



Using tablet in solitude for stress reduction: An examination of desire for aloneness, leisure boredom, tablet activities, and location of use



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ABSTRACT

A tablet may be the best media device to use to spend time alone or enjoy a moment of solitude to release stress. The goal of this study is to examine how the desire for aloneness and leisure boredom play a role in influencing diverse activities when using the tablet and how these socio-psychological states, tablet activities, and location of tablet use may affect the perception of stress reduction, especially when the tablet is used alone. Data were gathered from a probability sample of 948 respondents, of which 348 were tablet users, through a telephone survey. Results indicate that people with a high preference for aloneness were more active tablet users of utility-, information-, social-, and fun seeking-oriented activities, while those who were leisurely bored did not show any significant difference. People with a high desire for aloneness and the leisurely bored tended to have a higher perception that using the tablet in solitude can help them reduce stress. Heavy users of both social- and fun seeking-oriented activities on the tablets also significantly predicted the perception of stress reduction in tablet use alone, particularly in the privacy of their bathroom. Theoretical and practical implications are discussed.

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1. Introduction

A tablet is not simply a larger mobile phone, nor is it a smaller computer; it is regarded as a new type of mobile platform that will, at least in theory, offer most of the functionality and connectivity of a personal computer (PC). A tablet usually has a base set of built-in applications, including browsing software, e-mail, instant messaging/chat functions, and a variety of plug-ins supporting animation and streaming media. Unlike a smartphone, a tablet also has a large screen for impactful viewing. Users can load or download application software (apps) of their choosing to the tablet from the Internet, or by using file sharing with their home PC. One of the biggest advantages of a tablet is that people can use them in places where they cannot use their PC, often in relaxed and comfortable usage positions, e.g., on a couch, in bed, or even in the bathroom. Thus, the tablet experience can be a qualitatively different one from the PC, evidenced by how and where a tablet is used.

By October 2012, 100 million iPads had been sold worldwide since its introduction two and a half years prior (Richard, 2014). In Mainland China, tablet computers have also gained popularity. According to data released by *Analysys International* (2014), 3.58 million tablets were sold during the second quarter of 2013, among

which iPad held a 65% market share. With its compact size and wireless nature, surfing the Internet, watching videos, and playing games are the functions most often used on a tablet (iResearch, 2014). Despite their popularity, research on tablet use is scarce. Past studies have focused on the adoption and use of mobile devices in topics such as uses and gratifications of cellular phones (Leung & Wei, 2000), smartphones (Zhong, 2013), mobile phone addiction (Bianchi & Phillips, 2005), and cellular phones and tumors (Kan, Simonsen, Lyon, & Kestle, 2008). Little attention was paid to tablets.

Research into media use and stress reduction is not new. Previous research has examined the use of television to alleviate stress (Zillmann & Bryant, 1985). In fact, the advent of new media technologies, such as online games, console games, 3D movie viewing at home, social network services (SNSs), MP3s, Blu-ray disks, digital video recorders (DVR), smartphones, and tablets, to name a few, has dramatically changed both the nature and number of relaxation and excitement devices available to most consumers. Although previous research has examined how the Internet has become an important resource for information and entertainment, little research has focused on the ways in which individuals use these technologies for stress reduction.

It is natural to think that, in times of stress, social interaction may be the best way to relieve stress and to improve our psychological well-being. SNSs such as Facebook, Friendster, MySpace,

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and Twitter allow individuals to present themselves, and establish and maintain relationships with others (Raacke & Bonds-Raacke, 2008). Some people, those who want to experience a moment of privacy, may prefer to spend time alone during times of stress. A key assumption of this research is that, for many people, a high preference or desire for aloneness is related to positive well-being. While in solitude, one can use the time to self-regulate emotions and explore the private self.

Although some people typically avoid social interactions because of social anxiety or a lack of social skills, others elect to spend time alone because they enjoy the experience and appreciate the benefits that come from solitude. Solitude may mean physical isolation from others. It may also mean limiting contact to certain select people or groups and/or control over personal space and territoriality. However, people can maintain a sense of solitude in the presence of others by choosing not to interact with people around them. So, a tablet may be the best media device for spending time alone, enjoying a moment of solitude in bed, in the bathroom, or while commuting on public transit to release stress. Past research found that solitude increases social media use, and it also moderates the increasing effect of emotional and habitual needs on social media (Wang, Tchernev, & Solloway, 2012).

Another understudied area in relation to media use is leisure boredom. Mikulas and Vodanovich (1993) define leisure boredom as “a state of relatively low arousal and dissatisfaction which is attributed to an inadequately stimulating environment.” However, the concept “leisure boredom”—how it is understood and experienced by tablet users, how it is best conceptualized and operationalized, and how it can fit into and expand existing theories as it relates to tablet use—has received much less scholarly attention. In the past, most research often focused aloneness from the negative light, associating it with feelings of unhappiness, rather than perceiving it from the positive and beneficial functions. For example, using a tablet in solitude may help a person to relax, self-reflect, and reduce stress. Through this lens, it is particularly important to address the possible links between theories and constructs (such as gratifications, the use of media in solitude, and leisure boredom) and the perceived stress reduction possibility in the solitary use of the tablet. Thus, the goal of this study is to examine how *desire for aloneness* and *leisure boredom* play a role in influencing diverse activities in using a tablet and how these socio-psychological states, tablet activities, and location of tablet use may affect the perception of stress reduction, especially when the tablet is used alone.

