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# HOW DOES PERSONALITY MATTER? INVESTIGATING THE IMPACT OF BIG-FIVE PERSONALITY TRAITS ON CYBERLOAFING

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# How Does Personality Matter? Investigating the Impact of Big-Five Personality Traits on Cyberloafing

*Completed Research Paper*

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## Abstract

*Cyberloafing is the voluntary acts of individuals using their companies' Internet access for non-work related purposes during working hours. This study examines the impact of personality traits on cyberloafing as measured objectively by time spent by individuals on non-work related purposes. Specifically, we investigated (1) the main effects of Big-Five personality traits (Agreeableness, Conscientiousness, Extroversion, Neuroticism, and Openness to Experience) on time spent on cyberloafing, and (2) the interaction effect of Extroversion and Conscientiousness on time spent on cyberloafing. Results show that only agreeableness and extroversion significantly predicted time spent on cyberloafing. In addition, results indicate that conscientiousness interacted with extroversion in predicting cyberloafing. Implications of our findings are discussed.*

**Keywords:** Big-Five personality traits, cyberloafing, objective and self-reported measures

## Introduction

Researchers have called for the development of work behavior models that posit linkages between individual difference constructs and work performance components (e.g., Mount et al., 2006; Schmidt and Hunter 1992; Viswesvaren and Ones 2000). An important class of behaviors that represents one component of individuals' work performance is cyberloafing which is defined as the voluntary acts of individuals using their companies' Internet access for non-work related purposes during working hours. These behaviors that violate organizational norms have been conceptualized as production deviance (Lim 2002). That is, cyberloafing is a counterproductive behavior (CPB) which negatively impacts an individual's work performance (Blanchard and Henle 2008). Examples include activities such as sending/receiving non-work related emails, visiting news sites, browsing adult oriented (sexually explicit) sites and surfing gambling websites (Krishnan and Lim 2010).

These deviant behaviors are pervasive and costly to both organizations and employees. For instance, a recent study conducted by Entensys[1] Corporation in April-June 2009 with 41,200 employees in 1,600 enterprises revealed that 20% of employees visited social networking sites, blogs and personal sites daily. In addition, 26% of employees visited non-work related websites like entertainment, games and messengers (both online and instant). Another study conducted by Cyclope-Series[2] between June-December 2009 on 200 employees, using an employee monitoring software, revealed that (1) 24% of employees spent more than one hour on social networks during working time, (2) employees checked personal e-mail up to 5 times per day during working hours, and (3) employees spent an average of 30 minutes on chat application every day. These activities cost their employers a lot in terms of traffic expenses, channel bandwidth and general network performance (Sipior and Ward 2002). In addition, employees engaging in illegal activities like downloading music online or creating a harnessing environment through viewing or sending offensive materials may put the organization at risk (Blanchard and Henle 2008; Lichtash 2004).

Apart from above mentioned costs and risks, several intangible costs in form of productivity losses can also occur. For instance, it is reported that if each of 100 employees whose average wage is £14.55 an hour (for an 8-hour day) wastes 1 hour a day on Internet (not including lunch or breaks), it would cost the company £349,200 a year[3]. To minimize these costs, 54% of US companies (in 2009) blocked social networking sites at work and 8% of them fired their employees because of the use of Facebook during working hours[4]. More recently (March 2010), a study commissioned by Cisco Inc[5]., conducted in 10 nations reported that 52% of organizations prohibited the use of social media applications or similar collaboration tools at work. Thus, taken together, these statistics suggest that cyberloafing is a pressing issue for organizations.

While few attempts have been made to study the dark side of the Internet, existing studies on Internet abuse (an exception is Lim (2002)), to date, remain descriptive and largely unguided by theory (Blanchard and Henle 2008). As such, they provide very little insights to why this phenomenon occurs. Since misuse of the Internet entails considerable costs to both organizations and employees; it is beneficial to provide a better understanding of what motivates them to engage in cyberloafing. We believe that this analysis would help organizations to understand what intervention programs and policies should be executed to guide Internet usage at workplace.

The act of cyberloafing is discretionary. That is, individuals make conscious choice about whether to engage in such behaviors. As such, cyberloafing like other CPBs is likely to be influenced by individuals' personality traits (Marcus et al. 2007; Mount et al. 2006). Hence, the present study, by utilizing the theoretical frameworks offered by personality strives to explain why individuals may be motivated to misuse their organizations' Internet access, specifically in the form of cyberloafing, and the mechanisms through which this behavior is facilitated. Indeed, previous researches in the areas of work behavior have demonstrated the linkages between individuals' personality traits and deviant behaviors (e.g., Markus et al. 2004; Marcus et al. 2007). Thus, a major purpose of this study is to

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[1] http://www.entensys.com/library/Usage_of_Internet_at_Work.pdf

[2] http://blog.cyclope-series.com/2010/02/internet-usage-at-work-statistics-for-2009/

[3] http://www.statistics.gov.uk

[4] http://blog.cyclope-series.com/2010/02/internet-usage-at-work-statistics-for-2009/

[5] http://www.livemint.com/2010/03/24221140/Socialmedia-Indian-offices-mo.html

explore, by using the Five Factor Model of Personality (FFM), whether there exists differential relationships between personality traits and time spent on cyberloafing.

