-job fit improved, job satisfaction increased. This relationship also generally supports the various fit relationships posited by Caplan et al. (1980) and Bazerman (1982). When desired job autonomy is much greater than perceived job autonomy, job satisfaction drops. The interpretation of these results is limited, however, given the restricted range of JAD scores.

Although the actual relationships found between JAD and job competence, job stress, and intent to turnover were generally shaped as expected, they did not reach statistical significance. The intent to turnover result was particularly surprising given that

Edwards (1991) and Ostroff (1993) found person-environment misfit to be negatively related to intent to turnover. As expected, no relationships were found between JAD and environmental competence or satisfaction.

Relationships between ECD and the outcome variables were expected to be similar to those predicted for JAD. However, unlike the JAD expectations, it was predicted that the relationship between ECD and environmental competence would be positively sloped and the relationship between ECD and environmental satisfaction would resemble an inverted U-shape. ECD was not expected to be related to either job competence or job satisfaction.

Due to the full range of ECD responses, the relationships between ECD and the outcome variables were less difficult to interpret than the JAD relationships. Respondents indicated they worked in a wide range of office types (35 in a one person office, 28 in an office shared with 2-4 others, 14 in an office shared with 5 or more others, 8 in a shop or laboratory, and 8 no responses). This undoubtedly increased the amount of variability in the perceived environmental control responses resulting in ECD responses covering the entire response range.

Like JAD, not all relationships between ECD and the outcome variables supported earlier findings (Bazerman, 1982; Caplan et al., 1980). The explanatory power of ECD was also limited. Significant relationships were found between ECD and environmental satisfaction and ECD and environmental competence. The shape of the actual relationships generally followed the relationships that were predicted. When the perceived

amount of environmental control was greater than the desired amount of environmental control (-ECD), environmental competence and environmental satisfaction were found to be low. Like JAD, as fit improved (ECD became zero), environmental competence and environmental satisfaction increased. Finally, as the desired amount of environmental control became greater than the perceived amount of environmental control (+ECD), environmental competence generally remained high and environmental satisfaction decreased. Although no literature exists to verify these relationships, these results were expected given the relationships that have previously been found between job autonomy misfit and job satisfaction (Edwards, 1991).

A surprising significant relationship was found between ECD and job competence. Although it was predicted that no relationship would be found between ECD and this outcome variable, a slight inverted-U relationship was found. As misfit between perceived and desired environmental control increased, job competence decreased.

This unexpected job competence result might have been due to an overlap in the content of the job competence and environmental competence scales. Relatively similar inverted U-relationships were found between ECD and both job competence and environmental competence (Figures 4a/b). Because competence is a relatively new and unrefined construct it might be too much to ask participants to distinguish between job competence and environmental competence. Indeed, although the comparison was less convincing (not statistically significant), when the general relationships between JAD and job competence and environmental competence were examined, they too were found to be somewhat similar to each other (Figures 3a/b).

This possible overlap coupled with the significant relationship found between ECD and job competence, indicates that the delineation between job characteristics and environmental characteristics might not be as clear as is sometimes thought. For example, the more positive the fit between an employees' perceived and desired levels of environmental control, the more competent they might feel on the job as a whole. Job competency might not just be a result of appropriate amounts of job autonomy being provided. These findings begin to suggest that there could be useful links to be found between environmental psychology and industrial/organizational psychology.

The majority of the relationships predicted between JAD and the outcome measures were found to be non-significant. This might have been a result of the limitations of the data (e.g. restricted response range). Caplan (1983), suggested three possible fit relationships could exist (see Figure 1). Several of the relationships that I predicted (e.g. JAD-job competency relationship, Figure 2a) resemble Caplan's asymptotic relationship (Figure 1, Relationship B) where either an excess of desired control but not a deficit, or an excess of perceived control but not a deficit lead to poorer outcomes. Across the range of JAD responses that was obtained, such relationships were found not to be significant, probably because they generally followed the flat area of Caplan's asymptotic relationship. Had JAD responses covered the entire response range, perhaps the entire relationship would have resembled relationship B in Figure 1, resulting in several other significant relationships being found. Although at first glance, there appear to be many violations of the predicted relationships, a more complete JAD response range might have revealed

otherwise. The theory that some workplace outcomes are negatively affected only when perceived control is greater than what is desired, or only when desired control is greater than what is perceived could still prove to be accurate.

Measures of Fit

It has been suggested that person-environment fit generally explains greater variance in outcomes than do either attributes of the person or environment alone (Caplan et. al, 1980; Edwards, 1991; Ostroff, 1993). More specifically, researchers have attempted to demonstrate that the fit between the perceived and desired levels of control a person had was a better predictor of various outcomes than when perceived or desired control were considered separately (Bazerman, 1982; Conway, Vickers, & French, 1992).

It was hypothesized that measures that accounted for both employees' perceived and desired levels of job autonomy and environmental control (JAD and ECD) would explain more variance in outcomes such as job satisfaction and absenteeism, than would individual measures of perceived or desired job autonomy or environmental control. A direct test of this hypothesis was impossible because of multicollinearity.

In general, the results for the two measures of fit were mixed. Conway, Vickers and French (1992) found that misfits between three types of perceived and desired levels of control (internal, others, and chance) explained significantly more variance in psychological strain than any of the individual perceived or desired control types. In the current study, when explained variances were compared, it appeared that separate measures of perceived or desired job autonomy were generally better predictors of the dependent variables than was JAD, although restricted range and variability might account

for this. The results for ECD were somewhat more positive; ECD appeared to be the predictor of choice. These results as a whole, however, fail to conclusively demonstrate that measures of fit explain greater amounts of variance in outcome variables when compared to the amounts of variance explained by measures of perceived or desired variables alone.

There could be several reasons why ECD was more successful than JAD in predicting workplace outcomes when compared to their respective individual measures of perceived and desired environmental control or job autonomy. ECD had greater response variability. The failure of JAD could be attributed to the reduced range in JAD responses. Another explanation for JAD's failure might be that although similar techniques were used to calculate both JAD and ECD, ECD data was collected using a scale that had been previously designed, validated and used as a measure of fit. JAD data was collected using a scale originally designed to assess only perceived job autonomy that was then modified (using the ECD scale as a model) to allow for the assessment of JAD.

Given the limited number of significant results for the measures of fit, the results for the individual measures of perceived job autonomy and perceived environmental control were examined. Positive significant relationships were found between perceived job autonomy and the outcomes job satisfaction, environmental satisfaction and absenteeism. As the amount of perceived job autonomy increased, job satisfaction, environmental satisfaction and absenteeism also increased. The positive job satisfaction result is not surprising and is in line with other findings (Breugh, 1985; Spector, 1986;

Tetrick & LaRocco, 1987). The counter-intuitive absenteeism finding might reflect the additional responsibility and stress that can sometimes be associated with increased job autonomy, which in turn could possibly lead to increased levels of absenteeism. This finding contradicts the results of Breugh (1985), Spector (1986) and Kroesser et al. (1991) who all found increased perceived job autonomy to contribute to lower rates of absenteeism. The observation that perceived job autonomy explained a significant amount of variance in environmental satisfaction might also indicate that the line between job and environmental characteristics is blurred. Employees might consider more than the physical work environment in their assessment of environmental satisfaction. They might be responding to their satisfaction with the work environment as a whole, including aspects of both the physical environment and job characteristics.

When perceived environmental control was the predictor, a positive significant relationship was found with environmental satisfaction, indicating that as perceived environmental control increases, environmental satisfaction also increases. This result is not surprising and parallels the perceived job autonomy - job satisfaction results.

Environmental Contributions to Organizational Outcomes

To specifically examine the possible link between variables traditionally studied within environmental psychology and industrial/organizational psychology separately, it was predicted that environmental control measures would explain significant amounts of variance in outcome variables beyond that explained by the job autonomy measures above. Mixed results were found. Although final model variances were significant for job competency, environmental satisfaction, environmental competency, absenteeism and job

performance, ECD only explained additional variance beyond perceived and desired job autonomy for job competency, environmental satisfaction and environmental competency.

The fact that ECD explained significant amounts of variance in environmental satisfaction and environmental competency beyond what was explained by perceived and desired job autonomy was not surprising. It was not expected, however, that ECD would explain a significant amount of variance in job competency, and that perceived and desired job autonomy measures would explain a significant proportion of variance in environmental satisfaction.

Implications

There are several implications for employees and employers as a result of the current study. Although the data have some limitations (discussed below), the various control measures (JAD, ECD, perceived and desired job autonomy, and perceived and desired environmental control) did explain significant amounts of variance in some of the work outcomes, especially job satisfaction. Workplace control is one lever that employers could use to increase workplace factors such as employee job satisfaction levels. Whether the fit between the amount of control an employee desires and the amount of control the workplace provides is more important or critical than the absolute amounts of control provided is still an open question. The relationships found between JAD/ECD and the outcome measures, however, do suggest that employers at least need to be cognizant of the relationship between the amount of control employees have on the job and how much control on the job employees desire. Previous findings along with the current results do

suggest improvements in workplace measures as fit improves. Employers might want to consider recruitment processes that include examining the desires, wants and needs of prospective employees and how those desires fit in with company policies.

In addition, the fact that environmental control variables explained significant amounts of variance in some workplace outcomes, over and above the variance explained by job autonomy variables, suggests employers should place some emphasis on improving workplace environmental conditions, specifically the amount of environmental control that is provided. Doing so should only continue to improve important organizational outcomes.

Limitations

This study had several limitations and as a result, findings should be interpreted cautiously. Firstly, the shape and significance of the actual relationships between JAD and the outcome variables for the education sample were difficult to interpret due to the truncated nature of the JAD scores. Because of the restricted response range, it was impossible to determine whether the actual relationships continued to follow the predicted relationships between the JAD scores of -1 and -6. Although an effort was made to increase the variety of job types in the education sample, the number of job types was still limited and might have resulted in a relatively consistent amount of perceived job autonomy among the participants.

Second, because institution records regarding absenteeism and ratings of job performance either did not exist or were inaccessible, it was necessary to rely on self-report data. Although Johns' (1994) recommendations on improving self-report data were

considered when formulating scale items, the actual relationships found for both JAD and ECD indicated consistently high performance scores and consistently low absenteeism reports. This is not surprising considering this data was gathered through self-reports. Although confidentiality was assured, participants still might have attempted to portray themselves in a positive light.

Third, the generalizability of this study is limited. Both of the samples used in this study were unique in nature. One was representative of an educational institution; the other representative of a high technology corporation. At this point in time, results should not be considered representative of other work environments.

Finally, it should be noted that the relative amounts of variance explained by either the measures of fit or the separate measures of perceived job autonomy and environmental control in the outcome variables were small. There are two possible explanations for this. Firstly, relatively small amounts of variance are generally explained in research of this nature (Caplan, 1983). In addition, the range of responses for the dependent variables was restricted. As with the independent variables, this was possibly due to the similarity of participants' job types. It is reasonable to assume that if participants generally work in comparable jobs, it is likely that variability in the dependent variables will be limited.

Future Research

Although an effort was made to increase response variability in dependent variables by recruiting participants with several different job types, the majority of participants were still classified as having a professional job. Despite Edwards' (1991) assertion that the

relationships between measures of fit and workplace outcomes are usually robust to limited job types, future research should make every effort to maximize response variability by recruiting a wide range of participant job types. Future environmental control research could also maximize response variability by choosing a workplace that consists of many different work environments. In the current study, an educational institution was chosen that appeared to consist of several different office sizes and types. As a result, ECD variability was increased (as compared to JAD). This probably contributed to the success of ECD versus the individual measures of perceived and desired environmental control alone. Maximizing response variability will lead to a clearer understanding of fit variables such as JAD and ECD.

In addition, new or untested measures, such as the JAD measure or the measures of job and environmental competence used in this study, should be more thoroughly validated by future researchers. Although the face validity of these scales appeared to be good, findings such as the potential overlap between what the job and environmental competence scales measure limit confidence in these measures. In this case, until more valid measures of job or environmental competence are developed, perhaps researchers should rely on a global measure of workplace competence.

Also, whenever possible, future research should rely on organizational records of absenteeism and ratings of job performance to ensure the data's reliability and validity. There is the possibility of bias inherent in self-report data, especially with regards to sensitive issues such as employee performance and absenteeism. In the current study, although every effort was made to obtain objective measures of employee performance and

absenteeism to validate the self-report data, such objectivity was not possible. As a result, the accuracy of the tests of the hypotheses concerning job performance and absenteeism might be in question and must be approached with caution.

Future research should also explore the issue of generalizability between various workplaces. The current results, although they indicate a wider range of job types needs to be included in future research, also suggest that results from one workplace are not necessarily generalizable to other workplaces. In the present study it was decided not to combine samples because of the fundamental differences between the two groups (i.e. generalizability). As discussed, a consequence of this action was limited response variability possibly due to the limited number of job types. If generalizability was not an issue, then samples might have been combined, increasing statistical power.

In the current study, fit was assessed by calculating difference scores between perceived and desired levels of job autonomy and environmental control. The problem with this method is that it can sometimes lead to contamination of responses (Caplan et al., 1980). In the current study, for example, it is possible that when a desired amount of job autonomy was indicated, this response might have been influenced or contaminated by the previous response as to how much job autonomy he/she perceived. Although difficult, future research could overcome this methodological problem by calculating difference scores between the desired level of control a person wants and how much is actually provided, not how much the person perceives is provided. Researchers could examine fit in a laboratory setting strictly monitoring the amount of various control types provided.

Field setting research would have to rely on what the employer suggests the amount of control in the workplace actually is (i.e. based on job descriptions etc.) or, although no known measure yet exists, possibly monitor the chosen workplace prior to the study to arrive at a baseline of the amount of actual control provided, for whichever control type is being examined.

In examining person-organization fit, Saks and Ashforth (1997) successfully validated a measure of fit that asked respondents to directly indicate the amount of fit they perceived (i.e. To what extent does your new job measure up to the kind of job you were seeking?). No difference scores need to be calculated. This is another method for assessing fit researchers might want to consider in the future.

The current data was not strong enough to support in depth modeling or path analysis. The unreliable performance and absenteeism data, the restricted variability in the independent and dependent variables, the small amounts of variance explained and the relatively small sample size all made further multivariate analysis inappropriate. Future research should pursue these types of statistical analyses in an attempt to piece together relationships or models between the various workplace variables. It could be that ECD affects environmental competency which in turn affects environmental satisfaction.

Alternatively, job stress could act as a mediating variable between misfits in control and the various outcome variables. Although some implications of this study's results have been highlighted, developing multivariate models would more clearly demonstrate the links between measures of control fit and work outcomes.

Saks and Ashforth (1997) found person-job fit was positively related to job satisfaction and negatively related to intentions to quit and stress, as well as finding person-organization fit negatively related to intentions to quit and turnover. Roberts and Foti (1998) have also suggested that research on person-environment fit needs to be extended to the investigation of which specific dispositional determinants are involved in explaining work outcomes. By examining a specific person-job fit attribute (person-job autonomy fit or JAD) and a specific person-organization fit attribute (person-environmental control fit or ECD), the current study has attempted to take such findings and recommendations into consideration. Although results were not conclusive, some encouraging results have been found and do suggest that the concept of fit should continue to be explored. In addition, by illustrating that job autonomy and environmental control do explain some significant amounts of variance in outcomes such as job satisfaction and environmental satisfaction, a link between the domains of industrial/organizational psychology and environmental psychology has begun to emerge. Future researchers should continue to build on these results so that a convincing case can be made to today's employers. Only then will workplaces take notice and make the necessary changes to create more productive work environments for both employers and employees.

References

- Adelman, P. K. (1987). Occupational complexity, control, and personal income: their relation to psychological well-being in men and women. Journal of Applied Psychology, 72, 529-537.
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. Psychological Bulletin, 80, 286-303.
- Averill, J. R., O'Brien, L., & DeWitt, G. W. (1977). The influence of response effectiveness on the preference for warning on psychophysiological stress reactions. Journal of Personality and Social Psychology, 23, 128-141.
- Barnes, R. D. (1981). Perceived freedom and control in the built environment. In J. H. Harvey (Ed.), Cognition, social behavior, and the environment. Hillsdale, NJ: Erlbaum, pp.409-422.
- Baron, R. A. (1994). The physical environment of work settings: Effects on task performance, interpersonal relations, and job satisfaction. Research in Organizational Behavior, 16, 1-46.
- Baum, A., Singer, J. E., & Baum, C. S. (1982). Stress and the environment. In G. W. Evans (Ed.), Environmental stress. New-York, NY: Cambridge University Press, pp. 15-44.
- Bazerman, M. H. (1982). Impact of personal control on performance: is added control always beneficial?. Journal of Applied Psychology, 67, 472-479.

Becker, F. (1991). Workplace planning, design, and management. In E. H. Zube, & G. T. Moore (Eds.), Advances in environment, behavior, and design, Vol. 2. New York: Plenum Press, pp.115-151.

Breaugh, J. A. (1985). The measurement of work autonomy. Human Relations, 38, 551-570.

Brehm, J. W. (1966). A theory of psychological reactance. New York: Academic Press.

Brill, M., Margulis, S., Konar, E., & BOSTI. (1984-1985). Using office design to increase productivity, Vols. 1 & 2. Buffalo, NY: Workplace Design and Productivity.

Burger, J. M. (1989). Negative responses to increases in perceived personal control. Journal of Personality and Social Psychology, 56, 246-256.

Caplan, R. D. (1983). Person-environment fit: Past, present, and future. In C. L. Cooper (Ed.), Stress research. London: Wiley, pp. 35-78.

Caplan, R. D., Cobb, S., French, J. R. P., Jr., Van Harrison, R., & Pinneau, S. R. (1980). Job demands and worker health: Main effects and occupational differences. Ann Arbor, MI: Institute for Social Research.

Carlopio, J. R. (1996). Construct validity of a physical work environment satisfaction questionnaire. Journal of Occupational Health Psychology, 1, 330-344.

Conway, T. L., Vickers, R. R., Jr., & French, J. R. P., Jr. (1992). An application of person-environment fit theory: perceived versus desired control. Journal of Social Issues, 48, 95-107.

Cornelius, R. R., & Averill, J. R. (1980). The influence of various types of control on psychophysical stress reactions. Journal of Research in Personality, 14, 503-517.

Edwards, J. R. (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper, & I. T. Robertson, International review of industrial and organizational psychology, Vol. 6. London: Wiley, pp. 283-357.

Evans, B. K., & Fischer, D. G. (1992). A hierarchical model of participatory decision-making, job autonomy, and perceived control. Human Relations, 45, 1169-1189.

Evans, G. W. (1994). Working on the hot seat: urban bus operators. Accident, Analysis, and Prevention, 26, 181-193.

Evans, G. W., & Carrère, S. (1991). Traffic congestion, perceived control, and psychophysiological stress among urban bus drivers. Journal of Applied Psychology, 76, 658-663.

Evans, G. W., & Cohen, S. (1987). Environmental stress. In D. Stokols, & I. Altman (Eds.), Handbook of environmental psychology. New York: Wiley, pp. 571-610.

Evans, G. W., Shapiro, D. H., & Lewis, M. A. (1993). Specifying dysfunctional mismatches between different control dimensions. British Journal of Psychology, 84, 255-273.

Gifford, R. (1997). Environmental psychology. London: Allyn & Bacon.

Gifford, R., & Eso, S. J. (1988). The survey of personal influence in common environments. Victoria, British Columbia: University of Victoria, Department of Psychology.

Glass, D. C., & Singer, J. E. (1972). Urban stress. New York: Academic Press.

- Hackman, J. R., & Lawler, E. E. (1971). Employee reactions to job characteristics. Journal of Applied Psychology Monograph, 55, 259-286.
- Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. Journal of Applied Psychology, 60, 159-170.
- Howell, W. (1997). Psychologists at work. APA Monitor, p. 18.
- Johns, G. (1994). How often were you absent? A review of the use of self-reported absence data. Journal of Applied Psychology, 79, 574-591.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications of job redesign. Administrative science quarterly, 24, 285-308.
- Kompier, M. A. J., & Di Martino, V. (1995). Review of bus drivers' occupational stress prevention. Stress Medicine, 11, 253-262.
- Kroesser, H. L., Meckley, R. F., & Ranson, J. T. (1991). Selected factors affecting employees' sick leave use. Public Personnel Management, 20, 171-180.
- Kuzmits, F. (1980). How good is your absenteeism control system? S. A. M. Advanced Management Journal, 45, 4-15.
- Landy, F. J. (1985). Psychology of work behavior. Homewood, IL: Dorsey Press.
- Langer, E. J., & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. Journal of Personality and Social Psychology, 34, 191-198.

