

Dark Side of Technology: Investigating the Role of Dark Personality Traits and Technological Factors in Managing Cyberloafing Behavior

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Intentional misuses of technology in classroom environment raised serious concerns in recent years. Because of the widespread proliferation of technology misuse, researchers called for more research into the dark sides of technology use, such as managing cyberloafing behavior. In this study, we seek to gain a deeper understanding of the cyberloafing phenomenon in classroom. Using the Dark Triad personality traits and several domain-specific technology use factors, we propose a model and test using a sample of 974 participants. We report several interesting findings and discuss implications for researchers and practitioners in the context of better and productive classroom learning environment.

Keywords: dark triad, cyberloafing, technology misuse, dark side of technology, personality traits

INTRODUCTION

Technologies has become an integral part of our everyday life. Proliferation of internet, communication, and mobile technologies have multifarious implications in social, professional, and personal lives. Although most of the technological implications lead to efficiencies and improved quality of life, some unintended consequences are also attributed to the widespread technology use. Because of this nature of Internet and mobile technologies, they are often referred to as a “double-edge sword” (V. K. Lim, 2002). Intentional misuse of internet and mobile technologies have become an issue of concern in recent years and, thus, the concept ‘Dark Side of Technology’ emerged as an important topic of discussion. People of all age, social, and geographical background can be a victim of this technology misuse. Several studies have pointed nonproductive use of technology as the most common ways employees waste their time while they are at work (e.g. Andreassen, Torsheim, & Pallesen, 2014; Sheikh, Atashgah, & Adibzadegan, 2015; Weatherbee, 2010). Others have studied the nonproductive use of technology by teenagers (e.g. V. K. Lim & Teo, 2005), students of all age (e.g. Akbulut, Dönmez, & Dursun, 2017; Gökçeşlan, Mumcu, Haşlaman, & Çevik, 2016), and even teachers in educational institutions (e.g. McBride, Milligan, & Nichols, 2013; Zoghbi Manrique de Lara, Verano Tacoronte, & Ting Ding, 2006).

The intentional use of Internet and mobile technologies for nonproductive work purposes is widely known as cyberloafing (V. K. Lim, 2002; Polito, 1997). Cyberloafing behavior not only wastes valuable time, but also acts as a deterrence from successful and efficient goal achievement. Studies have found that

cyberloafing behavior has become such a prevalent issue at workplace that employees spend a significant amount of time on non-work related use of technology while they are at work (Blanchard & Henle, 2008). Naughton et al. (1999) reported as high as 90% of the surveyed employees admitted of using Internet technology for non-work related purposes. A number of studies in recent years have focused on understanding cyberloafing behavior in educational environment. Yilmaz et al. (2015) reported that Cyberloafing behavior act as a barrier to the successful integration of information and communication technologies into teaching and learning environment. Baturary & Toker (2015) and Akbulut et al. (2017) both reported widespread presence of cyberloafing behavior among high school students, which is a major concern for effective learning while they are in the classroom. As the mobile and cloud technologies become more prevalent, the issue of cyberloafing and its harmful impacts on society is expected to rise sharply. Given the increased trend, both practitioners and researchers, in recent years, have turned their attention to the issue in order to understand the root causes, antecedent factors, harmful impacts, and preventatives measures of cyberloafing behavior.

Despite the increased phenomenon of cyberloafing behavior and its harmful consequences on personal and professional lives, this topic has received limited attention by the IS researchers (Jia & Jia, 2015). Early researches on cyberloafing are descriptive in nature, primarily focused on understanding the concept and the complexity of cyberloaf and cyberloafing behavior. In recent years, researchers are focused more on understanding the root causes of cyberloafing behavior formation, rather than just understanding the concept itself. Several recent research have studied the impact of demographics on cyberloafing behavior (Baturay & Toker, 2015; Yilmaz et al., 2015). Askew et al. (2014) studied the antecedents of cyberloafing behavior in the context of theory of planned behavior. Hassan et al. (2015) has researched cyberloafing behavior from general deterrence Theory perspective and identified several organizational antecedents that are important for cyberloafing behavior. Jandaghi et al. (2015) investigated the importance of several personal, work-related, and organizational factors as antecedents of cyberloafing behavior. Using a meta-analytic study, Mercado et al. investigated several demographic factors as well as work-related attributes as important antecedents for cyberloafing behavior. One striking similarity among these and many other recent studies on cyberloafing that these studies are focused on either organizational factors or demographics factors or both in efforts to understand the root causes of the issue. There is a void in understanding the issue of cyberloafing phenomenon from individual traits perspective. None of the literature we have reviewed to date tried to empirically understand and study the impact of individual traits on cyberloafing behavior with an exception of Jia and Jia (2015), where big five personality traits are studied to understand individual cyberloafing behavior. Although demographic and organizational factors do provide important insights and step forward in understanding cyberloafing behavior, they do not provide a complete picture. Individual characteristics can interact with technology that can potentially influence peoples' technology use behavior (Chang et al., 2004). Thus, we strongly feel that personality traits are important in shaping human behavioral intention and, ultimately, the actual behavior, and more research should focus on understanding individual characteristics along with organizational characteristics.