2. Literature review

2.1. Tablet activities and gratifications

In explaining media behavior and consequences, the objectives and underlying assumptions of the uses and gratifications (U&G) perspectives seem to constitute a good approach for the study of the tablet. Uses and gratifications paradigms generally place human needs as the focal point in our investigation. Wimmer and Dominick (1994) proposed that U&G began when researchers became interested in why audiences engaged in various forms of media behavior, such as reading newspaper and listening to the radio. U&G assumes that the appropriate media and their messages are sought to gratify a variety of social and psychological needs. Social psychological origins of needs, values, and beliefs give rise to motives for behavior, which may in turn be guided by beliefs, values, and social circumstances into seeking various gratifications through media consumption (Palmgreen, Wenner, & Rosengren, 1985). Uses and gratifications theory assumes that audience members actively seek out the mass media, fulfill expectations, and

actively select media and media content to satisfy individual needs. The most important assumption of this approach is that the audience is active and media use is goal-directed. Human needs, though, are not directly observable and typically are inferred from individuals' stated or observed motives for media use or communication behavior. As early as 1974, Rosengren suggested that certain basic needs interact with personal characteristics (e.g., desire for aloneness and leisure boredom in this study) and the social environment of the individual would produce different motives and gratification behaviors that can come from using the media or other activities.

In an investigation of motives for television viewing, Rubin (1984) affirms the existence of both habitual and intentional viewing and suggests that habitual or (*ritualized*) viewing involved more routine use of TV for diversionary reasons and a greater attachment with the media itself. Intentional (or *instrumental*) viewing, on the other hand, reflected a more goal-oriented use of the medium to gratify information or cognitive needs. Instrumental use of media is, in general, more purposive and involving while ritualized use is more habitual and less cognitively involved. In other words, we may infer that instrumental use of media may be stress-inducing and ritualistic use of media may be relaxing and diversionary. Using this distinction, Joo and Sang (2013) also characterized that Koreans' smartphone use is affected more by motivations based on instrumental and goal-oriented use than by ritualized and less-goal oriented use. However, Rubin cautioned that instrumental and ritualized media use should not be neatly dichotomized and pointed out that people may use media instrumentally or ritualistically depending on users' personality, lifestyles, time of the day, and moods. Thus, the engagement in different tablet activities will be influenced by users' psychological arousal states such as desire for aloneness and leisure boredom. Based on these conceptual dimensions and grounded in U&G framework, this study seeks to expand previous research by addressing an important question: How social and psychological characteristics influence instrumental and ritualistic tablet activities? However, before we address this question, it is necessary to first categorize common tablet activities by asking:

RQ₁: What kind of *instrumental* and *ritualistic* tablet activities can be identified?

2.2. Stress reduction and tablet use

Previous research in the impacts of information and communication technology (ICT) has been focusing on high quantity of ICT use and the risk factors for developing psychological symptoms (Thomé, Eklo, Gustafsson, Nilsson, & Hagberg, 2007). For decades, concerns have been about the increasing pace and volume of work and the implications of both for the stress that people face in their lives (Barley, Meyerson, & Grodal, 2011; Leung, 2011). However, few studies focused on the benefits of ICTs on stress reduction or life quality. To understand the relationship between tablet activities and perceived stress reduction with the use of a tablet, mood management theory can be applied to describe how individuals experiencing stress might use the tablet to access the internet in a similar manner to television, to block anxious thoughts and replace dysphoric moods (Zillmann, 1982). Zillmann (1988) conceptualizes mood management theory as selections of media messages motivated by affect optimization goals. Previous mood management studies typically found that users select media that enhance positive moods and reduce negative moods (Dillman Carpentiera et al., 2008). Knobloch (2003) argued that the aim of mood management is to alter disagreeable moods, enhance mediocre feelings, and to maintain pleasant moods.

Past research has investigated the relationships between stress and television use (Lohaus, Ball, Klein-Hessling, & Wild, 2005; Zillmann, 1982; Zillmann & Bryant, 1985). A common hypothesis is that viewers use television to relieve stress (Anderson & Collin, 1996). Zillmann proposed that TV can temporarily alleviate the negative affects of stress by displacing anxious thoughts and by substituting negative affect with positive affect (Zillmann, 1982). The social withdrawal afforded by TV might allow negative feelings to return to baseline levels, reducing the likelihood of stress-induced conflict with family members (Henggeler, Cohen, Edwards, Summerville, & Ray, 1991; Repetti, 1992; Zillmann, 1993). Zillmann and Bryant (1985) also predicted that people under stress will gravitate toward TV programs that incorporate comedy, variety entertainment, or games that predominantly contain positive affect. Similarly, people under stress may turn to the tablet to engage in calming rather than stimulating messages such as ritualistic activities to obtain agreeable arousal levels (e.g., playing online-games and watching TV/videos) for entertainment, diversion, and relaxation.

With the ubiquitous nature and wide assortment of entertainment available on tablets, their mood-regulating content is becoming more and more accessible and convenient. Morris (1990) called moods the “frame of mind.” They affect human behaviors, such as thinking and memory (Ellis & Moore, 1999), perceptions of others and of the self (Forgas & Bower, 1987), and feelings about one’s environment. Therefore, the use of tablets for ritualized activities on the tablet such as online games, SNSs, watching streamed and pre-loaded video, and their influence on mood and vice versa, is an important area for research.

However, few of the available published studies on stress reduction have examined perceptions of using tablets for stress reduction in relation to tablet consumption habits. This study investigates the generality of mood management concepts by examining the relationship between these activities in tablet use and the perception of stress reduction in the use of the tablet in solitude. Inspired by this line of research, the present study investigates how instrumental (i.e., more goal-oriented, utilities-based, and cognitively demanding) and ritualistic (i.e., more habitual, less involving, and diversionary) activities in tablet use can affect the perceived levels of stress reduced by the solitary use of the tablet. Thus, it is logical to think that:

H_{1a}: The more subjects engage in *instrumental* activities on a tablet, the less they perceive that solitary use of tablet can reduce stress.

