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Understanding the Wired Workplace: The Effects of Job Characteristics on Employees' Personal Online Communication at Work

Guowei Jian

As organizations increasingly embrace Internet technologies in daily work activities, an unintended consequence is the growing personal Internet use by employees. This study examines the association between job characteristics and a particular form of personal Internet use at work, personal online communication (POC). The study analyzes data of the 2008 Networked Workers Survey sponsored by the Pew Internet & American Life Project. The results demonstrate that job characteristics explain a large, significant portion of the variance of POC at work. The findings suggest that for jobs with high knowledge intensity, managing POC could be approached from a work-life balance perspective. The study also suggests that changes in work structure, job variety, and autonomy could have significant implications for managing POC activities in the wired workplace.

Keywords: Cyberloafing; Job Characteristics; Personal Internet Use at Work; Personal Online Communication at Work; Work Design

According to the 2008 *Networked Workers Survey* sponsored by the Pew Internet & American Life Project, 62% of employed adults in the United States use the Internet or e-mail at work. D'Urso and Pierce (2009) found that e-mail and the Internet were two most commonly used communication technologies at work. As the phenomenon continues to grow, non-work-related personal Internet use in the workplace attracts

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increased attention from both employers and scholars (Anandarajan, Paravastu, & Simmers, 2006; Garrett & Danziger, 2008; Mahatanankoon, Anandarajan, & Igbaria, 2004). According to Mahatanankoon et al. (2004), personal Internet use refers to any voluntary use of Internet in the workplace for non-work-related purposes, including, but not limited to, such activities as online shopping for personal items, checking personal e-mails, conducting personal financial investment, and so on. With a few exceptions (e.g., Anandarajan & Simmers, 2005; Oravec, 2002), personal Internet use is often treated as technology misuse and undesirable or abusive workplace behavior in both popular business literature and scholarly work. The negative connotation is easily seen in the use of such terms as cyberloafing (e.g., Lim, 2002; Lim & Teo, 2006), cyberslacking (e.g., Garrett & Danziger, 2008), and Internet deviance (e.g., Lara, 2006) when referring to personal Internet use at work. As a result, much research on such behavior has been devoted to understanding its antecedents, such as organizational justice (Lara, 2006, 2007; Lim, 2002; Lim & Teo, 2006), organizational sanctions (Henle & Blanchard, 2008; Lara et al., 2006), and stress and boredom (Henle & Blanchard, 2008). Stemming from the literature of organizational surveillance (Sewall & Barker, 2006), another line of research has explored the theoretical mechanism of workplace electronic surveillance and its panoptic effects (Botan, 1996; D'Urso, 2006), and privacy expectations and management by organizational members (Allen, Walker, Coopman, & Hart, 2007; Snyder & Cistulli, 2011).

By contrast to the existing literature, the present study argues that personal Internet use may not be intrinsically negative. Instead, joining Anandarajan and Simmers (2005), we argue that the behavior may partly result from the incompatibility between conventional values and practices regarding work design and the reality of an increasingly wired workplace. To further our understanding in this regard, the present study intends to explore the effects of job characteristics on one particular type of personal Internet use, personal online communication (POC) at work, which refers to communication directed to members in their non-work-related interpersonal relationships, mostly friends and family members, through e-mail, text messaging, instant messaging, and social media sites.

Job Characteristics and POC

Studies of job characteristics have evolved over the years in the past few decades along with the continuing transformation of the workplace (Fried & Ferris, 1987; Morgeson & Humphrey, 2006; Parker, Wall, & Cordery, 2001). Two recent developments that have gained growing scholarly attention are the rise of knowledge work and team-based work. Since the late 20th century, scholars have noticed the rise of knowledge-intensive work and knowledge as a key ingredient of work (Alvesson, 1995, 2001, 2004; Blacker, 1995; Nonaka, 1994). Although defining work knowledge has been a contentious issue (Alvesson 2001; Blacker 1995), the conceptual model offered by Frenkel, Korczynski, Donoghue, and Shire (1995) proves useful to delineate knowledge intensity as a job characteristic. Their model comprises three dimensions: knowledge, skill, and creativity. The Frenkel et al. (1995) model suggests