There is a long history of research on linking personality traits to various decision making process. These studies have shown that personality traits play an important role in explaining a multitude of individual behaviors (John & Srivastava, 1999). Most personality trait research in technology adoption deal with the five factor model, where neuroticism, agreeableness, conscientiousness, extraversion, and intellect characteristics are known to influence individuals' technology-related behavior (Devaraj, Easley, & Crant, 2008; McElroy, Hendrickson, Townsend, & DeMarie, 2007). Another type of personality trait known as 'The Dark Triad' traits are also found as important in shaping human behavior. Traditionally, the Dark Triad personality traits are considered as exploitive social behavior that may have evolved to enable exploitation of the ongoing situation and its consequences, and, thus, are considered undesirable personality traits (Jonason, Li, & Teicher, 2010). Many recent works have related the Dark Triad personality traits to negative or adverse decision making. As individuals' decision to cyberloaf is considered as adverse or defiant behavior, we feel that it is important to understand the cyberloafing behavior through the lens of Dark Triad personality traits. In this study, we attempt to understand how the

Dark Triad personality traits and technology use behavior (e. g. technology time, technology literacy, etc.) contribute to individuals' cyberloafing behavior. To do so, first, we conduct a literature review to understand existing research on the Dark Triad personality traits and to identify several factors related to technology use behavior that may influence individuals' cyberloafing behavior. Second, we predict that the Dark Triad factors and individuals' technology use behavior factors are important antecedents that shape their cyberloafing behavior. Third, we examine these relationships to understand the statistical significance of our prediction using a survey study.

This study seek to gain a deeper understanding of the cyberloafing phenomenon in classroom environment where adverse use of technology influences students' learnings. To do so, we use the Dark Triad traits (Narcissism, Psychopathy, and Machiavellianism) as individual personality traits as well as domain-specific factors related to technology use (technology literacy, number of devices, and technology time). We utilize personality literature to explain why individuals intentionally or unintentionally engage in misusing technology in the form of cyberloafing. We try to explain the mechanisms through which this deviant behavior is facilitated. This study contributes to the trait literature in the field of Information Systems by understanding the interplay between personality traits and technology use factors and their influence on cyberloafing.

THEORETICAL BACKGROUND AND HYPOTHESES

The Issue of Cyberloafing

Misuse of available resources is a human nature and there is no exception for the case of technological resources. Since the widespread use of Internet and computer technology, misuse of these resources at workplace has become a growing challenge for organizations. To describe the emerging problem of technology misuse at the time, early researcher defined the term "cyberloafing" as "wasting time on the Internet while at work" (Frook, 1996). With the increased use and misuse of Internet and other mobile technologies in everyday life, cyberloafing quickly became an interesting topic of discussion to researchers and practitioners. Since the inception of this concept, early researches in cyberloafing are primarily focused on defining, explaining, and high-level understanding of the issue. Lim and her colleagues (V. K. Lim, 2002; V. K. Lim & Teo, 2005) explained the concept as counterproductive work behavior where organizations' Internet accesses were used voluntarily for non-work related purposes while at work. They explained that this counterproductive work behavior negatively impact employees' work performance. The non-work related use of Internet is no longer limited just use of work computer for browsing web. With the rise of social media, electronic commerce, and digital media, cyberloafing behavior has now broadened to the use of any technology (Internet, computer, mobile device, etc.) for non-work related purpose(s) while someone is at work. Kim and Byrne (2011) explained cyberloafing behavior as unproblematic but aimless slacking behavior that is caused by a lack of self-control. Others have explained it as a way to reduce stress that is needed to diversify daily routine, recharge energy level, and increase work performance (Coker, 2013; V. K. Lim & Chen, 2012; Sonnentag, 2003). Yet others have explained it not only as a barrier to productive work environment but also a threat to organizations' information security (Bock, Park, & Zhang, 2010; Bortolani & Favretto, 2009; Hadlington & Parsons, 2017).

Much of the research in cyberloafing is focused on organizational aspects where several organizational factors are investigated in efforts to find their influences on this defiant behavior. Using the theory of organizational justice, Lim (2005) studied the relationships between different forms of organizational justice (interactional justice, distributive justice, and procedural justice) cyberloafing. Zoghbi-Manrique-de-Lara (2009) investigated inequity, conflict, and compliance dilemma as the causes of employees' cyberloafing behavior in organization and found that procedural unfairness can provoke a normative conflict, which then leads to cyberloafing attitudes. Liberman and his team (2011) investigated and reported several organizational characteristics, such as job involvement, managerial support, and employee job attitude as predictors of cyberloafing. There are strong evidences that suggest employees often time engage in cyberloafing behavior to cope with certain types of workplace stressors, such as job

burnout, role ambiguity, and role conflict (Aghaz & Sheikh, 2016; Henle & Blanchard, 2008). Regardless of the organizational aspects leading to cyberloafing behavior, there is a tendency among individuals who cyberloaf to justify their defiant behavior by engaging in both cognitive and behavioral compensatory techniques (Rajah & Lim, 2011). As cyberloafing became a widespread and costly problem for organizations, studies are conducted to explore ways to manage this problem and to propose organizational solutions to minimize this defiant behavior. General Deterrence Theory provided an important theoretical perspective for many anti-cyberloafing disciplinary practices research. Zoghbi-Manrique-de-Lara (2006) reported influence of several anti-cyberloafing organizational characteristics (perceived organizational control, fear of formal punishment, and physical leadership proximity) on cyberloafing behavior. Hassan et al. (2015) found that existence of severe regulations against cyberloafers will decrease the intention of this behavior. They reported having appropriate detection mechanisms, history of past enforcement of the regulations, and relevant sanctions will substantially lower the chance of employees being involve in cyberloafing behavior.

