Abstract

It is time to pursue a new perspective on players’ aggression studies. In this study, we examined whether and how players’ aggression is affected by game usage. In contrast to most existing studies, our study asks about crucial underlying factors among the general game population and thereby investigates therapeutic factors (internal health status belief, game and life self-efficacy, and therapeutic catharsis seeking), psychological problems (depression, loneliness), and demographic variables (age, gender). A sample of 918 players was recruited through the Internet and asked to fill out a questionnaire. Results show that players who reported higher levels of internal health status belief, game and life self-efficacy, therapeutic catharsis seeking, depression, and loneliness showed significantly decreased degrees of aggression. By revealing the crucial role of health belief, mood repair, mood management theory, use and gratification theory, as well as aggression catharsis effects as underlying concepts of players’ aggression, our results provide a deeper insight into mechanisms of aggression alleviation in game studies.

1. Introduction

Over the last decades, some researchers have concluded that violent games promote players’ aggression based on the General Aggression Model (GAM). The GAM has retained dominance particularly in the media about violence. However, some scholars have questioned GAM-based outcomes. Several recent studies have challenged this model in regard to violent games. Although studies about players’ enhanced aggression based on the GAM have been dominant over the last several years, the concept of catharsis needs to be embraced to change its potential influence [5, 40]. The GAM no longer fits methods to study aggression and does not adequately explain aggression, especially depictions of violence in the media, such as players’ aggressive tendencies. The time has come to pursue new aspects [11]. Thus, we aim to study the potential of games as a therapeutic venting outlet based on the catharsis perspective of aggression. This idea is supported by several recent studies. Mounting research demonstrates that playing games can serve as a mood repair tool [12, 13, 14] and reduce blocking by providing satisfaction in virtual environments, particularly when playing violent games [9, 20, 22, 39]. Both aspects can foster therapeutic relaxation in the form of outburst experiences that can extend to daily lives.

In recent years, an increasing number of areas, such as healthcare, government, and corporations, have endeavored to integrate positive game function into training and teaching because they consider well-designed digital games as an effective means to improve people’s knowledge and modify beliefs [15, 16]. In addition, previous studies have indicated that the media have the potential to change mental health beliefs [17, 18]. Comparatively few studies have examined reduction of aggression with game play based on mental health belief.
2. Theoretical background and hypotheses

2.1. Aggression and health belief

Aggression is an inevitable natural occurrence [23]. Although levels of aggression appear to vary from one culture to another, aggression is omnipresent in humankind [24]. There are numerous definitions of aggression but it is typically defined as a behavior that is intended to inflict harm on others [23, 25]. Even though aggression is recognized as a serious danger to our mental health and global health [26], there is considerable evidence that aggression does not predict violent acts or even physically aggressive behaviors [5, 6, 7, 8, 9, 10, 11]. However, research on aggression is a worthwhile endeavor, because aggression in mental health settings is well recognized as a major problem [26, 27].

A lack of belief in health-promoting actions or behaviors is a major risk factor for several chronic diseases [28]. The socio-psychological Health Belief Model (HBM) has been applied to various areas for health-risk prevention, behavioral intervention, and self-management [29, 30]. In recent years, researchers from a wide variety of domains have been adopting and modifying mind and behavior change models rooted in HBM as a way of explaining mental health care utilization [31, 32], such as mental health care of anxiety and depression [33] and use of mental health services [34, 35].

The HBM became one of the most widely applied conceptual frameworks to explain how people acquire and maintain behavioral health patterns by focusing on the individual’s motivation to create perceptions, modify behaviors, and change the likelihood of generating actions [36]. The factors that contribute to players’ aggression depend on the level of embedded health belief because perceived health belief may intervene with the players’ aggression. A high internal health status belief can be regarded as a personal tendency reflecting a healthy mental attitude. However, the influence of internal health status belief on players’ aggression has not been studied.

According to social cognitive theory, individuals, environments, and behaviors are constantly influencing each other and concurrently contribute to changes in perceptions, emotions, and behaviors [38]. Accordingly, internal health belief has a direct effect on subsequent behaviors, which further influences cognitions and emotions [38]. Thus, we can expect a relationship between players’ internal health status belief and degree of aggression.