- Maslow, A. H. (1943). A theory of motivation. Psychological review, 50, 370-396.
- O'Neill, M. J. (1994). Work space adjustability, storage, and enclosure as predictors of employee reactions and performance. Environment and behavior, 26, 504-526.
- O'Neill, M. J. (1996). The role of user control in person-environment fit. In O. Brown Jr., & H. W. Hendrick (Eds.), Human factors in organizational design and management-V. New York: North Holland, pp. 193-196.
- Ostroff, C. (1993). Relationships between person-environment congruence and organizational effectiveness. Group & Organization Management, 18, 103-122.
- Paciuk, M. T. (1989). The role of personal control of the environment in thermal comfort and satisfaction at the workplace. Unpublished doctoral dissertation, University of Wisconsin-Milwaukee.
- Perlmutter, L. C., & Monty, R. A. (1977). The importance of perceived control: Fact or fantasy? American scientist, 65, 759-765.
- Perlmutter, L. C., Scharff, K., Karsh, R., & Monty, R. A. (1980). Perceived control: A generalized state of motivation. Motivation and emotion, 4, 35-46.
- Roberts, H. E. & Foti, R. J. (1998). Evaluating the interaction between self-leadership and work structure in predicting job satisfaction. Journal of Business and Psychology, 12, 257-267.
- Ross, C. E., & Reskin, B. F. (1992). Education, control at work, and job satisfaction. Social science research, 21, 134-148.

- Sainfort, P. A. (1990). Job design predictors of stress in automated offices. Behaviour and Information Technology, 9, 3-16.
- Saks, A. M. & Ashforth, B. E. (1997). A longitudinal investigation of the relationships between job information sources, applicant perceptions of fit, and work outcomes. Personnel Psychology, 50, 395-425.
- Schaeffer, M. H., Street, S. W., Singer, J. E., & Baum, A. (1988). Effects of control on the stress reactions of commuters. Journal of Applied Social Psychology, 18, 944-957.
- Seligman, M. E. P. (1975). Helplessness on depression, development, and death. San Francisco: Freeman Press.
- Sherrod, D. R. (1974). Crowding, perceived control, and behavioral aftereffects. Journal of Applied Social Psychology, 4, 171-186.
- Spector, P. E. (1986). Perceived control by employees: a meta-analysis of studies concerning autonomy and participation at work. Human Relations, 39, 1005-1016.
- Steele, F. I. (1973). Physical settings and organizational development. Reading, MA: Addison-Wesley.
- Steele, F. I. (1980). Defining and developing environmental competence. In C. P. Alderfer & C. L. Cooper (Eds.), Advances in experimental social processes, 2. London: Wiley, pp. 225-244.

Sundstrom, E. (1987). Work environments: offices and factories. In D. Stokols, & I. Altman (Eds.), Handbook of environmental psychology. New York: Wiley, pp. 733-775.

Tabachnick, B. G., & Fidell, L. S. (1983). Using Multivariate Statistics. New-York: Harper & Row.

Tetrick, L. E., & LaRocco, J. M. (1987). Understanding, prediction, and control as moderators of the relationships between perceived stress, satisfaction, and psychological well-being. Journal of Applied Psychology, 72, 538-543.

Veitch, J. A., & Gifford, R. (1996a). Choice, perceived control, and performance decrements in the physical environment. Journal of Environmental Psychology, 16, 1-8.

Veitch, J. A., & Gifford, R. (1996b). Assessing beliefs about lighting effects on health, performance, mood, and social behavior. Environment and Behavior, 28, 446-470.

Wagner, F. R., & Morse, J. J. (1975). A measure of individual sense of competence. Psychological Reports, 36, 451-459.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: how good are single-item measures? Journal of Applied Psychology, 82, 247-252.

Footnote

1. The meaning of environment here is quite different from how we have previously used environment to refer strictly to the physical environment. The environment in PE fit research could refer to the social, organizational or cultural, as well as the physical environment.

Glossary of Acronyms

DC	Desired Control - the amount of control a person would like to have.
ECD	Environmental Control Discrepancy - the difference between the amount of physical environmental control a person would like to have and how much they perceive they have (desired environmental control - perceived environmental control = ECD).
GNS	Growth Need Strength - indicator of how motivated a person is to grow and learn. Similar to need hierarchy theory (Maslow, 1943). A person high in GNS would be comparable to a person trying to achieve self-actualization; a person low in GNS would indicate a person who finds satisfying their security needs important.
JAD	Job Autonomy Discrepancy - the difference between the amount of job autonomy a person would like to have and how much they perceive they have (desired job autonomy - perceived job autonomy = JAD).
MPS	Motivating Potential Score - estimates the potential of a job to motivate its holder. Taps five core job dimensions developed by Hackman and Oldham (1975).
PC	Perceived Control - the amount of control a person perceives they have.
PE Fit	Person-Environment Fit - the fit between an attribute of the person (e.g. desired control) and an attribute of the environment (e.g. perceived control).
SPICE	Survey of Personal Influence in Common Environments - survey developed by Gifford and Eso (1988) that assesses the amount of influence respondents have over various physical features of their workplace and how important this influence is to them.

Appendix A

QUESTIONNAIRE FOR RESEARCH BEING CONDUCTED

by

Steffan Jones

phone number: 993-9669

email: sjjones@ccs.carleton.ca

In this booklet are a number of questions asking you about your work and your working conditions. There are also some questions about you. I am interested in your opinions and views. There are no right or wrong answers.

The questions will take you approximately 20 minutes to answer. Please answer them as accurately, honestly and completely as possible. Using the scales provided circle the appropriate answer to each question. Answering with your first response usually gives the best representation of how you really feel.

All responses will be kept confidential and anonymous. Your name will not appear anywhere in this questionnaire or in the final results.

If you are unsure about how to answer any of the questions, please do not hesitate to contact me by phone or email (see above), rather than leaving questions blank.

When you have completed the questionnaire place it in the enclosed self-addressed stamped envelope and drop it in the mail.

For those of you who indicate you would like a copy of the results, I will send them out to you in approximately two or three months time.

Thank-you for your co-operation.

SECTION I:

1. People have many reasons for missing work. Most people are occasionally away from work. How many times have you missed work in the last 12 months? A half-day or longer counts as a single day. Count *two or more consecutive days as one time*. For example, if you missed three consecutive days, count this as one time. Exclude holidays.

_____ times

For the next two questions, give a general answer that reflects how you have felt about your job in the past year.

2. How stressful do you consider your job? (circle one)

0 = none

1 = mildly stressful

2 = moderately stressful

3 = very stressful

4 = extremely stressful

3. How satisfied are you with your job in general? (circle one)

-3 = extremely dissatisfied

-2 = dissatisfied

-1 = mildly dissatisfied

0 = neutral

1 = mildly satisfied

2 = satisfied

3 = extremely satisfied

SECTION II:

- 2. . . .disagree strongly
- 1. . . .disagree
- 0. . . .neutral
- 1. . . .agree
- 2. . . .agree strongly

Please use the above scale, and circle the appropriate answer for each question. Please give your first response. Do not think about each question too much.

- 1. All things considered, I am very satisfied with my physical workspace.**

-2. -1. 0. 1. 2

- 2. My physical workspace helps me get my job done efficiently.**

-2. -1. 0. 1. 2

- 3. I'm proud to show people my physical workspace.**

-2. -1. 0. 1. 2

SECTION III:

The following questionnaire contains 9 pairs of questions. The first question of each pair is concerned with how much freedom you have over how and when you do your job. The second question of each pair is concerned with how important this freedom is to you.

- 3. . . .strongly disagree
- 2. . . .disagree
- 1. . . .mildly disagree
- 0. . . .neutral
- 1. . . .mildly agree
- 2. . . .agree
- 3. . . .strongly agree

Please use the above scale to circle the appropriate answer to each question. Please give your first response. Do not think about each question too much.

1. I am allowed to decide how to go about getting my job done (the methods to use).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

2. It is important to me that I be allowed to decide how to go about getting my job done (the methods to use).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

3. I am able to choose the way to go about my job (the procedures to utilize).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

4. It is important to me that I am able to choose the way to go about my job (the procedures to utilize).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

5. I am free to choose the method(s) to use in carrying out my work.

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

6. It is important to me that I be free to choose the method(s) to use in carrying out my work.

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

Continue to use this scale to circle the appropriate answer to each question.

- 3. . . .strongly disagree
- 2. . . .disagree
- 1. . . .mildly disagree
- 0. . . .neutral
- 1. . . .mildly agree
- 2. . . .agree
- 3. . . .strongly agree

7. I have control over the scheduling of my work.
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
8. It is important to me that I have control over the scheduling of my work.
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
9. I have some control over the sequencing of my work activities (when I do what).
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
10. It is important to me that I have some control over the sequencing of my work activities (when I do what).
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
11. My job is such that I can decide when to do particular work activities.
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
12. It is important to me that my job be such that I can decide when to do particular work activities.
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3
13. My job allows me to modify the normal way we are evaluated so that I can emphasize some aspects of my job and play down others.
-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

Continue to use this scale to circle the appropriate answer to each question.

- 3. . . .strongly disagree
- 2. . . .disagree
- 1. . . .mildly disagree
- 0. . . .neutral
- 1. . . .mildly agree
- 2. . . .agree
- 3. . . .strongly agree

14. It is important to me that my job allow me to modify the normal way we are evaluated so that I can emphasize some aspects of my job and play down others.

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

15. I am able to modify what my job objectives are (what I am supposed to accomplish).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

16. It is important to me that I be able to modify what my job objectives are (what I am supposed to accomplish).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

17. I have some control over what I am supposed to accomplish (what my supervisor sees as my job objectives).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

18. It is important to me that I have some control over what I am supposed to accomplish (what my supervisor sees as my job objectives).

-3. . . . -2. . . . -1. . . . 0. . . . 1. . . . 2. . . . 3

SECTION IV:

This questionnaire asks your opinion about how much influence you have over various physical features in your work place. There are no correct answers: Give your own opinion, from your own experience.

You may have a lot of influence, some influence, or very little influence over the physical features in the place where you do most of your working (e.g., whether a window is open or closed). Having this influence may or may not be important to you. For example, for some features, you may want a lot of influence, preferring that others do not decide. For other features, you may want very little influence, preferring that others decide.

1. Select one setting at work on which you will base your answers (circle one).

- 0 = One-person office
- 1 = Office shared with 2 - 4 others
- 2 = Office shared with 5 or more others
- 3 = Shop, factory, laboratory

Next, with this setting in mind, you will give two separate answers for each of the following features, one referring to your present, actual influence over the feature, and one referring to the importance of your influence. Use the scales given below. They will be at the top of each page.

Use this scale to circle your **INFLUENCE** answers:

- 0 = I have the final say or complete control concerning this feature.
- 1 = Others have some influence, but my opinion has more weight.
- 2 = My influence is about equal to that of others.
- 3 = I have some influence, but the opinion of others carries more weight.
- 4 = I have very little influence concerning this feature.

Use this scale to circle your **IMPORTANCE** answers:

- 0 = Reasonable influence concerning this feature is important to me.
- 1 = Reasonable influence is quite important to me.
- 2 = Reasonable influence is mildly important to me.
- 3 = Reasonable influence is not important to me.
- 4 = I prefer that others control this feature.

Please give your first response. Do not think about each question too much.

Use this scale to circle your **INFLUENCE** answers:

- 0 = I have the final say or complete control concerning this feature.
- 1 = Others have some influence, but my opinion has more weight.
- 2 = My influence is about equal to that of others.
- 3 = I have some influence, but the opinion of others carries more weight.
- 4 = I have very little influence concerning this feature.

Use this scale to circle your **IMPORTANCE** answers:

- 0 = Reasonable influence concerning this feature is important to me.
- 1 = Reasonable influence is quite important to me.
- 2 = Reasonable influence is mildly important to me.
- 3 = Reasonable influence is not important to me.
- 4 = I prefer that others control this feature.

Lighting: type of bulb

- 2. Influence 0. 1. 2. 3. 4
- 3. Importance 0. 1. 2. 3. 4

Lighting: location of lamps and fixtures

- 4. Influence 0. 1. 2. 3. 4
- 5. Importance 0. 1. 2. 3. 4

Lighting: brightness

- 6. Influence 0. 1. 2. 3. 4
- 7. Importance 0. 1. 2. 3. 4

Temperature

- 8. Influence 0. 1. 2. 3. 4
- 9. Importance 0. 1. 2. 3. 4

Wall decorations

- 10. Influence 0. 1. 2. 3. 4
- 11. Importance 0. 1. 2. 3. 4

Use this scale to circle your **INFLUENCE** answers:

- 0 = I have the final say or complete control concerning this feature.
- 1 = Others have some influence, but my opinion has more weight.
- 2 = My influence is about equal to that of others.
- 3 = I have some influence, but the opinion of others carries more weight.
- 4 = I have very little influence concerning this feature.

Use this scale to circle your **IMPORTANCE** answers:

- 0 = Reasonable influence concerning this feature is important to me.
- 1 = Reasonable influence is quite important to me.
- 2 = Reasonable influence is mildly important to me.
- 3 = Reasonable influence is not important to me.
- 4 = I prefer that others control this feature.

Colours

12. Influence	0. 1. 2. 3. 4
13. Importance	0. 1. 2. 3. 4

Furniture: style, comfort

14. Influence	0. 1. 2. 3. 4
15. Importance	0. 1. 2. 3. 4

Furniture: arrangement (e.g., desk, workstation)

16. Influence	0. 1. 2. 3. 4
17. Importance	0. 1. 2. 3. 4

Flooring (e.g., carpet, tile)

18. Influence	0. 1. 2. 3. 4
19. Importance	0. 1. 2. 3. 4

Noise (sources inside the building)

20. Influence	0. 1. 2. 3. 4
21. Importance	0. 1. 2. 3. 4

Use this scale to circle your **INFLUENCE** answers:

- 0 = I have the final say or complete control concerning this feature.
 1 = Others have some influence, but my opinion has more weight.
 2 = My influence is about equal to that of others.
 3 = I have some influence, but the opinion of others carries more weight.
 4 = I have very little influence concerning this feature.

Use this scale to circle your **IMPORTANCE** answers:

- 0 = Reasonable influence concerning this feature is important to me.
 1 = Reasonable influence is quite important to me.
 2 = Reasonable influence is mildly important to me.
 3 = Reasonable influence is not important to me.
 4 = I prefer that others control this feature.

Music

22. Influence 0. 1. 2. 3. 4
 23. Importance 0. 1. 2. 3. 4

Privacy

24. Influence 0. 1. 2. 3. 4
 25. Importance 0. 1. 2. 3. 4

Size of your area

26. Influence 0. 1. 2. 3. 4
 27. Importance 0. 1. 2. 3. 4

Decorations of personal work area (e.g., posters, photos)

28. Influence 0. 1. 2. 3. 4
 29. Importance 0. 1. 2. 3. 4

Indoor traffic

30. Influence 0. 1. 2. 3. 4
 31. Importance 0. 1. 2. 3. 4

Use this scale to circle your **INFLUENCE** answers:

- 0 = I have the final say or complete control concerning this feature.
- 1 = Others have some influence, but my opinion has more weight.
- 2 = My influence is about equal to that of others.
- 3 = I have some influence, but the opinion of others carries more weight.
- 4 = I have very little influence concerning this feature.

Use this scale to circle your **IMPORTANCE** answers:

- 0 = Reasonable influence concerning this feature is important to me.
- 1 = Reasonable influence is quite important to me.
- 2 = Reasonable influence is mildly important to me.
- 3 = Reasonable influence is not important to me.
- 4 = I prefer that others control this feature.

Number of people around you

- 32. Influence 0. 1. 2. 3. 4
- 33. Importance 0. 1. 2. 3. 4

Odours (from indoor sources)

- 34. Influence 0. 1. 2. 3. 4
- 35. Importance 0. 1. 2. 3. 4

36. **OVERALL**, the influence over features in your workplace.

0. 1. 2. 3. 4

37. **OVERALL**, the importance to you of having influence in your workplace.

0. 1. 2. 3. 4

SECTION V:

Circle the number that best reflects how you rate your work performance in each of the following ways. Please note that you are rating your performance against absolute standards (from absolutely unacceptable to absolutely ideal) rather than how your work performance compares with that of other people. Please give your first response to each item.

	Absolutely Unacceptable										Absolutely Ideal
Amount of work accomplished	0	1	2	3	4	5	6	7	8	9	10
Quality of work accomplished	0	1	2	3	4	5	6	7	8	9	10
Meeting deadlines	0	1	2	3	4	5	6	7	8	9	10
Frequency of errors	0	1	2	3	4	5	6	7	8	9	10
Taking responsibility	0	1	2	3	4	5	6	7	8	9	10
Creativity	0	1	2	3	4	5	6	7	8	9	10
Getting along with others	0	1	2	3	4	5	6	7	8	9	10
Dependability	0	1	2	3	4	5	6	7	8	9	10
Overall performance	0	1	2	3	4	5	6	7	8	9	10

SECTION VI:

- 2. . . .disagree strongly
- 1. . . .disagree
- 0. . . .neutral
- 1. . . .agree
- 2. . . .agree strongly

Please use the above scale to circle the appropriate answer to each question. Please give your first response. Do not think about each question too much.

1. If I could, I would gladly leave "Algonquin College".

-2. -1. 0. 1. 2

2. I am currently interested in finding another job.

-2. -1. 0. 1. 2

3. If I could, I would gladly transfer to another department within "Algonquin College".

-2. -1. 0. 1. 2

4. If I could, I would gladly transfer to another job within my department.

-2. -1. 0. 1. 2

SECTION VII:

This questionnaire assesses how competent you feel when it comes to doing your job.

- 4. . . .very strong disagreement
- 3. . . .strong disagreement
- 2. . . .disagreement
- 1. . . .mild disagreement
- 0. . . .neutral
- 1. . . .mild agreement
- 2. . . .agreement
- 3. . . .strong agreement
- 4. . . .very strong agreement

Please use the above scale to circle the appropriate answer to each question. Please give your first response. Do not think about each question too much.

1. No one knows this job better than I do.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

2. Even though the work here could be rewarding, I am frustrated and find motivation continuing only because of my paycheck.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

3. I meet my own personal expectations for expertise in doing this job.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

4. Unfortunately, an individual's worth often passes unrecognized no matter how hard he/she tries.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

5. This job is manageable and any problems tend to be optimally solved.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

6. If someone here can find the answer, I'm the one.

-4. . . .-3. . . .-2. . . .-1. . . .0. . . .1. . . .2. . . .3. . . .4

Continue to use this scale to circle the appropriate answer to each question.

- 4. . . .very strong disagreement
- 3. . . .strong disagreement
- 2. . . .disagreement
- 1. . . .mild disagreement
- 0. . . .neutral
- 1. . . .mild agreement
- 2. . . .agreement
- 3. . . .strong agreement
- 4. . . .very strong agreement

7. Sometimes I feel like I'm not getting anything done.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

8. This job offers me a chance to test myself and my abilities.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

9. A difficult problem in this job is not knowing the results of one's actions.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

10. My talents, or where I can concentrate my attention best, are found in areas not related to this job.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

11. Considering the time spent on the job, I feel thoroughly familiar with my tasks.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

12. If the work were only more interesting I would be motivated to perform better.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

13. I honestly believe I have all the skills necessary to perform this task well.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

Continue to use this scale to circle the appropriate answer to each question.