More recent researches in cyberloafing are focused mostly on understanding the individual characteristics rather than organizational aspects of this behavior. In a meta-analytic investigation, Mercado (2017) and her team found that five factor model personality variables are related to cyberloafing. They also reported that individuals high in self-control and socialization character are less likely to exhibit cyberloafing. Additionally, individuals who are high in self-efficacy are more likely to engage in cyberloafing behavior. Another study show that some of the emotional factors, such as affect, habit, social influence, are also important antecedents of cyberloafing intention and actual behavior (Huma, Hussain, Thurasamy, & Malik, 2017). Jia and Jia (2015) empirically investigated the Big Five individual traits and their influence on cyberloafing behavior. They found some of the personality factors are important contributors of individuals' cyberloafing behavior. Based on our extensive literature search on cyberloafing and our discussion thus far, it is clear that the number of studies that focused on individual characteristics are very limited in number compared to the ones focused on organizational and situational characteristics. In addition, the study of interaction between personality and situational characteristics are also relatively rare in Information Systems literature. Thus, there is a lack of research in understanding the issue of cyberloafing phenomenon from individual traits perspective.

The Dark Triad Personality and Cyberloafing

Personality traits are known to play an important role in various aspects of human life. Much of the research on personality traits are mostly around the Big Five Factor traits. These traits are often referred to as good traits. However, there are some aversive personality traits that are referred to as the "Dark Triad" personality traits. The term 'Dark Triad' is used to describe a constellation of three high-order interrelated undesirable personality traits namely, narcissism, psychopathy, and Machiavellianism (Paulhus & Williams, 2002). Since the inception of this concept in literature, the importance and popularity of this topic has quickly grown in psychology literature. Research in personality traits have new paradigm with the introduction of the 'Dark Triad' personality traits. Much research has been done exploring the Dark Triad personality traits within a work settings and the effects that it may have on individuals' work productivity. The three personality traits have been linked to various individual actions from counterproductive work behavior (Cohen, 2016) to choosing occupational niches (Jonason, Wee, Li, & Jackson, 2014). However, there is a lack of interest to date in understanding its relation and impact on technology use and misuse behavior. In this section, we review the existing literature to explore how narcissism, psychopathy, and Machiavellianism affects individuals' behavior in order to derive hypotheses about their influence on cyberloafing, a popular technology misuse behavior.

Narcissism

Narcissism personality trait derives from the psychodynamic formulations and often refers to a psychological personality disorder (Jonason, Lyons, Bethell, & Ross, 2013). Some characterized narcissism as extreme self-aggrandizement, a personality that most individuals possess at some level (O'Boyle, Forsyth, Banks, & McDaniel, 2012). Individuals with high narcissism personality have inflated

view of self, fantasies of control, success, and admiration and desire to have self-love reinforced by others (Morf & Rhodewalt, 2001). Thus, narcissism is considered as egoistic personality trait. They are more likely to have a sense of superiority, grandiosity, exhibitionism, envy, exploitativeness, and instability in mood (Ackerman et al., 2011). Research has shown that there is a high correlations between narcissism and sense of high self-esteem that is inflated and not grounded in objective reality (Penney & Spector, 2002). Narcissists are believed to be socially aversive and are known to be linked with many adverse behavior, such as gambling (Lakey, Rose, Campbell, & Goodie, 2008). A number of studies have linked narcissism personality trait to unethical and maladaptive behaviors. For example, individuals with this personality tend to engage in anti-social behaviors such as bragging and game playing (W. K. Campbell, Foster, & Finkel, 2002), direct and indirect bullying (Madan, 2014), and overall moral disengagement and unethical attitudes (Egan, Hughes, & Palmer, 2015). Because of the sense of superiority, narcissistic individuals would act antisocially rather than more socially desirable way in order to maintain their social superiority status. Moreover, this personality trait have been linked to more frequent use of Facebook (Buckels, Trapnell, & Paulhus, 2014), more intense use of social network sites, and have larger online networks (Carpenter, 2012), which are all known to be anti-social behavior. Because narcissists tend to have exploitative, socially aversive, and anti-social characteristics while believing in short-term gain, and would engage in technology for anti-social activities, we believe that individuals with high in narcissism personality trait are more likely to engage themselves in cyberloafing behavior. Thus we propose the following hypothesis:

H1: Narcissism personality trait positively influences individuals' cyberloafing behavior.

Psychopathy

Psychopathy personality trait is the darkest among the triad because this trait has strong link to criminality (Jonason, Baughman, Carter, & Parker, 2015). This personality trait is described as attitude that is lack of concern for people and social regulatory mechanisms as well as lack of remorse for harmful behavior (O'Boyle et al., 2012). Individuals with psychopathy trait show impulsive behavior through a consistent pattern of disregard and violation of others' rights. These individuals are predatory and decisive in nature and violate social norms (Moor & Anderson, 2019). Psychopathy personality trait has been associated with a wide variety of aversive behaviors, such as academic cheating, use of exploitative and short-term mating strategies, and preference for antisocial attitude (O'Boyle et al., 2012). Thus, individuals with this personality are prone to untruthful behavior and do not hesitate to use dishonesty for personal gain. Harrison et al. (2018) reported strong relationship between this personality trait and fraud intention. Because, psychopathy trait has been linked to cyber-aggression (Ciucci, Baroncelli, Franchi, Golmaryami, & Frick, 2014) and cyberloafing (Lowe-Calverley & Grieve, 2017), we posit the following hypothesis:

H2: Psychopathy personality trait positively influences individuals' cyberloafing behavior.

