Journal of Communication and Computer 13 (2016) 271-280
doi:10.17265/1548-7709/2016.06.001

A Case Review of Selected Popular Computing Games: Therapeutic and Affective Aspects of Gaming and Comparisons to Children's Literature

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Abstract: A series of seven computing and online games was reviewed following a criterion based selection process. The games were reviewed relative to their capacity to incorporate elements of gaming comparable to content or themes evident in children's literature including, type of game, genre, elements of violence, disturbing scenes, gender of key protagonists or heroes, location and relative time frame, as well as major themes, evidence of trauma or PTSD components and elements of grief or loss. Selected games demonstrate some capacity for use in virtual narrative therapy and as virtual methods for facilitating maturing processes, and to some extent may interface with moral development as appropriate for age and level of development. Games also show capacity for modifying affect positively based on themes, but will need additional evaluation or research.

Key words: Affective change, children, computing, gaming, literature.

1. Introduction

Knowledge about complex systems and collective values, as well as, pro-social, or anti-social behaviors, has been provided for children and adolescents though psycho-educational means for generations through narrative cultures, retelling of historical accounts and deeds, and fables and metaphorical learning examples, and even more directly through culturally based sports activities and games, as well as through adaptive or maladaptive role models. Learning in large part is observed or experienced. More recently, online video gaming has developed as an emerging source and resource for metaphorical learning per D. A. Gentile and J. R. Gentile [1]. However there are few reviews or guidelines available in the professional literature to provide direction and decision support on the variations within the online gaming genre to address the positive developmental, therapeutic and affective needs of children and adolescents.

The computer and information technology age has provided a medium for storing and manipulating human information contributions and transferring knowledge though communication and the transmission of facts and data. This can be accomplished through experiential and observational means such as video or multimedia based knowledge, and vicarious experientially based methods, including online gaming. Complexity of virtual display and gaming themes and plots have improved to the point that viewers experientially work though game sequences that often serve to improve skill sets cognition, affective change, memory enhancement and even life themes involving growth and maturity as discussed by Connolly and Doyle [2] as well as by Kato et al. [3].

Narrative knowledge and virtual experience are becoming well documented in the shaping, of shared learning, socialization, and behaviors for numbers of children and adolescents having access to computing and online gaming. Research efforts have differed in the determination of whether the emergent phenomenon of online gaming shapes behavior or

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conduct in socially negative directions, or whether gaming provides corrective and positive restorative experiences and knowledge that aide in the pro-social development of children and adolescents who would not have access to real world similar experiences, as related by Kato et al. [3].

Virtual narrative therapy approaches are becoming possible though the prescriptive use of selected and popular gaming platforms and plots to provide elements missing from the child or adolescent socialization experience, or to facilitate positive adaptation though trauma, or impoverished developmental experiences, per Shashoua [4]. However, the gaming industry has been slow to develop strategic plot development, similar to those found in the context of classical children and adolescent literature. Online gaming is rich with creative imagery and engaging action sequences, but few to date have the depth of experience possible though immersion in children or adolescent literature, though the gap is narrowing according to D. A. Gentile and J. R. Gentile [1]. Nonetheless, therapeutic and affective modification challenges and metaphorical life experiences are embedded into the storyline or action sequences of most online games, though perhaps not purposefully, or with therapeutic or affective change outcomes predesigned into the experience.

Comparisons between commonly developed classical narratives of fabled, or other children's stories, could account for why children and adolescents are both drawn to selected gaming experiences, and why game choice, or repetition of play, may be related to supplying something needed in the particular development for a specific child, or specific set of problems for selected children, or adolescents victimized, or otherwise engaged in a non-normal, life trajectory.

The determination of online gaming plotlines or experiences that may improve affect response or behavior among troubled youth would provide alternative and cost effective methods of reducing negative outcomes and intervention needs in the restoration of positive life trajectory for those who would benefit from virtual narrative therapeutic outcomes derived from gaming experiences, similar to behavioral change identified by Ferguson [5]. Identifying the few most sought gaming experiences among children and youth, and determining their utility for promoting positive change could provide basis for exploration of best themes and best responses.