H_{1b}: The more subjects engage in *ritualistic* activities on a tablet, the more they perceive that the solitary use of tablet can reduce stress.

2.3. Desire for aloneness

Many people use the terms “aloneness” and “loneliness” interchangeably (Pierce, Wilkinson, & Anderson, 2003); however, individuals can feel alone, but not in the sense of being lonely (Larson, 1997). According to the *American Heritage Dictionary of the English Language* (2014), aloneness does not necessarily imply feelings of unhappiness. Instead, aloneness can be viewed as being self-reliant, hopeful, and resourceful and as having self-determination and being able to engage in self-reflection (Pierce et al., 2003).

People are born with the need both to be alone and to be connected with others (Buchholz & Chinlund, 1994). Aloneness, like attachment, is regarded as necessary for human growth, with loneliness being aloneness’ negative extreme (Buchholz & Catton, 1999). Researchers recommend that future studies explore more positive dimensions of aloneness, including when people choose to be alone, what they do while alone, and how they feel after

being alone (Buchholz & Catton, 1999). Larson (1990) has conducted extensive research on the time adolescents spend alone, and sees aloneness as a time of reflection, rest, and self-renewal. Along with Larson’s work, there is a growing body of literature on aloneness that focuses on the positive effects of solitude (Griffin, 2001; Griffin & Kent, 1998; Moustakas, 1989; Storr, 1988). Buchholz and colleagues have explored aloneness as a developmental need, essential for all phases of personal growth (Buchholz & Chinlund, 1994; Buchholz & Tomasi, 1994; Galanaki, 2005). Winnicott (1965) shares the belief with Buchholz and his associates that the capacity to be alone is part of a healthy maturation process and is learned, similar to attachment, wherein individuals have to learn how to relate.

Social media (e.g., blogs, forums, SNSs, chat rooms, and instant messaging) has some unique qualities: it is mediated, it is not face-to-face, it is interactive, and can be anonymous. People who want to be alone may, therefore, select a tablet as their preferred device for engaging in social media, especially when they are alone. With its mobile, multifunctional, and multimodal nature, a tablet may perhaps be an ideal device for diverse activities ranging from less involving, habitual, or ritualized activities (such as playing online games, surfing the web anytime anywhere, viewing pre-loaded or streamed video, and communicating with someone via SNSs) for relaxation and entertainment to non-habitual, goal-directed, intentional, more cognitively involving, and information-oriented instrumental activities in the tablet (such as surfing the web for information, read or edit a document, and reading news or magazines). These activities in solitude with the tablet will, to some extent, affect the mood optimization goals, change disagreeable moods, enhance mediocre feelings, and perhaps reduce stress. Therefore, based on this literature, it is reasonable to believe that one can engage the tablet in instrumental as well as ritualistic activities anytime anywhere in solitude for personal growth and healthy maturation. Thus, this research hypothesizes that:

H_{2a}: There is a positive relationship between desire for aloneness and the level of tablet activities (both instrumental and ritualistic).

H_{2b}: The more subjects express their desire to be alone, the more they perceive that tablet use in solitude can reduce stress.

2.4. Leisure boredom

Perceptions of leisure as boredom are associated with negative affect, and can be manifested as beliefs that available leisure experiences are not sufficiently frequent, involving, exciting, varied, or novel (Iso-Ahola & Weissinger, 1990). Iso-Ahola and Weissinger (1990) argue that people are most satisfied with their lives and leisure when they feel that they have an optimal amount of discretionary time for their activities. Leisure behavior must be optimally arousing for it to be psychologically rewarding, especially when individuals perceive that they have just the right amount of time for leisure activities; not too much or too little. Thus, leisure boredom is a likely consequence of conflicting perceptions of having too much time available with too little to do (Hill & Perkins, 1985). In fact, Phillips (1993) has suggested that having an abundance of time is central to boredom. Past research have mostly investigated the negative consequences of leisure boredom such as risk behavior among adolescents (Wegner & Flisher, 2009), school dropout (Wegner, Flisher, Chikobvud, Lombardd, & King, 2008), substance use (Sharp et al., 2011), mobile phone addiction (Leung, 2008), and gambling behavior (Mercera & Eastwooda, 2010), among others.

Early theorists, such as Hebb (1955), invoked the classic inverted-U to describe the relationships between arousal and the sense of well-being. At the high point of the inverted-U, individuals enjoy

the optimal level of well-being when an ideal level of arousal is achieved. Sense of well-being drops sharply when the amount of arousal becomes more intense or weakens. Low levels of arousal mean individuals are experiencing boredom and will seek entertainment and stimulating activities or contentment from media. Similarly, high levels of arousal mean individuals are being bombarded with excitement, anxiety, and stress, which need to be alleviated through relaxation or entertainment from media. Bryant & Zillmann, 1984 pointed out that those bored, relatively unaroused people should have a strong desire for and appreciative of increments in autonomic arousal. Along this line of research, it is reasonable to believe that leisurely bored people will use the tablet at higher frequency for utilities, information seeking, relaxation, entertainment, and social interaction in both instrumental and ritualistic activities in the tablet than the less bored people to drive their emotional state to optimal level. However, individuals with low level of boredom or already experiencing high level of arousal would select less cognitively involving and less stimulating tablet activities for relaxation to alleviate the arousal state back to satisfactory level. Thus, we hypothesize that:

H_{3a}: Subjects who score high on leisure boredom will report a higher frequency of tablet use (both instrumental and ritualized or either).

H_{3b}: Subjects who score low on leisure boredom will report a higher frequency of ritualized tablet activities.