- 4. . . .very strong disagreement
- 3. . . .strong disagreement
- 2. . . .disagreement
- 1. . . .mild disagreement
- 0. . . .neutral
- 1. . . .mild agreement
- 2. . . .agreement
- 3. . . .strong agreement
- 4. . . .very strong agreement

14. Doing this job well is a reward in itself.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

15. I can get so wrapped up in my work that I forget what time it is and where I am.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

16. Mastering this job meant a lot to me.

-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

SECTION VIII:

As opposed to assessing how competent you feel when it comes to doing your job, this questionnaire assesses how competent you feel about your physical working conditions.

- 4. . . .very strong disagreement
- 3. . . .strong disagreement
- 2. . . .disagreement
- 1. . . .mild disagreement
- 0. . . .neutral
- 1. . . .mild agreement
- 2. . . .agreement
- 3. . . .strong agreement
- 4. . . .very strong agreement

Please use the above scale to circle the appropriate answer to each question. Please give your first response. Do not think about each question too much.

1. I believe I know how to create good working conditions for myself.
-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4
2. Considering the time I spend at work, I feel thoroughly familiar with the physical aspects of my workplace.
-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4
3. I am usually not successful at changing my working conditions to what I want.
-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4
4. My physical environment at work is manageable and any problems tend to be solved easily.
-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4
5. In general, I feel competent when it comes to creating a satisfactory place for me to work.
-4. . . -3. . . -2. . . -1. . . 0. . . 1. . . 2. . . 3. . . 4

SECTION VIII: DEMOGRAPHICS

These items will give me a little more information about the sample of people who are participating in this study.

AGE: _____

SEX: M _____ F _____

MARITAL STATUS:

single _____ married (common law) _____ divorced _____ widowed _____

HIGHEST COMPLETED LEVEL OF EDUCATION:

high school	community		
diploma	college	university	graduate
_____	diploma	degree	degree
	_____	_____	_____

JOB TITLE: _____

YEARS IN CURRENT JOB AT "ALGONQUIN COLLEGE": _____

YEARS AT "ALGONQUIN COLLEGE" (TOTAL): _____

YEARS IN YOUR FIELD OF WORK: _____

SECTION X (optional):

If you have any comments about any of the questions you just answered or this study in general, please put them below. Thank-you for your participation.

Appendix B

INTRODUCTION & INFORMATION FORM

Hello employees!

My name is Steffan Jones. A few of you know me - most of you don't. I am currently enrolled in the Master of Arts program in Psychology at Carleton University. Under the supervision of Dr. Jennifer Veitch, I am about to embark on a study which could affect all of us. As part of my M.A. requirements I have chosen to examine how various working conditions relate to things such as employee satisfaction, performance and absenteeism. With your help, I am hopeful we can discover results that will help make working conditions better for both employers and employees.

Your organization has given me permission to ask you if you would be willing to participate in my study. As members of various organizations, only persons like yourself can provide the information necessary for research such as mine. Before you decide if you would like to participate there are a few things you should know:

- participation is completely voluntary
- participation will take about 30 minutes to answer a questionnaire
- all answers will be kept completely confidential and anonymous
- you can withdraw from the study at any time
- at the end of the study you will be given a full explanation of the study
- you and your organization will be entitled to a copy of the same final results

Your decision to participate in this study will not affect your job or your standing within your organization. Take a few moments to consider whether or not you would like to participate. If the answer is yes then I ask that you respond via email with your name, work phone number, and location within your organization. I will then contact you to arrange a convenient time for you to answer the questionnaire. If you have any questions or concerns feel free to contact me at:

phone number: 993-9669
email: sjjones@ccs.carleton.ca

Thank-you for your time.

Steffan Jones, B.Sc.

INFORMED CONSENT FORM

The purpose of informed consent is to insure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

I, _____, have been asked to participate in a study examining how various working conditions affect work performance, attendance and satisfaction.

I understand that the study will involve spending approximately 20 minutes answering a questionnaire.

I have been informed that all my results will be kept completely confidential (no specific or identifying data will be released to your employer) and anonymous (your data will be assigned a number and your name will not be used) and that I am free to withdraw from the study at any time without penalty. In addition, I am free to not answer any particular question or questions I do not wish to answer. There are no known risks or benefits from participation in this study (i.e. your decision to participate will have no direct affect on your job).

I have been informed that my identity will not be revealed in any publication or document resulting from this research. In addition, at the end of the study I will be entitled to a full explanation of the nature of the study, and to a complete copy of the final results.

Based on this information, I freely and voluntarily consent to serve as a participant in the research investigation being conducted by Steffan Jones (993-9669), under the supervision of Dr. Jennifer Veitch (993-9671). If I have any questions concerning the research I am free to contact the researcher or his supervisor. Should I have any ethical concerns about this study I may contact Dr. M. Gick (Chair, Dept. of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. K. Matheson (Chair, Dept. of Psychology, 520-2600, ext. 2648).

Signed this _____ day of _____, 199__

Signature of Participant

Printed Name of Participant

Signature of Investigator

Steffan Jones

Printed Name of Investigator

I would like a copy of the final results: YES _____ NO _____

Appendix C

DEBRIEFING AND EXPECTED RESULTS

The study you participated in was primarily concerned with the issue of control in the workplace. Although studies have found occasions when control may be considered negative, most researchers agree that people like to be in control. Specifically, we were interested in how job autonomy (control one has over the work that they do) and physical environmental control affects outcomes such as job satisfaction and employee absenteeism.

Although control in the workplace has been studied extensively, most researchers have examined only job autonomy, often neglecting the role of physical environmental control. Perhaps by combining the effects of job autonomy and physical environmental control, a better understanding of relevant outcomes could be achieved. In addition, researchers have focused on how simply increasing or decreasing various types of control affects outcomes of interest. We believe that what is more important than a person's absolute amount of control is how well a person's perceived levels of control (how much job autonomy or environmental control an employee believes they have) "fit" with their desired levels of control (how much job autonomy or environmental control they would like). The better the fit between perceived and desired levels of control the more positive outcomes will be.

The present research was therefore designed to test a number of hypotheses. Results are expected to indicate that the better the fit between perceived and desired levels of job autonomy and environmental control the higher the levels of job satisfaction, environmental satisfaction, and job performance, and the lower the levels of job stress, absenteeism and intent to turnover. In addition, it is expected that the fit between perceived and desired levels of control will explain these outcomes more completely than either the absolute amounts of job autonomy or environmental control provided will explain alone. If these results are indeed found, they will provide employers with greater insight into how to improve employee performance and attendance, while at the same time leading to more beneficial working conditions for employees.

I would like to take this opportunity to thank you again for participating in this research. Your time and effort was greatly appreciated.

As a result of your participation in this study, if you have continuing concerns about aspects of your job you may wish to consult a career counselling centre (i.e. Gauzas & Associates, 231-2051). If you have any questions or comments about this research, then please feel free to contact S. Jones (Principle Investigator - 993-9669) or Dr. J. Veitch (Research Supervisor - 993-9671). If you have any ethical concerns about this research then please contact Dr. M. Gick (Chair, Dept. of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. K. Matheson (Chair, Dept. of Psychology, 520-2600, ext. 2648).

Appendix D

Results of Partial Replication: High-technology Corporation

Descriptive Statistics

Sample. A total of 42 individuals agreed to participate, of which 24 were males and 17 were females (one did not answer). The age of participants ranged from 22 to 43 years old with a mean age of 30.5 years ($SD = 5.5$). Participants were employed in their current jobs for an average of 1.9 years ($SD = 1.3$) and had been at their current workplace for an average of 5.1 years ($SD = 5.5$). Fifteen of the participants were single, 25 indicated they were married or living common-law, and one was divorced. One participant elected not to provide his/her marital status. Three participants said that high school was their highest completed level of education, six had community college diplomas, 23 had completed a university degree, and nine participants had completed some form of graduate degree (one participant missing). As with the educational sample, the large number of participants completing higher levels of education was manifested in participant job types. Twenty-seven participants were classified as having a professional designation while four were classified as having an administrative type job, and five a technical job (six participants missing).

Outcome variable results. Table D1 presents the means, standard deviations, medians, and possible ranges for each self-report variable.

Table D1

Means, Medians, Standard Deviations, and Possible Ranges for Self-Report Variables

Variable	M	SD	Median	Actual Range	Possible Range
JAD	.58	.80	1.17	-0.7 to 3.7	-6 to 6
ECD	.87	.76	1.22	-0.3 to 3.7	-4 to 4
Perceived J.A.	1.25	.87	1.44	-1.7 to 2.6	-3 to 3
Desired J.A.	1.83	.76	1.89	0.0 to 3.0	-3 to 3
Perceived E.C.	1.14	.70	1.09	0.0 to 2.9	0 to 4
Desired E.C.	2.00	.77	2.00	0.1 to 4.0	0 to 4
Job Satisfaction	1.60	1.13	2.00	-2.0 to 3.0	-3 to 3
Job Competency	1.11	.77	1.06	-0.4 to 2.9	-4 to 4
Env. Satisfaction	.63	.68	.67	-1.3 to 2.0	-2 to 2
Env. Competency	1.57	.95	1.60	-1.4 to 3.6	-4 to 4
Absenteeism	2.44	2.50	2.00	0.0 to 14	0 to ?
Job Stress	1.83	.79	2.00	0.0 to 4.0	0 to 4
Intent to Turnover	-.74	.77	-.75	-2.0 to 1.0	-2 to 2
Performance	7.82	.67	7.88	6.4 to 9.3	0 to 10

Examining Predictor Variables

Testing the shape of the relationships between JAD/ECD and outcome variables.

Before the shape of the relationships between JAD/ECD and the outcome variables were examined, it was necessary to first test whether relationships were linear or curvilinear (parabolic).

Table D2 illustrates the change in R^2 when the parabolic relationship enters the regression equation after the linear relationship for each outcome variable, and whether this indeed indicates a parabolic or linear relationship exists. As can be seen, the relationship between JAD and job satisfaction was the only relationship found to be curvilinear.

Effectiveness of Discrepancy Measures

JAD/ECD vs. measures of control. Hierarchical multiple regressions were conducted to test if the fit measures of JAD/ECD explained more variance in the outcome variables as compared to separate measures of perceived and desired job autonomy and environmental control.

JAD, perceived and desired job autonomy, ECD, and perceived and desired environmental control were each regressed onto our outcome variables (multicollinearity was a problem). Education was again entered first as a proxy for job type. Adjusted R^2 's were then compared to determine the relative predictive ability of the various independent variables.

Table D2

Changes in ΔR^2 's When Parabolic Relationships Between Measures of Fit and Outcome Variables are Entered After Linear Relationships

Outcome Variable	ΔR^2	Relationship
JAD		
Performance	.000	Linear
Turnover	.025	Linear
Stress	.007	Linear
Absenteeism	.001	Linear
Job Satisfaction	.076*	Curvilinear
Job Competency	.007	Linear
<i>Environmental Satisfaction</i>	.020	<i>Linear</i>
<i>Environmental Competency</i>	.058	<i>Linear</i>
ECD		
Performance	.074	Linear
Turnover	.003	Linear
Stress	.000	Linear
Absenteeism	.007	Linear
Environmental Satisfaction	.031	Linear
Environmental Competency	.014	Linear
<i>Job Satisfaction</i>	.022	<i>Linear</i>
<i>Job Competency</i>	.000	<i>Linear</i>

Note. * $p < .05$. Significance indicates relationships are curvilinear (parabolic).

Table D3 illustrates the R^2 's, ΔR^2 's, adjusted R^2 's, and unstandardized and standardized beta's for the hierarchical regressions of education and JAD on to the outcome variables. Only job satisfaction ($R^2 = .232$) and performance ($R^2 = .183$) have significant amounts of variance explained by JAD. Table D4 presents the same results for the hierarchical regressions of education and perceived and desired job autonomy on to the outcome variables. Final model R^2 's are again only significant for job satisfaction ($R^2 = .352$) and performance ($R^2 = .291$) when perceived and desired job autonomy are predictors.

Regardless of significance, for the purposes of further analysis, final model adjusted R^2 's were compared between outcome variables predicted by JAD and outcome variables predicted by perceived and desired job autonomy. Results generally suggested that for this particular sample, perceived and desired job autonomy were better predictors than JAD.

Similar analyses were conducted with ECD and perceived and desired environmental control as predictors. Table D5 illustrates the R^2 's, ΔR^2 's, adjusted R^2 's, and unstandardized and standardized beta's for the hierarchical regressions of education and ECD on to the outcome variables. Final model R^2 's are significant for intent to turnover ($R^2 = .159$) and job satisfaction ($R^2 = .170$). Table D6 presents the same results for the hierarchical regressions of education and perceived and desired environmental control on to the outcome variables. Only job satisfaction was found to have a significant amount of variance explained ($R^2 = .193$) by measures of perceived and desired environmental control.

Table D3

Summary of Hierarchical Regression of Education and JAD on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.061	.061	.037	-.175	-.224
	JAD	2	.183*	.122*	.141*	-.031*	-.350*
Turnover	Education	1	.134*	.134*	.112*	.343*	.362*
	JAD	2	.139	.005	.093	.007	.067
Stress	Education	1	.053	.053	.029	.196	.214
	JAD	2	.117	.064	.070	.026	.253
Absenteeism	Education	1	.001	.001	-.025	.110	.036
	JAD	2	.002	.001	-.052	.009	.026
Job Satisfaction	Education	1	.108*	.108*	.085*	-.389	-.279
	JAD	2	.232**	.124*	.191**	-.064*	-.355*
Job Competency	Education	1	.000	.000	-.025	-.012	-.013
	JAD	2	.019	.019	-.032	-.014	-.137
<i>Env. Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.024</i>	<i>.024</i>	<i>-.001</i>	<i>-.127</i>	<i>-.151</i>
	<i>JAD</i>	<i>2</i>	<i>.027</i>	<i>.003</i>	<i>-.024</i>	<i>-.005</i>	<i>-.055</i>
<i>Env. Competency</i>	<i>Education</i>	<i>1</i>	<i>.068</i>	<i>.068</i>	<i>.044</i>	<i>-.306</i>	<i>-.262</i>
	<i>JAD</i>	<i>2</i>	<i>.068</i>	<i>.000</i>	<i>.019</i>	<i>.003</i>	<i>.022</i>

Note. *p < .05.

Table D4

Summary of Hierarchical Regression of Education and Perceived and Desired Job Autonomy on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.061	.061	.037	-.124	-.159
	Perceived J.A.	2	.287**	.226**	.249**	.042**	.524**
	Desired J.A.	3	.291**	.005	.234**	-.008	-.081
Turnover	Education	1	.134*	.134*	.112*	.347*	.367*
	Perceived J.A.	2	.135	.001	.089	-.006	-.063
	Desired J.A.	3	.139	.004	.069	.009	.078
Stress	Education	1	.053	.053	.029	.201	.220
	Perceived J.A.	2	.071	.018	.022	-.025	-.262
	Desired J.A.	3	.118	.047	.046	.028	.252
Absenteeism	Education	1	.001	.001	-.025	.105	.034
	Perceived J.A.	2	.002	.001	-.052	-.010	-.032
	Desired J.A.	3	.102	.000	-.081	.006	.017
Job Satisfaction	Education	1	.108*	.108*	.085*	-.474*	-.341*
	Perceived J.A.	2	.121	.013	.075	.057*	.397*
	Desired J.A.	3	.352***	.231***	.300***	-.097***	-.561***
Job Competency	Education	1	.000	.000	-.025	.039	.042
	Perceived J.A.	2	.093	.093	.045	.026	.271
	Desired J.A.	3	.097	.004	.024	.009	.077
<i>Env. Satisfaction</i>	<i>Education</i>	<i>1</i>	<i>.024</i>	<i>.024</i>	<i>-.001</i>	<i>-.091</i>	<i>-.108</i>
	<i>Perceived J.A.</i>	<i>2</i>	<i>.066</i>	<i>.042</i>	<i>.017</i>	<i>.014</i>	<i>.155</i>
	<i>Desired J.A.</i>	<i>3</i>	<i>.074</i>	<i>.008</i>	<i>-.011</i>	<i>.011</i>	<i>.107</i>
<i>Env. Competency</i>	<i>Education</i>	<i>1</i>	<i>.068</i>	<i>.068</i>	<i>.044</i>	<i>-.265</i>	<i>-.227</i>
	<i>Perceived J.A.</i>	<i>2</i>	<i>.083</i>	<i>.016</i>	<i>.035</i>	<i>.006</i>	<i>.053</i>
	<i>Desired J.A.</i>	<i>3</i>	<i>.099</i>	<i>.016</i>	<i>.026</i>	<i>.021</i>	<i>.148</i>

Note. *p < .05, **p < .01, p < .001..

Table D5

Summary of Hierarchical Regression of Education and ECD on Outcome Variables

Outcome Variable	Predictor	Step	R²	ΔR²	adj. R²	b	B
Performance	Education	1	.061	.061	.037	-.190	-.244
	ECD	2	.063	.002	.014	-.002	-.046
Turnover	Education	1	.134*	.134*	.112*	.341*	.360*
	ECD	2	.159*	.025	.115*	.009	.157
Stress	Education	1	.053	.053	.029	.202	.221
	ECD	2	.099	.046	.052	.012	.216
Absenteeism	Education	1	.001	.001	-.025	.108	.035
	ECD	2	.003	.002	-.051	.008	.039
Env. Satisfaction	Education	1	.024	.024	-.001	-.129	-.153
	ECD	2	.025	.001	-.027	-.002	-.030
Env. Competency	Education	1	.068	.068	.044	-.298	-.256
	ECD	2	.081	.013	.033	-.009	-.117
Job Satisfaction	Education	1	.108*	.108*	.085*	-.443*	-.318*
	ECD	2	.170*	.062	.127*	-.022	-.250
Job Competency	Education	1	.000	.000	-.025	-.012	-.013
	ECD	2	.041	.041	-.009	-.012	-.202

Note. *p < .05.

Table D6

Summary of Hierarchical Regression of Education and Perceived and Desired Environmental Control on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.061	.061	.037	-.178	-.229
	Perceived E.C.	2	.067	.006	.018	.005	.087
	Desired E.C.	3	.067	.000	-.009	-.000	-.014
Turnover	Education	1	.134*	.134*	.112*	.329*	.344*
	Perceived E.C.	2	.151*	.017	.106*	-.012	-.189
	Desired E.C.	3	.163	.012	.095	.007	.127
Stress	Education	1	.053	.053	.029	.219	.240
	Perceived E.C.	2	.054	.001	.004	-.009	-.147
	Desired E.C.	3	.105	.052	.033	.015	.258
Absenteeism	Education	1	.001	.041	-.025	.055	.018
	Perceived E.C.	2	.008	.007	-.046	-.018	-.085
	Desired E.C.	3	.008	.000	-.075	.000	.003
Env. Satisfaction	Education	1	.024	.024	-.001	-.060	-.071
	Perceived E.C.	2	.124	.100*	.078	.015	.260
	Desired E.C.	3	.140	.016	.070	.008	.144
Env. Competency	Education	1	.068	.068	.044	-.281	-.241
	Perceived E.C.	2	.079	.011	.031	.012	.149
	Desired E.C.	3	.085	.006	.011	-.006	-.087
Job Satisfaction	Education	1	.108*	.108*	.085*	-.493*	-.354*
	Perceived E.C.	2	.108	.000	.061	.012	.129
	Desired E.C.	3	.193*	.085	.128*	-.029	-.331
Job Competency	Education	1	.000	.000	-.025	.010	.011
	Perceived E.C.	2	.033	.033	-.018	.016	.255
	Desired E.C.	3	.051	.018	-.026	-.009	-.153

Note. *p < .05.

Contrary to the JAD/job autonomy results, when adjusted R^2 's were compared greater variance was explained in all but two (environmental satisfaction and job satisfaction) outcome variables when ECD was the predictor as opposed to measures of perceived and desired environmental control. This suggests that for this particular sample, ECD is the predictor most appropriate for use in the remaining analyses.

Effectiveness of ECD. To test if environmental control explained a significant amount of variance in the outcome variables beyond that explained by job autonomy alone, further hierarchical regressions were performed. Based on the results described above, measures of perceived and desired job autonomy were entered into the equations, followed by ECD. Again, in all regressions education was entered first.