Research in personality and work behaviors has almost always examined main effects. Studies argue that personality traits may interact with each other to result in desirable (or undesirable) workplace behaviors (e.g., Hogan et al. 1996; Witt et al. 2002). Though prior research has stopped short of analyzing interactions among personality variables, support for a "constellation approach" to examine personality's influence on work behavior is occasionally called for in the literature (e.g., Hogan et al. 1996; Organ, 1996; Witt et al. 2002). Only recently, the possibility has been analyzed with respect to conscientiousness, suggesting that this characteristic can be linked to performance more closely when it is accompanied by certain other attributes than without them (Warr et al. 2005). For instance, Witt (2002) found that conscientiousness was more associated with performance in extroverts than in introverts. Further, Witt et al. (2002) found a similar pattern in conscientiousness with agreeableness. As cyberloafing is a form of work performance component, it is reasonable to expect interactions between personality factors in predicting cyberloafing. In line with this, based on the Abridged Big-Five Dimensional Circumplex Model of Personality (AB5C), we argue that conscientiousness interacts with extroversion in predicting cyberloafing. Thus, the second purpose of our study is to understand the interaction effect of extroversion and conscientiousness on time spent on cyberloafing.

Also, to date, previous researches on cyberloafing rely on self-reported measures of cyberloafing activities. These measures are subject to measurement errors and variability due to unknown factors (Spector 1994). Indeed, several researchers expressed the need for objectively measuring cyberloafing activities (e.g., Lim 2002; Blanchard and Henle 2008). This study is an attempt to fill this void. That is, our research objectively measure cyberloafing using system monitoring software, 'System Surveillance Pro' (SSPro). We believe that this approach extends previous literature on cyberloafing in significant ways.

With these motivations, by using survey and laboratory experiment methodology (e.g., Mikulay and Goffin 1998), we collected data from a sample comprising of 213 participants to study the following research questions:

*RQ1: What is the effect of individuals' personality traits on time spent on cyberloafing?*

*RQ2: How does conscientiousness interact with extroversion in predicting time spent on cyberloafing?*

## Theoretical Background and Research Hypotheses

In this section, we first present an overview of personality theory and the FFM. Then, we develop, through both theoretical arguments and empirical support, hypotheses concerning the main effects of Big-Five personality traits on time spent on cyberloafing. It should be noted that the empirical support driving our hypotheses were drawn from work performance and related literatures like workplace deviance (e.g., Berry et al. 2007; Markus et al. 2004). This is because (a) cyberloafing is a component of work performance construct, and (b) cyberloafing is conceptualized as deviant behavior (in the present study). Next, by using the AB5C model of personality, we explain the interaction effect of extroversion and conscientiousness in predicting time spent on cyberloafing.

### *Personality and the Five-Factor Model*

Personality refers to cognitive and behavioral patterns that show stability over time and across situations. It reflects the unique facets of every human being and his thoughts and actions (Devaraj et al. 2008; Marcus et al. 2007). Though not universal, there is an agreement among psychologists that the domain of personality can be parsimoniously and comprehensively represented by five subordinate factors and labelled as Big-Five (Costa and McCrae 1992). While some researchers have argued for a model of less than five factors (e.g., Block 1995; Eysenck 1992), it is the FFM that has been the focus of personality research in organizational science (Barrick et al. 2001). Indeed, the FFM has been described as "…the model of choice for the researcher wanting to represent the domain of personality variables broadly and systematically" (Briggs 1992, p.254).

The FFM is based on factor analysis approach in which personality items have principal loadings on one or another of the highest-level factors (Witt 2002). The validity of the FFM has been well established in predicting deviant behaviors and other work related outcomes like job performance and career success (Witt 2002). Further, the structure has been generalized across cultures, sources of ratings and measures (Saucier and Goldberg 2003). Recently, in IS research, Devaraj and colleagues demonstrated the potential utility of incorporating the FFM

personality factors in the context of technology acceptance. In line with these existing studies, we believe that the FFM would present a concise theoretical framework for studying personality and cyberloafing linkages.

The five personality traits inherent in the FFM are agreeableness, conscientiousness, extroversion, neuroticism, and openness to experience. These traits depict enduring emotional, interpersonal, experiential, and motivational styles that explain behavior in different situations (Marcus et al. 2007; Saucier and Goldberg 2003). Table 1 summarizes the alternative names and the salient characteristics associated with each of the personality traits.

| Table 1. Big-Five Personality Traits: Alternative Labels and Salient Characteristics | | |
|---|---|---|
| Personality Traits | Alternative Labels (Witt 2002) | Salient Characteristics |
| Agreeableness | Friendly compliance, social adaptability, likability | Achieving social harmony, compliance, altruistic, sympathetic, helpful, self-sacrifice |
| Conscientiousness | Will to achieve, conformity, prudence | Orderly, achievement oriented, reliable, hardworking, determined, self-disciplined |
| Extroversion | Sociability, surgency, confident self-expression | Social, energetic, 'life of the party', gratification seeking , assertive, active, bold, adventurous |
| Neuroticism | Emotional stability, emotional control, adjustment, ego strength | Emotionally reactive, anger, anxiety, depression, vulnerability, self-conscious |
| Openness to Experience | Intellect, culture, intellectance, autonomy, imagination | Curious, appreciation for ideas, creativity, sophistication |

### Hypothesized Relationships: Main Effects (Trait Influences on Time Spent on Cyberloafing)

As cyberloafing represents a behavior that is triggered when a given task or job is monotonous, tedious, and unsatisfactory, it is reasonable to expect that personality can best account for variance in time spent by individuals on cyberloafing. Given this, we derive the following main effect hypotheses.