H_{3c}: Subjects who score high on leisure boredom will report less desire to be alone.

2.5. Solitary location and tablet use

Despite increased attention to people's leisure pursuits at the explosion of information and communication technologies (ICTs) over the past two decades, researchers have generally overlooked leisure-related factors as correlates and causes of media use, such as playing online games, watching videos on YouTube, and browsing websites using portable devices in solitude such as mobile phones and tablets (Leung & Lee, 2005). This is surprising, considering that such activities probably occur most often during leisure time and in leisure settings, especially when people perceive their leisure time as being qualitatively less fulfilling (Smith & Caldwell, 1989) and/or with a high desire to be alone to self-reflect. To alleviate such boredom, individuals may retreat to a solitary location, such as one's bedroom or bathroom, to be away from people. In the presence of others while traveling alone on public transit, people may immerse themselves in their tablets to self-reflect and to regain the optimal level of arousal in their leisure time. In this study, relationships, among the desire for aloneness, leisure boredom, the use of specific tablet features, locations of tablet use, and perception of stress reduction via using tablets in solitude will be examined.

Larson (1990) pointed out that "solitary media experiences provide adolescents an important context for dealing with stress and negative emotion" (p. 535). Today the multi-functioned tablet allow solitary video watching, music listening, and game playing for people who are bored or stressed out to be able to relax and find their preferred stress-relieving activities on the tablet. The present study examines how persons with a high desire to be alone and bored select activities in the tablet which holds the greatest perception that use of the tablet in solitary can reduce stress. It also attempts to determine how effective the selected tablet activities can alleviate stress reduction. Thus, we ask the following research questions:

RQ₂: To what extent can demographics, desire for aloneness, leisure boredom, and location of tablet use alone predict tablet activities?

RQ₃: In what way can demographics, desire for aloneness, leisure boredom, tablet activities, and location of tablet use alone predict perceived stress reduction from tablet use in solitude?

3. Method

3.1. Sample and sampling procedure

Data for this study were collected from a telephone survey with a probability sample of 948 respondents aged 18 or above, randomly chosen from the latest Hong Kong telephone directory. All calls were made from a central location during evening hours, with close supervision by trained advanced undergraduates at the Survey Research Laboratory using its Computer-Assisted Telephone Interviewing (CATI) system. Non-eligible respondents (i.e., those younger than 18), nonworking numbers, and numbers that were not answered after five attempts were excluded. The next birthday method was used to select a respondent if more than one individual within the household qualified. In addition, the survey instrument was pilot tested on 25 university students. Actual fieldwork was conducted in November 2012. Of the 948 completed interviews, 32.7% ($n = 348$) of these were tablet users. Of the 348 tablet users, 47.5% were male, and the median age category was between 30 and 39 years of age. Median education level was Grade 10–11, and median family monthly income was in the range US\$5161–6452. The response rate was 38.1%.

3.2. Measures

3.2.1. Need for aloneness

Respondents were asked to respond to how much they agreed with seven statements using a 5-point Likert scale where 1 = strongly disagree and 5 = strongly agree. Items include "When I am in a bad mood, I need to get away from others;" "Being alone gives me solitary time to self-reflect;" "Being alone allows me to emotionally discharge;" "Aloneness is an opportunity for me to self-regulate my emotions;" "It is psychologically healthier to take advantage of being alone;" "Being able to spend time in solitude helps me explore my private self;" and "Solitary music listening serves for more than just demarking separation from parents, it is a context for self-exploration." Reliability alpha was = .82. Higher scores were indicative of a greater desire to be alone.

3.2.2. Leisure boredom

To assess perceptions of boredom in leisure, the Leisure Boredom Scale (LBS: Iso-Ahola & Weissinger, 1990), containing 16 items that ask people to indicate how they feel about their leisure time (i.e., non-work hours), was used. LBS is potentially usable in clinical and applied research involving examination of leisure dysfunctions such as lethargy, substance abuse, and vandalism. The scale items (e.g., "For me, leisure time just drags on and on; leisure time activities do not excite me") were used on a 5-point scale ranging from strongly disagree (1) to strongly agree (5), with high scores indicating greater leisure boredom. The LBS was examined and the results indicated a high internal consistency reliability of .75.

3.2.3. Perceived stress reduction

To assess how much respondents agreed that tablet use can help them cope with stress, using a 5-point Likert scale with 1 = strongly disagree and 5 = strongly agree, two items were used (alpha = .65): "Socializing with friends with my tablet in solitude can be a coping strategy for dealing with stress" and "Being able to use my tablet in solitude helps me turn off the emotional stress I experience during the day." Higher scores were indicative of greater stress reduction.

3.2.4. Tablet activities

Initially, a total of 15 activities that researchers often used in previous research into traditional and new media, such as television (Rubin, 1983), personal computers (Lin, 1998), mobile phones (Leung & Wei, 2000), the Internet (Papacharissi & Rubin, 2000), and friends-networking sites (Raacke & Bonds-Raacke, 2008) were included in the survey questionnaire. Additional items were gathered through a focus group of 12 tablet users to refine the unique activities associated with tablet use. A pilot study of 20 items was conducted with 35 respondents to eliminate ineffective items and to solicit new ones. Items that were ambiguous or repetitive were eliminated. A 5-point Likert scale was used, with “1” meaning “never” and “5” meaning “very often”.

3.2.5. Location of tablet use in solitude

Because of its compact and ubiquitous nature, a tablet can be used in many solitary locations. Respondents were asked how often they used their tablets in three popular locations, including: (a) while commuting alone on a bus, train, or taxi, (b) in bed, and (c) in the bathroom. They replied using a 5-point Likert scale where 1 means “rarely” and 5 means “very often”.