that work of low knowledge intensity tends to be routine, depends on contextual knowledge, and requires minimum amount of reasoning skills, whereas work of high knowledge intensity is more likely to involve abstract knowledge, creative problem solving, and complex reasoning. Empirical research on knowledge-intensive work has shown that work–life boundaries tend to be blurred for employees doing knowledge-intensive work (Scholarios & Marks, 2004) in contrast to those with routine work. For example, research by Huang and Lin (2009) found that knowledge-intensive workers tend not to consciously differentiate work-related e-mails from personal ones and most participants handled personal e-mails during work time. Woolley (2009) argued that the emphasis on work outcome rather than process is more effective in performance evaluation of knowledge-intensive work than that of routine tasks. The emphasis on outcome instead of process allows knowledge-intensive workers to have more control over the work process. Given the blurred work–life boundary and outcome-focused nature, knowledge-intensive work potentially provides employees with more opportunities to engage in nonwork activities during work time, including POC. Hence, it is reasonable to hypothesize:

H1: Employees with higher knowledge-intensive jobs are more likely to engage in POC at work than those with less knowledge-intensive jobs.

In addition to knowledge intensity, adoption of team-based work structure is another growing trend in work design (LaFasto & Larson, 2001; Parker, Wall, & Cordery, 2001). Recent research has documented productivity gains through teamwork in comparison to tasks executed individually (DeVaro, 2008; Maxwell, 2008; Procter & Burridge, 2008; Román, 2009). Several reasons have been attributed to these positive effects of teamwork. For example, research by Mas and Moretti (2009) identified positive productivity spillover effects among team members who frequently interact with each other. Research on organizational surveillance and concertive control suggests that peer scrutiny in teams functions as team self-surveillance among members and could be more powerful in effect than the superior-to-subordinate surveillance (Barker, 1993, 1999; Sewell & Barker, 2006). Team concertive control results in reduced free riding and idle time. However, research on teams working in call centers points in the opposite direction (Townsend, 2005; van de Broek, Barnes, & Townsend, 2008). For instance, van de Broek et al. (2008) found that workers in their case study teamed up to resist managerial control and undermine managerial objectives. Their findings challenge those that support a productive view of teamwork. Team members could collectively adopt resistance behavior, such as deliberately performing POC or other non-work-related Internet activities, to undercut managerial control. Because of these conflicting findings on the effects of team structure vis-à-vis individual-based work design, a research question is proposed:

RQ1: Is work structure (individual- versus team-based) associated with one's level of POC at work?

In theories of work design, job variety refers to the extent to which a wide range of jobs an employee is assigned to perform (Morgeson & Humphrey, 2006). Job variety

has been positively associated with productivity (DeVaro & Brookshire, 2007). The main rationale is that higher job variety tends to engage workers more effectively. On the other end of the continuum, monotonous jobs tend to generate boredom. Previous research has linked boredom to media consumption. Drawing upon social cognitive theory (Bandura, 1991), it is found that dysphoric psychological states, such as boredom, trigger attempts in behavior to achieve more desirable psychological outcomes (LaRose, Lin, & Eastin, 2003). Eastin, Glynn, and Griffiths (2006) show that boredom is positively related to Internet misuse at work. It is reasonable to argue that POC at work could be a behavior triggered by job monotony to overcome boredom. Therefore, it is hypothesized:

H2: Employees with less job variety are more likely to engage in POC at work.

Like job variety, job autonomy assumes an important position in work design models (Hackman & Oldham, 1975, 1980; Morgeson & Humphrey, 2006). It refers to an employee's level of control in accomplishing his or her own job on a daily basis (Peterson, 1992). Research has shown that job autonomy significantly influences job satisfaction and job performance (DeVaro & Brookshire, 2007). Garret and Danziger (2008) found that employees with a higher level of job autonomy, however, were more likely to engage in overall personal Internet activities at work. The rationale for this finding could be that employees have more discretion in how to allot their time for activities. Therefore, it is hypothesized that:

H3: Employees with higher level of job autonomy are more likely to engage in personal online communication at work.

