# PLAYING INCREMENTAL GAMES AT WORK AS RELIEF? MAYBE NOT

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**Abstract**

Incremental game is a popular genre of games characterized by incremental progress with or without player input. Incremental games are often thought of as the perfect games to play at work since it does not interrupt work. Using an online survey of 466 incremental game players that have full-time jobs, this study seeks to examine to what extent does work-related stress predict incremental game playing behavior during work and outside of work. Moreover, does playing incremental games during work facilitate recovery from work-related stress? The findings showed that recovery needs predicted incremental game-playing during work, but not outside of work. However, playing incremental games during work was negatively associated with recovery experience.

## Introduction

Playing digital games during work time is generally viewed as a form of "cyberslacking," defined as the use of internet and technology during work time for personal purposes (Vitak, Crouse, & LaRose, 2011). Studies estimate that the average American workers spend between two to three hours of their work time on activities including online shopping, checking personal emails, blogging, watching online videos, and playing digital games (Blanchard and Henle, 2008; Greenfield and Davis, 2002; Madden and Jones, 2008). With increased ease of access to the internet, many workers in developed countries are found playing casual games during work. A survey conducted by PopCap Games found that 24% of the surveyed white-collared workers play games during work including 35% of the surveyed senior executives (Gameindustry.biz, 2007). Cyberslacking is often perceived as a threat to work productivity because the activities distract workers from their work (Lim, 2002). However, some scholars argue that personal activities during work can serve as coping strategies that relieve work-related stress and add variety to routine work (Henle and Blanchard, 2008; Lim and Chen, 2012; Oravec, 2002). Taking a break during work time by engaging in personal activities may even help workers re-focus on work-related tasks (Lim and Chen, 2012).

Recent studies support the idea that playing digital games can help workers recuperate from work-related anxiety, stress, and cognitive exhaustion (Collins and Cox, 2014; Reinecke, 2009a; Reinecke, Klatt, & Krämer, 2011). Scholars argue that digital games' recovery potential is due to its high absorption potential from interactivity and immersion. As an interactive media, digital games provide

players with a sense of control and agency (Grodal, 2000), requiring players' attention to process the continuous input-feedback loops (Klimmt and Hartmann, 2006). Digital games can also immerse players in virtual worlds and play different roles, allowing players to briefly escape their mundane work (Sherry, Lucas, Greenberg, & Lachlan, 2006). However, different types of digital games vary in their level of cognitive demand and immersion. The types of digital games that workers play during work are less likely to be games that are highly immersive and takes multiple hours to complete, such as massively-multiplayer online games or first-person shooter games. Instead, the games played during work are more likely to be casual games that have simple mechanics and can be played at short durations. One type of casual game that is of interest to this study is incremental games that require minimal player inputs and can sometimes play by itself in the background. Unlike immersive games that support work recovery through its absorption potential, incremental games may act as short mental breaks. Will work-related stress predict more incremental gameplay during work or outside of work? Can playing incremental games during work support recovery from work-related stress?

*Incremental games*, also known as idle games or clicker games, is a genre of digital games defined by its focus on minimal player interaction and incremental resource growth. In an incremental game, players acquire resources by performing simple actions such as clicking on the screen or making simple decisions. Even when the player is not interacting with the game, many incremental games have mechanics that allow incremental resource growth. For example, in the popular game *Cookie Clicker*, players earn cookies by clicking on a cookie repeatedly or by leaving the game to play in the background of the browser. The cookies earned can be spent to purchase items that speed up the automatic accumulation of cookies. The game's goal is simple, to accumulate more cookies, indefinitely, with no win-lose scenario or an end. Incremental games such as *Clicker Heros*, *Tap Titans*, and *AdVenture Capitalist* are regularly among the top played games on mobile phones and Valve's gaming platform Steam. Through an online survey of workers who play incremental games, this study examines the relationship between work-related stress and playing incremental games, as well as the recovery potential of playing incremental games during work and outside work time.