To understand the relationship between computer gaming and children's narrative literature, a literature review was conducted using online databases including EBSCO Host, Academic Search Premiere, Science Direct, ERIC, ACM Digital Library and Web of Science. Keywords used for searching included combinations of Children, Adolescents, computer games, online games, intervention, therapy, treatment, mental health, social skills, and other related terms. Articles had to be peer reviewed, and unpublished doctoral, or master's dissertations were not included. In addition, our selection of literature was supplemented with articles, books, book chapters and other resources, and online sources obtained from these sources. Finally, articles had to have content that dealt with games used in physical and mental health related treatments for children and adolescents. Both research and review articles were retained for our work. Research articles were either qualitative or quantitative in nature. Our selection criteria were necessarily broad due to the relative dearth of literature in our chosen area of study. The review identified a dearth in literature related to the linkage of online video or virtual game progression and therapeutic narrative themes, narrative therapy, or virtual narrative therapy, and the promotion of positive affective and behavioral change related to common developmental tasks or problematic behavioral issues of children and adolescents.

Information technology including computing and

online gaming may serve an important role in the transmission of cultural values, beliefs, and socialization knowledge to adulthoods through simulated experience. Information technology is generally specified as the storing, retrieval, transmission and manipulation of data through internet, communications and computing technology, explained by Daintith [6]. However, digital information stored includes: images, graphics, audio and video data and various gaming applications, and increasing virtual models and environments. These include increasing levels of independent, though for now, non-self-aware intelligence. Solutions to complex problems, knowledge building, conveyance of model or best practices and decision support have aided in knowledge transfer, though behavioral and affective change among interacting human beings is well established per Ferguson and Garza [7]. Knowledge transfer is increasingly more complex than simply information based knowledge. Knowledge transfer has improved to include educational advancement and sustained or improved functioning through rehabilitation applications, both motor based, and cognitive, and as suggested by Bavelier and Davidson [8] in recent year's knowledge that would have been previously derived from non-virtual life experience.

Technology including computing technology has served throughout industry and government as a mechanism for online service delivery including data, information and learning applications in service to supporting or enhancing human capacity and human behavior. The focus has not been on child and adolescent development, as service delivery has been defined historically as the various services that may be delivered through information and communication technologies to support business customers, per the Office of Government Commerce [9]. Online service delivery has included technology directed toward managerial tasks related to service level, capacity, continuity, availability and financial management. Surprisingly, this has not been historically inclusive of customers' needs for social and human services including those directed to quality of life, or development, beyond the technical and infrastructure related service provision. Nonetheless, these technology and online service delivery forms are now growing exponentially and in recent years have included social networks, entertainment, health advisories and delivery and numerous others that are exceptions to the restrictive definition of service delivery. Technology has in some ways served to augment family and social deficits in life, combat isolation and loneliness, raise and educate children, inform the masses, archive and transmit learned competencies and serve both as an enhancement to the experience of life and at times as a viable substitute for aspects of life and growth, and is a growing resource to facilitate advancement though child and adolescent developmental tasks or challenges.

According to Ingersol [10], some of the normal development tasks of adolescence include adjusting to a new physical sense of self, intellectual abilities, increased cognitive demands at school, development of expanded verbal skills, a personal sense of identity, and establishment of adult vocational goals. Other common tasks include development of emotional and psychological independence from his or her parent's, development of stable and productive peer relationships, learning to manage her or his sexuality, to adoption of a personal value system, and development of increased impulse control and behavioral maturity, even though combat games per Ferguson and Garza [7]. For a number of reasons, development, or resolving these developmental tasks, may depend upon how constrained opportunities are to have adequate information or experiences with which to aid in positive transition. Some tasks may be augmented or even substituted by computing, gaming and virtual experience, or simulations, as discussed by Adachi and Willoughby [11].

For generations various culturally based versions of

child and adolescent classical literature have served an important role in the coming of age of young, adaptive, and knowledgeable adults with dynamic intellectual capacity and emotional maturity, developed in part through themes literature exposure. Similarly, there are a number of common characteristics and themes of online games popular with children and adolescents, and those of children and adolescent literature which may contribute to their popularity. For example, for children and adolescents with delayed development, the following are common characteristics of children's literature. Children's literature is simple and straightforward as is most initial play of online games. The literature focuses on action, with subtle psychological events implied in narration or symbol and may contribute to therapeutic enhancement, per Crenshaw [12]. The game themes are often about childhood. Children's literature and game play proceed through the child's point of view. Kendall [13] asserts that optimism and fantasy are common elements in child and adolescent therapy. In online virtual games, success or optimism develops through levels of play.