**Agreeableness**

Agreeableness consists of tendencies to be kind, gentle, trusting and trustworthy, and warmth (Judge and Iles 2002). While individuals with low score on agreeableness are self-centered, non-cooperative, inconsiderate, manipulative, vengeful, argumentative, and insulting (Goldberg 1999), individuals with high score prioritize relationship with work and career success (Judge et al. 1999). As disagreeable individuals are characterized by conflict and discord, they tend not to follow rules and cheat to get ahead (Goldberg 1999). As cyberloafing is a behavior that is often considered deviant and violates organizational policies and norms, it is reasonable to expect that cyberloafing would be caused by disagreeable people as they often breach organizational policies and norms. Also, as agreeable people are gentle and trustworthy individuals of organization, it is logical to expect that they would spend less time on cyberloafing activities. This is because engaging in cyberloafing behaviors should affect their image of 'gentleness', career success and trustworthiness. In line with this reasoning, Salgado (2002) reported that Agreeableness is likely to be negatively related with behaviors involving organization rule breaking. Thus, we propose:

*H1: Agreeableness is negatively related to time spent on cyberloafing.*

**Conscientiousness**

The hallmark of conscientious personality is self-control which is usually reflected in a need for achievement, order, and persistence (Costa et al. 1991). According to Ones and Viswesvaran, highly conscientious individuals show greater productivity than less conscientious individuals because: (a) they spend more time on tasks they are assigned; (b) they set goals autonomously and persist in following them; and (c) they avoid counterproductive behaviors (Ones and Viswesvaran 1996). Further, conscientious personalities are intrinsically motivated to achieve, perform at a high level, and take actions to improve their work performance (Devaraj et al. 2008). In line with this reasoning, research on production deviance suggests that conscientiousness is negatively related to CPBs (Salgado 2002). Further, Sackett and DeVore (2001) reported that conscientiousness is the most consistent predictor of such

behaviors. Hence, as conscientiousness reflects an intrinsic motivation to improve performance wherever possible, we expect that conscientious people would spend less time on cyberloafing compared to their counterparts. That is, individuals who report high scores on conscientiousness would refrain from cyberloafing behaviors. Thus, we propose:

*H2: Conscientiousness is negatively related to time spent on cyberloafing.*

## Extroversion

Extroverts possess a tendency to be sociable, dominant, and positive (Watson and Clark 1997). That is, those who score high on extroversion are social, active, and outgoing and place a high value on close and warm interpersonal relationships (Watson and Clark 1997). According to theory of reasoned action (TRA), Ajzen and Fishbein identified extroversion as one of the personality variables affecting beliefs about behavior. As extroverts tend to be sociable, gregarious, and attracted to stimulating environments (Eysenck 1967) they may use (and misuse) the Internet as a means of socializing and developing relationships, as well as for sensation seeking. Given this, studies (e.g., Kraut et al. 2002) have found that, individuals with high score on extroversion abused their Internet privileges and used it as a platform for socialization. Further, in their study, Wyatt and Phillips (2005) found that extroverts abused their Internet privileges and spent more time on non-work related matters which in turn led to decreased productivity. Consistent with these existing studies, we predict that individuals with high score on extroversion spend more time on cyberloafing compared to individuals who score less on extroversion. Hence, we propose:

*H3: Extroversion is positively related to time spent on cyberloafing.*

## Neuroticism

Neuroticism is a tendency to show poor emotional adjustment in the form of stress, anxiety, and depression (Judge and Iles 2002). In other words, they encompass characteristics that include excessive worry, pessimism, low confidence, and tendencies to experience negative emotions (Bozionelos 2004). That is, individuals with low score on neuroticism are emotionally stable and well-adjusted and those high in neuroticism are anxious, self-conscious, paranoid, and prone to negative emotions and negative reactions to work-related stimuli (Devaraj et al. 2008). Empirical research suggests that neuroticism is negatively associated with several constructs of work behavior like job performance, job satisfaction and perceived career success (e.g., Barrick et al. 2001; Judge et al. 1999). Ajzen's and Fishbein's (1980) TRA identifies neuroticism (apart from extroversion) as one of the personality variables affecting beliefs about behaviors. In line with these existing studies, we predict that individuals with low score on neuroticism will spend less time on cyberloafing as engaging in cyberloafing should affect their work performance, satisfaction level with the job and career success. Also, as neurotic personalities are likely to view their work related tasks as threatening and stressful, it is more likely that people with high scores of neuroticism spend more time on cyberloafing to get rid of the stress associated with their work tasks. Hence, we propose:

*H4: Neuroticism is positively related to time spent on cyberloafing.*

## Openness to Experience

Individuals who score high on openness to experience are creative, flexible, curious and unconventional (McCrae 1996). These individuals are often described as people who are willing to try new and different things that are increasingly important in explaining work related behavior (Hough and Furnham 2002). Studies on work performance, demonstrated that openness to experience is positively associated with engaging in learning experiences and proficiency (Barrick et al. 2001). Further, Judge and Iles (2002) found that openness related positively to motivation towards accomplishment of self-set work goals. In addition, Mount et al. (2006) reported that individuals with low score on openness engaged in more deviant behaviors. Further, they reported that the results were true for both interpersonal and task-based CPBs. Given this, it is logically reasonable to expect that people who score high on openness to experience will spend less time on cyberloafing because engaging in cyberloafing should affect their activities associated with work behaviors, learning experiences and work related goals. Hence, we posit:

*H5: Openness to experience is negatively related to time spent on cyberloafing.*

### Abridged Big-Five Dimensional Circumplex Model of Personality

A substitute to the factor analysis approach of classifying personality is the interpersonal circumplex model (Witt 2002). According to Wiggins and Trapnell (1997), the circumplex model designates no optimal orientation of the principal axes of the circumplex. In this model, traits are presented along angular positions in a two-dimensional factor space (Witt 2002). As reported in Witt (2002), though the circumplex model provides "much more opportunity for identifying clusters of traits that are semantically cohesive" (Hofstee et al. 1992, p. 146) and therefore permits fine-grained personality descriptions (Becker 1999), it is often criticized for not capturing all of the trait space as it leaves out at least two of five personality factors (Hofstee et al. 1992). To overcome this limitation, Hofstee and colleagues proposed the AB5C model of personality, which consisted of ten two-dimensional circumplexes that considered all possible pairs of the Big-Five dimensions as coordinates (Hofstee et al. 1992). The facets, in this model, are presented in terms of their two highest factor loadings. That is, each trait is characterized by its loadings on a subset of two of the five factors at a time (Witt 2002). The AB5C model of personality, which integrates the FFM and circumplex model of personality, provides a theoretical framework for examining interactions between personality variables in predicting cyberloafing.

