Impact Of Work Isolation On Performance In Information Technology Area

An Empirical Examination

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ABSTRACT

To measure the effects of information technology workers' isolation on organizational commitment, job satisfaction and job performance. We used a survey questionnaire to measure the effects of worker isolation on organizational commitment, job Satisfaction and job performance. The survey was first tested for validity and then emailed to a total of 500 Information Technology employees of Fortune 500 companies in the United States. A total of 101 valid responses were received. Statistical analysis of the data acquired from the surveys was carried out through a reliability test, [illegible] and a correlation analysis. We found a statistically significant relationship between isolation and job performance. The results of our study indicate that higher organizational commitment leads to higher job satisfaction, which in turn leads to higher job performance in the case of information technology workers. This is not an exhaustive survey of all organizations in the United States and it surveyed only the opinions of Information Technology workers of selected companies. A case study may provide an in-depth analysis of the relationship between isolation and performance. Organizations should make the necessary investments to develop strategies to deal with worker isolation in the information technology arena, and should address the subsequent effects of isolation on job performance. This study provides valuable empirical evidence in the design and implementation of competitive strategies and in deciding dimensions of job performance measurement.

INTRODUCTION

Many authors have addressed isolation and its elements, including but not limited to: Caldwell (1997), Pedersen (1997), Taha and Caldwell (1993), Diekemma (1992), Rook (1984), Rokach (1997), Miller (1975), and Seeman (1975). This list is according to Vega and Brennan (2000), who created a consolidated list of organizational factors relating to the elements of isolation from the aforementioned authors. Vega and Brennan (2000) also suggest that social isolation has been used as a tool to control behavior and offer a historical account of isolation through literature from the Middle Ages to the modern electronic workplace. Distinctions are also made between real and perceived isolation (Kurland & Cooper, 2002 and Connaughten & Daly, 2004) and social and professional isolation (Kurland & Cooper, 2002).

This study pursues the examination of the relationship and correlation between isolation and its potential effects, rather than elements. These effects namely are organizational commitment, job satisfaction, and job performance. Many of the factors that drive isolation are related to off-site employment (Vega and Brennan, 2000), a job attribute, among others, that can be frequently used in the information technology (IT) occupation. Hence our desire to segment our sample by that occupation. By choosing a sample pre-disposed to many of the elements and drivers of isolation, the relationship between isolation and its potential effects should be heightened.

Worker Isolation and Organizational Commitment

Literature on the topic suggests that worker isolation and organizational commitment are related. Gainey, Kelley and Hill (1999) argue that the potential effects of isolation for an employee include effects on an "individuals' levels of comfort, turnover, satisfaction and commitment". The overall correlation that should be expected between isolation and an individual's "attitudes and behaviors" is negative (Gainey, Kelley & Hill, 1999), with attitudes effecting commitment (as well as satisfaction) and behaviors effecting performance. Mann, Varey and Button (2000) also argue that the outcome of an individual working in an environment with limited face-to-face contact and reduced intimacy (isolation) is diminished loyalty to peers and firm.

Hart, Miller and Johnson (2003) suggest that reducing isolation within a work unit through supervisory facilitation or interaction will increase an employee's commitment to the firm. Wiesenfeld, Raghuram and Garud (2001) found that the perception of "work-based social support" was a "significant predictor of virtual workers' strength of organizational identification." In other words, the less isolated an employee felt from others, the stronger they identified, and were potentially committed to, the firm. Turnover intentions were found to be inversely correlated to organizational commitment (Jaramillo, Nixon & Sams, 2005) and professional interaction (Mason, Chang and Griffin, 2005).

Ward and Shabha (2001), addressing the social and psychological factors involved in tele-working, suggest that the lack of a consistent means of feedback and interaction, both aspects of isolation, may leave employees feeling less committed to their company. Identifying with an individual's leader can be seen as a necessary element to avoid worker isolation. When such identification is present, according to Connaughten and Daly (2004), an employee is more committed to the organization (citing Sass & Canary, 1991), less likely to leave the organization (citing Mael & Ashforth, 1995; Saks & Ashforth, 1997 and Scott et al. 1999a), and "likely to behave in ways that are aligned with the organization's identity, interests, and beliefs" (Cheney, 1983a; Dutton et al., 1994; Simon, 1976; Tajfel, 1981, 1982; Tompkins & Cheney, 1985). All such effects of identification, which reduce the degree of isolation, will positively affect an individual's organizational commitment.