Table D7 illustrates the R^2 's, ΔR^2 's, and adjusted R^2 's for the hierarchical regressions of education, perceived and desired job autonomy and ECD on to the outcome variables. Finalmodel R^2 's indicate that significant amounts of variance were explained in performance ($R^2 = .294$) and job satisfaction ($R^2 = .366$). Although ECD did not explain significant amounts of variance beyond that explained by measures of perceived and desired job autonomy for any of the outcome variables, some additional variance was explained by ECD in the majority of outcome variables.

Table D7

Summary of Hierarchical Regression of Education, Perceived and Desired Job Autonomy and ECD on Outcome Variables

Outcome Variable	Predictor	Step	R ²	ΔR ²	adj. R ²	b	B
Performance	Education	1	.061	.061	.037	-.121	-.156
	Perceived J.A.	2	.291**	.231**	.234**	.042**	.518**
	Desired J.A.					-.006	-.063
	ECD	3	.294**	.003	.215*	-.003	-.051
Turnover	Education	1	.134*	.134*	.112*	.337*	.356*
	Perceived J.A.	2	.139	.005	.069	-.004	-.044
	Desired J.A.					.003	.026
	ECD	3	.160	.021	.067	.009	.152
Stress	Education	1	.053	.053	.029	.190	.207
	Perceived J.A.	2	.118	.065	.046	-.023	-.240
	Desired J.A.					.022	.192
	ECD	3	.145	.027	.050	.010	.173
Absenteeism	Education	1	.001	.001	-.025	.096	.031
	Perceived J.A.	2	.002	.001	-.081	-.008	-.027
	Desired J.A.					.001	.004
	ECD	3	.004	.002	-.110	.008	.039
Env. Satisfaction	Education	1	.024	.024	-.001	-.087	-.103
	Perceived J.A.	2	.074	.050	-.001	.013	.146
	Desired J.A.					.014	.132
	ECD	3	.079	.005	-.024	-.004	-.072
Env. Competency	Education	1	.068	.068	.044	-.251	-.215
	Perceived J.A.	2	.099	.032	.026	.004	.031
	Desired J.A.					.030	.208
	ECD	3	.127	.028	.030	-.013	-.175
Job Satisfaction	Education	1	.108*	.108*	.085*	-.462*	-.332*
	Perceived J.A.	2	.352***	.245**	.300***	.055*	.381*
	Desired J.A.					-.089**	-.518**
	ECD	3	.366**	.014	.296**	-.011	-.124
Job Competency	Education	1	.000	.000	-.025	.056	.061
	Perceived J.A.	2	.097	.097	.024	.023	.238
	Desired J.A.					.019	.165
	ECD	3	.157	.060	.063	-.015	-.257

Note. *p < .05, **p < .01, ***p < .001.

Appendix E:

Sample Data

SAMPLE	AGE	SEX\$	MARITAL	EDUCATE	JOB_TYPE	JOB_YRS	COMP_YRS
2	46	2	3	2	1	1	19
2	43	1	1	4	1	10	10
2	50	2	2	4	1	2	24
2	39	1	2	2	1	12	12
2	38	1	2	2	1	9.5	9.5
2	45	2	3	2	1	3	9
2	42	1	2	2	1	4	9
2	55	2	2	2	3	17.5	22
2	57	2	2	4	1	18	19
2	61	1	2	3	1	27	27
2	48	2	3	4	1	1.5	14
2	49	2	2	4	1	10	15
2	30	2	2	3	3	2.5	5
2	39	1	1	2	1	1	13
2	41	1	2	2	1	14	14
2	46	2	2	3	3	4	10
2	52	2	2	4	1	24	24
2	54	1	2	1	1	2	2
2	48	2	4	4	1	18.5	18.5
2	56	2	2	4	1	6	6
2	50	2	2	3	3	10	10
2	48	1	2	3	1	24	24
2	49	1	2	3	1	6	6
2	22	2	2	2	3	1	1
2	60	1	2	4	1	29	29
2	43	1	2	3	1	18.5	18.5
2	55	1	2	4	1	5	29
2	54	1	1	4	1	30	30
2	40	2	2	4	1	7	9
2	51	2	1	4	1	10	24
2	49	2	2	4	1	19	19
2	48	1	2	3	1	9	22
2	59	1	2	4	1	19	19
2	50	2	2	3	1	1	13
2	56	1	2	2	1	16	16
2	49	1	2	3	1	10	10
2	49	1	2	4	1	17	17
2	46	1	2	2	1	18	18
2	56	1	2	2	1	24	24
2	47	1	2	4	1	6	15
2	49	2	2	4	1	1	22
2	57	1	2	3	1	14	30
2	53	2	2	4	1	15	30
2	53	2	4	3	1	12	12
2	51	1	2	3	1	23	25

2	53	2	3	4	1	12	12
2	28	2	2	2	3	3	8
2	63	2	2	3	1	16	16
2	55	2	1	1	3	17	27
2	45	1	2	1	3	13	25
2	40	1	2	4	1	1	10
2	60	2	2	4	1	5	27
2	54	2		4	1	4	25
2	57	2	3	3	3	10	25
2	40	2	3	3	3	10	11
2	52	2	1	1	3	2	31
2	53	2	2	3	1	1	27
2	41	2	2	2	1	7	10
2	51	2	2	4	1	21	24
2	41	1	1	4	3	1	5
2	51	1	2	4	1	22	22
2	49	1	2	2	1	20	20
2				3	1	12	12
2	39	1	2	2	1	4	9
2	54	2	2	3	1	9	9
2	56	2	1	3	1	10	10
2	52	2	2	2	3	1	9
2	54	2	2	1	3	7	17
2	52	2	3	3	1	17	18
2	55	2	3	1	1	20	20
2	50	1	2	4	1	10	28
2	38	1	2	2		10	10
2	55	2	3	4	1	3	12
2	45	2	2	3	1	7	12
2	48	2	2	1	3	3	17
2	42	2	2	4	1	12	12
2	40	2	2	2	1	7	7
2	55	2	3	3	1	27	27
2	50	2	2	4	1	7	11
2	45	1	2	2	1	6	9
2	30	1	1	4	1	1	1
2	51	1	2	2	1	21	23
2	42	2	2	1	3	8	23
2	49	2	2	4	1	6	7
2	44	1	2	2	3	10	20
2	43	1	2	3	1	11	11
2	40	2	1	3	1	9	10
2	50	1	2	3	1	5	5
2	50	2	2	4	1	9	16
2	45	2	3	1	3	6	13
2	41	2	2	4	1	6	6

2	56	2	3	4	1	8	8
2	49	2	2	4	1	26	26

FIELD_YRS	J_INF1	J_IMP1	J_INF2	J_IMP2	J_INF3	J_IMP3	J_INF4	J_IMP4	J_INF5	J_IMP5
19	3	3	2	3	3	3	1	2	3	3
20	3	3	3	3	3	3	2	3	2	3
24	3	3	3	3	3	3	2	3	2	3
19	2	2	2	2	2	2	0	0	1	2
20	3	3	3	3	3	3	1	2	2	2
11	3	2	3	2	3	2	1	0	2	2
5	-1	2	-1	1	-1	1	1	1	1	1
17.5	2	2	2	2	2	2	1	1	2	2
23	3	3	3	3	2	3	-1	3	-1	3
38	3	3	3	3	3	3	1	2	3	3
1.5	3	3	3	3	3	3	2	2	2	2
20	3	3	2	3	3	3	1	3	3	3
6	3	2	2	2	2	2	1	2	2	3
2	-2	3	0	3	-1	3	-1	3	-1	3
24	2	3	2	3	2	3	1	3	1	3
4	3	3	1	3	2	3	3	3	1	2
28	1	2	1	2	1	2	-2	2	1	2
34	-1	1	1	1	1	1	-1	0	1	1
27	1	2	1	3	1	3	-2	-3	1	3
13	3	3	2	2	3	3	1	2	2	2
10	3	2	3	2	3	2	2	2	3	2
24	2	3	2	3	2	3	1	2	2	3
6	2	3	1	3	2	3	1	2	1	2
1	2	2	3	3	3	3	2	2	2	2
29	2	2	2	2	-1	2	-3	-1	-2	2
22.5	2	2	2	2	2	2	2	2	2	2
33	1	2	2	2	1	2	0	2	2	2
32	2	3	2	3	2	3	2	3	2	3
12	2	3	3	3	2	2	-1	2	2	2
31	2	2	2	2	1	2	0	0	1	1
22	3	3	3	3	3	3	1	2	1	2
9	3	2	3	2	3	2	3	2	3	3
25	2	2	2	2	3	3	-1	-1	1	1
11	2	2	2	2	2	2	2	2	2	2
31	2	2	2	2	2	2	1	2	1	2
25	2	3	2	3	3	3	-2	2	1	2
27	2	2	2	2	-1	2	1	2	2	2
23	2	3	2	3	2	3	-2	2	-2	0
28	2	2	2	3	3	3	-1	3	3	3
19	3	3	2	3	2	3	2	3	3	3
14	2	3	2	3	2	3	2	3	2	3
14	2	2	2	2	2	2	1	3	1	3
32	2	3	1	3	2	3	1	2	2	2
22	2	3	2	3	1	3	1	3	2	3
23	3	3	3	3	3	3	-2	1	3	3

20	3	3	3	3	3	3	2	3	2	2
8	3	3	2	3	2	2	1	2	3	3
26	2	2	2	2	2	2	0	1	0	1
37	3	2	3	2	3	2	3	2	2	2
25	2	2	2	2	2	2	1	2	2	2
3	2	3	3	2	3	3	2	3	2	2
10	3	3	3	3	3	3	2	2	2	2
31	3	3	2	3	3	3	0	2	2	3
12	3	3	3	3	3	3	3	3	1	2
6	3	3	2	3	3	3	2	2	3	3
17	3	3	3	3	2	3	2	3	2	3
27	2	3	2	3	1	3	2	3	3	3
20	2	2	2	2	2	2	2	2	1	2
27	1	2	0	2	1	3	0	2	2	2
15	3	3	3	3	3	3	2	3	3	3
	3	2	3	2	3	2	3	2	3	2
29	3	3	3	3	3	3	1	0	-3	0
12	-1	3	2	-1	-2	-2	-2	3	1	1
9	2	2	2	2	3	2	0	1	2	2
33	3	3	3	3	2	2	-1	2	2	2
18	3	2	3	3	3	2	2	2	2	3
9	2	2	2	2	2	2	2	2	0	1
17	2	2	2	2	2	2	1	2	2	2
21	-3	3	-3	3	-3	3	-2	2	-2	2
23	2	3	2	2	2	2	-2	2	-1	2
18	2	3	3	3	3	3	2	3	3	3
15	2	2	1	1	0	1	0	2	1	1
12	1	3	1	3	1	3	-3	3	-3	3
22	2	3	2	3	1	3	1	1	0	2
3	2	2	2	2	2	2	2	2	2	2
18	3	3	3	3	3	3	-2	1	2	3
19	3	3	3	3	3	3	1	2	1	1
5	2	2	2	2	2	2	1	2	1	2
31	3	3	3	3	3	3	1	3	3	3
20	3	3	3	3	3	3	0	2	3	3
5	2	1	2	1	2	1	0	1	1	2
28	2	2	1	2	1	2	1	1	1	2
25	3	2	3	2	2	2	2	2	2	2
15	2	3	2	3	2	3	0	1	1	1
10	3	2	3	2	3	3	2	2	2	2
24	2	2	2	2	2	2	-2	1	2	2
10	2	3	3	3	2	2	2	3	3	3
15	2	3	2	3	2	3	1	3	1	3
18	2	2	2	2	2	2	-1	-1	-1	-1
26	2	2	2	2	2	2	-1	2	2	2
15	2	2	2	2	2	2	1	2	2	2

20	2	2	2	3	1	3	2	2	2	2
26	2	3	3	3	3	3	2	3	3	3

J_INF6	J_IMP6	J_INF7	J_IMP7	J_INF8	J_IMP8	J_INF9	J_IMP9	PERC_JA	DESIR_JA	JAD
2	3	1	1	2	2	3	2	2.22	2.44	0.22
2	3	2	2	3	3	3	3	2.56	2.89	0.33
2	3	2	3	2	3	2	3	2.33	3.00	0.67
2	0	0	1	2	2	2	2	1.44	1.44	0.00
2	2	0	1	1	2	2	2	1.89	2.22	0.33
2	2	0	0	1	2	3	2	2.00	1.56	-0.44
-1	1	0	1	-2	1	1	2	-0.33	1.22	1.56
-1	-1	-1	-1	1	1	2	2	1.11	1.11	0.00
-1	3	-1	2	-1	3	3	3	0.67	2.89	2.22
2	2	-2	3	1	2	2	2	1.78	2.56	0.78
3	3	2	2	0	0	3	3	2.33	2.33	0.00
3	3	0	1	2	3	2	2	2.11	2.67	0.56
1	2	0	0	-1	-1	1	2	1.22	1.56	0.33
-1	3	-2	0	2	3	-3	3	-1.00	2.67	3.67
2	3	-1	3	1	1	3	3	1.44	2.78	1.33
1	2	0	2	2	3	2	3	1.67	2.67	1.00
-2	2	-3	1	1	2	-1	2	-0.33	1.89	2.22
-1	1	-2	0	-2	2	-1	2	-0.56	1.00	1.56
-2	2	1	2	-1	2	-1	2	-0.11	1.78	1.89
1	2	2	2	2	2	2	2	2.00	2.22	0.22
3	2	2	0	0	0	2	1	2.33	1.44	-0.89
1	2	2	2	1	1	1	2	1.56	2.33	0.78
1	2	0	2	1	2	1	2	1.11	2.33	1.22
1	1	0	0	-1	1	-1	0	1.22	1.56	0.33
0	0	-1	1	-2	-2	-2	-2	-0.78	0.44	1.22
1	1	0	0	1	2	2	2	1.56	1.67	0.11
1	2	0	0	0	1	0	1	0.78	1.56	0.78
2	3	-2	2	-1	2	2	2	1.22	2.67	1.44
2	2			2	2	2	2	1.75	2.25	0.50
0	1			-1	-2	1	2	0.75	1.00	0.25
3	3	2	2	1	2	2	3	2.11	2.56	0.44
3	2	0	0	2	3	3	3	2.56	2.11	-0.44
2	2	2	2	2	2	2	2	1.67	1.67	0.00
2	2	1	0	1	1	1	1	1.67	1.56	-0.11
0	1	-2	1	1	2	1	2	0.89	1.78	0.89
2	2	0	0	-1	1	1	2	0.89	2.00	1.11
1	1	-2	0	-1	1	1	2	0.56	1.56	1.00
-2	3	0	0	1	0	2	3	0.33	1.89	1.56
0	3	1	2	2	3	2	3	1.56	2.78	1.22
2	2	1	2	0	2	2	2	1.89	2.56	0.67
1	2	2	2	2	2	2	3	1.89	2.67	0.78
1	2	-1	-1	1	2	2	2	1.22	1.89	0.67
2	2	2	2	2	2	2	2	1.78	2.33	0.56
-1	3	-3	2	-1	1	1	3	0.44	2.67	2.22
1	2	0	1	1	1	2	2	1.56	2.11	0.56

2	2	-3	1	1	2	2	2	1.67	2.33	0.67
2	2	0	0	1	1	2	2	1.78	2.00	0.22
1	1	1	1	0	0	0	0	0.89	1.11	0.22
3	2	2	2	2	2	2	2	2.56	2.00	-0.56
2	2	-1	-1	-1	-1	1	2	1.11	1.33	0.22
2	3	0	2	1	2	2	2	1.89	2.44	0.56
2	2	1	1	3	3	2	2	2.33	2.33	0.00
0	2	0	1	1	2	1	2	1.33	2.33	1.00
1	2	2	2	3	3	3	3	2.44	2.67	0.22
2	3	1	2	1	2	0	1	1.89	2.44	0.56
3	3	1	2	2	2	2	2	2.22	2.67	0.44
1	3	0	0	1	3	1	3	1.44	2.67	1.22
-2	2	2	2	2	2	2	2	1.44	2.00	0.56
1	2	-1	0	-1	2	0	2	0.33	1.89	1.56
3	3	0	0	0	0	0	0	1.89	2.00	0.11
3	2	3	3	3	2	3	2	3.00	2.11	-0.89
2	2	-3	2	2	2	3	3	1.22	2.00	0.78
-2	1	-3	2	-1	1	1	1	-0.78	1.00	1.78
1	2	1	1	0	1	1	2	1.33	1.67	0.33
-2	1	-2	2	-1	2	2	2	0.67	2.11	1.44
3	2	1	2	1	0	1	1	2.11	1.89	-0.22
0	0	0	0	0	0	-1	-1	0.78	0.89	0.11
1	2	1	1	1	2	1	2	1.44	1.89	0.44
-2	2	-2	2	1	2	1	2	-1.67	2.33	4.00
-1	2	-1	0	1	2	1	2	0.33	1.89	1.56
3	3	3	3	3	3	3	3	2.78	3.00	0.22
1	2	0	1	0	1	1	1	0.67	1.33	0.67
-1	2	-3	3	-1	3	-2	3	-1.11	2.89	4.00
0	2	0	0	2	1	2	2	1.11	1.89	0.78
2	2	2	2	1	2	2	2	1.89	2.00	0.11
-1	1	0	0	1	1	2	2	1.22	1.89	0.67
1	1	0	1	3	2	1	1	1.78	1.89	0.11
1	2	0	2	1	2	1	2	1.22	2.00	0.78
3	3	1	2	3	3	3	3	2.56	2.89	0.33
3	3	2	2	3	3	3	3	2.56	2.78	0.22
2	1	1	0	-1	-3	-2	-2	0.78	0.22	-0.56
1	1	-2	0	1	0	1	1	0.78	1.22	0.44
2	2	2	2	2	2	2	2	2.22	2.00	-0.22
1	1	2	2	1	1	1	1	1.33	1.78	0.44
2	2	2	2	2	2	3	2	2.44	2.11	-0.33
0	1	1	1	-2	0	-1	1	0.44	1.33	0.89
3	3	-1	0	-1	1	2	3	1.67	2.33	0.67
1	1	0	2	0	3	1	3	1.11	2.67	1.56
-3	-1	-3	3	-1	1	1	2	-0.22	1.00	1.22
-1	2	-2	2	-2	2	1	1	0.33	1.89	1.56
2	2	1	2	3	2	2	2	1.89	2.00	0.11

2	2	0	1	1	1	2	2	1.56	2.00	0.44
-2	2	-3	3	2	3	2	3	1.33	2.89	1.56

SQ_JAD	PERC_JA2	DESI_JA2	JAD2	TR_JAD2	E_INF1	E_IMP1	E_INF2	E_IMP2
0.05	20	22	2	4	4	0	4	2
0.11	23	26	3	3	4	2	4	2
0.44	21	27	6	6	4	2	4	4
0.00	13	13	0	4	3	2	3	2
0.11	17	20	3	3	4	1	2	3
0.20	18	14	-4	6	4	3	4	3
2.42	-3	11	14	14	4	4	4	1
0.00	10	10	0	0	2	2	4	2
4.94	6	26	20	20	4	4	4	4
0.60	16	23	7	7	4	3	4	3
0.00	21	21	0	0	4	4	4	4
0.31	19	24	5	5	4	4	4	2
0.11	11	14	3	5	4	3	4	3
13.44	-9	24	33	33	4	2	2	2
1.78	13	25	12	12	4	3	4	3
1.00	15	24	9	9	4	2	4	2
4.94	-3	17	20	20	4	3	4	2
2.42	-5	9	14	14	4	2	3	2
3.57	-1	16	17	19	4	4	4	4
0.05	18	20	2	2	4	2	3	0
0.79	21	13	-8	8	4	3	4	3
0.60	14	21	7	7	2	2	2	2
1.49	10	21	11	11	4	2	4	1
0.11	11	14	3	3	4	2	2	2
1.49	-7	4	11	11	4	0	4	0
0.01	14	15	1	1	4	3	4	3
0.60	7	14	7	7	4	2	4	2
2.09	11	24	13	13	4	3	4	3
0.25	14	18	4	4	4	4	4	2
0.06	6	8	2	4	4	2	4	2
0.20	19	23	4	4	4	1	4	1
0.20	23	19	-4	6	4	3	4	3
0.00	15	15	0	0	4	1	4	1
0.01	15	14	-1	1	4	2	2	1
0.79	8	16	8	8	3	2	4	2
1.23	8	18	10	10	4	3	2	2
1.00	5	14	9	9	4	3	4	2
2.42	3	17	14	16	4	1	4	1
1.49	14	25	11	11	3	1	3	3
0.44	17	23	6	6	4	2	3	2
0.60	17	24	7	7	2	2	0	1
0.44	11	17	6	6	4	1	4	1
0.31	16	21	5	5	2	1	2	1
4.94	4	24	20	20	4	2	4	2
0.31	14	19	5	5	4	2	4	2