According to the circumplex model of personality, of Big-Five, Extroversion is the only "pure" factor. That is, with the exception of Extroversion, the Big-Five scales have been defined in the AB5C by blends rather than factor-pure terms (Hofstee et al. 1992). It is reported in Witt (2002) that Watson and Clark (1997) noted Extroversion as a higher-order factor included in every major taxonomy of personality offered during the past 50 years. Given this, most reviews of personality–CPB relationships have concluded that conscientiousness, neuroticism, and agreeableness are the strongest predictors (e.g., Cullen and Sackett, 2003; Ones et al. 2003). However, Sackett and DeVore (2001) reported that conscientiousness is the most consistent predictor among the three traits. Hence, as an initial attempt of applying the AB5C model of personality to explain why cyberloafing phenomenon occurs, we expect an interaction between extroversion and conscientiousness.

### Hypothesized Relationship: Interaction Effect (Extroversion × Conscientiousness)

Adjectives or illustrative terms have been used to exemplify the AB5C facets (Hofstee et al. 1992; Johnson and Ostendorf 1993). For instance, while individuals who score low on conscientiousness and high on extroversion (i.e., low conscientious extroverts) are described as mischievous and thoughtless, individuals with low conscientiousness and low extroversion (i.e., low conscientious introverts) are aimless and indecisive. Similarly, while individuals with high score on both conscientiousness and extroversion (i.e., high-conscientious extroverts) are described as active and persistent, individuals with high conscientiousness and low extroversion (i.e., high conscientious introverts) are cautious and deliberate.

As indicated in main effect hypotheses, since extroverts are social, outgoing and place a high value on close and warm interpersonal relationship, they use (and misuse) organization's Internet privileges for socialization and sensation seeking. However, individuals with high score on conscientiousness would refrain from engaging in cyberloafing behaviors as they are achievement oriented and self disciplined. Hence, individuals who score low on conscientiousness and high on extroversion should spend more time on cyberloafing compared to individuals with low conscientiousness and low extroversion. In similar vein, individuals with high score on both conscientiousness and extroversion should spend more time on cyberloafing compared to individuals with high score on conscientiousness and low score on extroversion.

Thus, taken together, we suggest that the relationship of extroversion with time spent on cyberloafing is contingent upon the level of conscientiousness such that additional units of extroversion leads to decrements in time spent on cyberloafing among high-conscientious individuals but to increments in time spent on cyberloafing among low-conscientious individuals. Hence, we posit:

*H6: The positive relationship between extroversion and time spent on cyberloafing is moderated by conscientiousness such that the relationship is stronger for individuals who score low on conscientiousness and weaker for individuals who score high on conscientiousness.*

*Control Variables*

We examined the following additional variables (see Table 2) that we felt would affect participants' time spent on cyberloafing (Krishnan and Lim 2010).

| Table 2. Control Variables | |
|---|---|
| Variable | Description |
| Gender | Previous studies showed that gender was related to both cyberloafing and time spent on cyberloafing. Lim and Chen (2009) found that men were more likely to cyberloaf than women. The study also reported that men spent more time cyberloafing than women. Results of their study revealed that there were significant gender differences in the perceived impact of cyberloafing on work. Women felt that cyberloafing had a negative impact on their work whereas men reported that cyberloafing had a positive impact on their work. Thus, we controlled for gender in our study. |
| Comfort | As the experimental task (listening to a video lecture on Leadership by an Indian professor and evaluating his teaching effectiveness) was in English, few participants generally may not be comfortable listening to English or understand the professor's oral expression which may prime them to spend their time on cyberloafing. Hence, we controlled for the participants' comfort level with listening to English. |
| Interest | As the video lecture was on Leadership, it is more likely that participants may have varying interest on its contents. Thus, we controlled for interest level as participants with high levels of interest may be less likely to cyberloaf. |
| Satisfaction | It is more likely that participants may or may not be satisfied with the study. There is also a possibility that participants may feel enthusiastic or rather unpleasant watching the video. This may affect their cyberloafing behavior and ultimately their time spent on cyberloafing. Hence, we controlled for participants' satisfaction level with the study. |
| Stress | There is a possibility that participants may get stressed as they were tasked to listen to a 45 minutes video lecture without any break in-between. As this task may affect the participants' cyberloafing behavior, we controlled for the participants' stress level with the study. |

## Research Method

Data were collected using a survey and laboratory experimental design. Participants were 213 undergraduate students enrolled in a management course at a university in Singapore. These students earned credits for participating in the study. The study consisted of two parts. In the first part of the study, participants completed a survey which captured their personality and demographic variables.

A week after this, participants reported for the second part of the study in an experimental laboratory. Each laboratory session consisted of 15-17 participants. When they arrived in the laboratory, the research assistants took down their student identity number and assigned them to specific computer. They were asked to switch-off their mobile phones and leave them with the research assistants. Participants were informed that they are not allowed to move or go out of the experimental lab once the experimental task was started. Participants were told that in this part of the study, they are required to "watch" and "listen" carefully a video lecture of a professor who has applied for a visiting position with the Department and evaluate his teaching effectiveness. Each participant was provided with a headset so that they could watch the video in the privacy of the cubicle where the computer is placed (see appendix A for briefing instructions). Once the experimental task was completed, a questionnaire consisting of four questions (a sample question included, "The professor has increased my interest in the topic of leadership") related to professor's teaching effectiveness was distributed. Participants were asked to input their feedback by circling appropriate responses (7-point Likert scale ranging from (1) Strongly Disagree to (7) Strongly Agree).