Methods

Data and Sample

This study is a secondary analysis based on data from the *Networked Workers Survey*, a national telephone survey sponsored by the Pew Internet & American Life Project. Princeton Survey Research International conducted the survey from March 27 to April 14, 2008. Using random-digit dialing methodology, a sample representative of the continental U.S. telephone households was obtained, including 2,134 adults. Several measures were taken to maximize contact with potential respondents. These include making as many as 10 attempts to establish contact with every sampled household and staggering calls over times of the day and days of the week. Respondents were asked their employment status at the beginning of the telephone interview. Those with full-time or part-time employment status proceeded with the full interview, while those remaining were asked a series of demographic questions for the purpose of weighing the data. The survey resulted in a contact rate of 82%, cooperation rate 33%, completion rate 89%, and the final response rate 24%. In the total sample, 1,000 were full-time or part-time adult workers. Among these adult workers, 54.2% were males and 45.8% females with an average age of 41.15 years, ranging from 18 to 88. Their racial distributions were 78.1% Whites, 12.3% Blacks,

and 2.9% Asians or Pacific Islanders, while 9.4% of the workers self-identified as Hispanic or of Latino origin or descent. Their educational level ranged from high school incomplete (6.9%) and high school graduate (26.5%) to some college (26.5%), college graduate (20.6%), and postgraduate after college (14.2%).

Instruments

Outcome Variable. A review of existing research on cyberloafing indicates e-mailing, instant messaging, and texting are common POC activities (Garrett & Danziger, 2008; Henle & Blanchard, 2008). In recent year, social networking sites have grown to be popular channels of communication. Therefore, to measure POC, four items were included. Respondents were asked, “While you are at work, how often do you (a) check personal email, (b) send instant messages to friends or family, (c) send text messages to friends or family, and (d) communicate with friends or family using social networking sites?” A 7-point scale was used, with 1 being *constantly*, 2 *several times an hour*, 3 *several times a day*, 4 *about once a day*, 5 *every few days*, 6 *less often*, and 7 *never*. To ease interpretation, the scale was reverse coded. A summated scale was constructed to measure POC with values ranging from 4 to 28 ($M=10.37$, $SD=5.24$, $\alpha=.64$). Because this is an exploratory measure of POC, its reliability level is considered acceptable.

Predictor Variables. The predictor variables are the four job characteristics as discussed earlier, namely, knowledge intensity, work structure (team-based vs. individual work), job variety, and job autonomy. To measure knowledge intensity, following the Frenkel et al. (1995) conceptualization, three items were used, including knowledge (“my job requires abstract knowledge about the ideas behind my work”), creativity (“my job requires creativity”), and skill (“my job requires a high level of skill”). A Likert scale was employed, from 1 *being strongly agree* to 5 *being strongly disagree*. For interpretation purposes, the scales were reverse coded for analysis. Using these three items, a summated scale for knowledge intensity was constructed with values ranging from 3 to 15 ($M=11.36$, $SD=3.22$, $\alpha=.75$).

To measure *work structure* ($M=2.30$, $SD=2.92$), the respondent was asked, “In some organizations, you may work mostly by yourself . . . or you may work as a member of the same group of colleagues all the time . . . , or you may be part of several work groups . . . on different projects or tasks. Thinking about the past month, how many work groups were you a member of, if any?” Because our intention is to test whether the difference in work structure, that is, individual- versus team-based, regardless of the number of teams with which one is affiliated, is associated with one’s POC at work, the continuous work structure measure was recoded into a binary measure in which 0 indicates working individually (31.4%) and 1 indicates working in teams (68.6%).

To measure *job variety* and *job autonomy*, modified items from Hackman and Oldham’s (1980) Job Diagnostic Survey were used. For job variety ($M=2.46$, $SD=1.41$), one item was used, “my job requires that I do the same things over

and over.” A Likert scale was used ranging from 1 being *strongly agree* to 5 being *strongly disagree*. *Job autonomy* ($M = 3.71$, $SD = 1.33$) was measured by one item, “I have a lot to say about what happens in my job”. A Likert scale was used ranging from 1 being *strongly agree* to 5 being *strongly disagree*. It was reverse coded for analysis.

Control Variables. Existing literature on personal Internet usage at work suggests that variables that could have potential confounding effects on the hypothesized relationships include age, gender, job tenure, and Internet and e-mail access at work (Garrett & Danziger, 2008; Henle & Blanchard, 2008; Lara, 2007). These four variables were included in the analysis to control for their potential confounding effects.