This study then predicts that worker isolation and organizational commitment are inversely related: where isolation increases an individual's commitment to the firm will decrease. Organizational commitment is also related to an individual's likelihood or desire to leave the firm and their acceptance of firm values.

Worker Isolation and Job Satisfaction

Literature suggests that worker isolation and job satisfaction are related. Gainey, Kelley and Hill (1999) also suggest that employee isolation potentially affects satisfaction, with a negative correlation similar to organizational commitment. Feldman and Gainey (1997) acknowledge the relationship between these two in their examination of tele-working, a work arrangement characterized by employee isolation. The authors suggest that the individual outcome variables of such non traditional work include job performance, absenteeism and turnover, organizational commitment, and job satisfaction (372 citing Baig, 1995; Connelly, 1995; Cooper, 1996 & Weiss, 1994). Talya, Bauer and Green (1998) found that manager acceptance was positively correlated to job satisfaction in new employees. This suggests that employees who are not accepted or feel that their supervisor is not accepting them, another characteristic of isolation, are less satisfied with their job. Finally, the prediction is made that worker isolation and job satisfaction are inversely related, where isolation increases, an individual's satisfaction with their job decreases.

Worker Isolation and Job Performance (Productivity)

Finally, literature on this topic also suggests that worker isolation and job performance are related. According to Kurland and Cooper (2002), the degree of employee isolation may also affect productivity. The authors argue that restricted face to face interaction (isolation) impedes trust, which can affect group synergy, thereby affecting productivity. Also, the lack of informal learning can arguably affect productivity (Kurland & Cooper, 2002 citing Argote, 1993; Kraut, Fish, Root & Chalfonte, 1990). The result is a negative correlation between isolation and performance.

Furthermore, Cooper and Kurland (2002) found that professional isolation is inextricably linked to employee growth. Such development can be necessary to maintain acceptable levels of job performance or productivity. When the factors of interpersonal networking (which is needed to advance a career), informal networking (which is needed to advance personal development), and mentoring (which is needed to advance both) are absent or in short supply, isolation increases, specifically affecting the employee's overall development (Cooper & Kurland, 2002). When isolation increases, an individual's personal development diminishes, leading to a decrease in job performance.

Mann, Varey and Button (2000) report that those who have experienced worker isolation also experience the challenge of not being able to compare oneself to other workers, which allows an employee to judge their performance against his peer. Such a loss may leave workers feeling unsure of themselves and less certain of their abilities, leading to a potential decrease in performance. Also, the authors found that an increased use of computer mediated communication, oftentimes used by isolated workers, is associated with a reduction in intimacy or in the affective bond between workers (Mann, Varey & Button, 2000). Affective bonds can be used to motivate persons in teamwork, leading to higher performance (Mann, Varey & Button, 2000). Therefore, isolated workers who use such means to communicate may be less productive or have lower performance because they are lacking the affective bonds built by teams who operate face-to-face.

This study therefore predicts that worker isolation and job performance are also inversely related, so where isolation increases, an individual's performance will decrease. The degree of correlation between the two can be driven or

mitigated in part by the strength of team synergy and employee development opportunities.

Inter-Relationship between Effects

The value of understanding the relationship between isolation and its effects lies in the inter-relationships between the effects. Organizational commitment and job satisfaction were found to be positively correlated (Talya, Bauer & Green, 1998; Jaramillo, Nixon & Sams, 2005), and job satisfaction was found to be a positively correlated predictor of performance (Talya, Bauer & Green, 1998). The literature reviewed also suggests a negative relationship between job satisfaction and turnover intention (Slattery and Selvarajan, 2005 citing Griffeth, Horn, & Gaertner, 2000; Vandenberg & Lance, 1992). Slattery and Selvarajan (2005) also suggest that their literature supports the leading view that job satisfaction precedes organizational commitment (citing Lincoln & Kalleberg, 1990; Mowday, Porter & Steers, , 1982); however, there is some support for the opposite (citing Vandenberg & Lance, 1992). Overall, the causal relationship between job satisfaction and organizational commitment remains "unresolved" (Slattery and Selvarajan, 2005).