Machiavellianism

Machiavellianism personality trait evolved from the human character of deception and manipulation for personal gain and power (Madan, 2014). Similar to Psychopathy, Machiavellianism is also a darker personality trait. Although there are many similarities between Machiavellianism and psychopathy in a way that both traits are manipulative in nature, the first is less aggressive than the second. Individuals with Machiavellianism personality are characterized by aggressive, cruel, self-centered, ruthless, and manipulative in nature. They tend to think immorally, have suspicious attitude, and have socially undesirable behavior because of their deceitful and exploitative motivation. Machiavellianism personality trait is described as manipulative personality because of its nature to pursue and maintain power while disregarding morality, use of craft and dishonesty, and less intrinsically motivated to work (Cohen, 2016). O'Boyle et al. (2012) stated that individuals with Machiavellian personality possess three interrelated values – they believe in the effectiveness of manipulative tactics in dealing with other people, they have a

cynical view of human nature, and they prefer expediency above moral principle. Thus, individuals with this personality are prone to untruthful behavior and do not hesitate to use dishonesty for power or personal gain. Moor and Anderson (2019) reported Machiavellianism to have the strongest correlation with problematic Internet use and have strong association with online gambling and online sex. Because, Machiavellianism personality trait has been linked to cyber stalking (Smoker & March, 2017), cyberbullying (Goodboy & Martin, 2015), and cyber-aggression (Pabian, De Backer, & Vandebosch, 2015), we posit the following hypothesis:

H3: Machiavellianism personality trait positively influences individuals' cyberloafing behavior.

Technology Use and Cyberloafing

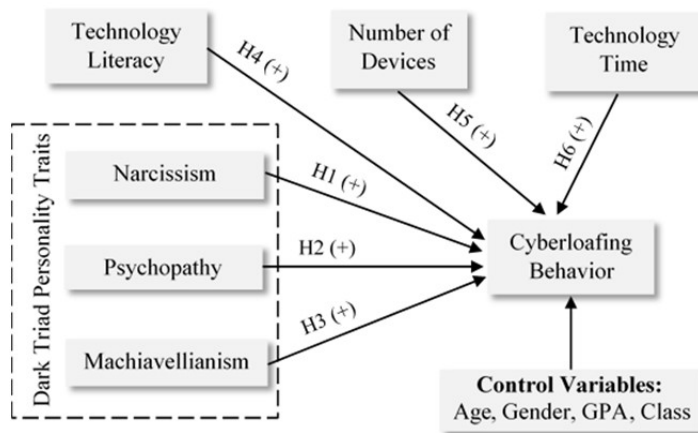
Technology has become an integral part of our daily life that often time improve the quality of our life. However, overuse or misuse of technology can have negative consequence on individuals' social behaviors, skills, and other habits. The concept of cyberloafing evolved because of the widespread dissemination of mobile and Internet technologies, and, thus, there is a very close relationship between people technology use behavior and cyberloafing. For example, Jia and Jia (2015) reported a positive significant relationship with the spontaneity of computer interaction and cyberloafing, implying that individuals who are fluent in computer interaction are more likely to engage in cyberloafing behavior. Arabaci (2017) investigated the cyberloafing behaviors among students and reported that students with expert in using Internet are more likely to engage in cyberloafing than the students with medium or low-level of Internet usage skills. They also found that individuals with longer period of Internet experience are more likely to involve in cyberloafing behavior. Several other studies also reported similar findings where advanced and expert Internet users are more involved in cyberloafing than intermediate and novice users (Baturay & Toker, 2015; Keser, Kavuk, & Numanoglu, 2016). Gokcearslan (2016) also investigated cyberloafing behavior among university students and reported a strong relationship between smart phone addiction and cyberloafing behavior. Duration of technology use also influence individuals' cyberloafing behavior. Yilmaz and her team (Yilmaz et al., 2015) investigated cyberloafing activities using information and communication technologies into teaching and learning environment. They found that students who spend more time on Internet tend to cyberloaf more than the students who spend less time on Internet. Betts and her team (Betts, Setterstrom, Pearson, & Totty, 2014) also reported similar findings that Internet skill and percentage of time used for Internet positively influences individuals' cyberloafing behavior. Based on the existing research findings, we believe that individuals technology skills, time spend with technology, and access to number of devices will influence their cyberloafing behavior. Thus, we put forward the following hypotheses regarding technology use and cyberloafing behavior:

H4: Individuals level of technology literacy will positively influence their cyberloafing behavior.

H5: Access to Number of devices will positively influence individuals' cyberloafing behavior.

H6: Technology time (amount of time spent using technology) will positively influence individuals' cyberloafing behavior.

FIGURE 1
CONCEPTUAL MODEL FOR CYBERLOAFING BEHAVIOR



Control Variables

In order to mitigate confounding effects on cyberloafing behavior, several demographic variables are included in this study. Following best practices, we selected control variables for reasons beyond collecting basic demography (Bernerth & Aguinis, 2016). Four control variables are used: age, gender, GPA, and education level. Existing research suggest that cyberloafing behavior varies based on individuals’ gender. For example, Sheikh et al. (2015) reported that men are more prone to cyberloafing activities than women. Their finding is in line with several other findings (Jia & Jia, 2015; Liberman et al., 2011; V. K. Lim & Chen, 2012) that gender is an important variable and that cyberloafing behavior can vary based on gender. Similar to gender, age is also considered important factor in understanding cyberloafing behavior. This is because existing research suggest that younger individuals are more likely to misuse technology than older individuals and more prone to cyberloafing behavior (Jia & Jia, 2015; Liberman et al., 2011; V. K. Lim & Chen, 2012; Sheikh et al., 2015). Level of one’s education is also known to be an important factor that influence the person’s cyberloafing behavior. Studies suggest that more educated person are less likely to cyberloaf than less educated person (Sheikh et al., 2015).

