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How Do You Blow off Steam - The Impact of Therapeutic Catharsis Seeking, Self-Construal, and Social Capital in Gaming Context

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***Abstract*—**This study will examine how the therapeutic factors (therapeutic catharsis-seeking and game-efficacy of the game player) and self-construal factors (independent and interdependent self-construal of the game player) as well as social capital factors (bonding and bridging social capital of the game player) affect aggression in the game. Results show that both therapeutic catharsis-seeking and game self-efficacy are particularly important to the players since they cause the game players' aggressive tendencies to be greatly diminished. Independent self-construal reduces the level of the players' aggression. Interestingly enough, the bonding social capital enhances the level of the players' aggression, while individuals with bridging social capital did not show any significant effects. The results and implications will be discussed herein.

***Keywords*—**Aggression catharsis, therapeutic catharsis seeking, game self-efficacy, self-construal, social capital.

I. Introduction

OVER the past few decades, the field of games has grown exponentially, and has been the subject of numerous research studies [1]-[5]. There has been an increasing interest in the effects of these games on the game players, whether they are positive effects (such as learning, training and collaborating) or negative (such as game addiction and personal aggression resulting from the playing of violent games) [1]-[6]. Digital games have been used as an effective tool for education, physical and mental health care, scientific research and military training [7]. Yet, the majority of extant studies performed on the subject of games have focused on the players' level of aggression. To the best of our knowledge, no study has specifically examined the effects of the players' aggressive tendency as a function of the therapeutic care experience. Thus, this study aims to contribute to the current literature by examining the players' aggression within the mental health care context.

Humankind's four innate fundamental instincts (aggression, hunger, sexuality and flight- the "big four") play a role as a motivating source for human behavior [8]. In this respect, human aggression can be seen as inevitable in our daily lives. Generally, any event can have a negative effect on a person's state of mind, possibly leading to feelings like anger, shame and anxiety, making it possible for them to internalize repressed feelings in a negative way. This emotional repression can lead to a number of psychological or mental problems, including hysteria [9]. Due to the sometimes explosive nature of aggression, people need to vent their aggressive feelings and "blow off steam" as a form of therapy [10], [11].

Over the last several decades, games have become one of the most popular leisure activities. While general surveys exist regarding the broad patterns of involved in game usage, less is known about the relationship between game usage and aggression. So, this study was undertaken with the aim to clarify the relationship between the two. It is important to note that we are not simply discussing the existence of violent game users, but are debating the effects of different types of games on more universal game players (e.g. solo computer games, online games). We think that games can be effective tools in alleviating tension or feelings of aggression. Previous studies have found that playing games showed a high degree of similarity to catharsis seeking [5], [11].

The focus of this study is on self-construal, within the context of the players' aggression in an effort to arrive at a different interpretation of these aggressive tendencies. Self-construal is associated with an individual's self-concept or self-view [12]. Self-construal can be defined as those thoughts, feelings, and actions of heterogeneous individuals from a homogenous group [13]. They see themselves as similar or distinct to others depending on how they view themselves in relation to others. Cultural norms, values, and attitude all have an effect the individuals' self-construal, as well as cognitive performances, preferences, social interactions, emotions, motivations and the behaviors of individuals [13]. In that games become part of the culture and cognitive leisure activity, players' aggression could be affected by their self-construal. Indeed, playing games facilitates relations with others (IE: MMORPG), by causing players to meet numerous other individuals, thereby encountering a number of independent or interdependent relational situations.

Brewer and Gardner [14] posit that personal self-construal is accompanied by motivating self-interest. According to the motivational model, games have the potential to improve this intrinsic motivation by providing experiences that satisfy universal psychological needs. Also, previous research indicates that the aggressive imagery and narratives present in many games are motivating in their perspective [15], [16]. We can thus suppose that self-construal can be associated with the players' aggression.

There has been a developing interest in identifying the social

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capital associated with aggression. Social relationships can be associated with in-game aggressive behavior, depending on the personal or interpersonal relationships that might be related to social capital, sharing many things in common [17]-[19]. The concept of social capital has gained extensive attention over the past few years in game studies [20]. Despite increasing interest in social capital, empirical studies on the relationship between social capital and players' aggression are relatively sparse, compared to other areas. Thus, we will make an attempt to determine the relationship between social capital and players' aggression.