The benefit of health belief, including the HBM, reported in related studies is no longer limited to physical disorders; the application of health belief has
the potential to alter people’s lives in fundamental ways. Recently, a new movement to alleviate aggression has been proposed that applies games for mental aspects and belief-related purposes [9, 20, 22, 39]. Therefore, we focus on mental health beliefs about players’ aggression. Given that health belief has been used previously in relation to behavior change within health-care settings, this paper extends the application by first considering game usage, particularly players’ aggression in a broader everyday game use, and its suitability in the context of internal health status belief. In other words, games may help alleviate aggression in accordance with one’s self-perceived health status beliefs. Thus, the following hypothesis will be tested.

**H1:** Players with higher levels of health status belief will show decreased degrees of aggression.

### 2.2. Self-efficacy

Self-efficacy is defined as individuals’ conviction or belief to successfully engage in behavior required to produce a certain outcome and can influence how individuals reason, experience emotions, and incentivize themselves [40]. Bandura [41] noted that self-efficacy predicts degree of therapeutic change in a variety of settings. Moreover, self-efficacy deals with stressors that affect immune function [42]. Even when coping with pain, individuals who have high efficacy beliefs are better able to control pain than those who have low self-efficacy.

Furthermore, Schunk [43] alluded that self-efficacy has a positive impact on performance regardless of the domain. Computer-related self-efficacy can be considered a domain-specific efficacy expectation. Previous research further suggests that self-efficacy effects can occur after game playing [44]. In game studies, game self-efficacy refers to the individual’s confidence in his or her ability to successfully interact with game systems [45]. Previous studies indicate that players’ performance is associated with the experience of self-efficacy [46]. Thus, higher efficacy in games could be due to the fact that high and worthy achievements occur in the virtual environment. In addition, players might regain self-confidence through game play after experiencing low self-efficacy in real life. Williams and colleagues [47] argued that playing games might compensate for lack of achievement in real life. Thus, perceived self-efficacy that occurs while playing games may affect players’ real lives. Perceived self-efficacy refers to individuals’ beliefs concerning their ability to meet desired outcomes in life [48]. Notably, Schwarzer, Mueller, and Greenglass [49] posit that self-efficacy is helpful to those coping with a variety of stress resulting from real-life problems. That is, self-efficacy could be a regarded as a predictor for alleviating anger, hostility, and aggressive thoughts. In this regard, examining the relationship between self-efficacy and aggression could be valuable in elucidating such mechanisms.

While self-efficacy has been widely measured and discussed in the social psychology literature, there is little research regarding the effects of game and life self-efficacy on players’ aggression. Based on the previous arguments, we assume that game self-efficacy can be contagious to real life through the gaming experience. Although several studies examined various real life situations and gaming behaviors [50], no research has yet investigated the relationship between game self-efficacy and real life self-efficacy by focusing on player aggression. Thus, we examined empirical relationships between player’s aggression and game and real life self-efficacy. Based on the findings of our previous studies [20, 22, 39], we tested the following hypothesis by controlling other variables.

**H2a/b:** Players with higher levels of a) game self-efficacy and b) life self-efficacy will show decreased degrees of aggression.

### 2.3. Therapeutic catharsis seeking

Regarding the cause of aggression, it has been suggested that aggression is a natural drive or instinct that consistently builds up in accordance with environmental stress [51]; thereby, the cyclic blow-off of aggression should keep it at manageable levels. This means that people under stress naturally seek out solutions for relieving that stress. This idea has been associated with the concept of catharsis, which posits that aggression is a biological drive, which requires release, and refers to the process of purging and cleansing through the release of emotional tension [20, 22, 39, 51]; these effects are often associated with psychological healing [52, 53, 54]. Catharsis is considered one of the major curative factors in psychotherapy [52, 53, 55, 56].