## Related Literature

### *Cyberslacking*

Cyberslacking is prevalent among workers around the world who have access to computers during work. National surveys showed that 80% of workers in the United States reported using the internet for personal purpose during work, while cyberslacking is not limited to workers of specific professions, it is especially prevalent among workers with higher status and autonomy, younger workers, and male (Garrett and Danziger, 2008a; Vitak, et al., 2011). Similarly, Lim and Chen (2012) examined workers in Singapore and found that the average worker spends 51 minutes of work time on personal use of the internet. Cyberslacking is a concern to companies and organizations because it can distract workers from work-related tasks and lead to production loss (Anandarajan, Devine, & Simmers, 2004; Blanchard and Henle, 2008; Lim, 2002). Some estimates that cyberslacking activities cost companies in the UK roughly £300million (~USD 600million) in productivity annually (Taylor, 2007).

Workers may be especially tempted to engage in cyberslacking activities because they are less observable than other physical breaks to their workers or supervisors. Checking one's private email,

chatting on instant messenger, or browsing one's social media page can provide quick gratifications and discontinued immediately at will. However, the motivations behind cyberslacking are mixed. While some studies show that perceived injustice in the organization (i.e., that the company is not fair to workers), or lack of control over one's work predicts minor cyberslacking activities (Blanchard and Henle, 2008; Lim, 2002). Other studies found that disaffection towards the company does not predict cyberslacking behaviors. Instead, the behaviors are mostly driven by perceived utility of the internet and psychological benefits of the technology (Garrett and Danziger, 2008a). Many workers reported positive gains from the personal use of the internet during work such as helping them boost their emotions, or learning new skills that can support their work (Lim and Chen, 2012).

The conflicting findings may be due to the different cyberslacking activities examined in previous studies. While some studies included all internet use during work without distinguishing activities(Lavoie and Pychyl, 2001), other studies focused on a few specific activities such as checking email or browsing the web (Garrett and Danziger, 2008a; Lim, 2002). Some scholars have attempted to differentiate different types of cyberslacking by its cause or effects. For example, Lim (2002) argued that cyberslacking activities can be categorized into two categories: browsing and emailing. Browsing consists passive use of the internet, such as reading online news, watching sports, checking the stock market, and visiting adult websites. Emailing involves more interactive communication, such as checking and sending personal emails. Based on research in workplace deviance, Blanchard and Henle (2008) made a distinction between minor and serious cyberslacking activities. Minor cyberslacking refers to common use of the internet including browsing websites and sending emails; it is considered minor as it resembles commonly tolerated but inappropriate behaviors at work, such as reading the morning newspaper or making personal phone calls. In comparison to minor cyberslacking, serious cyberslacking consists of behaviors that are disruptive and potentially illegal, such as visiting adult websites, downloading videos, and online gambling. Similarly, Anandarajan, et al. (2004) identified three types of cyberslacking behavior. Recreational activities include browsing online shopping websites and checking emails. Personal learning activities include checking the news or professional forums. Disruptive activities are the behaviors that organizations should be worried about, such as visiting adult websites, online gambling, downloading illegal music, and playing video games. According to these typologies of cyberslacking, playing digital games during work is viewed as a severe disruption to work that can have negative consequences. However, few studies have examined the cause the effects of playing games during work, and the few studies that have examined the effects (e.g., Reinecke, 2009b) do not differentiate between different types of games played at work. Just as it is problematic to examine internet use as a monolithic experience, different types of games consist of varying degrees of attention, immersion, and disruption, which may lead to different outcomes.

#### *Work recovery experience*

One potential motivation for playing digital game during and after work is to recovery from work-related fatigue. Working for long hours can be mentally, physically, and emotionally straining, which can lead to stress, burnouts, productivity loss, and decreased well-being. To replenish energy and restore one's mood, individuals may engage in activities that help them recover. *Recovery* is the opposite of stress and fatigue and can be viewed as a process that helps "unwind" one's functional systems to its pre-stressed states (Sonnentag and Fritz, 2007). Summarizing previous studies on work recovery, Sonnentag and Fritz (2007) identified four types of recovery experience:

**Psychological detachment.** Some workers can detach themselves from work physically when they leave the workplace, but physical detachment from work may not be available to all workers (e.g., workers who work from home or workers who are on call), nor is it sufficient for recovery. With the increased adoption of communication technology such as mobile phones and email in organizations, many workers are expected to respond to work demands even after they leave the workplace. Work-related stress can spillover to one's life and have detrimental effects on one's mood, sleep quality and well-being. Therefore, recovery requires psychological detachment, the ability to mentally detach oneself from work. Psychological detachment can take many forms, while one person may choose to take a walk in the forest, another person may choose to watch a movie or read a book to remove one's thoughts away from work. Studies have shown that successful psychological detachment from work is related to positive affect and well-being (Newman, Tay, & Diener, 2014; Reinecke, 2009a; Sonnentag, Binnewies, & Mojza, 2008).