0.44	15	21	6	6	4	2	4	2
0.05	16	18	2	2	1	0	4	2
0.05	8	10	2	2	4	4	4	4
0.31	23	18	-5	5	2	1	4	2
0.05	10	12	2	2	4	4	2	2
0.31	17	22	5	7	1	1	1	1
0.00	21	21	0	0	1	1	1	1
1.00	12	21	9	9	3	3	3	2
0.05	22	24	2	2	4	1	4	1
0.31	17	22	5	5	3	2	0	0
0.20	20	24	4	4	4	3	4	3
1.49	13	24	11	11	4	1	4	2
0.31	13	18	5	5	4	0	4	0
2.42	3	17	14	14	4	0	3	0
0.01	17	18	1	1	4	2	3	1
0.79	27	19	-8	8	4	0	4	0
0.60	11	18	7	9	4	0	4	2
3.16	-7	9	16	22	2	1	2	1
0.11	12	15	3	5	3	2	4	2
2.09	6	19	13	13	4	0	4	0
0.05	19	17	-2	6	4	2	2	2
0.01	7	8	1	1	2	2	2	2
0.20	13	17	4	4	2	2	2	2
16.00	-15	21	36	36	4	3	4	3
2.42	3	17	14	14	4	0	4	0
0.05	25	27	2	2	2	3	2	3
0.44	6	12	6	6	4	0	4	2
16.00	-10	26	36	36	4	0	4	0
0.60	10	17	7	9	4	2	4	2
0.01	17	18	1	1	4	3	4	3
0.44	11	17	6	6	4	3	4	3
0.01	16	17	1	3	4	4	4	4
0.60	11	18	7	7	4	3	4	1
0.11	23	26	3	3	4	4	4	4
0.05	23	25	2	2	0	4	0	4
0.31	7	2	-5	9	0	0	0	1
0.20	7	11	4	6	1	2	1	2
0.05	20	18	-2	2	4	3	4	3
0.20	12	16	4	4	4	1	4	2
0.11	22	19	-3	3	4	3	4	3
0.79	4	12	8	8	4	3	4	3
0.44	15	21	6	6	0	3	4	2
2.42	10	24	14	14	4	1	4	1
1.49	-2	9	11	11	4	3	4	2
2.42	3	17	14	14	2	2	2	2
0.01	17	18	1	3	4	2	4	2

0.20	14	18	4	4	4	1	4	1
2.42	12	26	14	14	0	0	0	0

E_INF3	E_IMP3	E_INF4	E_IMP4	E_INF5	E_IMP5	E_INF6	E_IMP6	E_INF7
4	1	4	1	2	3	4	1	4
4	2	4	0	4	3	4	3	4
2	2	4	2	4	2	4	2	4
4	2	4	0	3	2	4	2	3
2	1	2	1	2	2	4	2	4
4	3	4	2	1	1	4	3	1
4	1	4	0	4	2	4	1	4
2	2	4	1	2	2	4	2	4
4	4	4	4	0	0	4	0	4
4	1	2	1	0	2	1	2	1
4	4	2	1	2	2	2	2	2
2	2	2	2	2	2	4	4	4
4	2	4	0	4	2	4	1	4
1	1	1	1	0	0	4	1	2
4	2	4	2	4	1	4	2	4
4	3	4	4	0	0	4	2	1
4	2	4	0	4	0	4	2	4
3	2	4	1	2	2	4	2	4
4	0	4	0	4	0	4	4	4
4	0	4	0	2	0	4	1	4
4	3	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2
4	1	4	0	4	2	4	3	4
2	2	1	1	1	1	3	2	1
4	0	4	0	2	2	4	3	4
4	3	4	3	4	3	4	3	4
4	2	4	2	4	2	4	1	4
4	0	4	1	3	2	4	3	4
4	2	4	0	1	1	4	1	4
4	2	4	0	1	1	4	1	4
4	1	4	1	2	1	4	0	3
2	1	4	3	0	1	4	3	3
4	1	3	1	4	1	4	2	4
0	0	0	0	0	0	4	2	2
1	1	3	1	2	2	2	2	3
4	3	4	1	4	3	4	3	4
4	3	4	2	3	2	4	3	4
4	1	2	1	4	3	2	3	2
1	1	4	0	4	1	2	2	3
4	1	0	0	0	0	3	1	3
1	1	3	1	0	0	1	1	1
4	0	4	0	4	1	4	1	4
2	1	4	0	2	1	4	0	4
4	2	4	0	0	0	4	2	4
4	2	4	2	4	3	4	3	4

4	2	4	0	0	0	0	0	4
1	0	4	1	4	2	4	2	4
4	4	4	2	2	2	4	4	4
4	2	4	2	4	3	4	3	4
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
1	1	2	2	1	1	1	1	1
3	1	3	1	0	1	3	1	2
4	1	4	1	0	1	4	0	3
0	0	4	0	0	0	4	2	2
3	2	4	2	2	2	4	3	2
4	2	3	0	3	0	4	0	3
4	0	4	0	4	0	4	0	4
4	0	4	0	1	0	4	0	4
4	0	4	0	2	2	4	0	4
4	0	4	0	4	0	4	2	4
4	2	2	1	4	3	4	4	4
2	1	2	1	2	1			1
4	2	3	1	2	2	2	2	2
4	0	4	0	0	3	4	3	4
2	2	2	1	2	2	4	2	4
2	2	2	2	4	3	4	2	2
2	2	2	2	2	3	2	2	2
4	3	4	2	1	2	4	2	4
4	0	4	0	2	0	4	0	4
2	3	2	3	2	3	2	3	2
4	2	3	1	2	1	2	1	2
4	0	4	0	0	0	3	1	3
4	2	4	0	0	2	4	2	4
4	3	4	1	4	3	4	2	4
4	3	4	1	2	2	3	2	3
2	2	4	2	2	1	4	4	4
4	1	2	1	0	0	4	2	4
4	4	0	0	0	0	4	1	0
0	4	0	4	0	4	0	4	0
0	0	0	3	2	2	0	0	1
1	2	1	2	1	2	3	2	2
4	3	1	2	0	2	0	2	0
4	0	4	0	0	0	4	2	4
2	2	2	1	2	2	2	2	2
4	2	4	2	2	2	3	3	3
4	3	4	2	0	0	4	3	4
4	1	4	1	0	0	4	1	4
4	2	4	1	4	3	4	3	4
2	2	2	2	2	2	2	2	2
4	2	4	0	1	0	2	1	1

4	1	4	1	0	0	4	1	4
0	0	4	1	4	1	4	1	4

E_IMP7	E_INF8	E_IMP8	E_INF9	E_IMP9	E_INF10	E_IMP10	E_INF11	E_IMP11
1	2	2	4	2	4	2	2	1
1	4	1	4	3	4	0	4	0
2	2	2	4	4	4	4	4	0
2	3	1	4	1	4	0	4	2
1	2	1	4	4	2	1	2	2
1	0	1	4	4	4	1	0	1
1	0	0	4	3	4	0	4	1
2	3	2	4	2	4	1	2	2
0	0	0	4	1	4	1	4	0
1	0	0	3	3	1	0		
2	2	2	2	2	2	2	0	0
2	2	2	4	4	2	2	4	2
1	2	1	4	3	4	2	4	3
2	0	0	3	0	2	0	0	0
1	1	1	4	3	4	2	4	2
1	4	2	4	3	0	0	0	0
1	4	1	4	3	4	1	4	1
0	3	0	4	1	4	1	2	2
0	4	0	4	4	4	0	4	0
0	4	0	4	2	2	0	2	0
2	2	2	4	2	4	2	4	2
2	2	2	2	2	2	2	2	2
0	4	0	4	2	4	0	4	0
1	2	1	4	4	4	2	1	1
3	3	3	4	3	3	0	3	0
2	4	2	4	3	2	0	2	0
1	4	1	4	1	4	1		
2	3	1	4	2	4	1	3	3
1	3	1	4	4	4	0	2	2
1	4	1	4	2	3	1	3	1
1	4	0	4	1	3	1	4	1
2	0	1	4	3	4	0	0	1
1	2	1	4	1	2	1	4	1
2	0	0	4	2	1	0	0	0
2	1	0	4	2	3	1	0	0
0	2	1	4	3	2	1	2	1
2	3	1	4	2	4	1	4	1
4	2	1	4	3	0	1	0	0
1	2	0	4	3	0	0	0	0
1	2	1	2	1	3	1	4	2
0	1	0	1	1	4	3	0	0
0	1	0	4	1	4	0	2	0
1	1	1	4	2	4	2	4	2
2	1	1	4	3	4	0	4	0
2	2	2	4	3	4	1	4	1

1	3	1	3	1	4	0	4	3
2	1	0	4	2	4	3	4	4
2	2	2	4	2	2	2		
3	1	0	4	3	4	1	4	0
2	2	2	2	2	2	2	2	2
1	3	3	1	1	1	1	1	1
1	1	1	1	1	2	2		
1	0	0	3	2	3	1	0	1
0	0	1	4	0	4	1	1	2
1	0	0	4	2	3	1	0	0
2	2	2	3	3	4	3	2	2
0	0	0	4	2	3	0	4	0
0	4	0	4	0	4	0	2	2
0	2	0	4	1	3	0	1	0
0	4	2	4	3	4	1	2	2
0	4	0	4	0	4	0	4	0
1	3	1	4	4	4	1	4	4
2	2	2			4	2		
1	3	2	4	2	2	2	1	1
2	0	0	4	4	0	0	0	0
2	4	1	4	1	4	0	4	3
3	4	3	4	3	4	3	2	2
2	2	2	2	2	2	2	2	4
2	1	2	4	2	4	2	2	1
0	2	0	4	0	4	0	0	0
3	2	1	2	3	2	1	2	1
1	3	2	3	1	2	1	2	2
1	1	0	4	2	4	0		
2	0	0	4	3	4	3	0	0
1	4	2	4	1	4	1	4	1
1	3	1	4	3	4	1	2	1
4	2	1	4	4	4	2	2	2
2	4	2	4	2	4	2	4	2
0	0	0	3	1	4	0	0	0
4	0	4	0	4	0	4	0	4
2	2	2	0	0	0	3	1	2
2	2	2	2	3	3	2	2	2
2	0	2	0	2	0	2	0	2
0	4	0	4	1	4	1	4	0
2	2	3	2	2	1	0		
3	2	3	4	2	4	0	0	0
3	2	1	4	4	1	0	0	0
1	1	0	4	2	4	2	4	2
2	4	2	4	3	2	2	4	3
2	2	2	2	2	2	2	2	2
1	0	0	3	2	2	1	1	2

1	3	0	4	0	4	0	4	1
0	2	0	4	2	4	0	1	0

E_INF12	E_IMP12	E_INF13	E_IMP13	E_INF14	E_IMP14	E_INF15	E_IMP15	E_INF16
1	1			1	1	1	0	1
4	0	4	2	0	2	4	1	4
4	0	4	2	2	1	4	2	4
4	0	4	0	3	1	3	1	4
1	1	2	1	2	2	2	1	1
0	1	4	2	0	0			4
4	1	4	0	4	1	4	1	0
4	1	4	1	2	2	2	1	2
4	0	4	2	0	0	4	4	4
0	0	4	1	0	0	0	0	4
2	2	2	2	2	2	2	2	2
2	0	4	2	1	0	4	2	4
4	1	4	1	2	2	3	1	4
0	0	1	1	0	0	1	1	1
2	0	4	2	3	2	4	2	4
1	1	4	0	0	0	4	3	3
4	1	4	1	2	1	4	1	4
2	0	3	1	2	2	3	1	2
2	0	4	0	0	0	0	0	0
4	0	4	1	0	0	4	0	4
2	2	2	2	0	2	4	2	4
2	2	2	2	2	2	2	2	2
0	0	4	0	4	3	1	0	4
4	2	4	3	0	0	4	1	3
4	0	4	2	0	3	4	0	4
2	2	2	2	4	0	2	1	4
4	1	4	3	2	1	4	1	4
1	2	4	1	2	2	1	1	1
4	0	4	1	1	1	4	1	2
1	0	4	1	1	1	4	2	4
1	0	4	1	1	0	2	1	1
4	1	0	2	0	1	4	3	3
3	1	4	1	3	1	3	1	4
0	0	4	2	0	0	2	2	2
1	1	2	1	1	2	0	1	3
2	1	4	1	2	2	4	2	4
4	3	4	1	4	2	4	2	4
0	0	4	0	2	3	0	1	4
1	0	2	2	4	1	2	2	0
1	1	3	1	0	1	2	1	3
1	0	1	1	0	0	1	1	0
2	1	2	0	2	1	2	1	2
2	0	4	1	0	0	4	0	4
2	0	4	2	0	0	4	2	4
2	2	3	1	3	3	3	2	3

4	0	0	0	0	0	4	1	1
4	1	4	2	2	1	4	2	4
2	1	4	2	1	1	2	2	4
4	0	4	2	2	2	4	2	4
0	0	1	1	1	1	1	1	1
2	2	1	1	1	1	2	2	2
1	1	2	2	1	1	1	1	1
1	1	3	3	0	1	0	0	3
4	1	4	0	0	1	3	1	4
2	1	4	1	0	0	3	0	4
2	2	4	2	4	0	2	2	2
0	0	2	0	0	0	2	1	2
4	0	4	0	2	2	2	2	4
1	1	4	2	0	0	4	2	4
4	0	4	3	0	0	4	1	4
4	0	4	0	4	0	4	0	4
4	0	4	0	1	0	3	1	4
2	3	2	2	2	1	3	3	2
2	1	3	2	0	0	2	1	2
2	0	4	0	0	0	0	0	3
4	0	4	1	2	0	4	2	4
2	1	4	2	2	3	4	3	4
2	1	2	1	0	0	2	2	1
4	1	4	1	1	1	1	1	1
3	0	4	0	0	0	3	0	4
2	1	2	3	2	1	2	1	2
2	1	4	1	2	1	2	1	2
1	0	4	1	0	0	1	0	1
0	0	4	2	0	0	4	4	2
4	0	4	1	0	0	4	3	4
3	1	4	2	2	2	2	3	2
2	2	4	2	0	0	4	3	2
4	2	4	2	0	2	4	2	4
0	0	2	1	0	0	2	1	1
0	4	0	4	2	4	0	4	0
0	2	1	2	3	3	2	2	2
2	2	1	2	2	2	1	1	2
0	2	0	2	0	2	0	2	0
0	0	4	0	0	0	0	0	0
0	0	1	1	0	1	2	2	2
4	2	4	1	0	2	0	1	4
1	0	4	2	0	0	1	1	2
4	0	4	0	0	0	0	0	4
4	3	4	3	4	3	2	0	2
2	1	2	2	2	2	2	2	2
2	3	2	0	0	1	2	2	2

4	0	4	0	0	0	4	0	4
4	0	4	0	0	0	0	0	0

E_IMP16	E_INF17	E_IMP17	OVER_INF	OVER_IMP	OVER_DIF	PERC_EC	DESIR_EC	ECD
1			1	1	0	1.20	2.73	1.53
1	4	0	4	1	-3	0.24	2.65	2.41
2	4	4	4	2	-2	0.35	1.82	1.47
0	4	2	4	1	-3	0.41	2.82	2.41
1	2	0	2	1	-1	1.65	2.53	0.88
1	4	3	1	2	1	1.38	2.13	0.75
0	4	3	4	0	-4	0.47	2.82	2.35
2	4	1	3	2	-1	0.88	2.35	1.47
4	4	2	3	0	-3	0.71	2.24	1.53
0	4	0	1	1	0	2.00	2.94	0.94
2	2	2	2	2	0	1.76	1.82	0.06
1	4	0	2	2	0	0.88	2.06	1.18
2	4	2	3	2	-1	0.29	2.24	1.94
1	2	2	1	1	0	2.59	3.18	0.59
2	4	2	4	2	-2	0.35	2.12	1.76
2	4	3	3	2	-1	1.35	2.35	1.00
1	4	1	4	1	-3	0.12	2.71	2.59
1	4	1	3	1	-2	0.88	2.76	1.88
0	0	0	2	0	-2	1.06	3.06	2.00
1	4	0	3	1	-2	0.65	3.59	2.94
2	4	2	2	2	0	1.06	1.82	0.76
2	2	2	2	2	0	2.00	2.00	0.00
0	4	0	4	0	-4	0.41	3.18	2.76
2	4	0	3	2	-1	1.41	2.41	1.00
0	2	2	4	0	-4	0.65	2.76	2.12
1	2	1	2	0	-2	0.71	2.12	1.41
1	4	1	4	2	-2	0.13	2.56	2.44
1	3	0	2	1	-1	0.88	2.35	1.47
1	4	0	4	1	-3	0.65	2.71	2.06
1	3	0	4	1	-3	0.71	2.88	2.18
0	4	0	4	1	-3	0.88	3.35	2.47
0	4	4	1	0	-1	1.41	2.12	0.71
1	3	1	4	1	-3	0.53	2.94	2.41
0	0	0	1	0	-1	2.53	3.24	0.71
1	1	1	3	1	-2	2.00	2.71	0.71
2	4	1	2	1	-1	0.71	2.24	1.53
2	4	2	4	2	-2	0.12	2.00	1.88
1	4	1	2	0	-2	1.53	2.53	1.00
0	0	0	2	1	-1	1.94	3.00	1.06
2	4	1	2	1	-1	1.59	2.88	1.29
0	3	3	1	1	0	2.82	3.12	0.29
0	2	0	2	0	-2	1.00	3.53	2.53
1	4	0	3	1	-2	1.00	3.18	2.18
2	4	0	2	1	-1	0.76	2.82	2.06
2	4	2	4	2	-2	0.47	1.94	1.47

1	4	1	2	4	2	1.24	3.12	1.88
2	4	3	3	2	-1	0.65	2.29	1.65
2	3	1	2	1	-1	0.88	1.69	0.81
1	4	2	4	2	-2	0.41	2.29	1.88
1	0	0	2	2	0	2.35	2.35	0.00
2	1	1	2	2	0	2.71	2.71	0.00
1	2	2	1	1	0	2.75	2.75	0.00
2	3	1	2	1	-1	2.06	2.71	0.65
2	4	2	4	0	-4	1.00	3.06	2.06
2	4	0	2	1	-1	1.82	3.29	1.47
2	4	2	2	2	0	0.94	1.82	0.88
1	2	0	2	1	-1	1.41	3.47	2.06
0	4	0	4	0	-4	0.35	3.65	3.29
2	4	0	3	0	-3	1.00	3.53	2.53
1	4	1	4	1	-3	0.53	2.88	2.35
0	4	0	4	1	-3	0.00	3.88	3.88
1	4	0	4	1	-3	0.41	2.53	2.12
3	3	0	2	2	0	1.79	2.36	0.57
1	2	1	2	2	0	1.59	2.53	0.94
0	3	0	3	0	-3	1.65	3.29	1.65
2	2	2	2	2	0	0.71	2.53	1.82
2	4	2	2	2	0	0.94	1.65	0.71
1	2	1	2	1	-1	2.18	2.18	0.00
1	1	1	4	1	-3	1.18	2.24	1.06
0	4	0	3	0	-3	0.82	4.00	3.18
1	2	1	2	2	0	2.00	1.94	-0.06
1	3	1	3	1	-2	1.29	2.82	1.53
0	4	0	3	0	-3	1.38	3.69	2.31
2	4	0	4	2	-2	1.29	2.47	1.18
2	4	0	4	1	-3	0.24	2.41	2.18
1	2	2	3	2	-1	0.94	2.12	1.18
2	4	2	3	2	-1	0.94	1.59	0.65
2	4	1	3	2	-1	0.59	2.29	1.71
1	4	0	1	1	0	2.12	3.00	0.88
4	0	4	0	4	4	3.88	0.00	-3.88
2	0	0	1	1	0	3.18	2.47	-0.71
1	1	1	1	1	0	2.35	2.12	-0.24
2	0	1	0	2	2	3.24	1.88	-1.35
0	2	1	0	0	0	1.29	3.53	2.24
2	1	0	1	0	-1	2.19	2.38	0.19
2	0	2	2	2	0	1.29	2.06	0.76
1	4	3	2	1	-1	1.71	2.35	0.65
1	4	2	4	1	-3	0.88	3.12	2.24
2	4	2	4	2	-2	0.35	1.71	1.35
2	2	2	2	1	-1	2.00	2.06	0.06
2	1	1	1	1	0	1.94	2.71	0.76