'SSPro' was installed on each computer. SSPro captured, (1) the websites visited by the user, (2) the instant messages exchanged, and (3) the screenshots of the desktop at a periodic interval of 1 minute during the experiment. SSPro had a capability of automatically storing the captured data to the local disk. Later, we saved the log files (see appendix B) that listed the activities the participants engaged in for analyses.

### Measures

Measures used in our study are shown in Table 3.

| Table 3. Measures Used | |
|---|---|
| **Variable** | **Description** |
| Time Spent on Cyberloafing (in minutes) | This was measured by analyzing the log files. The log files contained the URL of the website visited by the participants and the corresponding timestamps. Time spent on cyberloafing was computed by examining the timestamps which indicated the time that participant spent on the Internet. |
| Big-Five Personality Traits | Personality was measured with 44 items Big-Five Inventory (BFI) developed by Benet-Martinez and John (1998). BFI captured all five dimensions of personality. Items were anchored on a 5-point Likert scale ranging from (1) Strongly Disagree to (5) Strongly Agree. Sample items included, "I see myself as someone who is talkative" and "I see myself as someone who tends to find fault with others". |
| Control Variables | Participants were asked to indicate whether they are male or female. Other control variables were measured using a 5-point Likert scale. The anchors were named accordingly to reflect the nature of the control variables. For example, comfort was anchored on the scale ranging from 'Not comfortable at all' to 'Very Comfortable'. Similarly for other variables: interest, satisfaction and stress. |

## Data Analyses

### Descriptive Statistics, Correlations and Reliabilities

Fifty two percent of our participants were women. The average age of the participants was 21.43 years (SD=1.5 years) and there were no significant differences in terms of age and background on the amount of time spent on cyberloafing. Table 4 presents the descriptive statistics, correlations and reliabilities.

| Table 4. Descriptive Statistics, Correlations and Reliabilities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** |
| Time Spent on Cyberloafing | 4.29 | 10.17 | - | | | | | |
| Agreeableness | 3.56 | 0.55 | -0.17* | (0.80) | | | | |
| Conscientiousness | 3.29 | 0.57 | -0.05 | 0.19** | (0.82) | | | |
| Extroversion | 3.16 | 0.62 | 0.12 | 0.06 | 0.15* | (0.85) | | |
| Neuroticism | 2.89 | 0.63 | 0.10 | -0.42*** | -0.29*** | -0.27*** | (0.81) | |
| Openness to Experience | 3.40 | 0.48 | -0.02 | 0.08 | 0.15* | 0.24*** | -0.13 | (0.72) |
| Reliabilities are shown in parentheses along the diagonal. Time spent on cyberloafing is measured in minutes. Personality traits are measured using 5-point Likert scale. | | | | | | | | |
| N = 213    *p < 0.05    **p < 0.01    ***p < 0.001 | | | | | | | | |

### Validity of BFI Personality Measure

The BFI questions (or items) were tested for validity using factor analysis with principal components analysis and varimax rotation. While convergent validity was assessed by checking loadings to see if items within the same construct correlate highly amongst themselves, discriminant validity was assessed by examining the factor loadings to see if questions loaded more highly on their intended constructs than on other constructs (Comrey 1973). As

expected, factor analysis yielded five components with eigenvalues above 1. The five components corresponded to the 5 constructs (Agreeableness, Conscientiousness, Extroversion, Neuroticism and Openness to Experience) in personality. As suggested by Comrey (1973), the questions which tapped onto other constructs or loaded below 0.4 were removed. In total, 8 out of 44 items were removed (4 items from agreeableness, 1 item from extroversion, 1 item from neuroticism and 2 items from openness to experience).

## *Hypotheses Testing*

Studies in IS (e.g., Kankanhalli et al. 2005; McKegen et al. 1994; Weill and Olson 1989) and in other disciplines (e.g., Jehn et al. 1999) have used moderated multiple regression over structural equation modeling techniques (LISREL or PLS) to test interaction effects. Hence, in the present study, we used moderated multiple regression, a hierarchical regression analysis technique for testing main and interaction effect hypotheses. We adopted the method recommended by Aiken and West (1991) for examining interactions in regression methods where we first centered or linearly rescaled each of the two variables by subtracting the mean from each person's score for each variable to reduce the effect of multicollinearity between the interacting term and the related main effect. As a first step, controls were entered into the regression equation. In steps 2 and 3, we entered independent variables and interaction term respectively into the regression equation. A summary of our results are presented in Table 5.

| **Table 5. Regression Results** | | | |
|---|---|---|---|
| | **Hierarchical Regression** | | |
| **Variables** | $\beta$[a] | | |
| | **Step 1** | **Step 2** | **Step 3** |
| **Controls** | | | |
| Gender[b] | 0.15* | 0.13 | 0.13 |
| Stress | -0.09 | -0.13 | -0.13 |
| Interest | -0.14 | -0.13 | -0.12 |
| Satisfy | -0.04 | -0.03 | -0.06 |
| Comfort | -0.01 | -0.03 | -0.02 |
| **Main Effects** | | | |
| Agreeableness | | -0.17* | -0.12 |
| Conscientiousness | | -0.00 | 0.02 |
| Extroversion | | 0.15* | 0.18* |
| Neuroticism | | 0.03 | 0.04 |
| Openness to Experience | | -0.03 | -0.03 |
| **Interaction Effect** | | | |
| Extroversion X Conscientiousness | | | -0.21** |
| $R^2$ | 0.06 | 0.11 | 0.14 |
| $\triangle R^2$ | 0.06* | 0.05* | 0.04* |
| [a]The betas reported is based on standardized coefficients. | | | |
| [b]Coded as 1 = male, 0 = female. | | | |
| N = 213 　　*p < 0.05　　**p < 0.01 | | | |

Our results indicate that agreeableness is negatively associated with time spent on cyberloafing while extroversion is positively associated with time spent on cyberloafing. Hence, of five main effect hypotheses, only H1 and H3 were supported.