**Relaxation.** Work stress is often caused by the high physical and psychological demands at work; relaxation is reducing these demands to allow the body and mind to replenish. Activities that support relaxation is often characterized by low activation, increased positive affect, and not challenging, such as meditation, yoga, or listening to music (Stone, Kennedy-Moore, & Neale, 1995). Relaxation can facilitate recovery by reducing the strains from prolonged activation at work, and also by offsetting negative emotions (Sonnentag and Fritz, 2007).

**Mastery experience.** In comparison to relaxation, individuals can also recover from work by engaging in challenging activities that boost their competence and self-efficacy. Examples include playing sports, learning a new language, or volunteering during the weekend (Sonnentag and Fritz, 2007). A study by Rook and Zijlstra (2006) used diary method to examine the relationship between recovery activities, sleep quality, and recovery. Their study found that low-effort and social activities did not predict recovery, but the challenging physical activities supported recovery. While the challenging activities can place additional physical or psychological demands on the individuals, they can also build up the individuals' skills, competency, and self-efficacy that can help them cope with stress from work.

**Control.** Autonomy has been identified as an intrinsic human need and motivation (Deci and Ryan, 2010). A major source of work-related fatigue comes from the feeling that one has no control over the work schedule or the outcome (Laschinger, Finegan, Shamian, & Wilk, 2004; Organ and Greene, 1974). Engaging in activities voluntarily, and activities that offer individuals control over their pace, progress, and outcomes support individuals' autonomy needs and can promote well-being.

Entertainment media offers many recovery potentials and is a convenient option in modern society. Research in mood management theory has consistently found that people's media choices are often motivated by the need to boost their mood and arousal (Knobloch-Westerwick, 2006; Zillmann, Hezel, & Medoff, 1980). Watching television is a common way for people to relax and escape from the stress of life (Henning and Vorderer, 2001), and watching familiar television shows helps restore sense of self-control (Derrick, 2013). Recent studies show that video games can support all four types of recovery (Collins and Cox, 2014; Reinecke, 2009a; Reinecke, et al., 2011).

*Recovery potential of digital games*

Video games have potential to support recovery through psychological detachment, relaxation, mastery experience, and control. Many games are designed to immerse players in their game mechanic, virtual worlds, and rich characters, which can help players detach from their work-related thoughts and stress. Some games such as casual games are designed to support relaxation by reducing the physical or cognitive demands on players. As an interactive media, most video games require active player input to progress, and players are directly responsible for the process and outcomes of the game. The interactive features and choices afford mastery experience and sense of control (Grodal, 2000; Klimmt, Hartmann, & Frey, 2007; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010). Reinecke et al. (2012) found that games that can support competence and autonomy were most effective in helping people repair their mood. Rieger, Frischlich, Wulf, Bente, & Kneer (2015) directly compared the mood recovery potential of digital games against non-interactive media and found playing digital games to be most effective in supporting mood repair due to its higher task demand and arousal.

Very few studies have directly examined the recovery potential of playing video games during work and outside of work. Using a national survey of video game players, Reinecke (2009a) showed that video games could support all four types of recovery. In a similar study, Reinecke (2009b) found that workers with higher work-related fatigue were more likely to play video games during work than workers with less fatigue. Workers with less social support during work were also more likely to play games during work. The study also found that playing games during work was effective in supporting recovery experience. While these two studies support the recovery potential of video games, the studies did not distinguish between different types of games or examined the underlying mechanisms for supporting recovery experiences. Collins and Cox (2014) found that gamers reported lower need for recovery than non-gamers, which may support the idea that games are effective recovery means. Their study also compared different game genres and found that first-person shooter games, which was the genre that the respondents played the most, was the strongest predictor of recovery. However, different genres of games predicted different types of recovery experience. For example, playing role-playing games predict relaxation. Playing massively multiplayer online games positively predicted mastery experience, while playing sports games negatively predicted mastery experience.