0	4	0	4	1	-3	0.53	3.59	3.06
0	3	0	1	0	-1	1.76	3.71	1.94

SQ_ECD	PERC_EC2	DESI_EC2	ECD2	TR_ECD	ECOMP1	ECOMP2	ECOMP3	ECOMP4
2.35	26	49	23	25	3	3	-3	-2
5.82	4	45	41	45	2	2	-2	2
2.16	6	31	25	25	1	2	-2	-1
5.82	7	48	41	41	2	2	-2	-2
0.78	28	43	15	17	2	4	-1	2
0.56	26	38	12	18	2	2	0	1
5.54	8	48	40	40	3	3	3	4
2.16	15	40	25	25	2	3	1	-2
2.34	12	38	26	26	1	3	-4	-1
0.88	36	51	15	21	4	4	3	3
0.00	30	31	1	1	3	3	0	2
1.38	15	35	20	20	4	4	3	1
3.77	5	38	33	33	1	4	-3	-1
0.35	44	54	10	10	4	4	-2	2
3.11	6	36	30	30	3	3	1	-1
1.00	23	40	17	17	1	3	-1	2
6.70	2	46	44	44	2	2	-1	-2
3.54	15	47	32	32	4	4	-3	-3
4.00	18	52	34	34	1	4	-1	0
8.65	11	61	50	50	4	4	-2	-2
0.58	18	31	13	17	3	3	3	3
0.00	34	34	0	0	1	1	0	1
7.64	7	54	47	47	3	2	-4	-3
1.00	24	41	17	17	2	4	1	3
4.48	11	47	36	42	4	4	-3	-4
1.99	12	36	24	24	2	2	2	0
5.94	6	45	39	39	2	3	1	-1
2.16	15	40	25	27	3	2	-3	-2
4.24	11	46	35	35	1	3	-2	-2
4.74	12	49	37	37	1	2	0	-2
6.10	15	57	42	42	3	3	-3	3
0.50	24	36	12	24	3	4	3	3
5.82	9	50	41	41	1	2	2	2
0.50	43	55	12	12	2	2	2	1
0.50	34	46	12	16	3	2	-2	-1
2.34	12	38	26	26	4	4	-3	-2
3.54	2	34	32	32	1	3	0	-1
1.00	26	43	17	29	2	3	-1	2
1.12	33	51	18	18	3	4	-3	2
1.67	27	49	22	24	2	4	3	2
0.09	48	53	5	7	2	3	4	1
6.40	17	60	43	43	3	4	3	-1
4.74	17	54	37	37	4	4	3	3
4.24	13	48	35	35	2	3	0	-1
2.16	8	33	25	25	0	2	-2	-1

3.54	21	53	32	32	4	4	-4	2
2.71	11	39	28	28	2	3	1	2
0.66	18	31	13	13	2	2	1	2
3.54	7	39	32	32	3	2	1	-1
0.00	40	40	0	0	1	2	-2	1
0.00	46	46	0	0	3	1	2	1
0.00	48	48	0	0	3	4	4	4
0.42	35	46	11	17	3	3	2	3
4.24	17	52	35	43	3	2	3	-3
2.16	31	56	25	25	2	4	0	0
0.78	16	31	15	15	3	3	3	3
4.24	24	59	35	35	3	4	-2	0
10.85	6	62	56	56	1	1	0	-2
6.40	17	60	43	43	2	3	-1	-3
5.54	9	49	40	40	2	0	-3	-4
15.07	0	66	66	66	0	1	0	-2
4.48	7	43	36	36	3	4	4	2
0.33	37	45	8	14	2			2
0.89	27	43	16	16	1	2	1	0
2.71	28	56	28	34	3	3	-1	2
3.33	12	43	31	31	2	3	-4	1
0.50	16	28	12	16	2	2	0	1
0.00	37	37	0	6	3	3	3	2
1.12	20	38	18	22	2	2	-2	-2
10.09	14	68	54	54	2	2	-1	1
0.00	34	33	-1	17	3	3	2	3
2.34	22	48	26	26	2	4	-2	-1
5.35	26	63	37	37	2	2	-1	2
1.38	22	42	20	24	1	2	1	-2
4.74	4	41	37	37	3	3	-2	2
1.38	16	36	20	22	4	0	1	1
0.42	16	27	11	11	2	2	3	2
2.91	10	39	29	33	2	3	2	2
0.78	36	51	15	15	4	0	3	2
15.07	66	0	-66	66	0	0	3	-4
0.50	54	42	-12	12	-1	-1	0	-2
0.06	40	36	-4	10	2	2	0	2
1.83	55	32	-23	29	1	3	1	2
5.00	22	60	38	38	3	3	2	2
0.04	39	42	3	7	3	4	3	2
0.58	22	35	13	25	2	2	0	2
0.42	29	40	11	17	2	4	1	0
5.00	15	53	38	38	2	2	0	-3
1.83	6	29	23	23	1	1	-4	-1
0.00	34	35	1	1	-1	1	-1	2
0.58	33	46	13	19	3	3	2	2

9.36	9	61	52	52	4	4	-2	2
3.77	30	63	33	33	4	4	3	.

ECOMP5	ENV_COMP	ESAT1	ESAT2	ESAT3	AVG_ESAT	JCOMP1	JCOMP2	JCOMP3
-1	0	-1	-1	0	-0.67	1	3	3
2	1.2	-1	-1	-2	-1.33	-2	2	2
-1	-0.2	-1	0	-2	-1.00	3	2	2
1	0.2	0	0	0	0.00	1	1	2
3	2	1	1	0	0.67	1	2	2
2	1.4	1	1	1	1.00	0	3	2
1	2.8	-1	-1	-2	-1.33	2	-3	4
-2	0.4	-1	-1	-1	-1.00	4	1	4
1	0	1	1	1	1.00	-4	-4	4
3	3.4	1	2	1	1.33	3	2	4
2	2	1	1	-1	0.33	1	4	-4
3	3	2	1	1	1.33	1	3	4
0	0.2	0	-1	-1	-0.67	3	3	2
2	2	1	-1	1	0.33			
0	1.2	1	1	1	1.00	-3	2	3
3	1.6	2	2	2	2.00	4	3	3
-1	0	-1	-1	-1	-1.00	4	-1	4
1	0.6	-2	-2	-2	-2.00	2	1	3
1	1	-1	-1	0	-0.67	-2	1	2
4	1.6	-1	-1	-1	-1.00	4	4	3
3	3	1	1	1	1.00	3	3	3
1	0.8	0	1	0	0.33	1	0	2
0	-0.4	-1	-2	-1	-1.33	2	-1	1
3	2.6	-1	1	-2	-0.67	2	1	1
3	0.8	-2	-2	-2	-2.00	3	-3	-3
2	1.6	1	-1	1	0.33	0	3	-2
2	1.4	1	0	0	0.33	0	-2	3
2	0.4	1	1	-1	0.33	3	4	3
-1	-0.2	-2	-1	-1	-1.33	-3	-3	2
0	0.2	-1	-1	0	-0.67	4	-1	4
3	1.8	-1	2	1	0.67	-1	4	3
3	3.2	2	1	0	1.00	3	4	2
2	1.8	-1	-1	-2	-1.33	2	-4	4
2	1.8	1	1	1	1.00	0	3	0
2	0.8	-1	-1	-2	-1.33	1	2	1
3	1.2	-2	-2	-2	-2.00	3	-1	4
1	0.8	-1	-1	-1	-1.00	3	2	3
2	1.6	1	1	1	1.00	-2	1	2
1	1.4	1	1	1	1.00	-2	4	4
2	2.6	1	2	1	1.33	4	2	4
3	2.6	2	2	2	2.00	3	0	4
1	2	-1	-1	-1	-1.00	-2	4	4
3	3.4	1	1	1	1.00	4	3	4
1	1	0	-1	0	-0.33	3	-2	2
0	-0.2	-1	-1	0	-0.67	2	2	2

3	1.8	1	1	1	1.00	2	3	3
2	2	1	1	1	1.00	3	1	3
2	1.8	1	1	1	1.00	-2	3	2
1	1.2	-1	0	-2	-1.00	4	2	1
1	0.6	-1	-1	-1	-1.00	-1	3	3
2	1.8	1	1	0	0.67	0	3	0
4	3.8	2	2	2	2.00	4	2	4
3	2.8	1	1	-1	0.33	4	3	3
1	1.2	-2	-2	-2	-2.00	-2	3	2
0	1.2	1	1	0	0.67	3	2	3
3	3	2	1	2	1.67	3	3	2
1	1.2	1	1	0	0.67	4	-2	4
-1	-0.2	-2	-2	-2	-2.00	-1	4	2
-2	-0.2	-1	-1	0	-0.67	3	2	0
0	-1	-2	-2	-2	-2.00	3	1	2
-1	-0.4	-2	-1	-2	-1.67	0	0	2
3	3.2	-1	-2	-1	-1.33	-4	4	3
	2	-1	-1	-2	-1.33	3	3	2
1	1	0	-1	0	-0.33	2	4	2
2	1.8	2	2	1	1.67	2	2	4
1	0.6	0	0	0	0.00	-3	3	3
1	1.2	1	1	0	0.67	2	-1	1
3	2.8	2	2	2	2.00	3	4	3
-2	-0.4	-1	-1	-1	-1.00	-3	3	3
1	1	-2	-2	-2	-2.00	-2	2	2
2	2.6	1	1	-1	0.33	4	2	3
0	0.6	0	0	-2	-0.67	2	0	2
1	1.2	1	1	1	1.00	0	-1	-1
-1	0.2	-1	0	-1	-0.67	1	2	2
3	1.8	1	0	-1	0.00	3	2	2
1	1.4	-1	-1	0	-0.67	1	3	2
2	2.2	1	1	1	1.00	3	4	3
2	2.2	1	1	1	1.00	3	4	3
3	2.4	2	2	2	2.00	-1	1	3
-2	-0.6	-1	-1	1	-0.33	0	-2	0
0	-0.8	-1	-2	-1	-1.33	-1	2	1
2	1.6	-1	1	-1	-0.33	2	3	4
2	1.8	2	1	1	1.33	-1	1	1
3	2.6	1	1	1	1.00	1	3	3
2	2.8	1	1	1	1.00	1	3	2
2	1.6	-1	-1	-2	-1.33	-2	-2	-1
2	1.8	0	-1	0	-0.33	1	4	2
1	0.4	-2	-2	-2	-2.00	2	1	2
-1	-0.8	0	0	2	0.67	2	4	4
-1	0	-1	0	-1	-0.67	2	-1	1
2	2.4	1	1	1	1.00	-2	3	3

3	2.2	1	1	0	0.67	4	-3	2
	3.67	-1	-2	-2	-1.67	4	-3	4

JCOMP4	JCOMP5	JCOMP6	JCOMP7	JCOMP8	JCOMP9	JCOMP10	JCOMP11	JCOMP12
-1	1	-3	1	3		3	3	4
1	2	-2	-1	2	2	2	2	2
-3	1	0	-1	4	-2	2	-1	1
-3	3	3	-1	2	-2	2	3	2
-2	2	1	-2	3	-1	2	3	0
-4	0	1	-2	3	1	2	2	3
-4	-3	-1	-4	2	-1	-3	3	-4
-2	1	3	-2	3	4	3	4	2
-4	4	1	2	4	-3	-4	4	-4
-2	4	2	-1	3	2	3	4	-3
3	1	2	4	4	4	4	2	4
-1	4	-3	2	3	-2	4	4	0
2	1	1	-2	3	4	3	3	2
			4	2	-3	-4	4	4
-4	2	-1	-2	2	1	3	3	2
-1	-1	1	-3	3	3	2	3	4
-4	-1	1	2	3	-3	4	4	4
-1	-1	1	2	2	2	2	2	4
1	-4	1	2	2	1	-3	0	1
0	-2	2	2	3	2	3	4	4
3	3	2	2	2	2	2	3	2
-3	3	2	-1	2	0	0	2	0
-1	1	1	-2	0	3	-3	4	-1
1	2	1	-2	2	0	1	3	-4
-3	-3	1	-3	-3	3	-1	4	3
-3	-1	-1	2	3	3	4	4	0
-1	-3	-1	-1	2	2	2	3	3
-4	1	2	-2	3	-3	-2	3	2
-3	1	2	-4	3	-1	-2	3	-3
-4	2	2	0	4	2	-1	4	2
-2	3	3	-3	4	3	3	3	4
2	2	3	-2	3	2	3	4	3
-3	2	2	-2	1	-2	2	3	0
-2	2	0	2	3	1	0	-2	3
1	2	0	2	1	-1	1	2	1
-4	-2	0	-3	4	-4	2	3	0
-2	-2	-1	-1	2	1	1	3	2
-4	2	-2	0	3	3	4	4	1
-3	2	-3	-2	3	-3	-4	4	3
0	2	3	-1	2	2	1	4	-2
-4	3	2	-4	-4	-1	-3	4	0
-2	2	-1	3	3	3	4	4	4
-3	2	1	-2	3	-2	4	4	4
-4	0	1	1	2	-2	-1	3	0
-2	2	0	1	2	-2	0	2	1

-2	2	1	3	4	2	0	4	4
-3	3	2	-2	1	2	-3	4	-1
2	2	-2	-1	2	2	2	3	3
-1	2	1	-1	-1	-1	0	4	-1
-1	1	2	1	1	0	2	3	3
0	2	0	-1	3	0	3	2	3
-4	2	4	4	4	1	3	4	4
2	2	1	0	3	-1	2	-2	4
3	-1	-1	-1	3	2	3	-1	2
2	2	3	-2	3	3	1	4	3
1	1	2	-3	3	2	2	2	0
-3	3	0	-1	4	0	2	4	0
1	2	0		1	1	1	2	2
-1	-3	1	-3	2	-1	3	2	3
-4	-1	0	-3	2	-3	-3	2	-2
-4	-2	2	0	1	-3	-1	3	-3
-2	3	-3	-2	4	-1	4	4	4
-1	3		-1	3	0	4	3	3
-2	3	1	2	4	-3	4	2	4
-3	2	-1	-2	3	3	2	3	4
2	2	-2	-2	2	-3	-1	2	2
0	2	0	-2	2	-1	0	1	1
2	3	3	3	3	3	4	3	4
-3	-1	-3	2	3	2	2	1	2
1	1	-1	-1	1	-1	0	1	0
-3	3	3	3	3	2	2	3	2
-3	2	2	-2	3	0	1	3	-2
0	1	-2	-1	3	1	-3	3	-4
3	2	0	-1	3	2	2	1	3
-2	3	2	-1	2	-1	2	3	2
-1	1	0	-3	2	2	2	3	3
0	2	0	-1	4	3	4	3	4
-1	3	2	-1	3	-1	1	3	-2
1	2	1	2	2	2	2	2	3
-4	-4	0	2	3	-3	3	3	2
0	2	0	2	1	0	1	1	0
-2	2	2	-2	2	0	-2	2	2
2	-1	2	-1	2	2	1	2	3
0	1	0	-1	3	1	-1	3	0
-4	-1	-2	-2	2	3	2	3	2
0	2	-2	-1	0	2	1	2	1
1	2	3	-2	3	-3	2	4	2
1	0	1	-1	1	-2	0	0	4
-1	1	0	4	4	0	4	4	4
-1	1	2	-3	2	-1	0	1	0
2	-1	2	-2	3	2	3	2	3

-4	0	1	-2	2	-4	-4	4	0
-4	-2	1	4	3	-4	1	4	-1

JCOMP13	JCOMP14	JCOMP15	JCOMP16	JOB_COMP	AMOUNT	QUALITY	DEADLINE
3	3	3	4	2.07	9	10	10
3	2	-1	2	1.13	3	4	3
2	3	2	3	1.13	9	8	9
3	2	-2	2	1.13	8	8	9
3	3	4	3	1.50	7	8	8
2	2	3	3	1.31	8	7	9
4	3	-2	2	-0.31	8	7	3
3	2	1	3	2.13	9	9	10
4	-4	-4	-4	-0.75	9	9	9
4	3	2	3	2.06	8	8	9
3	4	4	4	2.75	8	8	8
2	4	4	4	2.06	8	8	10
3	2	1	4	2.19	7	8	9
4	4	4	4	2.30	9	9	9
3	3	0	3	1.06	8	8	9
3	4	4	4	2.25	8	8	10
4	3	1	4	1.81	8	9	9
3	2	3	1	1.75	8	8	8
-2	0	2	1	0.19	6	8	8
4	4	1	3	2.56	10	9	10
3	2	3	3	2.56	8	8	9
2	1	0	0	0.69	9	8	10
2	3	-1	2	0.63	8	7	7
4	4	2	2	1.25	7	9	10
3	3	-3	3	0.06	2	3	
2	3	1	2	1.25	7	8	8
3	1	0	2	0.81	7	8	9
3	3	3	4	1.44	7	7	9
4	-2	1	1	-0.25	8	7	8
2	1	2	0	1.44	8	9	9
4	4	4	4	2.50	9	9	6
2	3	4	2	2.50	6	7	9
3	1	-1	1	0.56	7	8	9
2	2	1	2	1.06	9	9	10
2	1	1	2	1.19	8	8	9
4	2	2	3	0.81	9	9	10
3	3	3	1	1.31	8	9	8
3	3	-3	3	1.13	7	8	9
3	4	3	4	1.06	8	7	7
4	2	2	2	1.94	7	9	9
4	1	3	4	0.75	9	9	10
4	4	2	3	2.44	7	8	9
4	4	4	4	2.38	10	10	9
3	2	2	3	0.81	7	8	8
2	2	0	2	1.00	8	8	7

3	3	2	4	2.38	8	8	8
4	2	1	2	1.19	8	9	9
4	3	3	4	1.88	7	8	6
3	1	1	3	1.06	5	9	10
3	2	1	1	1.50	7	7	8
3	3	2	2	1.56	7	7	8
4	2	4	4	2.88	8	9	8
1	3	3	3	1.94	8	8	7
2	2	2	2	1.25	8	8	9
4	0	3	2	2.25	9	9	10
3	3	3	3	1.88	7	9	7
4	2	1	2	1.50	9	10	7
-1	2	2	3	1.40	9	9	9
1	1	1	4	0.94			
-1	0	-4	0	-0.69	4	6	8
4	3	3	3	0.50	7	8	5
3	4	4	4	1.81	8	8	9
3		-2		1.77	3	6	3
2	4	2	3	2.13	7	8	7
4	4	4	4	2.19	8	7	9
2	2	1	4	0.88	5	4	6
1	1	2	1	0.63	6	7	8
3	4	3	3	3.19	8	8	9
2	4	4	4	1.38	9	9	9
1	2	2	2	0.63	7	7	7
3	3	3	3	2.44	7	8	9
3	3	3	3	1.25	8	8	7
3	2	-1	0	0.00	8	8	9
2	-1	1	2	1.50	8	8	9
3	2	2	3	1.69	8	8	8
3	2	-2	3	1.31	8	8	9
4	4	4	4	2.81	7	8	9
3	2	2	3	1.69	7	9	8
3	4	0	2	1.81	7	9	9
4	0	-3	4	0.31	8	6	9
2	0	1	1	0.81	5	6	7
3	3	2	2	1.44	8	8	9
1	1	2	1	1.13	7	7	7
3	2	4	3	1.56	8	8	8
-1	1	1	2	0.75	7	9	8
3	2	2	3	0.63	7	8	8
1	-1	1	3	1.44	9	9	10
3	3	1	2	1.13	5	5	4
4	4	2	4	2.75	7	7	5
-1	0	1	2	0.31	6	6	5
4	3	2	2	1.81	8	9	8