Following our previous research, the objective of the current study is to investigate how therapeutic factors (therapeutic catharsis seeking and game-efficacy of game player) and self-construal factors (independent and interdependent self-construal of game player), as well as social capital factors (bonding and bridging social capital of game player), affect the aggression trait within the context of the game.

II. Background and Hypotheses

A. The Aggression Catharsis Perspective

The desire to vent aggressive energy is deeply rooted in human nature. According to the ethological model on the concept of the catharsis of aggression, aggression is- as an inevitable matter- one of the strongest of the human instincts [8]. Naturally, human beings continuously build up aggressive energy in their daily lives. Because the human being's capacity to contain this aggression is limited, there is always a point at which this aggressive energy must be released. People need find an outlet for this energy, and games can be effective tools for releasing their aggression [12], [22], [23]. According to Dollard, Doob, Miller, Mowrer, and Sears [24], aggressive acts lead to a reduction in the aggressive drive, which decreases the likelihood of future such acts. They posit that any aggressive acts, such as viewing aggressive content or having aggressive fantasies, can diminish the desire to act on these tendencies. This idea could be supported by the aggression catharsis perspective. Since game playing serves as a bridge between reality and fantasy, game worlds are able to fulfill the players' needs and desires by turning impossibility into a possibility. [11]

To find a suitable outlet for aggressive energy, Lorenz proposed the strength of external stimulation, such as playing games [8]. Several previous studies have found that games could not only enhance personal entertainment, but also be a convenient way to relieve stress [11], [25]. More notably, some in-game features have the inherent capability of reducing aggression [26]. Therefore, playing games may offer temporary liberation from such feelings as anger, shame, and anxiety via participation in the game's imaginary environment.

The catharsis mechanism has been identified by several researchers as one of the major factors in group therapies (such as drama and art therapy) that make behavior and mind change possible [27], [28]. Related research has shown that expressive therapies are more helpful in making progress in mental or emotional healing [29]. Catharsis is defined as "the verbal or non-verbal expression of intense affects associated with a coherent narrative of experience that provides relief of chronic anxiety states" [30]. This definition describes a mental or emotional release from the repressed negative feelings through vicarious experiences, which reflect the game characteristics (such as multi-modality, interactivity, narrative, social use, and specific experiences).

B. The Unique Properties of Games

Due to their nature as an interactive medium, games offer uniquely different approaches to the concept of psychological and social interaction. Unlike traditional media (such as film and TV), games consist of interactive processes enacted by their players. Thus, game players' could be more affected by the unique properties of games-multi-modality, interactivity, narrative, social use, and specific experiences [3].

Multi-modality refers to advancements in game technology, which have been primarily focused on the visual and auditory senses. The multi-modality property of game technology affects not only the various senses, but also has been shown to influence the individual sense of presence within the game environment. Presence is defined as the sensation of being 'physically there' in a virtual environment [51]. Thus, games can create very convincing and immersive experiences [52].

Second, interactivity is one of core elements in game design. Interactive games are the enhanced players' self-reference; they create a sort of game empathy and a vicarious experience, allowing their players to perceive the specific game sequences as being the center of event, or the driver of change and progress. This sense of personal connection holds important implications for the overall game experience and the individual's cognitive processing of the game content.

Modern games can much more complex narrative structures, and specific techniques that allow the combination of player interactivity with a coherent narrative framework. In narrative-driven games, players explore a virtual world with both large and small stories that connect to a main plot that often reflects both realistic and fantasy elements.

Game players now represent a broader scope of the demographic than ever before, and thus offer a new channel through which socially oriented discourse can be distributed. Therefore, games allow them to play together, effectively making global relational connections. The ability to play with others changes the overall game experience, and opens new possibilities for entertainment in both the cognitive and motivational dimensions of game-playing. Finally, games offer specific situations not typically available in everyday life. That is to say, game worlds allow the players an illusory/fantasy experience that can facilitate role-play within the context of the game. Effectively, games offer simulated confrontation with the unknown, the complete freedom to fail or succeed at tasks, and the freedom to engage in behaviors or activities the players' might not ordinarily do, all within an essentially consequence-free environment [3], [31].