Games and literature begin or engage a form of idyll, or innocent life, with un-idyllic elements perceived form the subjective and innocent view of the player or child. Games and literature are didactic, preferring home or the dangerous world outside. However, some games directed at victim themes within the home, reverse this characteristic. Children's literature and online games have repetitious quality to the story line and resolutions. Nodelman [14] notes that among the pleasures of children's literature there is often a balance of themes of didactic versus idyllic life within each genre. Hanlon [15] also agrees to these common characteristics of children's literature.

There are also characteristic plot patterns common to most children's literature that may also be found commonly among the more popular online virtual experience gaming genre. These per, Children's Literature and Classics [16] include:

"home –away – home, movement from a protected environment to a new, adverse, or challenging environment, city – country – city (sometimes reversed), real world – fantasy world – real world, life – death – rebirth, separation from and reunion with parents (many classic adult novels end with marriage; many children's stories end with a reunion with parents), help others less fortunate and they will help you, movement from innocence to experience often patterned after the biblical Fall, coming of age, rite of passage, journey symbolizing development and seasonal cycle" (para. 6).

Online games are as old as the origin of some of the first computers conceived. Often they were available only to two or more players directly connected to the computer with a very few technicians or professionals having access. Early play was limited to direct or near direct access with the first or early gaming challenges including moving through simple mazes. Networked Games began to develop by the 1980's with operating systems games on personal computing or other gaming devices emerging in the 1980's and 1990's. Networked and commercial time sharing gaming application led slowly to the current online and online virtual gaming platforms that are popular today, per Woolley [17], though many are still purchased for use on in home game playing devices. Controversy however has also been evident in the exposure or overexposure of developing minds to excessive non reality based learning or experience.

Much has been written about the detrimental or negative effects of online video game play on adolescents. However, an emerging body of literature has focused upon the positive effects of online gaming on troubled adolescents within therapeutic programs or demonstration projects similar to the findings of Jackson et al. [18]. Differential experiential and learning outcomes are possible.

These relate the virtual therapeutic effects and more positive affective and behavioral changes possible though carefully developed computer and online

gaming applications, in conjunction with other restorative or rehabilitative human service provider programs and institutions.

Granic et al. [19] have identified a number of positive benefits of online gaming in general were verified in their recent published study, in which the investigators were focused specifically on children and adolescents, or on those with preexisting affective or behavioral problems. These positive benefits included improved spatial navigation, improved reasoning, sharpened memory, and enhanced perception. Other benefits included helping to develop problem-solving skills, promoting relaxation, warding off anxiety, improving decision-making, developing emotional resilience, and lead to better career prospects in science, technology, engineering and math specialties. However the connection to video gaming plot and positive affect, other than anxiety, were not investigated. The determination of the relationship between therapeutic and affective aspects of gaming in the professional literature has been limited.

Online games serve to provide a story narrative or plot progression that models many of the developmental tasks for developing children and adolescents. These provide a virtual narrative rather than a literature based narrative with similar sequencing or chapter like progression, of which the player gains experience and competency over time, per Shashoua [4]. Online games are being developed and utilized in a number of exploratory studies to provide a therapeutic change for children and adolescents from impoverished and disadvantaged backgrounds, having emotional, mental health or substance use issues as well as to prevent or recover from victimization. These constitute an emergent form of "virtual narrative therapy" from which the client, or client group, can work through to achieve positive developmental milestones. Affective change is also possible in both negatively and positively expressed ways. Shashoua [4] asserts that a number of published studies can readily attest to support both therapeutic and affective aspects of online gaming experience.