Furthermore, prior research suggests that games have the potential to repair negative mood and lead to positive emotional outcomes [12, 13, 57, 58] because they pursue alternative means of satisfying unfulfilled psychological desires. According to mood management theory, people will choose specific means that best suit their current mood state with the goal of reducing negative mood [14, 65]. In line with this notion, games could be played as a means to relax, to promote stress relieve, to get entertained, or even to vent anger. If a person plays preferred games as a means to vent anger, playing such games may well lead to subsequent reduction of aggressive thoughts. Games in particular may provide the best possible venue for exploring
feelings of control and power and to repair negative mood [12, 13, 14, 57, 58].

Several recent studies have challenged this theory in regard to violent games. According to Kutner and Olson [59], many players argue that violent games help them “get their anger out.” Continuing research also reports that longer game exposure not only reduces aggression [5], but players also respond less aggressively and feel calmer after playing violent video games [60]. These findings suggest that the catharsis aspect needs to be re-examined.

There is some evidence that violent games may be effectively incorporated in catharsis concepts. Ferguson et al. [10] found that violent video games are appropriate in terms of catharsis seeking. Under experimental conditions, Bushman and Whitaker [9] nevertheless reported that the catharsis theory is false, and that belief in catharsis partially supports player’s experience of venting anger via violent games. Likewise, Reinecke [61] identified that playing games after stressful events helps alleviate stress because game use is effective in reducing stress by activating the nervous system and increasing positive mood [13]. Furthermore, Allahverdipour [62] found that individuals with appropriate game use are predisposed to have improved mental health outcomes compared to non-gamers.

Taken together, playing violent games may be understood as a means of stress reduction. From this perspective, it would be expected that individuals with mental health problems, which include aggression triggered by the stress in their daily lives, would be more inclined to use games to reduce stress. Moreover, previous studies further suggest that catharsis effects in game studies need to be examined in a broader game use context [9, 10]. It is possible that general game playing allows “venting” aggression. This perspective is associated with catharsis seeking in the way of psychological healing. Thus, we assume that general game playing encompassing a wide range of game genres also affects catharsis seeking in a therapeutic context.

H3: Players with higher levels of therapeutic catharsis seeking will present with decreased degrees of aggression.

2.4. Depression and loneliness

Previous research suggests that hostile feelings such as aggression have been linked with depression [63, 64]. Nabi [82] suggested that individuals with depressed mood will seek out strategies that best allow them to enhance their emotions in a positive way. In addition, some individuals use these means to cope with negative mood such as loneliness or to escape psychological problems.

As explained by the mood management theory, games seem to be more appropriate to alleviate negative emotions. In particular, approaches that distract individuals from their negative mood are more likely to be chosen [66]. As for alleviating effects of negative mood, violent games could provide mood management for coping with stress and depression [60, 66, 67]. In this sense, we expect that aggression in general game players also affects depression.

The uses and gratifications (U&G) theory suggests that consumers use certain media to satisfy specific needs [68]. Influenced by the U&G theory, Starkman [69] pointed out that the primary purpose for using these media is the desire for relaxation, fun, and encouragement. Regarding game usage, Colwell [67] identified popular reasons for playing games among adolescents, which included companionship, fun, and stress relief. These results emphasize players’ needs and desires for ameliorating negative mood as reasons for playing games. Thus, people who have limited social ties and feel lonely and depressed are more likely to indulge in playing games to fill this void. Particularly, playing games is the best way to socialize and avoid feelings of loneliness for such individuals [69, 70]. In line with findings from previous studies, we expect that loneliness and depression affect players’ aggression. It is possible that as aggression decreases, loneliness and depression also decrease because of the ripple effect showing mood contagion [78].

H4a/b: Players with higher levels of a) depression and b) loneliness will show decreased degrees of aggression.