Feldman and Gainey (1997) offer a mitigating variable to the relationship between employee isolation and the three effects under this study's examination. Feldman and Gainey (1997) propose that those who willfully select the telecommuting arrangement (and isolation) will have higher job satisfaction, higher organizational commitment, lower levels of withdrawal behavior, and higher levels of performance. Therefore, although a relationship does exist between employee isolation and job satisfaction, negative in correlation, the employee's decision, choice, or initiative to work in isolation can mitigate the effect to job satisfaction, as well as organizational commitment and job performance (Feldman & Gainey, 1997). Key to the individual's choice and therefore success in isolated work is the appropriate personality (Feldman & Gainey, 1997 & Harpaz 2002). Potentially key to the appropriate personality is an individual's need for affiliation, which is positively correlated to organizational identification (Wiesenfeld, Raghuram & Garud, 2001).

We therefore predict that employee isolation is inversely related to all three effects, organizational commitment, job satisfaction and job performance. However, we also suggest that the employee's decision to work in such an environment, driven in part by their personality, can mitigate the effects of isolation by reducing or eliminating the negative correlation in the relationship.

ETHODOLOGY

The research task of this study is an assessment of the impacts of worker isolation on organizational commitment, job performance, and job satisfaction. This study was carried out for the US manufacturing and service sector. The information necessary to test the model is unavailable from existing databases, therefore we built our own database.

Sample and Questionnaire

A questionnaire booklet was assembled containing several scales. Organizational commitment was measured using the OCQ (Mowday et al., 1982) and job satisfaction was me using the Minnesota satisfaction questionnaire (Weiss 1967). A ten item scale was used to measure Work isolation (Marshall et al., 2004). An eight item scale deve by Behrman and Perreault (1982) was used for measur performance. This scale has also been used by Low et al., Five hundred companies in the United Staes were appro with this questionnaire booklet through a mail survey. two mailings, 101 usable responses with a response 20.2% were received.

Measurement of Research Variables

Isolation

The variable isolation has been used extensively in the area psychology, economics, sociology, anthropology, politi science, philosophy, religion, and communication science well as in management and engineering technology. Isola perceptions are developed within an individual over a peri of time due to a lack of support from fellow workers supervisors. Employees in the information technology fie may feel its effects with higher intensity due to their lack social and emotional interactions at work. They spend most their time in front of a computer screen which in turn leads lack of personal contact and loss of collegiality. Most of th meetings are done through virtual chat rooms or e-mai which in turn take the feeling out of the work setti (Pisonneault & Boisvert, 2001). For this study Isolation measured based on the combination of following the criteria:

- Level of work based support and mentoring received fro the supervisors
- Level of information interactions with the colleagues a coworkers
- Level of employee recognition and belonging to company

Organizational Commitment

The most commonly used instrument to measure employe organization commitment is the Organizational Commitm Questionnaire (OCQ) developed by Mowday et al. (1982). general, the OCQ, which was used in this study, is used identify attitudinal organizational commitment as defined Mowday and Steers (1979). A study of Japanese employ found that organizational commitment could be viewed multidimensional construct, and the organizatio commitment questionnaire (OCQ) is an effective cro cultural tool for measuring organizational commitm (White et al., 1995). Therefore the organizational commitm measured here is based on the combination of three eleme i.e. strong belief and acceptance of organizational goals a values, a willingness to exert considerable effort, and a str desire to maintain membership.

Job Satisfaction

Similar to organizational commitment, job satisfaction has an attitudinal variable. Most researchers (Smith et 1969; Goris et al., 2000; Schermerhorn et al., 2001) h

nceptualized satisfaction as a multifaceted construct mprising five facets: the work itself, quality of supervision, tionships with coworkers, promotion opportunities, and ... The job satisfaction in this research is measured in terms combining four of the key facets: i.e. satisfaction with their pervisor, satisfaction with their coworkers, amount of ployee influence over their job, and the sense of nievement an employee gets from their job.