Game characteristics generally include the mechanics of the game and the narrative of the game. Computing and online videogames utilize a variety of mechanisms ranging from passively watching play to using, keyboard, computer mouse, joysticks and other devices, including virtual glasses or gloves to mimic reality. Levels of engagement follow a progression for younger players from passive observation and recognition of themes to mechanical engagement to develop hand eye coordination or increase mental competency. Most games however involve themes or storylines within the play experience of interaction that allow the player to pursue a sequence or process and advance of gain experience with the gaming narrative. A few games however permit the player to make decisions which alter the story progression or complete essential programming tasks which alter the reality and potential outcome of the gaming sequence (see Fig. 1 below).

The narrative of the plot or story refers to the action or sequence of the game. Gaming structure includes aspects of the digital environment for the game such as, the complexity of the plot, narrative, or theme of the game, and the increase in options, or variation that may occur as more players are added to the play. These often combine to create narrative aspects that create a virtually real experience. Beyond the game itself, these are the situational characteristics of game play, or immersion.

As these were originally described by Dr. Timothy Leary [20] these are often referred to as Leary characteristics. These include the following:

(1) Set – the characteristics of the player. Includes personal issues, maturity level,

(2) Setting – where the game is played. Can have influence on mechanics (platforms in different settings have different mechanics – public relates to phones, relates to casual)

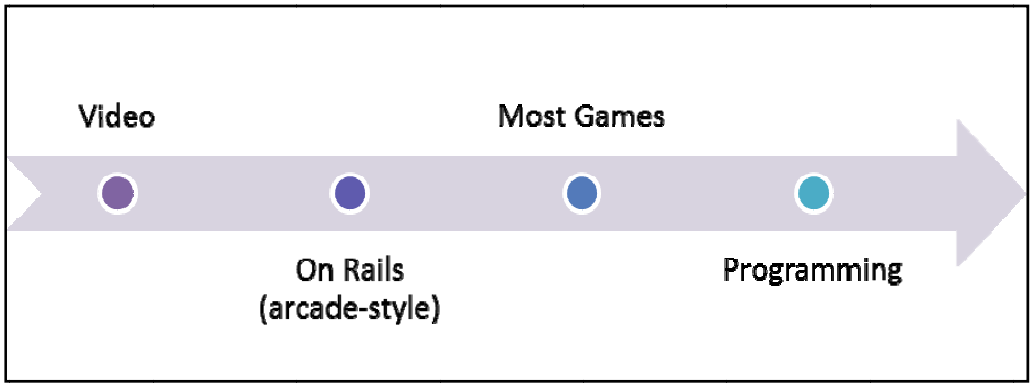

Fig. 1 Levels of interaction for computing and online gaming.

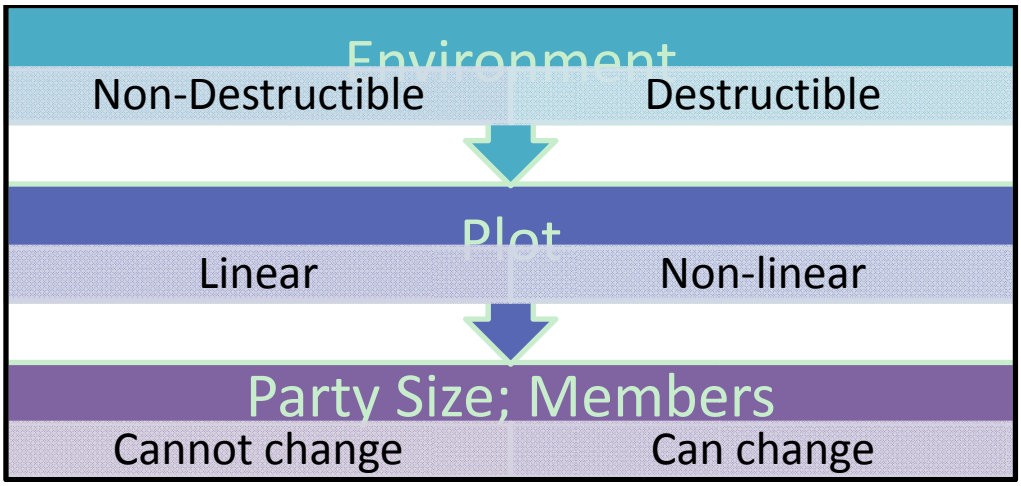

Fig. 2 Gaming structure: from static to flexible.