RESEARCH METHODOLOGY

Scale Development

The survey instrument for this study was developed using already established measurement items from existing literature as well as several new items. For measuring the Dark Triad personality traits, a total of 15 questionnaire (five for each of the three personality traits) was selected from Jones & Paulhus (2014) and Jonason & Webster (2010). Individuals’ cyberloafing behavior was measured using five measurement items selected from Lim (2002). All items adopted from existing literature were modified to fit the context specific for this study. While items for personality traits and cyberloafing were adapted from existing literature, six items for technology literacy were newly introduced for this study due to the unavailability of an appropriate and validated instrument. For all measurement items, a five-point Likert scale was used, ranging from 1 (strongly disagree) to 5 (strongly agree). Appendix A provides the measurement items utilized for this study.

Participants and Procedure

The research model and associated hypotheses proposed in this study were empirically tested using a survey methodology. Survey research method was selected for this study as it is generally considered to be appropriate in discovering the “interrelations of sociological and psychological variables” (Kerlinger & Lee, 2000). Additionally, situations where perceptual measures rather than objective measures more

effectively represent real-world situations, the survey technique is also known to be appropriate (Melone, 1990). The statistical population of this study consists of students from two major universities in USA. A total of 974 valid responses were collected from the study participants. Among the respondents, 56% were male and 44% were female, 10.4% were age 19 or younger, 83.4% were age between 20 and 24, and rest were age 25 or older. The distribution of the respondents according to their education background is as follows: 2% were freshman, 13% were sophomore, 58% junior, 26% senior, and rest were graduate students. In order to collect data, a measurement instrument with self-report questionnaires was developed to measure the factors. Appendix A provides the survey instrument as it was used to collect responses.

DATA ANALYSIS AND RESULTS

We analyzed the data for this study using a second generation causal path modeling technique, partial least square structural equation modeling (PLS-SEM) technique (Chin, Marcolin, & Newsted, 2003). We modeled the data using SmartPLS 3.2.9 software package developed by Ringle, Wende, & Will (2015) because of its ability to handle non-normally distributed dataset using bootstrapping resampling technique (Vinzi, Trinchera, & Amato, 2010). This statistical tool is also known to have capability to handle both large and small dataset while effectively handle interval and ratio responses (Chin, 1998), making it a suitable tool for this study. Structural Equation Modeling (SEM) technique has been widely used in empirical research because it not only allows testing of causal relationships between constructs with multiple measurement items but also because of its ability to examine the structural component (path model) and measurement component (factor model) simultaneously (Rahman, Ko, Warren, & Carpenter, 2016). Data analysis for this study are done in two steps – 1) reliability and validity of the instrument were first analyzed using measurement model analysis; 2) hypotheses were tested using the structural model analysis.

Measurement Model Analysis

We first analyzed the psychometric properties of the measurement items by examining the internal consistency reliability, convergent validity, and discriminant validity. Table 1 shows the results summary for the measurement model. The factor loadings and indicator reliability values are recommended to be above the threshold of 0.6 and 0.4 (Wong, 2013), respectively. Another measure for the significant of factor loadings is the T-statistics. Using a two-tailed t-test, the PLS-SEM analysis provides T-statistic values that must be greater than 1.65 for a 10% significant level, 1.96 for a 5% significant level, and 2.58 for achieving a 1% significant level (Wong, 2013). Based on these criteria set forth in the existing literature, several items in the survey did not meet the threshold of recommended levels of factor loading, indicator reliability, and T-statistic and were dropped from further analyses. The remaining items have all loaded strongly and significantly on to their respective construct as shown in Table 1, ensure a good convergent validity of the instrument.

In addition to the factor loadings, it is also important to ensure internal consistency reliability for the measurement items because internal consistency reliability ensures that the items belong to a construct accurately measure the construct (Junglas & Spitzmuller, 2006). The Cronbach's (1951) alpha is frequently use for this purpose and provides a lower bound estimate. Another internal consistency evaluation measure that is more rigorous than Cronbach's alpha is the composite reliability values for each constructs, which indicates the percent variance in a measurement. All of the constructs in this study have Cronbach's alpha and composite reliability values that are well above the threshold of 0.7, recommend minimum thresholds for both measurement criteria (Gefen, Straub, & Boudreau, 2000; Junglas & Spitzmuller, 2006). Thus, all constructs have high internal consistency reliability using our measurement scales.

TABLE 1
PLS-SEM RESULTS FOR MEASUREMENT MODEL

	Item	Loading (L)	Indictor reliability (L ²)	Cronbach's alpha	Composite reliability	AVE	VIF	T statistic
Cyberloafing	CL2	0.810	0.656	0.799	0.868	0.623	1.601	49.373
	CL3	0.828	0.686				1.856	52.973
	CL4	0.722	0.521				1.511	27.712
	CL5	0.793	0.629				1.601	42.642
Narcissism	NR1	0.747	0.558	0.770	0.851	0.588	1.868	25.884
	NR2	0.805	0.648				1.957	40.378
	NR3	0.741	0.549				1.345	28.237
	NR4	0.774	0.599				1.474	34.285
Psychopathy	PY1	0.808	0.653	0.751	0.842	0.573	1.775	36.887
	PY2	0.800	0.640				1.798	32.761
	PY3	0.751	0.564				1.312	22.201
	PY4	0.659	0.434				1.296	17.144
Machiavellianism	MC1	0.837	0.701	0.830	0.883	0.653	1.854	41.049
	MC2	0.815	0.664				2.281	29.441
	MC3	0.831	0.691				1.563	36.186
	MC4	0.746	0.557				1.890	20.805
Tech. Literacy	TL2	0.569	0.324	0.795	0.842	0.580	1.543	2.403
	TL3	0.793	0.629				1.933	3.311
	TL4	0.943	0.889				1.942	2.633
	TL6	0.692	0.479				1.699	3.017