Overall, these findings suggest that to understand the recovery potentials of digital games, we must consider the context of game-playing behaviors. It is also important to break down the different types of games so that we may understand the underlying mechanism that drives people to play digital games during work and outside of work and its recovery potentials.

*Incremental games and its recovery potential*

Most literature argues that digital games' recovery potentials are based on their immersive and absorptive affordances. However, this study is particularly interested in examining a popular type of digital game that is designed to minimize player input and often pitched as games that can be played at work without interrupting work (Bohn, 2016). This type of digital games has been called incremental games, clicker games, idle games, background games, or waiting games (Alharthi, Alsaedi, Toups, Tanenbaum, & Hammer, 2018; Keogh and Richardson, 2017). While these terms are used interchangeably, they refer to different game mechanics that, only when combined, can define

these games. Incremental games describe games in which the main goal is to accumulate resources incrementally. Clicker games describe the simple controls, which often involve clicking on the screen or a few keys repeatedly. Idle games, background games, or waiting games focuses on the automated game mechanics that allow the game to progress without player input. Taken individually, none of these features are unique to this genre of games. For example, traditional role-playing games like *Final Fantasy* or sandbox simulators such as *Minecraft* also focus on incremental accumulation of resources. Platform action games or early games such as *Pong* also have simple controls. Many massively-multiplayer online games or social network games also progress when the players are not actively playing (Wohn, Lee, Sung, & Bjornrud, 2010). However, when taken as a whole, these characteristics create a unique genre of games.

This study adopts the term *incremental games* to emphasize that incremental accumulation of resources is both the means and the goal of these games. This study defines incremental games as *games in which the player accumulates resources through simple inputs or wait for the resource to accumulate automatically*. These characteristics afford temporal flexibility to the players, so that players can play the games when they wish to, with little to no penalties from the games. Few incremental games are designed to be played in long stretches; most incremental games are designed to be played within a flexible and short period of time, allowing them to be played intermittently in between daily activities, including during work.

Many early incremental games were designed to be parodies of popular game mechanics. For example, Ian Bogost's *Cow Clicker* was intended to parody the wait-to-click game mechanics of social network games such as *Farmville*. In *Cow Clicker*, the only action available to the player was to click on a cow and receive a "Moo!" and then the player waits six hours to click on the cow again and receive another "Moo!" (Tanz, 2011). The game *Progress War* aimed to criticize the monotony of grinding and leveling-up involved in many role-playing games, the players create a character, and then the game plays by itself, the character kills endless monsters so that it can level up to improve its ability in killing more monsters. In the game *Universal Paperclips*, the player takes on the role of an artificial intelligence to perform an arbitrary task of manufacturing paperclips. The game attracted more than 450,000 players in the first week of launch, and most players completed the game, which ends in the destruction of the world when everything is sacrificed to make paperclips (Rogers, 2017). For many academics and critics, incremental games are not considered games due to its lack of interactivity (Purkiss and Khaliq, 2015). Many incremental games can play by itself in the background and do not require player input. However, other scholars argue that while incremental games started as boundary-drawing parodies aimed as criticizing existing games, overtime, the players and the industry has solidified its status as a unique genre that focuses on optimization of gains (Deterding, 2016). A study of over 220,000 incremental game players found that most of the players were not casual game players, but core game players (Yee, 2016). Yee (2016) argues that incremental games "cleanly isolate the power progression and accumulation mechanics from the typical trappings of AAA RPGs" and thus attracts "gamers who enjoy the leveling up and power accumulation in RPGs, but less interested in big-action combat or elaborate fantasy settings." In other words, incremental games can afford comparable experiences as more elaborate games but place less burden on the players regarding time commitments and efforts.

Since incremental games can be played intermittently between work-related tasks and do not penalize

players for not playing, the nature of incremental games makes them ideal games to play during work as a stress reliever or a short break. As literature suggest that work stress is associated with more cyberslacking behavior (Henle and Blanchard, 2008), we posit that work-related stress will be positively associated with more incremental game-playing during work.