Data Analysis

First, descriptive and correlational statistics were examined. Second, hierarchical regression analyses with two steps were performed to test the hypotheses and research question. The control variables were entered first, followed by the four predictor variables. A check of redundancy among predictor variables was conducted based on multicollinearity statistics. To correct biases that may result from nonresponses, the statistical analyses were weighted to match national demographic characteristics of the national population based on the U.S. Census Bureau’s 2006 Annual Social and Economic Supplement (ASES).¹

Results

Descriptive statistics and correlation matrix were calculated and are presented in Table 1. Hierarchical regression analyses were conducted to test the hypotheses and research question with results presented in Table 2. It needs to be mentioned first that after checking multicollinearity statistics, the variance inflation factors for all the predictor variables are well below 10 (Hair, Anderson, Tatham, & Black, 1998), ranging from 1.04 to 1.56. Therefore, redundancy among predictor variables did not cause concern. However, it is notable that the beta regression coefficients for knowledge intensity, work structure, and job variety are larger than their respective zero-order correlation coefficients with POC, indicating potential suppression effects among predictor variables. Therefore, according to Cohen and Cohen (1983), the beta regression coefficients are more appropriate indicators than zero-order correlation coefficients when interpreting their predictive relationships with the outcome variable. Step 1 of the hierarchical analysis indicated that the control variables accounted for 15% of variance in POC ($\Delta F = 21.15$, $p < .001$). In Step 2, results demonstrated that the four job characteristics together explained an additional 25% of variance controlling for the effects of the confounding variables ($\Delta F = 49.75$, $p < .001$). All four variables, including knowledge intensity ($\beta = .39$, $p < .001$), work structure ($\beta = -.22$, $p < .001$), job variety ($\beta = -.18$, $p < .001$), and job autonomy ($\beta = .21$, $p < .001$), are significant predictors of POC at work.

Table 1 Descriptive Statistics and Zero-Order Correlation Matrix (Pearson's Coefficient, r)

Variables	Mean	Std. deviation	1	2	3	4	5	6	7	8	9
1. Sex	1.46	.50	1								
2. Age	41.15	12.81	.028	1							
3. Tenure	8.94	9.44	-.097(**)	.501(**)	1						
4. Internet and e-mail access at work	3.75	2.03	.004	.072(**)	.066(**)	1					
5. Knowledge intensity	11.36	3.22	-.023	.134(**)	.130(**)	.218(**)	1				
6. Work structure	2.30	2.92	-.013	.029	.029	.203(**)	.193(**)	1			
7. Job variety	2.46	1.41	-.022	.101(**)	.085(**)	.201(**)	.111(**)	.205(**)	1		
8. Job autonomy	3.71	1.33	-.042(*)	.029	.067(**)	.130(**)	.436(**)	.085(**)	.079(**)	1	
9. POC	10.37	5.24	-.094(*)	-.108(*)	-.173(**)	.318(**)	.319(**)	-.119(**)	-.069	.260(**)	1

Note. POC, personal online communication at work; ** correlation is significant at the .01 level (two-tailed); * correlation is significant at the .05 level (two-tailed).

Table 2 Regressing Job Characteristics on Personal Online Communication at Work

	Personal online communication (POC) at work			
	Step 1		Step 2	
	B (std. error)	β	B (std. error)	β
Control				
Sex	-.89 (.46)	-.08	-1.24 (.39)	-.12**
Age	-.09 (.03)	-.17**	-.10 (.02)	-.20***
Tenure	-.13 (.05)	-.13*	-.12 (.04)	-.12**
Internet and e-mail access at work	.98 (.12)	.36***	.85 (.11)	.31***
Job characteristics				
Knowledge intensity			.67 (.07)	.39***
Work structure			-2.67 (.47)	-.22***
Job variety			-.75 (.17)	-.18***
Job autonomy			.90 (.17)	.21***
Adj. R^2	.15		.39	
ΔR^2	.15		.25	
ΔF	21.15***		49.75***	
<i>df</i>	4, 472		4, 468	

Note. Significance indicated by: * $p < .05$; ** $p < .01$; *** $p < .001$.

These results supported Hypotheses 1, 2, and 3. For RQ1, the results indicated that team-based work is associated with lower levels of POC at work than individual-based work.