Overall, due to the unique properties of the games, the abovementioned factors could affect the players' psychological and cognitive sensibilities. Thus, we suspect that the unique

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properties of games have the capacity to influence the degree of the players' aggression within the game environment.

Recently, the concept of self-efficacy has been applied in game research for the purpose of predicting game-user activity. Game (specifically videogame) self-efficacy is defined as "an individual's confidence in their ability to interact with videogame systems" [41] Orvis, Horn, & Belanich confirm that an individual is affected by their game experience [42]. Similarly, an individual's success in video games is influenced by game self-efficacy. Despite the empirical evidence that points toward self-efficacy as predicting the variables of game areas, self-efficacy has been little discussed in game research. In this regard, this study investigates the potential link between game self-efficacy and players' aggression.

C. Self-Construal

Self-construal, dealing with the diverse effects on individuals, can be manipulated by the game environment [32]. The concept of self-construal has been identified having two types: independent and interdependent [13]. The concept of independent self-construal highlights the individuals' autonomy, uniqueness and self-expression. Individuals who use more independent self-construal are likely to describe themselves in relation to their distinctive values, desires, preferences and abilities [13]. In other words, these individuals are psychologically stable in spite of a changing social context. In contrast, interdependent self-construal highlights a social role and relationship to others. These individuals tend to be more cooperative, supportive, and altruistic [33].

With regard to playing the game, players face various options during the process of playing. In these cases, the decision-making, problem solving and reasoning inherent in the game are all influenced by different self-construal dimensions, depending on whether an individual uses independent self-construal or interdependent self-construal (from the perspective of aggressive thinking). In other words, the choices involved in in-game events, activities, or objects can be either independent or interdependent, since people mentally construe such events or objects differently, in accordance with their own views. Related research suggests that people are generally attracted to situations in which they expect to have multiple options available when making their choice [34]. Thus, games can provide the best possible situations for alleviating aggressive feelings, in a consequence-free environment.

According to [13], self-construal could lead to different cognitive experiences and emotional responses. In that gaming activity can be affected by thoughts and feelings, we can assume that the self-construal of the players within a game might influence the degree of the players' aggression within the virtual environment. Furthermore, gaming worlds require more active engagements with the players' own role and interpretation [11]. We suspect that an individual's inherently aggressive trait will influence the degree of game aggression, via both independent and interdependent self-construal in the context of the game environment.

D. Social Capital

Social capital has gained increased attention in numerous fields of studies (whether online or offline), over the past few years [17]. Social capital can be defined as the benefits people obtain from their social networks, such as the acquisition of information or emotional support which is inherent in relationships between individuals [35], [36]. According to Putnam, there are two types of social capital: bonding and bridging. Bonding social capital refers to those benefits that stem from close personal relationships, including deep or strong social ties that give emotional support (such as can be found among family or close friends). Bridging social capital is derived from casual acquaintances, including weak social ties and new connections, such as novel information gleaned from distant connections. These relationships can lead to broadening social horizons or wider perspectives, and can even open up opportunities for new resources [36].

In the context of gaming, social capital has been found to occur in MMORPGs and increases of online social capital, and has resulted in the expansion of offline environments [20], [37]. These games generate weak ties in bridging capital, as well as strong friendships in bonding capital. E. Collins, J. Freeman [38] found that excessive gaming play was related with significantly higher online social capital and lower offline social capital compared to non-problematic players. This would imply that the social capital of players could have an effect on both their close or distant relationships. However, little research has done to investigate the relation between playing the game and players' aggression, by separating the bonding from the bridging variables. Thus, we can assume that both bonding and bridging relationships may influence the degree of the players' aggression in the virtual environment.

III. Method

For two weeks, we conducted an online survey in which a total of 918 participants, ranging from 16 to 59 years of age, were randomly selected from South Korea for our final analysis. 532 (58%) of the respondents identified themselves as male and 386 (42%) as female. These participants voluntarily completed a questionnaire, and were informed before the study began that they had to either be currently active in a game or active within the previous six months. After finding variables significantly correlated with aggression, we used a regression analysis to examine how each variable affected it.