**H1**. Need for recovery will positively predict incremental game-playing during work.

Incremental games may be the game of choice when it comes to cyberslacking due to its temporal flexibility, but players may seek more immersive or absorptive games for recovery after work. Thus we pose a research question about incremental game-playing outside of work:

**RQ1**. Will need for recovery be associated with incremental game-playing outside of work?

Previous studies have found that digital games can support all four dimensions of recovery potentially through its interactive nature and immersion (Collins and Cox, 2014; Reinecke, 2009a). As a genre of games characterized by minimal interactivity and requires low player commitments, can incremental games facilitate recovery? Recent studies on work attention and productivity suggest that taking brief mental breaks may help workers refocus their attention and improve productivity (Ariga and Lleras, 2011). The activities that provide the biggest boost to work performance are those that are performed voluntarily and do not require many cognitive resources, such as playing simple games. Indeed, many workers believe that playing casual games during work helps them unwind and concentrate (Gameindustry.biz, 2007; Lim and Chen, 2012). In other words, while incremental games do not have the affordances of more immersive digital games, they may support recovery is played briefly as a short break, but frequent gameplay can also distract from work. Thus, we pose the following research questions:

**RQ2**. To what extent is incremental game-playing during work associated with recovery?

**RQ3**. To what extent is incremental game-playing outside of work associated with recovery?

Based on the hypothesis and research questions, we propose the following path diagram for the relationship between the key variables.