ob Performance

rformance is widely acknowledged as a multifaceted nstruct rather than a one-dimensional variable (e.g. Angle d Lawson, 1994; Kalleberg and Marsden, 1995; Somers and rnbaum, 1998). However, there is no concurrence among searchers with regard to the number and nature of these mponents. Job performance measures can be objective or bjective. Some of the subjective measures assess many spects of the job such as technical knowledge, enthusiasm at workplace, understanding of work responsibilities and anning skill (Babakus et al., 1996; Behrman and Perreault, 982). Objective measures include productivity increase, the umber of new clients generated, market share, and profit rgets (Rich et al., 1999). The current study examines a mbination of five facets of job performance namely: work nthusiasm, readiness to innovate, quality and quantity of ork, understanding of work duties, and planning skills.

easure Validation

confirmatory factor analysis (CFA) was used to investigate he measurement properties of the scales used in this paper nderson and Gerbing 1988; Diamantopoulos and Siguaw 000). The parameters of the model were estimated using the aximum likelihood method, CALIS procedure of SAS 8.0. The sulting indices suggest an acceptable fit. Evidence of nvergent validity exists when all indicator loadings (λ) are atistically significant (Diamantopoulos and Siguaw 2000). e results showed that all indicator loadings were significant α = 0.05 as indicated by t-values in excess of 1.96, thus oviding validity evidence in favor of the items used to present the constructs. As shown in Table 1, both indices ggest that the scales used are reliable (Diamantopoulos and guaw 2000). Table 1 also indicates that Cronbach's alpha is gher than 0.7 for all multiple-item measures. Criterion ated validity was also measured using canonical rrelation. Table 2 uses the approximate F-value to assess the nificance level of the canonical correlation functions. Two onical functions were extracted and both are significant at 0.05 level or less. It is therefore concluded that this set of iables have criterion-related validity.

Table 1: Overall Internal Consistency of Scales

Scale	Cronbach's Alpha
olation	0.7123
b Performance	0.8551
b Satisfaction	0.7855
rganizational Commitment	0.8163

Table 2: Significance of Canonical Function

	First Canonical Function	Second Canonical Function
Approximate F Value	6.848	2.7172
Degrees of Freedom	26.172	12.87
Level of Significance	0.0001	0.0037
Canonical Correlation	0.8173	0.5221
Redundancy Index	0.6680	0.2726

RESULTS AND ANALYSIS

In order to examine the relationship between worker isolation and job satisfaction, job performance, and organizational commitment, the worker isolation elements were regressed against the other three criteria. The general form of the model (Figure 1) is as follows:

Research Model

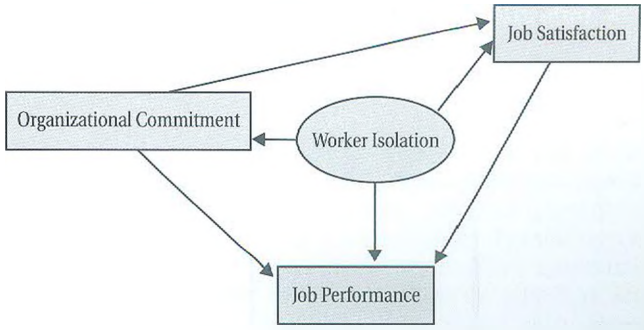


Figure 1

Level of worker isolation = f (Job Satisfaction, Job Performance, Organizational Commitment).

Table 3 presents the results of the regression procedure. The p-values indicate that only the organizational commitment is statistically significant. The findings with respect to each hypothesis are discussed below.

Table 3: Linear Regression Results

Variable	Standardized beta
Organizational Commitment	-0.487*
Job Satisfaction	-0.272
Job Performance	-0.21*

Note :* ($p<0.01$)

Organizational Commitment

The examination of the relationship between organizational commitment and worker isolation in the information technology environment reveals that it is statistically significant. The negative sign of the coefficient indicates that isolated workers are not good for the overall well-being of the organization. Lack of worker commitment may reflect on the

quality of products produced due to lack of ownership (Pateman, 1970). Employees with lack of commitment may not be giving all of themselves to the organization which in turn could lead to a group of nonconformists. This may create hurdles in terms of moving forward towards developing innovative products and services. In information technology organizations the source of competitive advantages are the cutting-edge innovations and organizational commitment is an important facet of developing a strong R & D organization.

Job Satisfaction

The results indicate a non- significant relationship between job satisfaction and isolation. The information technology workers are labeled as "loners" by many of their co-workers and this may point to why their job satisfaction is not adversely affected by working in isolation. They, by their nature, like to work in isolation and enjoy the work environment which provides independent work conditions (isolation).