For assessing aggression, we used the Buss and Perry's Aggression Questionnaire (AQ) [39]. AQ is probably the most extensively used report designed to measure human aggression. The subscale consists of 29 items. A 5-point Likert scale was used for the questionnaire, ranging from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me) ($\alpha = .89$).

Game self-efficacy was created by modifying the computer self-efficacy scales, a measure which focused on the individual's sense of competence with games [40], [41]. In the previously mentioned survey, evaluating statements such as the following were made: "I am a valuable and important person in

gaming-worlds; I know the game better than were asked to rate each such statement using a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). (α = .86) The scale contains 12 items that are rated on a 5-point scale. (α = .86).

In order to measure the therapeutic catharsis-seeking, H.Y. Lee created a detailed 20-item [11], 5-point Likert scale by combining both Ferguson's Catharsis-Seeking Scale [5], and the Therapeutic Realizations Scale- Revised (TRS-R) [43] to measure the individual degree of therapeutic catharsis-seeking by simply adding the terms "gaming" and "therapeutic aspects" to the questions. (α = .92)

TABLE I
REGRESSION ANALYSES ON AGGRESSION

Predictor	B	β	t	p
Game Self-Efficacy	-.211	-.112	-2.543	.011*
T-Catharsis Seeking	-.410	-.199	-4.770	.000***
Inter-Construal	.273	.010	.283	.777
Inde-Construal	-3.91	-.135	-3.890	.000***
Bonding-SC	.655	.246	6.475	.000***
Bridging-SC	.099	.032	.825	.409
Gender	-.290	-.011	-.340	.734
Age	.038	.033	1.017	.309

R square = .168 (p<.001), *p<.05, **p<.01, ***p<.001

The measure of social capital was developed using Williams' Social Capital Scale with 20 items. [35] Participants were required to rate the items on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). (α = 0.918) 10 of the items focused on strong social ties (bonding social capital) while the other 10 items related to weak social ties (bridging social capital). The independent (α =.792) and interdependent (α=.845) self-construal involves two dimensions: independence and interdependence. Self-construal was measured with the Independent and Interdependent Self-Construal Scale developed by Theodore M. Singelis. [44] Each subscale consisted of 6 items. The response to each item uses a 7-point Likert-type scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree").

IV. RESULTS

In the correlation test, there was a significant negative relationship between aggression and therapeutic catharsis-seeking (r=-.30, p<0.01) and game efficacy (r=-.27, p<0.01). Regarding the social capital, both bonding social capital (r= .22, p<0.1) and bridging social capital (r= .09, p<0.1) were significantly correlated with aggression. For the self-construal, independent self-construal was significantly negatively correlated with aggression (r=-.11, p<0.1), while interdependent self-construal did not show any significant relationship (r=.03). Regarding the demographic variables, gender had a negatively significant association (r=-.07, p<0.5) while age was positively correlated with aggression (r=.07, p<0.5).

To test our hypotheses, we used a regression analysis. Table I shows the results of the regression analysis. Regarding the therapeutic variables, both game self- efficacy ((β=-.11, p<.01)) and therapeutic catharsis-seeking (β=-.19, p<.001) showed a significant negative effect on trait aggression. Regarding the self-construal, independent self-construal exhibited a significant negative effect on aggression (β=-.13, p<.001), while interdependent self-construal did not show any significant effect (β=.01). The demographic variables (including gender and age) did not show any significant effect on trait aggression. For social capital, bonding social capital showed a significant positive effect on trait aggression (β = .24, p<.001), while bridging social capital did not show any significant effect on trait aggression (β = .03).

V. DISCUSSIONS

This study is the second trial using game-based therapeutic intervention to help with player aggression, as an extension of our previous study [11]. This study examined the impact of games on therapeutic, self-construal and social capital aspects of aggression in game players. The results of this study provide empirical evidence that gaming activities are negatively related with the degree of players' aggression.

Game self- efficacy and therapeutic catharsis-seeking are particularly important to the player because their aggressive tendencies become greatly diminished. This finding is in line with the results of previous studies stressing that playing the game fills players' needs and desires much more effectively through powerful vicarious experiences that reflect the unique properties of games [10], [11]. This seems to support the notion that games may be outlets for relieving repressed aggressive energy, having mental healing powers, a means of satisfying certain desires, as noted by the catharsis of aggression perspective [21]-[24]. This idea is clearly reflected in the results of our catharsis-seeking analysis, which indicates the existence of a relationship between game usage and aggression [5], [11]. Games could be therapeutic tools for humankind in that psychological or mental pressure diminishes the aggressive impulse.