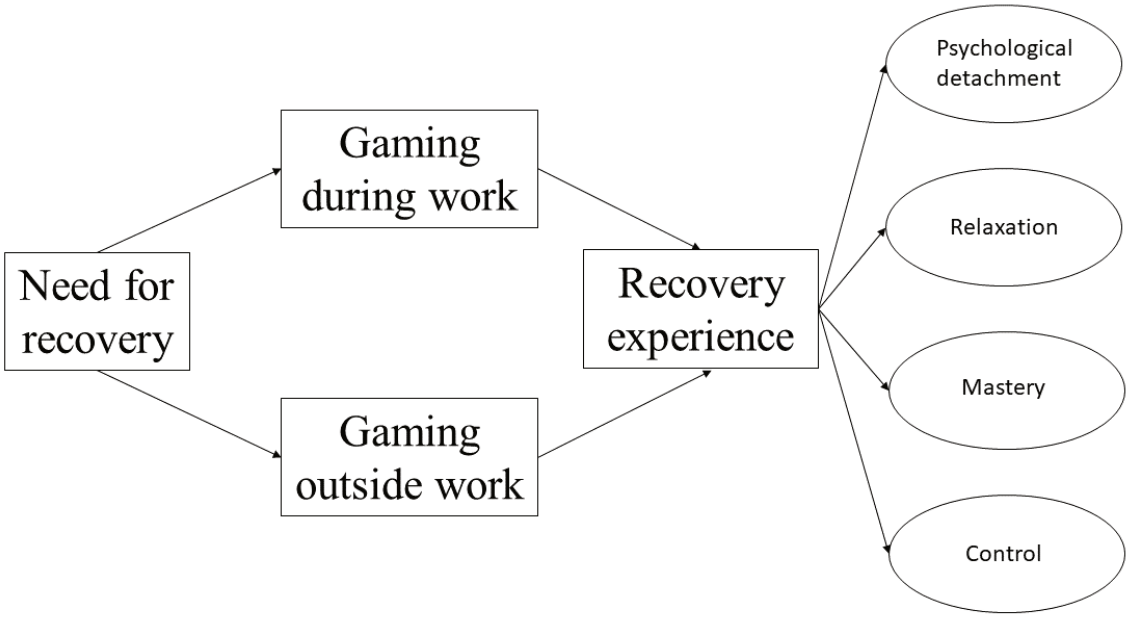


*Figure 1*

**Methods**

*Participants*

We recruited participants from Amazon's Mechanical Turk who resides in the United States. Each participant was paid USD 1.00 for their voluntary participation. The sample was selected because they are more diverse and representative of the general population compared to convenience samples such as undergraduate students (Buhrmester, Kwang, & Gosling, 2011). More importantly, the sample consists of diverse workers with different backgrounds and varying degrees of income status (Mason and Suri, 2012). A total of 522 participants were recruited for this study. The majority of the participants are working and identified as a paid employee ($n$=399, 76.4%), followed by self-employment ($n$=67, 12.8%), then unemployed or retired ($n$=47, 9.1%), nine participants did not disclose their work status (1.7%). The participants that were not working (unemployed, retired) or did not disclose were excluded from the analysis since a focus of this study is on playing incremental games during work. As a result, 466 participants were included for the analysis. Of the 466 participants, the mean age was 31.63 ($SD$=8.58) ranging from 18 to 80 with a median age of 30.00. There were more male ($n$=277, 59.40%) than female ($n$=185, 39.70%), two participants chose others and two did not disclose their gender. More than half (57.2%) of the participants received a bachelor's degree or higher.

*Measures*

*Incremental game frequency*. Participant were asked how many times do they play incremental games on an average day, the measure ranged from 0 (none) to more than 10 times a day. The mean score was 4.20 ($SD$=2.61).

*Incremental game frequency during work and outside of work.* Participants were asked how many times they played incremental game *during work*, the measure ranged from 0 (none) to more than 10 times a day. The mean score was 2.82 times during work (*SD*=2.57). Non-worktime gaming was calculated by subtracting worktime gaming from incremental game frequency. The average non-worktime gaming frequency was 2.36 times (*SD*=2.43).

*Need for recovery*. The Need for Recovery Scale (Van Veldhoven and Broersen, 2003) was used to measure fatigue from work. The scale consisted of 11 items about the severity and duration of work-related fatigue. For example, "By the end of the working day, I feel worn out," and "Often, after a day's work I feel so tired that I cannot get involved in other activities." The participants responded on a 7-point scale with 1=strongly disagree and 7-strongly agree, *M*=3.79, *SD*=1.22. The scale was reliable with a Cronbach's $\alpha$ = .89.

*Recovery effects of incremental games*. Recovery effects of incremental games was measured using the recovery experience questionnaire by Sonnentag and Fritz (2007). The scale included 16 items that measures the four subdimension of recovery including: psychological detachment (e.g., "I forget about work," Cronbach's $\alpha$=.88), relaxation (e.g., "I use the time to relax," $\alpha$=.88), mastery (e.g., "I do things that challenge me," $\alpha$=.90) and control (e.g., "I feel like I can decide for myself what to do," $\alpha$=.85).

### *Procedure*

Participants from Amazon Mechanical Turk voluntarily signed up to participate in the study. They were given a brief definition of incremental games and indicated whether they are currently playing any incremental games. Then they were instructed to list one incremental game that they are currently playing and respond to questions regarding that game. Afterward, they responded to a questionnaire measuring their incremental game frequency (total and during work), incremental game time, work satisfaction, need for recovery, recovery effects of incremental game games, satisfaction with life, game enjoyment, and demographics including age, gender, and employment status. After completion, they were paid $1 from Amazon Mechanical Turk.

## Results

Pearson product-moment correlation coefficients were calculated using SPSS 25. The hypothesis and research questions were tested with a structural equation model using AMOS 25. The 11 items of the Need for Recovery scale were used to estimate the latent variable of work-related fatigue. Recovery experience was modeled as a latent variable based on the four sub-scales of the recovery experience questionnaire.

Pearson's correlations among the independent and dependent variables are shown in Table 1.

***Table 1.*** Correlation between variables

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 1. | Need for recovery | -- | | | | | | |
| 2. | Gaming during work | .16** | -- | | | | | |
| 3. | Gaming outside work | .05 | .42*** | -- | | | | |
| 4. | Psychological detachment | -.06 | -.16*** | -.08 | -- | | | |
| 5. | Relaxation | -.18*** | -.21*** | -.06 | .56*** | -- | | |
| 6. | Mastery | -.05 | .07 | .03 | .18*** | .24*** | -- | |
| 7. | Control | -.14** | -.21*** | -.10* | .43*** | .59*** | .39*** | -- |