3. Method

3.1. Survey design and analysis

We conducted an online survey among Korean game players over two weeks. The study was conducted by the Research Company, which is one of the major research companies in South Korea. Participants were randomly recruited from Seoul, the capital city. The age of respondents varied between 16 and 59 years (M=35.5, SD=11.5). A total of 918 participants, including 532 (58%) males and 386 (42%) females, took part in this study. These participants voluntarily completed a questionnaire and were informed before the study that they had to be either currently active in a game or active within the previous six months. After selecting the variables significantly correlated with aggression, we used a regression analysis to examine how each variable affected aggression. All analyses were conducted in SPSS version 18.
3.2. Measures

To measure aggression, participants completed the Buss and Perry Aggression Questionnaire (AQ) [71]. The AQ is one of the most extensively used self-report measures of aggression. The 29-item scale is composed of four subscales: physical aggression, verbal aggression, anger, and hostility. A 5-point Likert scale is used for the questionnaire ranging from 1 “extremely uncharacteristic of me” to 5 “extremely characteristic of me” (α = 0.89).

To measure players’ perception of internal health status beliefs, a scale consisting of 11 items, which were adapted and combined from previous studies using the HBM [30], was created (e.g., “I feel I will get major health problems sometime during my life.” “I feel it is important to carry out activities that will improve my health.” “I believe that maintaining good health is extremely important to me.” “I know how to perform health management.”). The items were all scored with a 5-point Likert scale from 1 “strongly disagree” to 5 “strongly agree” (α = 0.92).

The scale to assess game self-efficacy (online) was created by modifying computer-based self-efficacy scales [72]. The scale measures conviction about a user’s ability to control over the games. Thus, we adjusted the game self-efficacy items by focusing on game-related experience by adding “gaming” to the questions (e.g., “I am a valuable and important person in the gaming world.” “I know the game better than others.”) The scale contains 12 items that are rated on a 5-point Likert scale, ranging from 1 “strongly disagree” to 5 “strongly agree” (α = 0.83).

To assess life self-efficacy (offline), we created scales by modifying general self-efficacy scales [73] focusing on experience related to real life. The scale contains 12 items (e.g., “I look for something good for my life in a negative situation.” “I stop myself from being upset by unpleasant thoughts.”) that are rated on a 5-point Likert scale, ranging from 1 “strongly disagree” to 5 “strongly agree” (α = 0.86).

For therapeutic catharsis seeking, we created a scale by combining both Ferguson’s catharsis seeking scale [10] and the Therapeutic Realizations Scale–Revised (TRS-R) [74] to measure an individual’s degree of therapeutic catharsis seeking by adding “gaming” and “therapeutic aspects” to the questions [22, 39] (e.g., “I think that gaming helps me relieve my stress.” “I think that gaming helps me share my joys and sorrows.” “I think that gaming helps me feel satisfied.”). The scale consists of 20 items in the form of a 5-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree” (α = 0.92).

Depression was measured with the CES-D (Center for Epidemiologic Studies Depression Scale). A screening version of the CES-D consists of a subset of the 11-item CES-D scale and has been used extensively in general populations [75]. The scale items ask about the degree of sadness, gloominess, and so forth (α = 0.74) and are rated from 1 (never/rarely) to 4 (very often) (α = 0.88).

Loneliness was measured with the UCLA Loneliness Scale [76]. The scale consists of 20 items designed to measure one’s subjective feelings of loneliness as well as feelings of social isolation. The items are rated on a 4-point scale, ranging from 1 “strongly agree” to 4 “strongly disagree” (α = 0.92).

In order to measure game genre, the participants were asked for details about what their favorite game of all time was (e.g., adventure games, sport games, social games, action or fighting games, shooting games, role playing games, simulation games, web board games, physics simulation games).