3.2.6. Demographics

Gender, age, education, and household income were assessed as control variables for the analyses.

4. Findings

4.1. Activities on tablets

To explore what instrumental and ritualistic-oriented activities users employ with their tablets, this study ran a principal components factor analysis with a varimax rotation to determine the potential groupings of 20 items. Six items with extremely low communalities and items that failed to load on any factors were removed. The analysis yielded four factors and explained 59.42 percent of the variance (see Table 1).

The first factor was “utility-oriented activities” (Eigenvalue = 4.74), which reflected tablet users’ use of their tablets to keep

appointment schedules, send and read e-mail, use a dictionary, read/edit documents, take photos and videos, and check the weather. The reliability of these six items, as indicated by Cronbach’s alpha, was high at .75. “Information-oriented activities” was the second factor (Eigenvalue = 1.33, $\alpha = .77$). It included three items, indicating that tablet users use their tablet to surf the web, search for information, and as a reader to read books and news. “Social-oriented activities” was the third factor (Eigenvalue = 1.29; $\alpha = .61$). It consisted of three items illustrating how tablet users use their tablets to engage in social interactions such as blogging, instant messaging, and using SNSs. The fourth factor, “Fun seeking-oriented” (Eigenvalue = .96; $\alpha = .61$), contained two items, indicating that tablet users use their tablets to play online games and watch TV/videos.

As a whole, these four factors were conceptually consistent with the theoretical expectations described by Rubin (1983), Leung and Lee (2000), and Papacharissi and Rubin (2000). In sum, this study identified that tablet users use their tablet to engage in two broad categories of activities: instrumental- (i.e., utilities- and information-oriented) and ritualistic-oriented (including social- and fun seeking-oriented) activities. Unlike television, tablets allow many instrumental activities (such as doing e-mail, reading/editing documents, checking weather conditions, surfing and looking up information on the Web, and reading e-books and news) which are more goal-directed and involving. At the same time, they also allow ritualistic or habitual activities including the use of SNS services, send/receive instant messages, play online games, and watch TV/video to relax and pass time.

4.2. Hypotheses testing

Hypothesis 1a posited that the more subjects engage in *instrumental* activities on a tablet, the less they perceive that solitary use of tablet can reduce stress. The correlation analyses in Table 2 found that instrumental activities including utilities-oriented ($r = .27, p < .001$) and information-oriented ($r = .24, p < .001$) were significantly related to perceived stress reduction in the use of tablets in solitude. The data showed positive relationships instead of negative. Thus, H_{1a} was rejected. Hypothesis 1b posited that the

Table 1
Factor analysis of activities on tablet.

How often do you use the TABLET to:	Factors				M	sd
	1	2	3	4		
Utility-oriented activities (factor mean = 2.47)						
1. Check calendar/appointment	.68				2.21	1.25
2. Do E-mail	.64				2.88	1.33
3. Use the dictionary	.60				2.62	1.28
4. Read/edit document	.56				2.35	1.23
5. Take photos and videos	.54				2.08	1.17
6. Check weather	.51				2.65	1.31
Information-oriented activities (factor mean = 3.53)						
7. Surf the Web		.82			3.78	1.19
8. Look up information		.75			3.57	1.25
9. Read books or news		.70			3.25	1.31
Social-oriented activities (factor mean = 2.41)						
10. Read or comment a blog			.73		2.17	1.26
11. Use instant message, e.g., MSN			.61		2.19	1.27
12. Use social networking services (Facebook, Twitter, etc.)			.58		2.87	1.41
Fun-seeking-oriented activities (factor mean = 2.75)						
13. Play online games				.83	2.66	1.40
14. Watch TV/videos				.66	2.83	1.32
Eigenvalues	4.74	1.33	1.29	.96		
Variance explained	33.88	9.48	9.18	6.88		
Cronbach’s alpha	.75	.77	.61	.61		

Scale: 1 = rarely and 5 = very often. $N = 348$.

Table 2

Zero order correlation of key variables.

	2	3	4	5	6	7	8	9	10
1. Perceived stress reduction in tablet use	.50***	.15**	.27***	.24***	.28***	.32***	.11*	.23***	.26***
2. Desire for aloneness		-.20***	.23***	.23***	.17**	.23***	.10	.20***	.16***
3. Leisure boredom			.07	.11	.03	.02	.11*	.03	.02
4. Utilities-oriented				.53***	.55***	.34***	.30***	.26***	.21***
5. Information-oriented					.47***	.31***	.30***	.30***	.24***
6. Social-oriented						.32***	.33***	.28***	.21***
7. Fun-seeking oriented							.26***	.40***	.27***
8. While commuting alone								.21***	.27***
9. On the bed alone									.32***
10. In the bathroom alone									

Note: N = 348.

*** p < .001.

** p < .01.

* p < .05.

more subjects engage in *ritualistic* activities on a tablet, the more they perceive that the solitary use of tablet can reduce stress. The correlation analyses in Table 2 found that ritualistic activities including social-oriented ($r = .28, p < .001$) and fun seeking-oriented ($r = .32, p < .001$) were significantly and positively related to perceived stress reduction in the use of tablets in solitude. Therefore, H_{1b} was fully supported.

Hypothesis 2a proposed that the relationships between desire for aloneness and the level of tablet activities (both instrumental and ritualistic) will be positive. The results in Table 2 indicate that the relationships between the desire for aloneness and utilities- ($r = .23, p < .001$), information- ($r = .23, p < .001$), social- ($r = .17, p < .01$), and fun seeking-oriented ($r = .23, p < .001$) were all significant and positive. These results fully supported H_{2a}. Hypothesis 2b hypothesized that the more subjects express their desire to be alone, the more they perceive that tablet use in solitude can reduce stress. As shown in Table 2, the correlation result between desire to be alone and the perceived stress reduction in tablet use was ($r = .50, p < .001$). Thus, H_{2b} was also supported.