(3) Dosage – length of time played. Includes casual versus hardcore; daily versus every few weeks; hours versus minutes.

Leary characteristics may also be adapted to gaming to encompass the amount of influence or control a player has over; (1) Environment (e.g., destructible); (2) Enemies (e.g., destructible); (3) Appearance; (4) Reaction to PC); (5) Mechanics; (6) Party size; (7) Plot (e.g., non-linear); (8) Character (and NPC); (9) Skills (appearance, movement, etc.) (see Fig. 2 above).

Mental health therapies such as narrative therapy, experiential therapy, biblio-therapy, or psycho-education have been supported in the literature for improving affective responses among those suffering from emotional distress. While these techniques have empirical support for positive emotional change among clients, little is known, as to whether online or game based equivalents, have similar capacity to improve affective states.

2. Materials and Methods

A review of online video games popular among children and adolescent may reveal that many or all have associated content and game progression that relates to the common developmental tasks and progression in development for youthful players. Further, these metaphorical comparisons are consistent with elements of classical and fabled children and adolescent literature can be identified within the context of play of the games reviewed. Additionally, virtual narrative therapy (or narrative therapy within virtual environments) that demonstrates capacity to stimulate affective change, including positive affective change will be identified, within most or all games reviewed.

A small sample of representative games (seven)

were selected for case review and analysis based upon several considerations from a very large population of computing and online games. Some common conventions for selecting representative games were followed, based upon the cases selection techniques outlined by Seawright and Gerring [21]. However the reviewers relied on consensus regarding these conventions. Selection criteria included (1) That the games or game platforms were current or developed in the past ten years; (2) That whether the games were puzzle oriented, a branching, decision based approach, or fighting or combat oriented, that they were character and plot driven and comprised common themes of adolescent or child development, or conflict; and (3) That the game genre could include fantasy, science fiction, or horror and combat.

Further, those online reviews are conducted among common review organizations online to determine their popularity across at least five posted reviews. Beyond these that there be agreement among the authors, and at least 1 independent reviewer, and that the following agreed characteristics be included in the review; (1) Gaming platform; (2) Release date; (3) Type of game (including linear, versus branching RPG (role playing game)); (4) Length of game; (5) Genre; (6) Violence; (7) Most disturbing scene; (8) PC Gender (theme or lead characters); (9) PC Race (Ethnic makeup of characters or role models); (10) Language; (11) Location; (12) Time frame or period of story setting; (13) Embedded major themes from adolescence or childhood (comparable to classic literature themes); (14) Capacity (presence or absence) of trauma or PTSD; (15) If present, who or what comprised this capacity; (16) Capacity (presence or absence) of loss issues. Within these parameters that the games selected for review comprise the agreed most typical examples.

A limited content analysis of highly popular virtual games (n = 7), representative of each common genre (puzzle, shooter, and adventure) was conducted to evaluate the types of games that contained narrative elements, and/or facilitated autonomous decisions, similar to those found in common mental health therapeutic techniques such as identification, catharsis, psychodrama, and passive developmental growth. Data then for the review, or case analysis, consisted of observations organized into the review criteria and game modeling criteria delineated above as agreed among three raters or reviews as present or observable within the game application.

3. Results

The content of the selected virtual games demonstrated the presence of identifiable pro-social and affirming game elements, consistent with theses or aspects common to conventional interventions, such as narrative therapy, biblio-therapy, and experiential training and competence or skill building. Game genres included in the review were: fantasy, science fiction and horror/shooter. These were identified from the literature and game selection as the most common themes, though puzzle games often supply a fourth alternative. Themes included common challenges or tasks to resolve during childhood or adolescence. These included: trust, child abuse, death of a parent, rejection from peers, running away from home, independence and self-identity, working relationships, personal relationships, trauma and recovery, experimentation, relationship loss, romantic relationships, etc. These themes may be familiar to many as also common and universal developmental child and adolescent milestones identified by Engler [22] as posed by the developmental psychologist Eric Erickson. Many of the symbols included in the game themes such as being chased, characters screaming, dead bodies, death of a pet are also common and traumatic symbols evident in both classic literature and as common in the nightmares of children. The dominant language for games reviewed was English and the dominant ethnicity of the lead character was white or Caucasian. These original briefly summarized findings suggest that virtual games have

Table 1 Selective case analysis results: computing and outline games.