Turning now to the interaction effect of extroversion and conscientiousness on time spent on cyberloafing, regression result indicated that the interaction is significant at $p<0.01$. To determine if the patterns characterizing the significant interaction conform to the directions as proposed in the research hypothesis, we graphed the interaction effect. This procedure was recommended by Cohen and Cohen (1983) for all interaction cases. The graph is shown in Figure 1. As anticipated, Figure 1 suggests that the interaction plot supported our hypothesis (H6). That is, the positive relationship of extroversion with time spent on cyberloafing is dependent upon level of conscientiousness such that that the relationship is stronger for individuals who score low on conscientiousness and weaker for individuals who score high on conscientiousness.



**Figure 1. Extroversion × Conscientiousness**
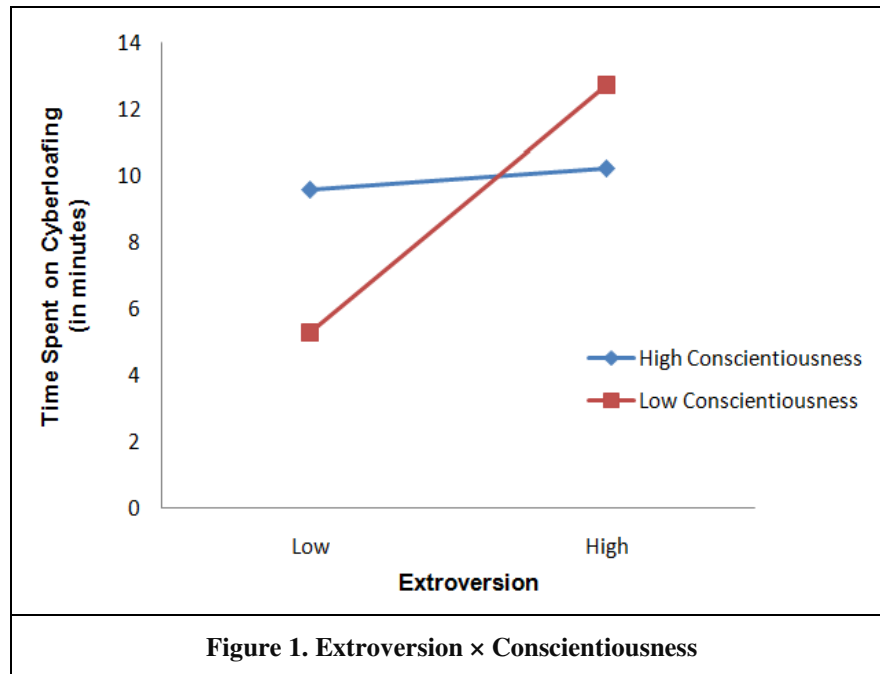
## General Discussion

Our study examined the use of the Internet by individuals for non-work related purposes during working hours from the perspectives offered by personality. More specifically, using FFM, we investigated the differential linkages between Big-Five personality traits and time spent on cyberloafing. In addition, based on AB5C model of personality, we examined the interaction effect of conscientiousness with extroversion on time spent on cyberloafing. With its findings, this study puts forth several questions and attempts to answer them in following paragraphs.

**Given the fact that several researchers do not believe cyberloafing as bad or even inappropriate, why does this study conceptualize cyberloafing as production deviance (or CPB)?**

While many researchers (e.g., Lim 2002; Sipior and Ward 2002) argue that cyberloafing is wasteful, violate organizational norms, and opens the organization up for lawsuits, several other researchers do not believe that cyberloafing is bad or inappropriate (Blanchard and Henle 2008). For example, in their paper, Balanchard and Henle note that Anandarajan and colleagues see the Internet as one that provides a much needed diversion at work which can lead to creativity, flexibility, camaraderie, and foster a learning environment. In addition, it is indicated that, engaging in cyberloafing may help employees in developing significant skills and valuable knowledge necessary for work related tasks (Anandarajan et al. 2004; Anandarajan and Simmers 2004). More recently, Lim and Chen (2009), in their study found that, using the company's Internet access for non-work purposes have a positive impact on

individuals and work. They found that browsing activities led to employees' positive affect and work facilitation and emailing activities led to negative affect and work depletion.

Given these tensions in the existing literature, our study conceptualized cyberloafing as production deviance for two reasons. First, although several studies have found that cyberloafing can be beneficial, these studies did not adequately explain the underlying mechanism of how cyberloafing can positively impact work. That is, these studies are often descriptive and unguided by strong theory. Second, although majority of cyberloafing activities are minor, they are costly to organizations and employers and are organizationally harmful misbehaviors in the Robinson and Bennett typology of deviant workplace behaviors (Berry et al. 2007; Lim 2002).