4	2	2	4	0.50	6	7	7
4	1	-4	4	0.75	10	10	10

ERRORS	RESPONSE	CREATE	W_OTHERS	DEPEND	OVERALL	PERFORM	TURN(1)
9	10	8	9	10	9	9.38	-2
3	3	3	5	5	4	3.63	-1
7	9	8	8	10	8	8.50	1
9	9	8	9	10	9	8.75	-1
1	9	8	9	9	8	7.38	-2
7	10	9	8	10	9	8.50	-1
6	10	9	10	9	8	7.75	-1
9	10	7	8	9	9	8.88	-2
8	10	10	10	10	10	9.38	2
8	9	8	8	10	9	8.50	-2
8	9	9	9	10	9	8.63	-2
9	8	8	10	10	9	8.88	-2
7	8	5	6	9	8	7.38	-2
9	10	10	10	10	9	9.50	2
9	10	7	8	10	8	8.63	-1
8	10	9	10	10	10	9.13	-2
8	9	6	7	10	9	8.25	-1
8	8	8	8	8	8	8.00	1
6	8	10	6	8	9	7.50	2
9	10	9	9	10	10	9.50	-1
8	9	7	9	10	8	8.50	-2
8	9	7	9	10	9	8.75	1
9	10	9	6	9	8	8.13	1
7	6	8	10	9	8	8.25	-1
.	2	2	5	10	2	4.00	2
6	9	9	8	9	8	8.00	-1
9	9	7	7	9	8	8.13	2
9	9	10	9	9	9	8.63	-1
8	8	6	9	9	8	7.88	2
6	10	6	7	10	8	8.13	0
8	10	8	10	10	9	8.75	-2
7	9	8	7	9	8	7.75	-2
8	8	8	9	9	8	8.25	2
10	10	10	9	10	9	9.63	-1
9	8	7	8	9	8	8.25	0
9	10	10	10	10	9	9.63	-1
7	9	8	6	10	8	8.13	-1
9	10	6	10	10	8	8.63	-1
7	9	10	10	10	8	8.50	0
9	10	8	9	10	8	8.88	0
9	10	9	8	10	9	9.25	0
9	9	8	9	9	9	8.50	-2
9	10	9	10	10	10	9.63	-2
9	8	7	8	8	8	7.88	0
7	8	8	8	8	8	7.75	-1

9	9	8	9	10	9	8.63	-2
9	10	8	10	10	9	9.13	1
8	8	8	8	9	8	7.75	-1
9	6	7	10	10	8	8.25	-1
5	9	8	9	9	8	7.75	-2
6	8	7	8	8	8	7.38	0
9	9	9	9	9	9	8.75	1
7	9	8	9	9	8	8.13	-1
7	9	6	9	10	6	8.25	-2
8	10	8	8	10	9	9.00	0
1	9	6	9	10	8	7.25	1
9	10	10	9	10	9	9.25	-1
9	9	8	9	9	9	8.88	-2
							1
6	8	9	6	8	7	6.88	1
6	9	7	9	7	7	7.25	1
8	9	7	9	10	8	8.50	-1
6	6	7	8	8	7	5.88	-1
6	8	9	9	8	8	7.75	-2
2	9	7	6	10	8	7.25	-2
6		6	8	9	7	6.29	-1
7	8	8	6	8	7	7.25	1
7	9	8	9	9	8	8.38	-2
9	9	9	9	9	9	9.00	0
7	7	7	7	7	7	7.00	-1
8	9	9	9	9	9	8.50	-1
7	9	9	9	10	9	8.38	-2
7	9	7	7	8	8	7.88	0
7	9	6	8	9	8	8.00	-2
8	8	8	9	9	8	8.25	-1
8	9	8	8	9	8	8.38	1
6	5	9	8	9	8	7.63	-2
8	9	8	9	9	8	8.38	-2
9	9	8	9	9	9	8.63	-1
9	10	7	0	10	5	7.38	2
3	5	5	6	6	6	5.38	-1
4	8	8	10	10	8	8.13	-1
7	8	8	8	8	7	7.50	1
8	8	8	8	8	8	8.00	-1
9	10	8	8	9	9	8.50	1
7	8	7	9	10	9	8.00	-1
8	10	6	10	9	9	8.88	0
5	5	2	5	7	5	4.75	-2
	5	7	10	10	7	7.29	-2
5	6	6	7	7	7	6.00	-1
9	9	9	8	9	9	8.63	-1

7	7	6	1	5	7	5.75	2
9	10	10	9	10	10	9.75	2

TURN(2)	TURN(3)	TURN(4)	TURNOVER	ABSENT	STRESS2	JOB_SAT
-1	-1	-1	-1.25	1	2	2
0	2	2	0.75	1	3	2
-1	1	-2	-0.25	2	3	2
-1	-1	-1	-1	0	1	2
-2	-2	-2	-2	1	3	3
-2	-2	-2	-1.75	2	3	2
-2	1	0	-0.5	0	2	-2
-2	-2	-2	-2	2	2	2
-2	-2	-1	-0.75	2	2	-2
0	-2	-2	-1.5	0	1	2
-2	-2	-2	-2	0	2	3
-1	-2	-2	-1.75	2	1	3
-1	-2	-2	-1.75	2	2	2
1	1	-2	0.5	1	4	-2
-2	-2	-2	-1.75	1	2	2
-2	-2	-2	-2	2	3	2
0	2	-1	0	0	2	2
1	-2	-2	-0.5	0	2	2
2	2	-2	1	1	4	1
-2	-2	-1	-1.5	2	3	2
-1	-1	-1	-1.25	1	3	2
0	1	0	0.5	0	2	2
0	0	0	0.25	0	3	1
0	-2	1	-0.5	2	1	1
2	-2	-2	0	1	1	-2
-2	-2	-2	-1.75	4	2	2
-2	-1	-1	-0.5	2	2	1
-2	-2	-2	-1.75	0	3	-1
2	0	2	1.5	2	3	-2
-1	0	1	0	0	2	2
-1	0	1	-0.5	3	3	3
-1	-2	-2	-1.75	1	2	2
-2	-2	-2	-1	0	2	-1
-2	-1	-1	-1.25	0	1	2
0	-1	-1	-0.5	1	2	2
-2	-2	0	-1.25	0	2	2
0	-1	-1	-0.75	1	3	2
-1	-1	-1	-1	2	3	2
-2	-2	-2	-1.5	5	2	2
0	1	-2	-0.25	2	2	2
1	1	0	0.5	1	3	-1
-2	-2	-2	-2	0	1	2
-2	-2	-2	-2	1	2	2
2	1	-2	0.25	3	2	2
-2	-2	-2	-1.75	5	2	2

-2	-1	-1	-1.5	3	3	2
1	1	-1	0.5	2	2	2
0	-2	-2	-1.25	2	3	2
-2	-1	-1	-1.25	2	1	1
-2	-2	-2	-2	3	2	2
0	2	0	0.5	1	2	3
0	-2	-2	-0.75	2	3	2
-2	-2	-2	-1.75	0	2	2
-2	-2	-2	-2	2	2	2
1	0	1	0.5	3	3	2
-2	-2	-2	-1.25	11	3	2
0	0	-2	-0.75	0	3	2
-2	-2	-2	-2	2	1	3
-1	-2	-2	-1	0	3	1
2	2	-2	0.75	5	2	2
1	1	-1	0.5	0	2	-1
-2	-2	1	-1	0	2	2
-2	-2	-2	-1.75	1	2	2
-2	-2	-2	-2	0	3	2
-2	-2	-2	-2	0	2	2
-2	-2	-2	-1.75	0	1	2
1	1	1	1	0	3	2
-2	-2	-2	-2	2	3	3
0	-2	2	0	1	2	2
-1	-1	-1	-1	5	2	2
-1	-1	-1	-1	2	2	2
-1	-1	-1	-1.25	0	3	2
0	0	-2	-0.5	2	3	1
-1	-1	-1	-1.25	2	3	2
0	0	0	-0.25	1	2	2
0	-1	-2	-0.5	1	1	2
-2	-2	-2	-2	2	2	2
-2	0	0	-1	3	1	2
-1	1	-2	-0.75	2	2	2
2	0	-2	0.5	2	3	1
0	-1	-2	-1	1	3	2
-2	-2	-1	-1.5	0	2	2
0	1	1	0.75	5	3	1
-1	0	0	-0.5	1	2	3
2	-1	-2	0	2	3	2
1	0	0	0	1	3	2
1	1	-2	0	1	2	2
-2	-2	-2	-2	0	2	2
-2	-2	-2	-2	0	1	3
-1	0	-1	-0.75	1	2	1
-2	-2	1	-1			

0	2	0	1			
2	0	-2	0.5			

SAMPLE	AG	SEX\$	MARITAL	EDUCATE	JOB_TYPE	JOB_YRS	COMP_YRS	FIELD_YR
1	32	1	2	4	1	2.5	6	5
1	32	1	2	4	1	1	1	2
1	27	2	2	4	1	2.5	2.5	2.5
1	35	1	2	4	1	1.5	1.5	10
1	26	2	2	3	1	4	4	4
1	33	2	2	4	1	1.5	1.5	4.5
1	29	2	2	2	3	1	1	10
1	28	1	1	3	3	1	1.5	
1	43	2	2	2		1	1	20
1	36	2	1	1	3	1	1	13
1				2		3	3	15
1	40	1	2	3		1	18	18
1	40	2	2	3	1	1.5	11	11
1	24	1	1	3	1	1.5	3	3.5
1	23	1	1	3	1	1	1.5	2
1	27	1	1	3	1	2	2	3
1	38	2	2	1	3	1	13	8
1	25	1	1	3				
1	35	2	2	2	1	2	13	13
1	25	1	1	3	1	1	1	2.5
1	33	2	3	1	2	1	1	1
1	24	1	1	2	2	1	1	1
1	30	1	2	4	1	1	4	4
1	24	1	2	3	1	1	3	3
1	38	1	2	4	1	1	13	18
1	34	1	2	3	1	2	2	14
1	29	1	1	4	1	6	6	11
1	29	1	2	3	1	3	3	3
1	30	1	2	3	1	3	3	14
1		1	1	3				7
1		1	2	3	1	2	10	13
1	26	2	2	3	1	4	4.5	4.5
1	29	1	2	3	1	2	6	6
1	35	1	1	4	1	1	11	13
1	22	2	1	2	2	1	1	1
1	25	1	1	3	1	2	2	2
1	24	2	1	3	1	1.5	1.5	1.5
1	28	2	2	3	1	2.5	3	7
1	35	2	2	3	1	1	12	12
1	29	1	2	3	2	1	1	1
1		2	1			6	25	
1	38	2	2	3	2	3	3	14

J_INF1	J_IMP1	J_INF2	J_IMP2	J_INF3	J_IMP3	J_INF4	J_IMP4	J_INF5	J_IMP5	J_INF6
2	2	0	2	0	2	0	1	2	2	1
2	2	2	3	1	2	1	1	2	2	-2
2	3	2	3	1	3	2	2	2	3	2
2	3	2	3	2	3	1	3	2	3	1
1	1	1	1	1	1	1	1	2	2	2
2	2	1	0	1	0	2	2	0	2	1
2	2	2	2	2	2	2	2	2	2	2
2	2	2	3	1	2	1	3	2	3	0
3	2	2	2	2	2	1	1	2	2	2
2	2	1	2	1	2	1	1	2	2	2
2	3	1	2	1	2	1	2	1	2	1
2	2	2	2	2	2	1	2	2	2	2
2	1	2	1	2	1	1	2	2	2	1
2	2	2	2	2	2	3	2	2	2	2
1	1	0	0	0	0	-2	-1	1	2	0
3	2	2	2	2	2	3	2	3	1	2
3	3	3	3	3	3	2	3	2	2	2
2	3	2	3	2	3	3	3	3	3	2
3	3	3	3	3	3	3	3	3	3	3
-1	2	-1	2	-2	1	1	1	2	2	2
0	1	0	1	0	1	1	1	1	1	1
3	3	3	3	3	3	1	3	1	3	0
3	2	2	2	2	2	1	2	2	2	2
1	3	1	3	1	3	-1	1	1	3	-1
1	2	1	2	-1	2	2	1	2	1	0
2	3	2	2	2	3	2	3	3	3	3
2	3	1	2	3	3	1	3	2	3	1
3	3	3	3	3	3	2	3	3	3	3
-1	-1	0	0	-1	-1	0	2	2	2	2
2	3	2	3	1	3	1	2	2	3	2
2	2	2	2	2	2	1	2	1	2	1
2	3	3	3	2	3	-2	2	0	1	-2
3	3	2	2	2	2	2	3	3	3	3
2	1	1	1	1	1	-2	1	-1	1	-3
-3	2	-2	2	-3	3	-1	3	1	2	-2
1	3	-2	1	3	3	3	3	3	2	2
3	3	3	3	3	3	2	2	3	3	2
2	2	-1	0	1	1	2	2	2	1	2
1	2	1	2	1	2	2	2	2	2	2
1	1	0	0	0	0	2	1	2	1	2
1	0	-1	0	-1	-2	-3	-3	3	2	2
2	3	2	3	2	3	3	3	2	3	0

J_IMP6	J_INF7	J_IMP7	J_INF8	J_IMP8	J_INF9	J_IMP9	PERC_JA	DESIR_JA	JAD	SQ_JAD
1	-2	0	1	2	1	2	0.56	1.56	1.00	1.00
-1	-2	-2	-2	-2	0	0	0.22	0.56	0.33	0.11
3	1	3	2	3	2	3	1.78	2.89	1.11	1.23
3	0	0	1	2	2	3	1.44	2.56	1.11	1.23
2	.	.	1	1	1	1	1.25	1.25	0.00	0.00
1	1	.	1	2	1	2	1.11	1.38	0.26	0.07
2	2	2	2	2	2	2	2.00	2.00	0.00	0.00
2	2	1	-2	2	1	2	1.00	2.22	1.22	1.49
1	0	0	0	0	0	0	1.33	1.11	-0.22	0.05
2	2	2	1	1	1	1	1.44	1.67	0.22	0.05
2	1	2	1	2	1	2	1.11	2.11	1.00	1.00
2	0	1	1	2	2	2	1.56	1.89	0.33	0.11
2	2	1	2	2	1	2	1.67	1.56	-0.11	0.01
2	0	0	2	1	2	2	1.89	1.67	-0.22	0.05
0	-2	-2	0	0	0	0	-0.22	0.00	0.22	0.05
2	2	0	-1	0	1	0	1.89	1.22	-0.67	0.44
2	2	2	2	2	3	3	2.44	2.56	0.11	0.01
3	-2	3	2	2	1	2	1.67	2.78	1.11	1.23
3	0	0	1	2	2	2	2.33	2.44	0.11	0.01
2	2	2	2	2	2	2	0.78	1.78	1.00	1.00
1	3	2	2	2	2	2	1.11	1.33	0.22	0.05
3	-2	3	3	3	3	3	1.67	3.00	1.33	1.78
2	0	0	1	2	3	3	1.78	1.89	0.11	0.01
3	1	1	1	2	1	2	0.56	2.33	1.78	3.16
-1	-2	0	0	0	-1	2	0.22	1.00	0.78	0.60
2	2	3	3	3	3	3	2.44	2.78	0.33	0.11
2	-2	0	-2	-1	-1	0	0.56	1.67	1.11	1.23
3	2	0	1	2	1	2	2.33	2.44	0.11	0.01
2	1	0	0	0	0	0	0.33	0.44	0.11	0.01
3	1	2	2	3	1	3	1.56	2.78	1.22	1.49
2	1	2	1	2	1	2	1.33	2.00	0.67	0.44
2	-2	3	-1	2	-1	3	-0.11	2.44	2.56	6.53
3	1	2	2	3	2	3	2.22	2.67	0.44	0.20
0	-1	1	0	1	2	3	-0.11	1.11	1.22	1.49
1	1	2	-3	1	-3	2	-1.67	2.00	3.67	13.44
1	2	1	1	1	1	2	1.56	1.89	0.33	0.11
3	3	3	2	2	2	3	2.56	2.78	0.22	0.05
1	1	0	2	2	2	1	1.44	1.11	-0.33	0.11
2	1	2	1	2	2	2	1.44	2.00	0.56	0.31
1	1	1	2	2	1	2	1.22	1.00	-0.22	0.05
2	0	0	2	2	2	2	0.56	0.33	-0.22	0.05
0	2	2	3	3	3	3	2.11	2.56	0.44	0.20

PERC_JA2	DESI_JA2	JAD2	TR_JAD2	E_INF1	E_IMP1	E_INF2	E_IMP2	E_INF3
5	14	9	9	4	4	4	4	4
2	5	3	3	2	4	2	2	2
16	26	10	10	2	0	2	0	2
13	23	10	10	1	3	1	2	1
10	10	0	0	4	3	4	3	4
10	11	1	7	3	3	2	3	3
18	18	0	0	4	3	2	2	4
9	20	11	13	4	0	4	0	4
12	10	-2	2	2	2	2	2	2
13	15	2	2	2	2	1	3	1
10	19	9	9	1	1	1	1	1
14	17	3	3	4	2	4	2	4
15	14	-1	7	4	3	4	3	4
17	15	-2	2	4	2	1	1	4
-2	0	2	2	4	4	4	4	4
17	11	-6	8	4	4	4	4	4
22	23	1	1	1	1	0	0	1
15	25	10	10	4	0	0	2	4
21	22	1	1	0	1	0	1	0
7	16	9	9	4	2	4	2	4
10	12	2	4	2	1	2	1	2
15	27	12	12	2	2	2	2	2
16	17	1	3	0	0	0	0	0
5	21	16	16	4	4	2	2	4
2	9	7	13	1	2	1	2	1
22	25	3	5	2	1	2	1	2
5	15	10	10	4	3	4	3	4
21	22	1	5	4	4	4	4	4
3	4	1	3	4	4	4	3	4
14	25	11	11	4	3	4	3	4
12	18	6	6	2	2	4	4	4
-1	22	23	23	4	3	4	2	4
20	24	4	4	4	3	3	2	3
-1	10	11	13	4	3	2	1	4
-15	18	33	33	1	3	1	2	1
14	17	3	9	4	4	4	4	4
23	25	2	2	4	3	4	3	0
13	10	-3	5	2	3	2	2	2
13	18	5	5	4	1	3	2	3
11	9	-2	4	4	4	4	4	2
5	3	-2	4	4	4	0	0	0
19	23	4	4	4	3	4	3	2

E_IMP3	E_INF4	E_IMP4	E_INF5	E_IMP5	E_INF6	E_IMP6	E_INF7	E_IMP7
4	4	3	4	4	4	4	3	3
2	2	1	2	3	2	1	2	3
0	2	0	2	0	2	0	2	0
3	4	3	4	4	2	3	2	2
2	4	2	0	2	4	3	3	2
2	3	2	3	2	2	3	2	3
2	4	2	1	2	4	2	2	2
0	4	0	4	0	4	0	3	0
1	2	2	2	2	4	2	4	1
2	0	2	1	2	2	2	2	2
1	1	1	1	1	1	1	1	1
2	4	1	3	2	4	4	4	4
2	4	1	4	2	4	2	4	2
2	4	2	1	1	2	2	1	1
4	3	2	4	4	4	4	4	4
2	3	1	0	2	4	3	2	0
1	1	1	1	1	3	1	2	1
2	4	2	0	2	4	3	3	0
1	4	3	4	3	4	3	2	1
2	4	1	4	4	4	4	3	1
1	4	3	2	1	4	3	4	3
2	2	2	0	0	2	2	0	0
0	2	2	4	3	2	2	1	0
3	4	3	1	3	4	4	3	2
2	4	3	2	3	4	3	2	2
0	2	0	1	1	2	2	1	0
2	4	2	4	3	4	2	2	0
4	4	2	0	0	4	4	4	4
4	4	4	4	4	4	4	4	4
3	4	3	2	2	4	3	2	2
4	2	2	4	4	4	4	3	3
1	4	1	2	3	4	2	4	0
0	3	2	3	3	4	3	3	1
3	3	1	2	0	4	2	3	2
1	4	1	1	1	2	2	1	0
4	4	4	4	4	4	4	2	1
0	4	4	0	0	4	4	0	0
3	2	3	1	2	2	2	1	2
1	4	3	2	0	4	2	4	2
2	4	3	4	4	4	4	4	2
0	0	1	3	0	3	1	4	1
2	4	3	0	0	4	3	2	2