While convergent validity assesses the degree to which different attempts to measure the same construct agrees (Cook, Campbell, & Day, 1979), discriminant validity, on the other hand, assesses the degree to which measure of different constructs are distinct (D. T. Campbell & Fiske, 1959). Both measures are very important to assess the validity of the measurement instrument. In addition to the factor loadings, convergent validity is also evaluated using each of the latent variable's Average Variance Extracted (AVE) values, a measure that gauge the level of variance in the items explained by the latent variables and recommended to be higher than 0.5 (Fornell & Larcker, 1981). For establishing the discriminant validity of the instrument, it is recommended that the square root of AVE must be greater than the shared variance between the constructs (Chin, 1998). The AVE values for each of the construct are higher than the recommended threshold, implying a good convergent validity for the measurement instrument. For satisfying the discriminant validity, we performed the Fornell-Larcker analysis, where all the diagonal values (square root of AVE) are much greater than the shared variance between the

constructs. The Fornell-Larcker analysis in Table 2 suggests that the measurement instrument has achieved a good discriminant validity.

Multicollinearity and common method bias are two common issues with any survey method study and should be tested to ensure their non-existence prior to performing hypotheses testing. To rule out the existence of multicollinearity, the variance inflation factors (VIF) values are recommended to be under 5. Table 1 shows the VIF values for all measurement items that are much lower than the threshold of 5, indicating that multicollinearity is not an issue with the measurement items. In order to rule out common method bias, we conducted the Harman single-factor test as recommended by Podsakoff et al. (2003) and found that no single factor is apparent in the un-rotated factor structure, which is an indication that common method bias is not an issue in this study.

TABLE 2
FORNELL-LARCKER CRITERION ANALYSIS

	Cyberloafing	Machiavellianism	Narcissism	Psychopathy	Tech Literacy
Cyberloafing	0.789				
Machiavellianism	0.195	0.808			
Narcissism	0.200	0.425	0.767		
Psychopathy	0.104	0.528	0.305	0.757	
Tech Literacy	-0.064	-0.029	0.007	0.099	0.762

Structural Model Analysis

As SEM-PLS analysis does not generate overall goodness of fit indices, the predictive validity was examined by using the explanatory power and significance of the paths. The summarized result for the structural model path analysis is shown in Table 3. In this study, several latent variables and control variables were considered and together they can explain 14.6% of the variances in the dependent variable, cyberloafing behavior. Three dark triad personality traits were some of the latent variables and path analysis suggest that, out of the three, Narcissism and Machiavellianism have significant influences on the dependent variable with $\beta = 0.117$, $p = 0.001$, T-statistics = 3.201 and $\beta = 0.094$, $p = 0.015$, T-statistics = 2.433, respectively. These results suggest significant support for hypotheses H1 and H3. According to the path analysis, the third triad personality trait factor, Psychopathy, do not have significant influence on the dependent variable, cyberloafing behavior. Hence, hypothesis H2 is not supported. This hypothesis and the implication of this finding is further discussed in the discussion section.

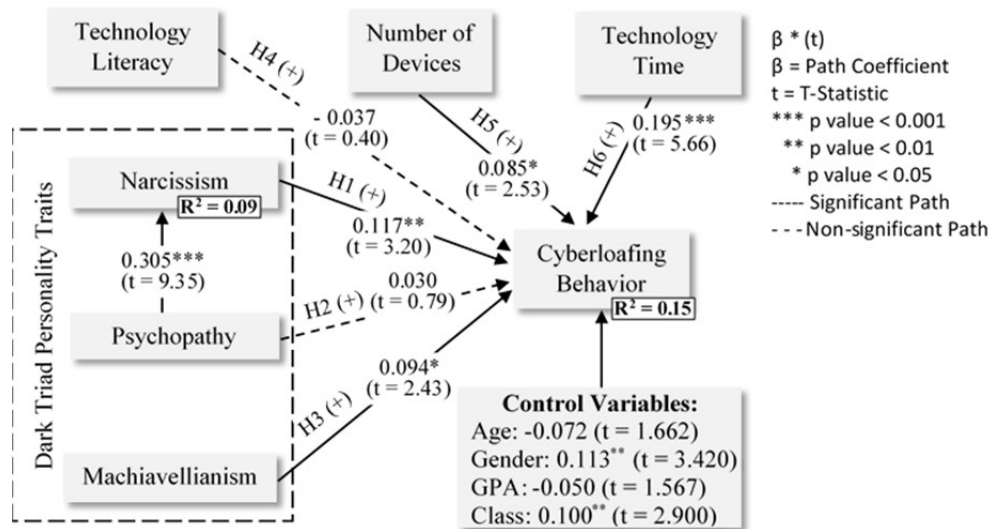
TABLE 3
PLS-SEM PATH ANALYSIS RESULTS SUMMARY FOR STRUCTURAL MODEL

Hypothesis	Path	β	p	T statistics	Test Result
Control Variables	Age \rightarrow Cyberloafing	-0.072	0.097	1.662	Not Significant
	Class \rightarrow Cyberloafing	0.100	0.004**	2.900	Significant
	GPA \rightarrow Cyberloafing	-0.050	0.117	1.567	Not Significant
	Gender \rightarrow Cyberloafing	0.113	0.001**	3.420	Significant
H1	Narcissism \rightarrow Cyberloafing	0.117	0.001**	3.201	Supported
H2	Psychopathy \rightarrow Cyberloafing	0.030	0.428	0.793	Not Supported
H3	Machiavellianism \rightarrow Cyberloafing	0.094	0.015*	2.433	Supported
H4	Technology Literacy \rightarrow Cyberloafing	-0.037	0.837	0.403	Not Supported
H5	Number of Devices \rightarrow Cyberloafing	0.085	0.011*	2.534	Supported
H6	Technology Time \rightarrow Cyberloafing	0.195	0.000***	5.660	Supported
Mediation Effect	Psychopathy \rightarrow Narcissism	0.305	0.000***	9.352	Significant