Discussion

As Internet technologies are increasingly adopted in the workplace, an unintended consequence is employees' personal Internet use at work. To design effective strategies and policies to manage Internet use at work, it is necessary to understand the factors that are associated with such behavior. From a work design perspective, this study seeks to examine the influence of job characteristics on POC, a specific form of personal Internet use at work. A secondary analysis was performed on data of a national survey sponsored by the Pew Internet & American Life Project. Overall, job characteristics are shown to explain a large, significant portion of variance of POC. Four job characteristics appear to be significant predictors of POC. More specifically, first, the results demonstrate that higher knowledge intensity is associated with increased level of POC activities at work after controlling for the effects of other job characteristics and confounding variables. As discussed earlier, *knowledge-intensive job* refers to work that involves creativity, requires higher level skills, and demands the use of abstract knowledge (Frenkel et al., 1995). Novel applications of abstract knowledge to problem solving are difficult to confine within a fixed

temporal structure and locale. As a result, managerial control of routine work over physical space and time becomes less meaningful or relevant for knowledge-intensive work. This is in line with Anandarajan and Simmers (2005), whose focus-group study revealed that employees perceive personal Internet use as one way of balancing work and life demands. With a blurred work–life boundary, the use of such terms as *cyber-loafing* or *cyberslacking* for personal Internet use at work could be a misnomer because the time used for personal matters in the workplace is likely compensated by time devoted to work while at home or on the road. Hence, conventional work design and control mechanism should be adjusted for managing work with higher knowledge intensity.

Second, the association between work structure, that is, individual- versus team-based, and the level of POC at work is shown to be significant. Specifically, team-based structure is associated with less frequent POC activities when the effects of other job characteristics and confounding variables are controlled. The effect could be attributed to tighter social control and surveillance of member behavior through team self-regulation (Barker, 1993, 1999; Sewell & Barker, 2006). As a result, employees working in teams may find fewer opportunities to engage POC than those working individually. This is not to say that all the teams are equally effective or productive. This study only shows that employees in teams in general are less likely to perform POC than those in individual-based work. As we know, team arrangements could vary greatly in their interdependency, reward structure, and size among other factors (Antoni & Hertel, 2009). Future study could explore effects of various team structures on personal Internet use.

In addition to knowledge intensity and teamwork, job variety and job autonomy are also shown to be significant predictors of POC at work. First, as predicted, higher job variety is associated with less POC at work, controlling for the effects of other variables. The reasoning is that job variety improves employee engagement and self-motivation and therefore leads to less boredom, resulting in less POC at work. This finding is consistent with previous research about the positive relationship between job variety and labor productivity (DeVaro & Brookshire, 2007). Job autonomy, on the other hand, presents a more complicated case. Previous research shows that job autonomy positively influences labor productivity (DeVaro & Brookshire, 2007). However, this study shows that increased job autonomy is associated with more POC activities. If the positive relationship between job autonomy and productivity holds true, it would mean that POC may not pose a negative impact on productivity. This lends support to the argument by scholars that a certain level of POC may serve positive functions in the work process, such as by releasing tensions and stress and boosting creativity (Anandarajan & Simmers, 2005; Oravec, 2002). Future research is definitely needed to explore the effects of POC and other Internet use on work outcomes.

These findings have several implications for employers and managers on managing POC at work. First, the study suggests that management of knowledge-intensive work should focus more on outcome than process. For knowledge-intensive work, POC could be considered part of managing work–life balance. This does not mean that

employers should not be concerned with potential legal ramifications that indiscreet POC could cause. Rather, POC should be allowed within the legal boundaries of a business operation. Second, the findings clearly indicate that employers could manage POC through improved job design. Although advanced electronic monitoring and negative sanctioning policies may be effective to a certain extent in curbing POC or personal Internet use in general, such measures often generate employee distrust toward employers and lower morale. Improving job design, on the other hand, may help manage POC at an optimal level without inducing distrust. This could be done through setting up team structure and improving job variety. Productive norms shared by team members could help regulate personal online activities. These design changes may help reduce monitoring costs and lead to longer term job satisfaction and productivity.

The study has several limitations that future research could help redress. First, as a secondary analysis, the study is constrained by the original survey design. For instance, the measurement instruments were restricted to items used in the original survey. As a result, several constructs had to be measured by a single item, although multiple indicators would have provided more reliable measurements. In spite of this limitation, the findings are still valuable in shedding light on a very nascent area of research. Second, the measurement for POC is still exploratory. As new online communication technologies and channels continue to emerge, the measurement should embrace such changes and be further developed. Finally, the present study focuses only on POC as the outcome variable. Future research could expand the investigation to other dimensions of personal Internet use at work in relation to job characteristics.

Note

- [1] Visit the website of Pew Internet & American Life Project, <http://www.pewinternet.org>, for a full disclosure about the methodology on sampling, data collection, and data management. The Pew Internet & American Life Project is not responsible for the interpretations or conclusions reached based on analysis of the data.

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