Hypothesis 3a posited that subjects who score high on leisure boredom will report a higher frequency of tablet use (both instrumental and ritualized or either). As shown in Table 2, no significant relationship was found between leisure boredom and any of the four tablet activities. Thus, H_{3a} was rejected. Hypothesis 3b hypothesized that subjects who score low on leisure boredom will report a higher frequency of ritualized tablet activities. But results in Table 2 did not provide significant relationship. Thus, H_{3b} was rejected. Hypothesis 3c proposed that subjects who score high on leisure boredom will report less desire to be alone. The results in Table 2 indicate a significant and negative relationship between leisure boredom and the desire to be alone ($r = -.20, p < .001$). Therefore, H_{3c} received full support.

4.3. Predicting tablet activities

To assess the influence of demographics, the desire for aloneness, leisure boredom, and location of tablet use alone on tablet activities, four parallel regression analyses were run using the four tablet activities as dependent variables. The results in Table 3 reveal that people who use utility- and information-oriented activities on their tablet tended to be young ($\beta = -.11, p < .05$ and $\beta = -.13, p < .05$ respectively), with a high desire to be alone ($\beta = .20, p < .001$ and $\beta = .18, p < .001$ respectively), and that they often use the tablet in bed ($\beta = .13, p < .05$ and $\beta = .17, p < .01$ respectively) and while commuting alone on public transportation ($\beta = .22, p < .001$ and $\beta = .19, p < .001$ respectively). Those who often use the tablet for social-oriented activities also tended to be young ($\beta = -.32, p < .001$) females ($\beta = -.12, p < .05$) with a high

Table 3

Regression of tablet activities.

Predictors	Tablet Activities			
	Instrumental		Ritualistic	
	Utility-oriented	Information-oriented	Social-oriented	Fun seeking-oriented
	β	β	β	β
Demographics				
Gender (male = 1)	-.00	.01	-.12*	-.01
Age	-.11*	-.13*	-.32***	-.27***
Education	.07	.04	.04	-.03
Household income	.06	.13*	.01	-.06
Socio-psychological traits				
Need for aloneness	.20***	.18***	.14**	.31***
Leisure boredom	.01	.01	.01	.01
Location of tablet use alone				
While commuting (in train, bus, taxi)	.22***	.19***	.22***	.08
On the bed	.13*	.17**	.08	.22***
In the bathroom	.06	.10	.08	.11*
R ²	.17	.20	.24	.29
Adjusted R ²	.16	.19	.23	.27
F	16.75***	16.36***	25.05***	25.81***

Note:

N = 348.

*** p < .001.

** p < .01.

* p < .05.

desire for aloneness ($\beta = .14, p < .01$) while traveling alone ($\beta = .22, p < .001$). Similarly, those who often use the tablet for fun seeking-oriented activities tended to be young ($\beta = -.27, p < .001$), also with a high desire for aloneness, and seek entertainment in bed ($\beta = .22, p < .001$) and in the bathroom ($\beta = .11, p < .05$). The amount of variance explained ranged from 16% to 27%.

4.4. Predicting solitary use of the tablet for perceived stress reduction

Finally, to compare the relative influences of demographic variables, the desire for aloneness, leisure boredom, tablet activities, and location of tablet use on tablet use in solitude for perceived stress reduction, a hierarchical regression analysis was run. Four blocks of variables as predictors were entered into the equation, with a total of four variables as the first block. The results in Table 4 show that age ($\beta = .14, p < .01$) and gender ($\beta = -.16, p < .001$) were significant predictors, indicating that older females tended to perceive that solitary use of a tablet can reduce stress. This block explained 5% of the variance.

Table 4
Hierarchical regression of perceived stress reduction using tablet in solitude.

Predictors	Perceived stress reduction using tablet in solitude	
	β	
Block 1: Demographics		
Age	.14**	
Gender (male = 1)	-.16***	
Education	-.06	
Household income	-.08	
ΔR^2		.05***
Block 2: Socio-psychological traits		
Need for aloneness	.48***	
Leisure boredom	.12**	
ΔR^2		.30***
Block 3: Tablet activities		
<i>Instrumental</i>		
Utility-oriented	.04	
Information-oriented	.04	
<i>Ritualistic</i>		
Social-oriented	.13**	
Fun-seeking oriented	.10*	
ΔR^2		.04***
Block 4: Location of tablet use alone		
While commuting (in train, bus, taxi)	-.03	
On the bed	-.02	
In the bathroom	.13**	
ΔR^2		.02***
R^2	.41	
Adjusted R^2	.40	
F	32.16***	

Note:

$N = 348$.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

When the desire for aloneness was entered into the equation next, it was found to be the strongest predictor ($\beta = .48, p < .001$) in predicting perception of stress reduction resulting from tablet use. Similarly, leisure boredom was entered next; it was also significant ($\beta = .12, p < .01$). This finding means that people who are leisurely bored and have a greater desire to be alone have a higher tendency to perceive that tablet use can help reduce stress. The socio-psychological traits block explained 30% of the total variance.

However, when the four tablet activities were entered as the next block, only ritualistic tablet activities including social-oriented ($\beta = .13, p < .01$) and fun seeking-oriented activities ($\beta = .10, p < .05$) turned out to be significant predictors. This block contributed an additional 4% in explaining the variance. These results demonstrate that the more people engaged in ritualistic-oriented activities on their tablet, the higher the perception that tablet use can reduce stress.