*p < 0.05, **p < 0.01, ***p < 0.001

Out of the three technology related attributes, technology literacy did not have significant influence on cyberloafing, not supporting H4. However, number of devices owned and amount of time spent on technology per day on non-class related activities were both found to be significant with $\beta = 0.085$, $p = 0.011$, T-statistics = 2.534 and $\beta = 0.195$, $p = 0.000$, T-statistics = 5.660, respectively. Thus, both hypotheses H5 and H6 are supported, indicating that the number of devices and amount of time spent on technology are both have significant influence on the dependent variable, individuals' cyberloafing behavior. Among the control variables, both class standing and gender were found to be significant with $\beta = 0.100$, $p = 0.004$, T-statistics = 2.900 and $\beta = 0.113$, $p = 0.001$, T-statistics = 3.420, respectively. Figure 2 shows the research model with path significance results.

FIGURE 2
RESEARCH MODEL WITH PATH SIGNIFICANCE RESULTS AND MEDIATING EFFECT



DISCUSSION OF RESULTS

In this study, we examined the effects of dark triad factors and technology related factors on individuals' cyberloafing behavior. Because of the lack of understanding in the existing literature for forming individuals' cyberloafing behavior, we proposed that dark triad factors along with some of the technology related factors can explain this adverse behavior. As younger generation is most prone to cyberloafing activities and specifically in educational settings, we tested our model using young participants (i.e. aged mostly 18 – 25) from educational institutions. The findings reveal that Narcissism is the most significant predictor of the cyberloafing behavior among the dark triad personality traits followed by Machiavellianism. As the results did not find significant influence of Psychopathy on the cyberloafing behavior, we ran a separate analysis and found that this dark triad personality trait has significant indirect (mediating) effect on the dependent variable with T-statistic = 2.995 and $p = 0.003$. The second analysis revealed that there is a very strong positive influence of Psychopathy on the Narcissism personality trait ($\beta = 0.305$, $p = 0.000$, T-statistics = 9.352), which in turn influences the Cyberloafing behavior.

Thus, Narcissism is not only a significant predictor of cyberloafing behavior, this personality trait also act as an important mediator between Psychopathy and cyberloafing behavior. In other words, individuals' high Psychopathy personality trait will lead them to become more narcissist, which in turn will influence them to engage in more cyberloafing behavior. Overall, our results support Paulhus et al's (2002) observation that while the Dark Triad constructs are related, not equivalent.

The results also revealed important and interesting findings for technology related factors. Among the three technology related factors, technology time has the strongest influence on the cyberloafing behavior. That means more time individuals spend on using technology, more likely they are to engage in cyberloafing behavior. Similarly, number of devices an individual have access to during the class also a significant predictor for cyberloafing behavior. Individuals who have access to higher number of devices during the class are more likely cyberloaf more than the individuals who have access to fewer number of devices during the class. Unlike technology time and number of technology factors, technology literacy was not found to have significant influence on cyberloafing behavior. We predicted a positive relationship between technology literacy and cyberloafing behavior. However, the results show a non-significant but a negative relationship, which we believe to be a very interesting finding. This finding implies that as individuals become more literate in technology, they tend to understand the implications of cyberloafing behavior and would keep themselves away from engaging in this adverse activity. As we did not find this negative relationship to be significant we believe further testing is needed to confirm this relationship.

The results also reveal interesting findings related to the control variables. Both age and GPA were found to be insignificant influencer of cyberloafing behavior, suggesting that there might be a decline in interest in school. However, class standing and gender are found to have positive significant relationships with cyberloafing behavior. These findings imply that as students mature and become senior from freshman, they tend to be more prone to the cyberloafing behavior. These findings also suggest that female students are more prone to cyberloafing behavior than male students, which contradicts many of the existing literature where men were found to engage in cyberloafing behavior than women. The rational for this reverse finding is that most if not all of the existing literature on cyberloafing are focused on work place environment where participants are older and more matured than the student participants in this study. Thus, we believe type of participants and their age as well as level of maturity have played a significant role for our finding.

CONTRIBUTIONS AND IMPLICATIONS

This empirical research contributes to existing literature in a number of ways. This research fills an important gap in cyberloafing literature by providing insights into the formation of this aversive behavior. Although a fairly large body of existing literature investigated cyberloafing behavior from organizational and individual perspective, to our knowledge, this is the first ever study to date that use the lens of dark

triad personality traits to understand the cyberloafing behavior. We not only show that all three dark triad traits are important in forming an individual's cyberloafing behavior, but also found that there is a mediating relationship between these traits where one of the trait (Psychopathy) influences the other trait (Narcissism), which in turn influences the cyberloafing behavior. Another important implication of this finding is that this study also the first one (to our knowledge) to reveal the existence of interrelationship between the three dark triad personality traits. We not only confirmed Paulhus et al's (2002) observation that while the Dark Triad constructs are related, they are not equivalent, but also one trait influence another and they have interrelationships.