4. Results

The average amount of time participants spent playing games each day was 86 minutes (SD = 1.55), with men playing for 91 minutes (SD = 1.59) and women for 79 minutes (SD = 1.50) per day. Considering the ratio of each age group, 65 (7.1%) were teens, 246 (26.8%) were in their 20s, 246 (26.8%) were in their 30s, 228 (24.8%) were in their 40s, and 133 (14.5%) were in their 50s. The average aggression score was 3.32 (SD = 0.48). The average level of internal health belief was 2.93 (SD = 0.36). The average level of game self-efficacy was 2.62 (SD = 0.64) and life self-efficacy was 3.39 (SD = 0.49). The average level of therapeutic catharsis seeking was 2.49 (SD = 0.71). The average loneliness score was 2.55 (SD = 0.44). The average depression score was 1.58 (SD = 0.55). The average violent games score was 2.55 (SD = 0.44). Regarding game genre (ratio of each genre), violent games (e.g., role playing games: Lineage, simulation games: StarCraft, action/fighting games: The King of Fighters, shooting games: Rainbow and Quake) represented 48%, while non-violent games (e.g., web board games: Tetris, social games: Anipang for Kakao, SimSE Online, Korean chess; simulation games: SimCity) represented 52% of reported games.

4.1. Correlation analysis

To examine the relationship between variables, we employed a Pearson correlation analysis using SPSS statistical software. The analysis was performed on players’ internal health belief, three therapeutic variables (game and life self-efficacy and therapeutic catharsis seeking), two psychological problems
... (depression, loneliness), demographic variables (age, gender), and game genre.

The analyses identified a significant negative relationship between internal health belief and aggression \( (r = -0.287, p < 0.01) \). Game self-efficacy showed a significant negative association with players’ aggression \( (r = -0.315, p < 0.01) \), while life self-efficacy showed a significant positive association with players’ aggression \( (r = 0.159, p < 0.01) \). Therapeutic catharsis seeking had a significant negative association with aggression \( (r = -0.321, p < 0.01) \). Psychological problems, such as depression \( (r = -0.451, p < 0.01) \) and loneliness \( (r = -0.444, p < 0.01) \), were also significantly and negatively correlated with players’ aggression.

Gender showed a negative association with players’ aggression \( (r = -0.076, p < 0.05) \), while age showed a positive association with players’ aggression \( (r = 0.070, p < 0.01) \). However, game genre did not show any association with players’ aggression.

4.2. Regression analysis

With the significant variables in the correlation analysis, we performed linear regressions to examine the associations of the independent variables in terms of degree of aggression prediction. Table 1 shows the results of the regression analysis for the different variables.

| Table 1. Regression Analysis on Aggression |

<table>
<thead>
<tr>
<th>Coefficient of Independent Variables</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>p value</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td>0.00</td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.176</td>
<td>1.541</td>
<td>20.292</td>
<td>0.00</td>
<td>0.871</td>
</tr>
<tr>
<td>IHSB</td>
<td>-0.423</td>
<td>-0.190***</td>
<td>-4.954</td>
<td>0.00</td>
<td>0.472</td>
</tr>
<tr>
<td>GSE</td>
<td>-0.220</td>
<td>-0.147***</td>
<td>-2.702</td>
<td>0.007</td>
<td>0.506</td>
</tr>
<tr>
<td>LSE</td>
<td>-0.236</td>
<td>-0.124*</td>
<td>-2.286</td>
<td>0.032</td>
<td>0.424</td>
</tr>
<tr>
<td>TCS</td>
<td>-0.446</td>
<td>-0.166**</td>
<td>-3.084</td>
<td>0.001</td>
<td>0.624</td>
</tr>
<tr>
<td>Loneliness</td>
<td>-0.415</td>
<td>-0.264***</td>
<td>-5.023</td>
<td>0.000</td>
<td>0.506</td>
</tr>
<tr>
<td>Depression</td>
<td>-0.679</td>
<td>-0.252***</td>
<td>-5.637</td>
<td>0.000</td>
<td>0.689</td>
</tr>
<tr>
<td>Game genre</td>
<td>-0.791</td>
<td>-0.462</td>
<td>-6.986</td>
<td>0.000</td>
<td>0.801</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.356</td>
<td>-0.500**</td>
<td>-1.284</td>
<td>0.200</td>
<td>0.530</td>
</tr>
<tr>
<td>Age</td>
<td>-0.005</td>
<td>-0.064</td>
<td>-1.15</td>
<td>0.909</td>
<td>0.937</td>
</tr>
<tr>
<td>Durbin-Watson = 2.001</td>
<td>R squared = 0.601</td>
<td><strong>p = 0.001</strong></td>
<td></td>
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</tr>
</tbody>
</table>