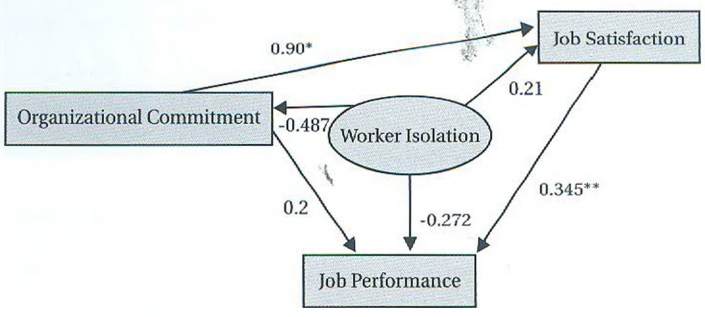
Job Performance

We found a statistically significant relationship between isolation and job performance. Some surveys have shown an average productivity increase for teleworkers ranging from 10% to as much as 40% (Loy and Butler, 2003; Butler, Aasheim & Williams, 2007). Loy pointed to the cause of the productivity gains as the lack of interruptions and travel in the office environment. They suggest that while there can be benefits to participating in office chatter, too much time around the water-cooler can often be a significant drain on productivity. Information technology workers, who work in a separate room, typically avoid this problem. They also have greater opportunities to match their work times with their peak productive periods.

Interrelationship Effects

The interrelationships between variables are shown in Figure 2. The results of this analysis indicate that job satisfaction and job performance have a statistically significant relationship. Also, organizational commitment and job satisfaction have a statistically significant relationship. The direction of this relationship in both cases is positive. This analysis implies that higher organizational commitment leads to higher job satisfaction which in turn leads to higher job performance in the case of information technology workers.

Regression Results



*(p<0.01) ** (p<0.05)

Figure 2

CONCLUSIONS

This study found negative support for the idea that worker isolation increases job performance. Vega & Brennan (2000) suggest that the presence of a feedback mechanism could reduce the feelings of isolation and help in improving job performance. In this study we did not study the presence or absence of a feedback mechanism, but this reasoning makes sense in terms of justifying our negative relationship between isolation and job performance. We found no evidence that productivity losses are an artifact of the process used to select information technology workers and little evidence to suggest that these workers negatively impact the performance of other employees. Dasgupta, Sarkis & Talluri (1999) suggest that as firms invest more in information technology there is a greater need for coordination between different activities and systems across all functional areas of the organization. This could be a possible reason for the negative impact of isolation on job performance as firms increase investment in information technology.

Some research points out that innovation has a direct bearing on performance improvements (Argote, 1999; Upton & Kim, 1999). We also found a negative relationship between worker isolation and organizational commitment. One possible rationalization for the negative relation between organizational commitment and worker isolation may lie in the current conceptualization of the commitment construct. Specifically, previous studies of commitment have a propensity to view commitment as an effective response to an employee's environment and as a behavioral intention concerning performance of the organization (Fishbein, 1967). Hence, we tend to think of highly committed employees as those who stoutly identify with the organization. Conceptually, however it may be more meaningful to distinguish between "passive" commitment and "active" commitment (Mowday and Steers, 1979). In this present study it is conceivable that the respondents experienced primarily an active form of commitment and that, for some reasons, affecting responses were translated into behavior intentions.

We found no evidence that worker isolation reduces job satisfaction. An important strength of our study is that these findings are based upon self reported data rather than secondary data. If such a view is correct, it suggests a rethinking of the current approach to the study of organizational commitment, as well as an improved effort at measuring its various facets.

This work adds to the body of research evaluating the relationship between isolation and job performance, organizational commitment, job satisfaction. Additional research should focus on evaluating the role of moderating variables such as the type of information technology environment (development, maintenance) and the presence of employee feedback mechanisms. It would also be interesting to conduct a sub group analysis between "passive" commitment and "active" commitment, as well as between personal isolation and social isolation. Additional work focusing on a longitudinal data set may provide more insight

to the effects of worker isolation in organizations. Finally, it ould be appealing to investigate the effect of worker isolation ing more advanced techniques such SEM, DEA models (such as cone-ratios), cross-efficiencies and game formulations. In summary, we recommend additional research in this critical area which has the potential to affect a firms bottom line over a period of time.

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