This research is among the first of its kind in an educational settings where both personality traits and technology use behavior are examined at the same time for the formation of cyberloafing behavior. Our findings confirm existing literature that more an individual have access to number of devices and longer they use the devices, more they are likely to engage in this aversive behavior. These findings are particularly important in shaping classroom policies for educational institutions. This study particularly call for attention to academic administrators and educators who are key individuals in shaping classroom policies. These findings suggest that more technology in the classroom and more technology time for students not necessarily mean a better and productive learning environment. Students' access to these classroom technologies should be relevant to the materials being taught and limited to class-related activities in order to provide a better learning experience for the students.

Another notable finding was that technical literacy was not a significant predictor of cyber loafing. Intuitively the person who has a background in technology should be a person who has the skills and knowledge to take advantage of technology. This is an important finding because it suggests that those individuals with understand technology also understand the consequences of technology abuse, providing an incentive to avoid abuse. This suggests that more education on information technology and not less is needed to demonstrate to both students and workers the potential implications of technology abuse. Another important finding is that women are more likely to cyber loaf, which suggests that in researching this topic, careful consideration of the type of sample is needed.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

A number of limitations must be acknowledged prior to considering the value of this study while interpreting the results and in conducting future studies. First, this study used students from two universities as convenient sample. These students were mostly undergraduate enrolled in mostly business classes. Although, participants with these specific background do not disqualify as valid respondents for this study, we believe that generalizability of this study can be greatly improved by recruiting students across different disciplines and from a broader population. A second limitation of this study is that different levels of cyberloafing was not considered in this study. For example, Blanchard and Henle (2008) separated cyberloafing behaviors as serious (major) and insignificant (minor), Baturay and Toker (2015) differentiated several types of cyberloafing as personal business, news follow-up, and socialization. Thirdly, we used short form measures of our Dark Triad constructs, which given the complexity of the personality variable, future research is needed using longer form measures. Fourthly, given that we collected our sample at one time, there could concerns over common method bias. However, given the different level of correlations we have received, we are not concerned (Spector & Brannick, 2010).

Future research should also consider which situations serve to activate personality characteristics and cyber loafing. Much of this research has been on trait activation theory (Tett & Burnett, 2003), which has considered variables such as leader member exchange and autonomy to examine their relationship with both trait activation and deactivation. Such research is warranted on cyber loafing personality. Likewise, scholars need to consider having other rater measures of personality or reports of cyber loafing from the supervisor or corporation. It is possible that psychopathy made induce people to understate their cyberloafing.

CONCLUSION

As the Dark Triad traits are considered as negative personality because of their aggressive and aversive nature, this study seek to gain a deeper understanding of the cyberloafing phenomenon using this personality traits. To do so, we use the Dark Triad traits (Narcissism, Psychopathy, and Machiavellianism) as individual personality traits as well as domain-specific factors related to technology use (technology literacy, number of devices, and technology time). We utilize personality and technology literatures to explain why individuals intentionally or unintentionally engage in misusing technology in the form of cyberloafing. We offer a model to explain the mechanisms through which this deviant behavior is facilitated. Our findings reveal narcissism and Machiavellianism to have direct influences and psychopathy to have indirect influence on individuals' cyberloafing behavior. Access to number of devices and duration of time spent are also important antecedents of cyberloafing behavior. However, technology literacy was found to have insignificant but negative influence on cyberloafing behavior, suggesting that technology knowledge deter individuals from engaging in cyberloafing behavior. This study contributes to the trait literature in the field of Information Systems by understanding the interplay between personality traits and technology use factors and their influence on cyberloafing. This study also advances the current understanding of negative aspects of technology use behavior.

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APPENDIX

Cyberloafing	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
During class I like to Keep up to date with current sporting events (Basketball, Soccer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shop online for personal goods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Browse non-class related media or news sites (Fox, NPR, Facebook, Instagram)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Browse entertainment related sites or apps (Netflix, games, music)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check, send, or receive non-school related email and messaging services (email, texting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Computer Literacy	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I am capable with using a computer to do basic things such as get on the internet, send email, and make documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am capable with troubleshooting errors in computers and fixing them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can program a computer application for others to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am familiar with computer code and programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think trying to keep up with the changes in technology is a hassle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My friends think of me as a knowledgeable source of information for technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Dark Triad Personality Traits	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I tend to want others to admire me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to want others to pay attention to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to expect special favors from others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I tend to seek prestige or status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to lack remorse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to be insensitive or callous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to not be too concerned with morality or the morality of my actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to be cynical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have used deceit or lied to get my way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to manipulate others to get my way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I have used flattery to get my way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to exploit others towards my own end	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to think it's better to be totally honest than to be successful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I tend to hate being the center of attention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have never gotten into trouble with the law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Gender

- Male
- Female
- Other

Age

- 19 or younger
- 20 – 24
- 25 – 29
- 30 – 39
- 40 and over

GPA

- 4.0 – 3.6
- 3.5 - 3.1
- 3.0 - 2.6
- 2.1 - 2.5
- 2.0 or below

Class Standing

- Freshman
- Sophomore
- Junior
- Senior
- Graduate

What type of technology do you have access to during class? (Select all that apply)

- Cellphone
- Laptop/Desktop
- Smartwatch
- Tablet
- Other

On average I spend __ minutes on technology for non-class related activities

- 0 – 10
- 11 – 20
- 21 – 30
- 31 – 40
- 41 or more