Note: IHSB = INTERNAL HEALTH BELIEF; GSE = GAME SELF-EFFICACY; LSE = LIFE SELF-EFFICACY; TCS = THERAPEUTIC CATHARSIS SEEKING

Based on this analysis, the players’ internal health belief was an important predictor for the degree of aggression. Players who reported higher levels of health belief had a significantly decreased degree of aggression \( (β = -0.198, p < 0.001) \). Thus, H1 was supported. Both game self-efficacy \( (β = -0.142, p < 0.01) \) and life self-efficacy \( (β = -0.124, p < 0.05) \) showed a negative effect on aggression. The stronger players feel game and life self-efficacy, the lower the degree of aggression. Thus, H2a and H2b were supported. Likewise, therapeutic catharsis seeking showed a significant negative effect on aggression \( (β = -0.146, p < 0.01) \). Thus, H3 was supported. For the factors of psychological problems, both depression \( (β = -0.252, p < 0.001) \) and loneliness \( (β = -0.264, p < 0.001) \) were significant negative predictors for degree of aggression. Thus, H4a and H4b were supported. However, we could not find any significant relationships between gender, age, and game genre and players’ aggression.

5. Discussion

Given the paucity of research examining internal health belief and catharsis effects on aggression in the field of game study, the current study investigated these and other factors and players’ aggressive tendencies. It was expected that both factors would predict the alleviation of aggressive feelings. In addition, real and game self-efficacy was expected to predict aggression reduction. In addition, the role of additional variables such as depression, loneliness, gender, and age were explored.

Unlike most previous studies of specific game effects (e.g., violent video games), the present study is one of the first to examine the general game population encompassing a wide range of game genres. The current study aimed to examine players’ aggression and effects of aggression release via gaming. Consequently, we found that not only violent games but also non-violent games could alleviate aggression. It therefore seems likely that games can be effective and therapeutic tools.

The results also confirmed the hypothesized role of internal health status belief, game and life self-efficacy, therapeutic catharsis seeking, depression, and loneliness. Furthermore, our results suggest that game playing could have therapeutic effects to “blow off steam.” The approach used in the current study allowed testing internal health status belief perspectives, social cognitive theory, mood management theory, uses and gratifications theory, as well as aggression catharsis effects. Notably, Bandura [37] pointed out that social learning and cognitive theories increasingly apply the catharsis effect for aggression research.

The internal health status belief framework would be supported if players with higher internal health belief showed decreased aggression. This framework thus agrees with the results obtained in the present study, because players with higher levels of internal health status belief had a relatively higher probability of reducing aggression. The utility of games as mental health management tools may have implications for health-related conditions in which feelings of anger or hostility may be an issue. Mental health issues such as aggression take longer to respond to non-

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pharmaceutical interventions. This implies that for mental or psychological health management, internal health belief should be integrated into health-care game programming to offer program participants an incentive to adhere to healthy mental adaptations in the long term. As such, not only violent games but all kinds of games may serve a mental health-promoting function to decrease aggression as well as increase game and life self-efficacy for those suffering from aggressive mental conditions.

Self-efficacy, as mentioned previously, has predicted therapeutic change in a variety of settings including coping with stress [21]. Accordingly, we integrated components of game and life self-efficacy into a therapeutic framework based on the study aim, which was developed to explain aggression-related effects. These results have shown that game and life self-efficacy decreases players’ aggression. Players who feel greater game and life self-efficacy are more likely to reduce aggression both online and offline, as they are more self-confident in satisfying their needs. It might be suggested that players’ vicarious in-game experience could be a strong predictor of game and life self-efficacy reflecting a contagion effect [78].

In the correlation analysis, interestingly, life self-efficacy showed a positive association with aggression while the regression results showed a negative association. We reason that there could be mediators or moderators between aggression and the independent variables. General explanations for the association between game and life self-efficacy (real-life effects) are still vague with negative, neutral, and positive connotations [20, 22, 39, 50]. Thus, future research should test the efficacy contagion effect of gaming from both online and offline domains.