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	1	2	3	4	5	6	7	8	9
1. Aggression	1								
2. Game Self-Efficacy	-.277**	1							
3. T-Catharsis Seeking	-.305**	.685**	1						
4. Inter_Construal	.039	.036	.052	1					
5. Inde_Construal	-.110**	.242**	.182**	.332**	1				
6. Bonding_SC	.222**	.043	-.008	.299**	.297**	1			
7. Bridging_SC	.099**	.111**	.084*	.344**	.374**	.581**	1		
8. Gender	-.076*	.214**	.170**	.035	.091**	.018	.037	1	
9. Age	.070*	-.258**	-.127**	.148**	.043	-.052	.006	-.052	1

Fig. 1 Correlations between Variables, *p<.05, **p<.01, ***p<.001

Regarding the self-construal, we found that independent self-construal decreased the levels of players' aggression, while interdependent self-construal did not show any significant effect. In studying the individual characteristics of self-construal, it can be noted that individuals with high independent self-construal tend to have more distinctive principles and beliefs. Thus, we can reason that this could be partly because of the mastery of the controls. Indeed, a mastery of the controls plays an important role in achieving psychologically satisfying game-play, since it affords players the ability to indulge their desires in a consequence-free environment [45].

People with higher interdependent self-construal are easily affected by others; they believe that social roles and relationships are more important than their own values and desires. Playing games forces players to make numerous and varied social relationships, whereby individuals with interdependent self-construal face a number of interpersonal situations; this could drive players with interdependent self-construal into a state of being emotionally repressed as a result of their altruistic tendencies.

With regard to social capital, individuals with a higher bonding social capital saw increased levels of player aggression, while individuals with bridging social capital did not show a significant effect. The results imply that strong bonds with fellow players may lead to higher interference and disruption, simply as a result of their close relationship. Previous research has shown that motivational processes based on psychological need deprivation can lead to more aggressive behavior [46]. Related research shows that interfering with performances in goal-oriented games can induce heightened aggression [47]. Therefore, we suggest that future research could outline some more detailed characteristics of game aggression and social capital research.

Moreover, game players sometimes show ambivalent behavior, via their avatar, in the gaming environment [48]. Future studies will look more deeply into the potential effects of social capital on players' aggression, dealing with these characteristics on the basis of the in-game avatar; in addition, since our study did not consider the special style or individual features of the games, future studies should also focus on how these factors influence players' aggression.

According to [49], need-satisfying games can enhance healthy behaviors. In the field of health, game-assisted health interventions have been shown to be more effective when they support individual needs [50]. Future intervention-focused game research in the mental health domain should account for the need- satisfaction provided by game. Our study of the games used for mental health-related purposes indicates that games can be effective tools for venting players' aggressive feelings and allowing them to "blow off steam" in a therapeutic way. Games can be a better medium for therapeutic relaxation and psychological intervention, because they require active participation and behavior rehearsal. To maximize the possibility of games for promoting mental health, related developers or researchers need to collaborate with music, art and drama therapists. The characteristics of these games especially seem to converge on drama therapy. Drama therapy is an active, experiential approach to facilitating change through storytelling, projective play, purposeful improvisation, and performance. Performers are invited to rehearse desired behaviors, practice being in life roles and perform the changes they wish to see in the real world [53]. There are many similarities between game properties and drama therapy

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methods, since games- like drama therapy- can affect various ways of communicating challenges, choices, and desired opportunities for the players.

Although the vast majority of studies performed on the impact of games on their players have been on their negative effects (such as violence and addiction), it is important to consider the potentially positive benefits of these games. Due to the progress being made in the arena of game design over the last decade, the nature of game-based entertainment has changed dramatically, becoming increasingly diverse, realistic and social in nature [11]. With this in mind, we focused our study on the relationship between game usage and human aggression. As expected, we found that game-playing, among other variables, did in fact have a strong influence on aggression. We hope that our study on human aggression will be helpful in creating games that are relevant to the psychological and emotional health care of humankind.

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