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

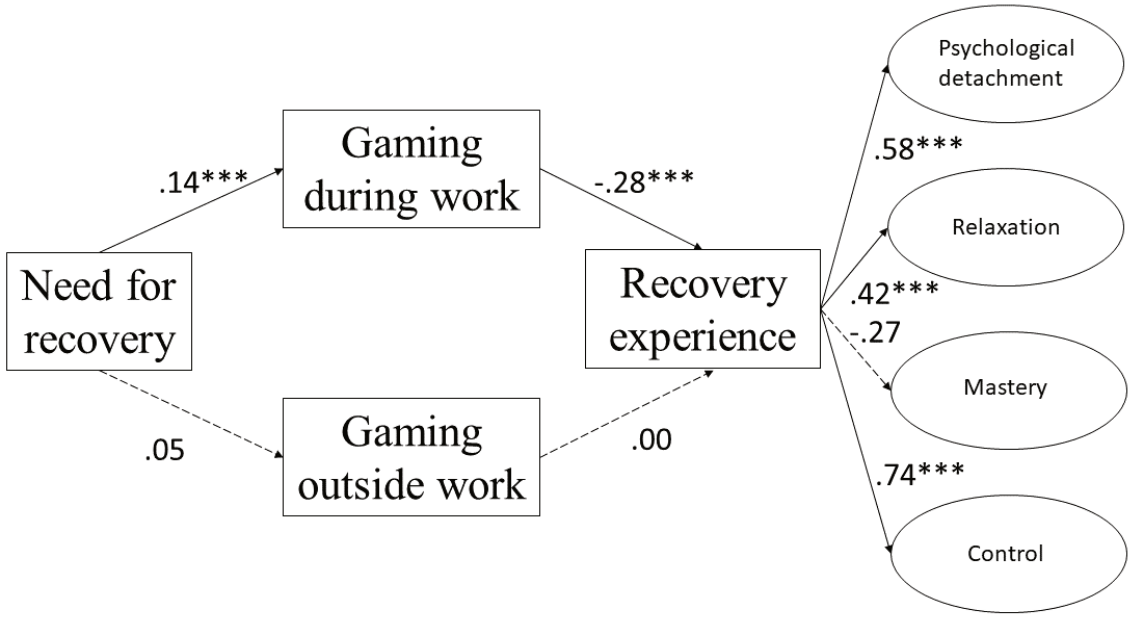


*Figure 2*

Three model fit indices were used to assess model fit ( . The model was a good fit, =13.7, $p$=.057, CFI=.988, RMSEA=.045 (Hu and Bentler, 1999).

Three of the four sub-dimensions of recovery experience loaded well into the latent variable of recovery experience: psychological detachment (β=.58, $p$<.001), relaxation (β=.73, $p$<.001), and control

(β=.74, $p$<.001). Surprisingly, mastery was negatively associated with recovery experience but was not statistically significant, β=-.27, $p$=.175.

Hypothesis 1 posited that need for recovery would positively predict the frequency of incremental game playing during work. The results showed that need for recovery positively predicted higher frequency of incremental game playing at work, β=.14, $p$<.001. The data was consistent with hypothesis 1.

Research question 1 asked whether the need for recovery would be associated with incremental game playing outside of work. The results showed that the relationship was not significant, β=.05, $p$=.269. In other words, work-related stress did not predict higher incremental game frequency outside of work.

Research question 2 and 3 asked to what extent does incremental game playing during work and outside of work predict self-reported recovery experience. The results showed that playing incremental games during work was negatively associated with recovery experience, β=.28, $p$<.001. However, there was no significant relationship between playing incremental games outside of work and recovery, β=-.004, $p$=.936. The findings suggest that playing incremental games during work did not facilitate recovery experience, but may instead, reduce sense of recovery. Playing incremental games outside of work was not associated with recovery experience.

#### Discussion

This study has two goals: The first goal was to investigate to what extent is work-related stress associated with frequency of playing incremental games during work and outside of work. The second goal was to examine to what extent is playing incremental games during work and outside of work associated with self-reported recovery experience composed of four sub-dimensions including psychological detachment, relaxation, mastery, and control. The results indicated that participants who reported higher work-related stress were more likely to play incremental games during work, but not outside of work. However, playing incremental games during work was not associated with more recovery. Instead, it reduced recovery experience. In other words, playing more incremental games during work made people feel less recovered.