**How does personality matter in predicting cyberloafing? Can other interaction effects predict cyberloafing?**

We hypothesized that while agreeableness, conscientiousness and openness to experience negatively predict time spent on cyberloafing, extroversion and neuroticism positively predict cyberloafing. In addition, we hypothesized that conscientiousness interacts with extroversion in explaining cyberloafing. Our findings showed that, of Big-Five personality traits, only agreeableness and extroversion significantly predicted cyberloafing as proposed. Further, conscientiousness interacted with extroversion in significant manner. Given these findings, we conclude that individual personality traits are not influential (as proposed) in predicting cyberloafing. However, we acknowledge that our results need to be replicated using different samples. Toward this, we call for studies to replicate our findings in different settings and confirm/falsify them. In addition, future researchers apart from using high level factors like Big-Five personality traits, may also consider using specific personality characteristics (e.g., narcissism, conformity) when they investigate personality–cyberloafing linkages.

Now turning to the question of other interaction effects, we acknowledge that, in addition to the proposed interaction effect, other interactions between personality traits could significantly predict cyberloafing. Despite the fact that prior research has stopped short of analyzing interactions among personality variables, our study in support of "constellation approach", is one among the few studies (e.g., Warr et al. 2005; Witt 2002; Witt et al. 2002) to examine the interaction effect between personality variables. Hence, our specific aim here is to demonstrate the possibility of interaction between personality traits in explaining an undesirable behavior like cyberloafing. Toward this, we call for studies to examine other interaction effects between personality traits and cyberloafing. For this, apart from AB5C model of personality, researchers may consider using trait activation theory (see Tett and Burnett 2003; Tett and Guterman 2000) and HEXACO model of personality (see Lee and Ashton 2004; Lee and Ashton 2005), which we believe would greatly help in deriving the interaction terms associated with cyberloafing.

**Are we recommending using objective measure of cyberloafing instead of subjective, self-reported measures?**

Prior studies on cyberloafing (e.g., Lim 2002; Blanchard and Henle 2008) and CPB in general (e.g., Mount et al. 2006) have often criticized the use of subjective, self-reported measures of deviant behaviors as they are prone to measurement errors and variability due to unknown factors (Spector 1994). Several scholars addressed this as a major limitation of their study and expressed the need for measuring deviant behaviors objectively. For example, Lim in her study reported, "…relying entirely on self-reports raises the issue of whether results may have been inflated due to common method bias…future studies should further reduce the potential of common method bias by supplementing the self-reports with reports from other sources"(Lim 2002, p. 690) In addition, a study on personality–CPBs by Mount and colleagues reported, "…if objective indicators of CPBs are used, the relationships among personality traits and CPBs may differ from those obtained in this study" (Mount et al. 2006, p. 617). More recently, Blanchard and Henle reported, "…our measure of cyberloafing is self-report…it is possible that participants underreported their cyberloafing behaviors…as a result, the tests of our hypotheses may be conservative and understate the true nature of these relationships" (Blanchard and Henle 2008, p. 1081). Further, Bannister and Griffeth (1986) suggested that it would be beneficial to supplement the analyses using objective indices of deviant behavior. This was also emphasized by Hackett (1989) and Salgado (2002) in their research papers and reports. Given these, we caution researchers to think carefully while choosing to use subjective self-reported measures. If objective measurement is not feasible, we recommend researchers to supplement self-reports at least with report from other sources (e.g., supervisors and colleagues).

# Conclusion

## *Implications for Research*

By addressing the research questions set forth at the beginning of the paper, this study makes several important contributions to theory and cyberloafing literature. First, while extant studies in the literature related to the Internet have largely examined the possible benefits that it offers, our study is one among the few studies (e.g., Lim 2002) that look into negative aspects or dark side of the Internet. Second, the present study seeks to extend the existing production deviance literature by examining a new form of individual misbehavior at workplace, i.e., cyberloafing within the framework offered by personality. Specifically, we examined (1) the main effects of Big-Five on time spent on cyberloafing, and (2) the two-way interaction of conscientiousness and extroversion on time spent on cyberloafing. By simultaneously looking at both the main effects and the interaction effects of personality on cyberloafing, our study corroborated the arguments made by Hogan et al. (1996, p. 470) that "interpreting a single scale in the absence of other information" is an ill-advised "article of faith in traditional personality assessment". Further, through interaction effect, we demonstrated that one trait in association with the other can influence a behavior that is undesirable (or desirable).

Second, while several studies on cyberloafing, to date, have used self-reported measures, we have attempted to show the research community, the possibility of measuring cyberloafing objectively. We strongly believe that our attempt to measure cyberloafing objectively would provide new directions to the researchers working in the area of Internet abuse or cyberloafing. Third, as an effort toward testing whether the existing schools of thoughts in organizational science literature (more specifically, personality and CPBs) holds for cyberloafing behaviors, we have attempted to show that conscientiousness, neuroticism and openness to experience do not predict cyberloafing. However, we acknowledge that these results are to be replicated in different samples and settings.

## *Implications for Practice*

From a practical standpoint, this study makes three contributions: (1) employee selection, (2) organizational training programs, and (3) rating individuals' performance. First, for employee recruitment, results show that selecting individuals based on their agreeableness scores is likely to reduce the occurrence of cyberloafing. Further, selecting individuals on extroversion is likely to increase the occurrence of cyberloafing. Second, for organizational training programs, it should include a component that conveys to managers the pervasiveness and expenses associated with cyberloafing and explain the nature of the behaviors that comprise cyberloafing (Mount et al. 2006). Finally, for rating individuals' performance, our findings recommend organizations to implement electronic monitoring programs to control Internet abuse.