As for the catharsis effect, the current evidence supports the hypothesis that general games allow players with high levels of therapeutic catharsis seeking to decrease anger, hostile or aggressive feelings. These players are more likely to succeed when it comes to relieving aggression. The aggression catharsis hypothesis would be supported if exposure to preferred games were associated with reductions in aggressive feelings. It is plausible that the use of violent or general games, at least for some individuals, may provide a means to blow off steam or manage aggressive feelings with an improved ability to tolerate stress occurring in their daily lives. It also suggests that in-game activity promotes mood repair regardless of game style or genre, as reflected by the mood management perspective.

With regard to players’ depression and loneliness, there is evidence to support the results in aggression reducing studies. Players who feel higher levels of depression and loneliness can diminish aggression via game playing. Previous studies found that players who were more experienced with games were better able to avoid negative mood [12, 13, 65, 66]. This is in line with the uses and gratifications perspective.

Previous studies addressed depression as a risk factor for aggression [79, 80]. Interestingly, our results indicate that depression can reduce aggression through gaming activity. In other words, players with a higher level of depression may alter their depressed mood to a more positive mood via game playing with the result that aggression is reduced.

Dutton and Karakanta [80] posit that depression should constitute an aspect of mental health assessment; thereby, our results have some important implications in terms of game-related therapy not only for measuring depression but also for reducing both aggression and depression. Because games require active participation and behavior rehearsal, their therapeutic effects can be explained with mechanisms similar to music, art, and drama therapies. The characteristics of various games especially seem to converge on drama therapy, which is an active, experiential approach to facilitating change through storytelling, projective play, purposeful improvisation, and performance [81]. Performers are invited to rehearse desired behaviors, practice being in life roles, and perform the changes they wish to see in the real world. There are many similarities between game properties and drama therapy methods, since games can affect various ways of communicating challenges, choices, and desired opportunities for the players [22, 39]. Thus, to maximize the potential of games for promoting mental health, gaming developers or researchers need to collaborate with music, art, and drama therapists.

According to the social compensation hypothesis, the media are more beneficial to very lonely or introverted individuals. Under this hypothesis, Internet-based media permit concealing one’s identity and reduce the introvert’s fear of rejection. Thus, it is possible that this compensatory situation satisfies the needs of lonely players, thereby decreasing both feelings of loneliness and aggression by playing games. Taken together, both depression and loneliness could be affected by venting aggression. It seems likely that blowing off steam via game playing triggers a chain reaction for players suffering from depression and loneliness.

Depression and loneliness are debilitating conditions, which are known to cause considerable emotional suffering and which have social as well as psychological consequences [77]. The current results suggest that individuals play games to satisfy certain needs for altering their depressed mood or avoiding social isolation, eventually generating mood repair and

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mood management. This further means that players with depressed mood can create a satisfying interaction through in-game activity.

As a final point, several limitations have to be mentioned. First, we used a survey and relied on self-report measures, which limits the generalizability of our results. Future studies should thus be carried out using other methods such as longitudinal designs and experimental settings with controlled conditions. Second, as our data were collected in South Korea, the findings might not generalize to other countries. Thus, future studies should be carried out in additional countries. Keeping these limitations in mind, our findings are useful in extending the understanding of games and aggression. To the best of our knowledge, this study is the first to investigate potential therapeutic mechanisms by which internal health belief, game and life efficacy, and therapeutic catharsis seeking jointly predict aggression with implications for mental health care. This study extends past work on the role of game use for aggression by combining internal health status belief, social cognitive theory, mood management theory, uses and gratifications theory, as well as aggression catharsis perspective to explain effects of blowing off steam in the general game population. Future research will likely benefit from the consideration of these factors. The present research will help us better understand the dynamic view of playing various games and aggression in the general game population, and therefore efficiently contribute to the alleviation of aggression by providing new perspectives on game studies.

6. References

SmartMediaApplication(SMA), Thailand December 10-13, 2014.