In the next step, the three variables measuring how often a tablet was used in three different locations were entered. Use of the tablet in the bathroom was the only significant predictor ($\beta = .13, p < .01$). This fourth block accounted for an additional 2% of variance, indicating the important influence of location of tablet use to the stress reduction perception. Based on the changes in R squares shown in Table 4, the influences of desire for aloneness and being leisurely bored far outweigh that of the type of tablet activities, location of use, and demographic differences.

5. Conclusions and discussions

The key theoretical contribution of the study is that it is a study of the positive or beneficial dimensions of aloneness (Griffin,

2001). Although aloneness has often been misconstrued as loneliness and implied feelings of unhappiness, with the unique nature of the tablet (being mobile, compact, and multi-functional), the tablet can, in fact, be a good companion for people who have a high desire to be alone. It not only keeps them from feeling lonely, but also can help them make use of the solitary time to self-reflect, relax, rejuvenate, self-regulate their mood, and reduce stress (Pierce et al., 2003). The ability to acknowledge beneficial aloneness, or solitude, seems to be a developmental aim that had not yet been reached and has been ignored in past research. A majority of people may have great difficulty in perceiving the positive functions of aloneness or recognizing the fact that aloneness can be beneficial, especially if, for example, the restriction and isolation of children and adolescents within one's bedroom has been used as a punishment for bad behavior. The data from this study clearly demonstrated that the desire for aloneness can be a positive thing.

In addition to providing valuable information for theory development, this study has important practical implications for future technology development. From the results, developers may gain a better sense of what applications and functions people with a high desire for aloneness would use most often on a tablet, and where the tablets are used, which can realistically help them cope with stress.

5.1. Effects of socio-psychological traits on tablet usage

The findings from the current investigation add to the modest body of literature that socio-psychological traits (in particular, the desire for aloneness) significantly predicted tablet use for ritualistic (i.e., social- and fun seeking-oriented) and instrumental (i.e., utility- and information-oriented) activities. This indicates that, when individuals' desire to be alone is strong, they probably see aloneness a perfect time for self-reflection, rest, and self-renewal (Larson, 1990). In fact, they could use the time to be entertained and find companionship through a mediated channel using a tablet in solitude. It may also be the solitary time for managing or catching up some unfinished work, such as reading/editing documents, sending and receiving e-mails, and going over their appointment schedule using the tablet. This supports the notion that being alone provides the opportunity to self-reflect and get away from others (Pierce et al., 2003). Furthermore, being able to use a tablet in solitude may help individuals to self-renew, find a partner with whom they can converse, and may also help them cope with stress. With the Internet being so easily accessible through tablets, for individuals whose desire to be alone is strong may prefer it as a means for exploring the social world.

However, contrary to what was hypothesized, the current analysis did not find any significant relationship between leisure boredom and ritualistic- and instrumental-oriented tablet activities. This means that, despite experiencing boredom, people do not necessarily seek out and engage in ritualistic- and instrumental-oriented activities on their tablets. This is understandable because, to alleviate boredom, one can select many other leisure activities, such as going to a movie, visiting a library, taking a walk in a park, playing sports, or playing a game of chess with friends. Using a tablet to engage in ritualistic- and instrumental-oriented activities to relieve boredom may not be the first thing in people's minds.

It is also interesting to note that our data supported the notion that individuals who score high on leisure boredom will report less of a desire to be alone. This is logical, as boredom means having too much time available with too little to do (Hill & Perkins, 1985). With such an abundance of time available and experiencing low levels of arousal, people will seek entertainment, stimulating activities or contentment from media, or seek companionship, rather than choose to be alone.

5.2. Where and for what activities tablets are used?

On one level, it may seem self-evident that tablets can be used anytime, anywhere, and for any number of activities. The results in [Table 3](#) indicate that, while commuting alone on a train, bus, or taxi, people tended to use a tablet for a variety of functions, including utility-, social-, and information-oriented activities, but not for fun-seeking. This can be explained by noting that it may be too crowded on public transit systems, such as a congested subway system, to play online games or watch pre-loaded video because the cars are almost always packed with passengers. While in bed, people tended to use their tablet for utilities, information seeking, and for fun, but not for social purposes. This may be due to the situation that people tended to take care of some of their unfinished business before bedtime, such as checking the weather, sending a quick business-related e-mail, reading documents or a novel, check their calendar, or watch a video. They may not want to be connected socially to anyone before a good night of sleep. They just want some peace and quiet before going to bed.

It is interesting to note that social-, utility-, and information-oriented activities are usually not carried out in the bathroom. However, playing games and watching videos on the tablets in the bathroom are quite common. This indicates that the “idle” time while doing “personal business” in the bathroom alone can be wisely used for relaxation and escape, especially for youth.

Overall, when people, especially young people, have a strong desire to be alone, they tended to habitually look for the multi-functioned and compact device called the tablet to spend their time in solitude to satisfy their utility, information, social, and fun-seeking needs. Through mood management uses of the tablet, they self-reflect, self-regulate their mood, and allow themselves to discharge emotionally ([Zillmann, 1988](#)). As indicated earlier, when people are leisurely bored, they tended not to immediately or habitually seek the tablet to help them relieve boredom, as there is much other stimulation one can choose to bring their emotional state back to the satisfactory level of arousal and to restore their well-being.