E_INF8	E_IMP8	E_INF9	E_IMP9	E_INF10	E_IMP10	E_INF11	E_IMP11	E_INF12
2	3	4	4	4	1	4	4	4
0	0	4	3	2	2	2	2	0
2	0	2	0	2	0	2	0	2
2	3	4	4	2	1	4	2	0
1	2	4	4	4	3	.	.	3
3	3	2	3	3	3	3	3	2
0	0	4	3	4	2	0	3	4
2	0	4	0	4	0	4	0	4
4	1	4	4	2	2	2	1	4
2	2	4	3	4	3	2	2	2
1	1	1	1	1	1	1	1	2
2	1	4	4	4	1	4	4	1
3	2	4	2	4	3	4	2	4
3	2	4	3	4	3	4	3	3
2	0	4	4	4	2	4	4	4
2	1	4	3	3	2	3	2	4
2	1	3	2	2	1	2	1	1
3	1	4	3	3	2	3	2	1
0	1	4	3	4	1	4	1	4
3	3	4	4	4	2	4	4	3
4	3	4	3	2	1	2	1	2
0	0	4	4	4	2	0	0	0
0	0	4	4	4	3	4	4	2
3	2	4	4	4	2	3	4	3
0	0	4	2	4	2	.	.	4
3	1	4	2	4	1	4	1	3
2	0	4	4	4	1	0	0	4
4	4	4	4	4	1	4	4	4
4	4	4	4	4	4	4	4	4
2	2	4	3	4	1	2	0	2
4	4	4	4	2	2	3	3	2
3	0	4	4	4	1	3	2	2
3	2	4	3	4	2	2	1	4
2	2	4	2	3	0	4	2	4
2	2	4	4	3	1	2	0	2
3	2	4	4	4	4	4	4	3
4	4	4	4	2	2	0	0	4
1	2	2	3	2	2	2	2	4
2	0	4	4	4	1	4	1	4
3	3	4	4	3	3	2	3	3
0	1	3	2	4	4	4	4	4
0	0	4	3	4	2	2	2	2

E_IMP12	E_INF13	E_IMP13	E_INF14	E_IMP14	E_INF15	E_IMP15	E_INF16	E_IMP16
1	4	2	1	2	4	2	4	4
0	4	1	0	2	2	2	4	3
0	2	0	0	0	2	0	2	0
0	4	2	0	0	0	0	4	0
2	4	2	0	2	4	3	4	3
2	2	2	2	2	3	4	2	3
0	3	2	0	2	4	2	4	3
0	4	0	1	0	4	0	4	0
2	4	2	2	1	4	3	4	2
2	4	2	2	2	4	3	4	2
2	1	1	1	1	1	1	1	1
0	4	2	2	2	4	1	4	1
1	4	1	3	1	4	1	4	2
2	4	3	1	2	4	3	4	3
4	4	3	1	0	4	4	4	4
2	3	1	1	0	4	3	4	3
0	2	1	0	1	2	1	2	2
1	3	2	1	2	3	2	3	2
2	4	1	0	1	4	1	4	1
1	4	1	1	1	4	2	4	2
1	4	1	2	1	2	1	4	3
0	2	2	0	0	0	0	1	0
0	2	0	0	0	2	2	4	2
1	4	2	1	1	4	3	4	3
0	4	2	0	2	4	1	4	3
1	4	1	0	1	4	2	4	1
1	3	2	0	0	4	1	4	3
1	4	1	0	0	4	1	4	1
4	4	4	4	4	4	4	4	4
1	2	1	2	0	2	2	2	2
1	3	1	0	0	4	4	2	1
1	4	1	0	0	4	1	4	1
2	4	2	1	2	4	2	4	3
1	4	4	2	2	4	3	4	3
0	3	0	1	0	0	0	1	0
3	3	3	1	0	1	1	3	3
4	4	4	3	3	4	4	4	4
2	4	3	0	2	4	2	2	2
1	4	3	1	1	4	2	4	4
1	4	3	0	3	4	3	4	3
4	4	4	3	3	4	4	4	3
2	4	2	0	0	4	3	4	3

E_INF17	E_IMP17	OVER_INF	OVER_IMP	OVER_DIF	PERC_EC	DESIR_EC	ECD	SQ_ECD
4	4	3	3	0	0.35	0.88	0.53	0.28
2	3	2	3	1	2.00	2.00	0.00	0.00
2	0	2	0	-2	2.12	4.00	1.88	3.54
2	2	1	1	0	1.82	2.00	0.18	0.03
4	3	4	3	-1	0.81	1.44	0.63	0.39
2	3	1	3	2	1.53	1.29	-0.24	0.06
4	0	3	2	-1	1.18	2.12	0.94	0.89
4	0	4	0	-4	0.35	4.00	3.65	13.30
4	1	2	1	-1	0.94	2.18	1.24	1.53
2	1	3	2	-1	1.71	1.82	0.12	0.01
2	1	2	1	-1	2.88	2.94	0.06	0.00
4	2	4	2	-2	0.47	1.94	1.47	2.16
4	2	4	2	-2	0.12	2.12	2.00	4.00
4	3	2	2	0	0.94	1.76	0.82	0.68
4	4	4	3	-1	0.35	0.76	0.41	0.17
4	2	2	2	0	0.88	1.94	1.06	1.12
2	2	1	1	0	2.41	2.94	0.53	0.28
4	2	1	2	1	1.24	2.24	1.00	1.00
4	2	2	1	-1	1.29	2.41	1.12	1.25
4	1	3	2	-1	0.35	1.82	1.47	2.16
4	1	2	1	-1	1.06	2.29	1.24	1.53
2	4	2	2	0	2.65	2.71	0.06	0.00
4	4	2	2	0	1.94	2.47	0.53	0.28
4	3	3	2	-1	0.71	1.29	0.59	0.35
2	2	2	3	1	1.44	2.06	0.63	0.39
4	2	3	2	-1	1.29	2.94	1.65	2.71
4	4	3	2	-1	0.76	2.18	1.41	1.99
4	1	4	4	0	0.47	1.65	1.18	1.38
4	4	4	4	0	0.00	0.06	0.06	0.00
2	0	2	1	-1	1.18	2.18	1.00	1.00
2	1	2	1	-1	1.12	1.41	0.29	0.09
4	0	3	1	-2	0.59	2.65	2.06	4.24
4	2	3	2	-1	0.65	1.94	1.29	1.67
4	2	3	1	-2	0.65	2.06	1.41	1.99
2	2	1	1	0	2.18	2.88	0.71	0.50
4	1	3	3	0	0.71	1.06	0.35	0.12
4	4	1	2	1	1.12	1.24	0.12	0.01
2	3	2	3	1	1.94	1.65	-0.29	0.09
4	2	3	2	-1	0.53	2.24	1.71	2.91
4	2	4	3	-1	0.65	1.00	0.35	0.12
4	4			0	1.18	1.65	0.47	0.22
4	2	2	2	0	1.18	1.94	0.76	0.58

PERC_EC2	DESI_EC2	ECD2	TR_ECD2	ECOMP1	ECOMP2	ECOMP3	ECOMP4	ECOMP5
6	15	9	13	1	1	0	-1	0
34	34	0	14	1	2	-1	2	1
36	68	32	32	2	2	-2	2	2
31	34	3	17	3	3	0	3	3
17	27	10	20	2	3		0	0
26	22	-4	10	-1	0	0	0	0
20	36	16	28	2	2	2	2	2
6	68	62	62	1	2	2	2	2
16	37	21	21	1	-1	1	2	2
29	31	2	14	1	2	0	1	2
49	50	1	1	2	2	1	1	2
8	33	25	25	2	3	2	2	2
2	36	34	34	1	1	-1	1	1
16	30	14	16	2	2	1	2	2
6	13	7	7	1	2	2	2	2
15	33	18	22	0	-2	-2	-2	-1
41	50	9	11	2	3	2	2	2
21	38	17	27	2	3	2	-3	0
22	41	19	29	3	4	2	3	3
6	31	25	25	2	3	1	2	2
18	39	21	21	2	3	2	2	2
45	46	1	5	3	3	4	4	4
33	42	9	9	1	2	0	2	2
12	22	10	16	-1	3	0	1	1
27	37	10	22	2	2	2	1	1
22	50	28	30	2	2	-3	3	2
13	37	24	24	3	4	1	2	2
8	28	20	20	2	0	-2	0	0
0	1	1	1	4	4	-2	3	3
20	37	17	17	2	2	0	1	2
19	24	5	5	1	2	2	1	2
10	45	35	37	2	2	0	-1	2
11	33	22	24	2	3	2	0	2
11	35	24	24	1	1	0	1	0
37	49	12	18	1	2	-2	2	2
12	18	6	6	4	4	4	1	3
19	21	2	2	2	2	3	2	3
33	28	-5	15	0	4	0	4	4
9	38	29	29	2	2	2	2	2
11	17	6	14	1	2	1	2	2
20	28	8	12	4	0	4	2	2
20	33	13	13	3	3	1	3	3

ENV_COMP	ESAT1	ESAT2	ESAT3	AVG_ESAT	JCOMP1	JCOMP2	JCOMP3	JCOMP4
0.20	1	0	-1	0.00	3	4	3	2
1.00	2	2	1	1.67	2	1	2	1
1.20	1	1	0	0.67	2	-1	1	-1
2.40	1	1	0	0.67	2	0	2	-2
1.25	0	0	-1	-0.33	2	1	-1	2
-0.20	1	0	0	0.33	0	1	1	2
2.00	1	1	1	1.00	0	2	2	-1
1.80	1	1	1	1.00	1	1	-1	-1
1.00	1	1	1	1.00	-2	2	-2	0
1.20	0	0	0	0.00	0	3	2	0
1.60	1	1	1	1.00	-2	0	2	1
2.20	1	1	1	1.00	3	3	3	3
0.60	1	1	1	1.00	1	1	2	-1
1.80	1	1	1	1.00	1	1	2	-2
1.80	0	0	0	0.00	-3	0	-2	1
-1.40	1	1	1	1.00	-2	-2	2	-1
2.20	1	1	1	1.00	-2	4	3	3
0.80	1	-1	0	0.00	-2	1	2	-3
3.00	2	2	2	2.00	3	3	3	2
2.00	-1	0	-1	-0.67	-3	1	-1	2
2.20	0	0	0	0.00	-3	3	2	2
3.60	2	2	2	2.00	-2	2	4	-4
1.40	0	1	0	0.33	-1	2	0	2
0.80	1	1	1	1.00	1	-1	2	-1
1.60	0	1	1	0.67	-2	3	2	1
1.20	1	1	2	1.33	2	1	2	-3
2.40	1	0	0	0.33	-1	-3	1	-3
0.00	-1	-1	-2	-1.33	2	3	2	4
2.40	0	0	0	0.00	1	-3	3	-4
1.40	0	0	-1	-0.33	0	-1	1	-1
1.60	1	1	0	0.67	3	0	0	0
1.00	1	1	0	0.67	2	-2	-2	-3
1.80	1	1	2	1.33	4	3	2	3
0.60	0	0	-1	-0.33	4	3	1	1
1.00	1	2	-1	0.67	3	1	2	-1
3.20	0	1	1	0.67	2	2	-1	1
2.40	2	1	0	1.00	0	3	3	-2
2.40	1	1	0	0.67	2	4	3	-1
2.00	1	0	0	0.33	2	-3	1	0
1.60	1	2	1	1.33	-3	2	1	0
2.40	1	1	1	1.00	-4	4	-4	-1
2.60	1	1	1	1.00	1	2	3	3

JCOMP5	JCOMP6	JCOMP7	JCOMP8	JCOMP9	JCOMP10	JCOMP11	JCOMP12	JCOMP13
2	2	-1	3	0	2	3	3	3
2	3	1	2	2	2	3	-3	4
1	2	1	1	-1	1	2	-3	4
2	2	1	-1	1	-1	3	-4	4
1	1	-1	2		-1	3	1	1
2	1	0	2	0	2	1	0	2
-1	0	-1	2	0	0	-1	2	4
0	0	2	2	-1	0	2	2	2
2	0	-2	2	0	-1	-1	1	-1
2	0	-1	2	-3	-1	2	2	1
2	2	0	2	0	1	2	1	2
2	1	2	3	2	3	3	3	3
-1	-1	2	1	-3	-3	3	0	2
2	0	0	2	1	-2	1	1	-2
1	-3	-2	3	2	-1	1	0	-1
2	1	3	-3	0	0	2	2	4
-2	3	-1	3	3		3	-3	2
-1	0	-3	1	1	0	3	0	3
2	2	3	3	2	2	4	2	4
1	-2	-1	-2	1	-1	2	-2	1
2	0	-1	2	2	2	2	2	-2
0	3	4	4	4	0	4	4	1
2	0	2	2	2	2	2	0	2
1	2	-2	2	-1	2	3	-1	3
2	0	1	2	1	3	3	-2	3
3	2	-2	1	-3	-2	3	-2	4
-2	0	-2	-1	2	-3	3	-4	3
3	2	-3	3	3	3	3	-3	3
3	3	4	4	-2	0	2	-3	2
-1	-1	-2	1	1	0	0	0	2
1	2	3	0	0	0	3	0	4
-2	1	-3	4	-2	2	3	0	4
3	2	1	3	2	3	3	2	2
0	2	-2	3	1	1	3	-2	3
1	1	-1	-1	-1	1	1	0	2
0	0	-1	0	3	0	4	0	3
3	1	3	2	1	-1	2	2	4
2	1	-2	3	0	1	3	3	4
-2	0	-3	3	1	3	2	2	2
1	-1	-2	2	0	0	-1	-1	2
3	-3		4	0	-2	-1	3	-2
-2	0	-1	3	2	2	-1	3	-1

JCOMP14	JCOMP15	JCOMP16	JOB_COMP	AMOUNT	QUALITY	DEADLINE	ERRORS
3	3	3	2.38	8	9	8	6
2	2	3	1.81	8	8	6	9
3	3	4	1.19	7	7	9	7
0	1	0	0.63	8	8	7	8
2	2	2	1.13	6	7	7	6
2	1	0	1.06	8	8	7	6
2	1	2	0.81	8	8	8	8
2	-3	2	0.63	8	8	9	7
2	1	2	0.19	7	9	8	7
2	3	3	1.06	7	8	7	7
2	0	2	1.06	8	7	9	8
4	4	4	2.88	7	7	7	7
2	3	3	0.69	7	8	6	5
2	1	2	0.63	8	7	9	7
0	-3	1	-0.38	5	5	10	6
3	3	2	1.00	7	9	7	2
3	3	3	1.67	9	9	10	9
2	1	2	0.44	8	9	8	5
2	2	3	2.63	8	9	9	9
2	1	2	0.06	7	8	7	7
0	0	2	0.94	7	8	8	7
4	4	4	2.25	7	7	6	9
2	1	3	1.44	8	8	8	4
1	2	-1	0.75	7	7	8	7
2	2	2	1.44	7	8	7	5
2	3	2	0.81	8	9	9	9
4	3	3	0.00	4	6	7	7
3	4	3	2.19	8	9	6	9
4	4	4	1.38	9	9	9	9
-1	3	1	0.13	5	7	3	4
3	-1	3	1.31	7	8	8	2
-3	4	4	0.44	7	8	7	7
1	3	4	2.56	8	9	9	7
2	0	2	1.38	7	7	5	8
3	3	2	1.00	7	8	7	7
4	3	4	1.50	6	9	8	9
3	2	1	1.69	8	9	9	8
1	1	1	1.63	8	8	8	8
2	1	2	0.81	6	9	7	8
2	1	2	0.31	8	7	7	6
2	-4	3	-0.13	9	10	9	
2	4	3	1.44	7	8	6	7

RESPONSE	CREATE	W_OTHERS	DEPEND	OVERALL	PERFORM	TURN(1)	TURN(2)
8	6	9	9	8	7.88	-1	1
9	9	9	9	8	8.38	-1	-1
7	6	5	10	7	7.25	-1	-1
8	8	8	8	8	7.88	0	0
8	6	9	7	7	7.00	-2	-2
9	7	9	9	8	7.88	-1	-1
7	8	10	8	8	8.13	-2	-2
8	8	10	10	8	8.50	-1	0
8	8	9	10	8	8.25	-2	-2
8	9	9	9	8	8.00	-2	-2
8	7	8	9	8	8.00	-2	-1
8	6	9	10	8	7.63	0	-2
8	7	9	8	7	7.25	1	1
9	8	10	10	8	8.50	-1	-1
9	4	10	10	7	7.38	-1	-1
8	6	9	9	8	7.13	2	2
9	9	9	10	9	9.25	-2	-2
10	6	8	9	8	7.88	0	1
8	6	9	9	9	8.38	-2	-2
7	4	8	7	7	6.88	-1	-1
7	5	9	9	8	7.50	-2	-2
8	9	10	7	8	7.88	0	-2
7	8	9	8	8	7.50	-1	-1
6	6	9	8	7	7.25	-2	-1
7	8	7	8	7	7.13	-2	-1
9	8	10	10	9	9.00	-2	0
9	7	9	7	7	7.00	1	0
8	8	9	9	9	8.25	-1	0
9	5	9	5	8	8.00	0	1
7	7	9	9	7	6.38	-1	-1
7	8	9	8	8	7.13	0	0
9	7	9	9	8	7.88	0	1
8	8	9	8	8	8.25	-2	-1
9	5	9	9	8	7.38	-1	0
6	4	8	6	7	6.63	-2	-2
10	7	10	8	7	8.38	0	0
9	10	9	9	9	8.88	-2	-2
9	7	10	8	8	8.25	-2	-2
9	8	7	8	8	7.75	-2	0
7	7	9	9	8	7.50	-2	-2
9		9	10		9.33	0	-2
9	9	10	8	8	8.00	0	-1

TURN(3)	TURN(4)	TURNOVER	ABSENT	STRESS2	JOB_SAT
-1	-1	-0.50	1	2	2
0	1	-0.25	4	2	1
0	-1	-0.75	1	2	-1
0	0	0.00	3	2	1
-1	-1	-1.50	5	2	2
-2	0	-1.00	2	2	2
-2	0	-1.50		2	2
-1	0	-0.50	3	2	2
-2	-1	-1.75	1	2	2
-2	-2	-2.00	0	1	2
0	0	-0.75	3	2	2
-1	-2	-1.25	0	2	2
1	1	1.00	5	2	2
1	0	-0.25	5	1	2
-1	-1	-1.00	3	1	2
0	0	1.00	2	2	2
0	1	-0.75	2	1	3
1	2	1.00	0	3	0
-1	-2	-1.75	1	3	3
1	-1	-0.50	1	1	1
-1	-1	-1.50	3	1	3
1	-2	-0.75	1	2	2
-1	-1	-1.00	1	2	2
-1	2	-0.50	1	1	1
2	-1	-0.50	0	2	2
0	0	-0.50	1	1	1
1	-2	0.00	3	3	1
-1	-2	-1.00	3	2	2
1	0	0.50	0	3	2
1	1	0.00	2	1	-1
0	-2	-0.50	14	2	-1
-2	-2	-0.75	7	4	-2
-2	-2	-1.75	1	2	2
0	-2	-0.75	1	2	2
-1	0	-1.25	2	2	2
0	-1	-0.25	0	2	2
-2	-2	-2.00	4	1	3
-2	-2	-2.00	2	2	3
0	-1	-0.75	5	3	1
-1	0	-1.25	3	0	2
-1	-1	-1.00	1	0	2
-1	-1	-0.75	3	2	2