Our findings were consistent previous studies that found cyberslacking was partially motivated by stress and fatigue from work (Blanchard and Henle, 2008; Lim and Chen, 2012). However, contrary to the findings from Reinecke (2009b)'s study that did not specify game genres, our study found that playing incremental games during work was negatively associated with recovery experience. One potential explanation is that prolonged gameplay or high frequency of incremental game playing during work can also be exhausting. However, this is less likely because most incremental games are not designed for extended sessions and often have game mechanics that promote waiting instead of playing (Alharthi, et al., 2018). Our data also shows that while the participants in our study play incremental games, on average, 4.20 times ($SD$=2.61) times a day, the majority (70.6%) of our participants spends less than 60 minutes per day playing incremental games. A more possible explanation is that playing incremental games during work led to a negative appraisal of one's game-playing experience. This explanation is consistent with previous studies. For example, Reinecke, Hartmann, & Eden (2014) found that people who experienced ego-depletion were more prone to select media as a means of recovery. However, they were also more likely to have a negative appraisal

of their media experience, perceiving their media use as procrastination, which leads to guilt and diminishes the recovery effects. Playing digital games during work often conflicts with workplace norms and can further increase work-related stress and guilt. Kubey and Csikszentmihalyi (2013) also found that people often experienced less relaxed and satisfied after media use because "it distracts and removes us from stress and the demands of reality only temporarily" (p.146). In other words, while people who are stressed or suffer fatigue from work are more likely to play incremental games during work, playing incremental games during work negatively affects their appraisal of their game-playing experience and its recovery effects.

Different media affords different recovery potentials (Reinecke, et al., 2011; Rieger, et al., 2015). Consistent with findings from Collins and Cox (2014), when the different game genres are examined independently, the different game mechanics affords different types of recovery experience. The results from our study showed that incremental games were most effective in offering people a sense of control, some psychological detachment and relaxation, but not mastery experience. As a genre of games designed to facilitate temporal flexibility, incremental games' greatest recovery affordance lies in its ability to provide a sense of control. Regardless of the players' commitment level, the games will progress incrementally. This type of design reduces the burden and stress of having to commit and collaborate with other players that many popular multiplayer games entails. Therefore, incremental games offer a sense of control over one's schedule and game progress, and a sense of security knowing that there will be little to no punishment involved with not playing for a while. The low commitment requirements afford relaxation, allowing people to unwind, or a chance to temporarily detach from work-related thoughts. However, incremental games do not support mastery experience because they typically do not involve complex skills or challenging game mechanics. Mastery experience requires overcoming challenges to boost one's self-efficacy. Many incremental games can play by itself or require very little player input to progress. While the accumulation of resources can provide achievement or gratification for some players, the most challenging aspect of many incremental games is waiting for the resources to accumulate in the background (Keogh and Richardson, 2017).

### *Limitations*

This study has several limitations. First, while the panelists are more representative than convenient sample of undergraduate students. They are nevertheless, not representative of all workers. For example, studies have shown that higher status workers in the workplace are more likely to engage in cyberslacking including playing games (Garrett and Danziger, 2008b; Vitak, et al., 2011). However, higher status workers are perhaps less likely to voluntarily participate in studies for $1. Second, the recovery experience is measured through self-report, and thus may or may not reflect actual recovery. A worker may report feeling recovered, but unconsciously still suffer from work-related fatigue. Therefore, the results should be interpreted as a perception of recovery rather than actual recovery. Playing incremental games during work is associated with lower perceptions of recovery, future studies should also include measures of actual recovery effects to assess the recovery potentials of incremental games as a short break during work.

## Conclusion

Overall, this study explores whether stress from work leads to increased cyberslacking through

playing incremental games? Moreover, does playing incremental games help workers recover from their work-related stress? The results showed that work-related stress is positively associated with more incremental game-playing behaviors during work. However, playing incremental games during work does not make workers feel recovered. When examining how incremental games contribute to the four sub-dimensions of recovery, we found that incremental games support psychological detachment, relaxation, and control, but not mastery experience. These findings highlight the importance of not treating all gameplay as a homogeneous experience. Different game elements afford different effects, as do the context of gameplay. While stress from work motivates people to play incremental games during work, playing games during work lead to negative appraisal of their behavior and the recovery effects.

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