## *Limitations and Future Research*

Findings of this study should be viewed within the context of its limitations. First, we examined only the higher level factors (Big-Five) that can predict cyberloafing. As mentioned earlier, specific personality traits (other than Big-Five) may also significantly predict cyberloafing. In addition, when we looked at the interaction effects, we examined only the traits that can interact with extroversion, as extroversion is the only "pure" factor of Big-Five (Witt 2002). However, based on theories like trait activation theory and HEXACO model of personality, several interaction terms with respect to cyberloafing could be theoretically predicted and examined. Further, given that conscientiousness is a consistent predictor of undesirable behaviors (Sackett and DeVore 2001) and other traits (e.g., agreeableness and extroversion) are significantly related to such behaviors, it is more likely that conscientiousness could play a mediating role between cyberloafing and other Big-Five traits. Future research could look into these concerns. Second, we conceptualize cyberloafing as production deviance, thereby neglecting the potential positive effects of cyberloafing. Future research, in line with other studies that view cyberloafing as not bad and appropriate at work, may consider extending our findings. Third, our study is conducted using laboratory experimental design. Though we are confident about the validity and reliability, our findings may lack context realism. Future attempts to examine this topic can use field experiments (by manipulating behavioral variables) whose context realism may be higher when compared to laboratory experiments.

Fourth, while steps were taken to mitigate common-method bias by obtaining responses on the variables at two different points in time, we do acknowledge that this design is not totally fool-proof. Thus, to rule out the potential problem of inflated observed relationships among the variables, future attempts to examine this topic can supplement the self-reported data of personality with other sources of data collection such as roommate's or friend's or classmate's reports. This will help to lend collaboration and confidence to findings of the present study. Fifth, participants were not told explicitly not to cyberloaf or not to multitask (e.g., listening to video lecture and surfing the Internet at the same time). In addition, they were also not told that they are being monitored for cyberloafing. While their behavior may have been impacted by this knowledge, we view this limitation as not very serious because, in organizations, while there may be policies governing cyberloafing, such policies may tend to be implicit rather than explicit (similar to our lab setting). For example, Lim et al. (2002) found that only 47 % of organizations in Singapore have policies regarding Internet usage. Future research may consider replicating this study in other contexts. In addition to these limitations, though we have taken steps to control for several variables like gender, stress, interest, satisfaction and comfort, we have not controlled for other variables like individual's tolerance level for risk due to cyberloafing. Future research may replicate this study by controlling for other variables.

## Conclusion

In conclusion, this study attempted to extend the existing production deviance literature by examining a new form of individual misbehavior at workplace, i.e., cyberloafing within the framework offered by personality. This study served as an initial attempt to investigate the differential linkages between personality traits and cyberloafing as measured objectively by time spent by individuals on non-work related purposes. Results showed that, of Big-Five, only agreeableness and extroversion significantly predicted cyberloafing. In addition, conscientiousness interacted with extroversion in predicting cyberloafing. Future research providing a broader and deeper view of cyberloafing, especially focusing on the limitations of our study, is both theoretically and practically essential.

## Acknowledgements

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# Appendix

## A. Briefing Instructions for Experimental Task

Professor AHKB of the Department of Management, Institute of Technology & Science, India has applied for a one-year (April 2010 - March 2011) visiting position with the Department of Management and Organization, University of Singapore, Singapore. In his application, Professor AHKB has proposed to design and teach a course on 'Leadership in Organizations'. The school has shortlisted Professor AHKB as one of the potential candidates for the visiting appointment from the pool of twelve applicants. The school would like seek students' feedback on his teaching effectiveness. In line with this, please "WATCH" his video lecture on 'Leadership' and provide your feedback.

<u>*Note:*</u> Click the video file named 'Leadership_AHKB' provided on your desktop and "LISTEN" carefully to it. The video lecture is about 45 minutes long. Use the headset provided.

## B. Sample Log File

**Log Type:** Website Activity          **Date:** 2/11/2010

| Machine | User | URL | Timestamp |
|---------|------|-----|-----------|
| EXPLAB116 | mktv9 | file://H:\KGL\Main Experiment\Feb10\13.html | 2/11/2010 12:47:30 |
| EXPLAB116 | mktv9 | http://sg.msn.com/iat/us_sg.aspx | 2/11/2010 14:41:35 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/ | 2/11/2010 14:41:57 |
| EXPLAB116 | mktv9 | http://chic-obsession.livejournal.com/6787.html | 2/11/2010 14:42:31 |
| EXPLAB116 | mktv9 | http://toolbar.live.com/signin.htm | 2/11/2010 14:42:37 |
| EXPLAB116 | mktv9 | http://chic-obsession.livejournal.com/6787.html | 2/11/2010 14:42:40 |
| EXPLAB116 | mktv9 | http://sg.msn.com/iat/us_sg.aspx | 2/11/2010 14:42:47 |
| EXPLAB116 | mktv9 | http://chic-obsession.livejournal.com/6787.html | 2/11/2010 14:42:50 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/92679624.html#cutid1 | 2/11/2010 14:43:24 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/92674674.html#cutid1 | 2/11/2010 14:44:48 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/?skip=50 | 2/11/2010 14:46:32 |
| EXPLAB116 | mktv9 | http://lynnine.livejournal.com/ | 2/11/2010 14:47:11 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/?skip=100 | 2/11/2010 14:47:45 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/?skip=150 | 2/11/2010 14:48:52 |
| EXPLAB116 | mktv9 | http://euphoria-ress.livejournal.com/ | 2/11/2010 14:49:24 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/92641078.html#cutid1 | 2/11/2010 14:49:39 |
| EXPLAB116 | mktv9 | http://community.livejournal.com/sgflea/ | 2/11/2010 14:50:28 |
| EXPLAB116 | mktv9 | http://toolbar.live.com/signin.htm | 2/11/2010 14:51:04 |
| EXPLAB116 | mktv9 | http://missyrea.livejournal.com/ | 2/11/2010 14:51:07 |
| EXPLAB116 | mktv9 | http://mytintedkiss.livejournal.com/12817.html | 2/11/2010 14:53:02 |