5.3. Tablet use and perceived stress reduction

As hypothesized, bivariate correlation results found that the more individuals use their tablets for ritualistic- and instrumental-oriented activities, the more they perceive that using a tablet in solitude may actually help them reduce stress (Pearson coefficients ranged from .24 to .32). In particular, as indicated in the hierarchical regression in [Table 4](#), after controlling for demographics and two socio-psychological traits, those who frequently used a tablet for social- and fun seeking-oriented activities tended to perceive that stress can be reduced through their tablet use in solitude. This makes sense as, through these activities, individuals can read and comment on blogs, send/receive instant messages, and use SNSs to update/connect with friends in a non-face-to-face and relaxed environment by using their tablets in solitude. For others, they may want to cope with stress by playing online games or watching streamed or pre-loaded video with their tablets alone. However, hierarchical regression results, after controlling for demographics and socio-psychological traits, did not indicate a significant influence on perceived stress reduction from the use of a tablet for instrumental reasons such as for utility and information-gathering. This may be due to the fact that utility- and information-oriented activities on the tablet may be considered stress-inducing activities that involve reading or editing documents, catching up on e-mails, following-up on appointments, and looking up information ([Zillmann, 1993](#)). All these activities require cognitive effort. It is reasonable to believe that people would avoid

activities on the tablet that may actually stimulate anxious thoughts, if they want to use the tablet to reduce stress. This supports the notion that people under stress will, as suggested by [Zillmann and Bryant \(1985\)](#), gravitate toward TV programs that incorporate comedy or variety entertainment, which is a predominantly passive behavior and demands little mental effort.

It is also important to note the powerful influence of the two socio-psychological traits (desire for aloneness and leisure boredom with beta weights of .48 and .12, respectively) on the perception of stress reduction using the tablet in solitude. After controlling for demographics, the results show that those who believe socializing with friends via their tablets in solitude can be a coping strategy for dealing with stress they experienced during the day also tended to be those who report a high desire for aloneness. This finding seems to be in line with what [Pierce et al. \(2003\)](#) argued, that aloneness does not necessarily imply feelings of unhappiness, but can be viewed as being self-reliant, hopeful, resourceful, and as having self-determination and being able to engage in self-reflection. As indicated by [Larson \(1990\)](#), research on aloneness can be focused on the positive effects of solitude, which sees aloneness as a time of reflection, rest, and self-renewal. Accessing social media (e.g., blogs, forums, SNSs, chat rooms, and instant messaging) via a tablet may be an ideal mobile device for such a moment for aloneness. The device is mediated, not face-to-face, it is interactive, and can be anonymous. With its mobility and compact nature, people can take their tablet anywhere to spend some private time self-reflecting, regulating their emotions, and relieving stress in diverse activities, especially from passive and non-stress-inducing pursuits, such as video viewing and game playing.

Similarly, it is worth noting that people who scored high in leisure boredom were those who also perceived that using a tablet in solitude can reduce stress. Previous studies have found that boredom occurs when people sense that their leisure activities are not challenging enough, when they have to face meaningless routines and obligations, or cannot find satisfactory recreational activities in offline settings. Then, they tend to look for alternative pleasures by using computers or the Internet ([Iso-Ahola & Weissinger, 1990](#)). Therefore, it is reasonable to believe that a tablet may be an attractive option to relieve boredom. As a result, they may engage in ritualistic or mood management activities on their tablets ([Dillman Carpentiera et al., 2008](#)), either through SNS platforms or media sources where they can find entertainment and stimulating activities or contentment, until the ideal level of arousal is achieved and well-being is restored. Along the way to achieving this ideal level of arousal, leisurely bored individuals feel that these boredom-busting behaviors through the use of a tablet in solitude may help them reduce stress. Behaviorally, leisurely bored individuals may not always go to the tablet to relieve boredom, but the thought of using a tablet for instant messaging (e.g., MSN, WhatsApp, or chat rooms), which is generally used to pass time and exchange gossip; online games for entertainment, diversion, and escape; and forums for in-depth discussion on specific topics may have created the impression that tablet use could have already helped them cope with stress. Besides, channels such as personal blogs and SNSs may be better online environments for showing love and affection, caring for others, giving encouragement, and comforting others when friends are in need. In fact, social ties online or offline are relationships that generally buffer people from life's stresses ([Leung, 2007](#)).

Finally, the results also reveal that the people who perceived that tablet use can reduce stress are those who said they often use their tablets in solitude in the bathroom. Such findings are interesting, as we can see in [Table 3](#) that most tablet activities in the bathroom are for fun-seeking. This includes playing online games and watching videos. With its compact size and mobile nat-

ure, media-related leisure activities are now spreading from the living room to the solitary bedroom and bathroom.

6. Limitations and suggestions for future research

Although the conceptual relationships in this research are based on sound theoretical assumptions and are empirically supported, the present results should be interpreted in light of the methodological limitations of the study. It is important to note that items used to measure some concepts in the questionnaire, such as “desire for aloneness” and “using tablet in solitude for stress reduction” may have been difficult for some respondents to understand, or they may not have been applicable to them. As a result, the overall findings may have been affected. Furthermore, the Cronbach's alphas ($<.70$) of these two measures and the measures for two dimensions in ritualistic-oriented tablet activities indicate less than desirable reliability. Thus, the results should be interpreted with caution. Secondly, participants were not specifically asked to link coping mechanisms they used for particular stressors. Although the findings based on cross-sectional data are consistent with the predictions of theories revealed, they do not demonstrate a cause and effect relationship. The use of quasi-experimental and longitudinal designs in future studies would improve the strength of the study.

Also, future research might examine the beneficial consequences of other locations for solitude. To what extent will we be able to identify specific positive outcomes associated with desire for aloneness that are associated with the use of newer media technologies such as the smartphone and personal wearable devices? Furthermore, the increasing use of mobile, compact, and personal media technologies in solitude in the future may also be a natural developmental behavior for people with different socio-psychological traits or personalities. Future research should widen the scope of this line of study by comparing the results for different age groups and cultural backgrounds.

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