	Braid	Psychonauts	Catherine	Papoy Yo	LA Noire	Remember Me	Portal 2
Platform	Steam	Steam	XBOX 360	Steam	Steam	Steam	XBox 360
Release date	2008	2005	2011	2012	2011	2013	2011
Type of game	Platformer Puzzle	Fighting platformer linear RPG	Branching RPG puzzle	Platformer Puzzle	Branching RPG (small scale) shooter	Fighting platformer	Platformer puzzle
Length of game	Takes a long time because of difficulty of puzzles, levels short	Medium (10 + hours)	Medium (16 hours)	Short (6 hours)	Long (20 hours)	Medium (10-15+ hours)	Medium (8+ hours)
"Genre"	Fantasy	Fantasy	Horror	Fantasy	Noir, police work	Science fiction	Science fiction
"Violence"	Platformer jumping on cartoon animals	Cartoon, but meat circus disturbing	Yes, but in cut scenes and nightmare levels (not done by PC)	Monster attacks, PC, Lula, and friend	Shooting scenes (not graphic)	Fighting horror enemies (not graphic)	None (enemies not human)
Most disturbing scene	None really disturbing	Meat circus, Ollie's father killing pet	Being chased in nightmare scenes	Quico screaming when monster attacks	Dead bodies (naked female)	Jonny Greenteeth fight	None, but aperture losing money is sad
PC gender	M	M	M	M	M	F	F
PC race	W	W	W	South American (dark skin)	W	½ French ¼ Ethiopian ¼ Indian	W
Language	E	E	E	Mix of Latin American languages	E	English French (graffiti)	E
Location	Fantasy, outdoors	Camp, inside of minds	Bar, Café, nightmare world	Favela (fantasy)	Los Angeles, flashback to	Neo-Paris (future city/sewers)	Condemned experimental lab
Time period when story set	Alternate past	Present	Present	Present	1947	Future	Future
Themes	Relationship, loss	Running away from home, rejection, death of parent, dealing	Themes Romantic relationships, order/freedom, Infidelity	Child abuse, Fantasy as a means of coping, letting go of anger, loss	Working relationships, crime organizations, trust, 1940's	Memory, trauma, rebellion, human experimentation, technology	Power, trust, revenge
Trauma/PTSD explicit	No	Yes	No	Yes	Yes	Yes	No
If yes, who/what?	No	Mila, Orphanage fire	No	Quico (PC), Child Abuse	Arsonist, War (civilian casualties)	Scylla, Car accident, Limb lost	No
Loss/grief	Yes	Yes	Sort of	Yes	Yes	Sort of	Yes

associated content that may provide positive therapeutic gains, through resolution of plat and play that mirror real conflicts of children and adolescent during development. The review will be of interest to mental health service providers seeking to improve the affective response outcomes of clients suffering from negative emotional states, and of interest to numerous other gaming researchers who have developed systematic reviews, suggestive of the negative effects of virtual gaming (obsessive compulsive issues and violence) (see Table 1 below).

4. Discussion

Recently, research into video games has uncovered potentially therapeutic effects on players in the scientific and professional literature. In this study, a

selective systematic content analysis was conducted over a selection of game genres, including puzzle, shooter, and adventure games. Narrative elements and game play mechanics were identified and are comparable to common therapeutic problems and techniques for resolution. Games reviewed games were found to contain selected pro-social, affirming, and psycho-educational elements. These observational findings run counter to the popular destructive and compulsive image of video gaming among children and adolescents, enjoining future research to identify, isolate, demonstrate and heighten narrative game's developmental themes and potential therapeutic effects. Common gaming levels and gaming structure were identified as a process of the review.

5. Conclusions

Selected games demonstrate some capacity for use in virtual narrative therapy and as virtual methods for facilitating maturing processes, and assisting with trauma and recovery and to some extent may interface with social and moral development as appropriate for age and level of development. Games also show capacity for modifying affect positively based on themes, but will need additional evaluation or research. Much of the scientific and systematic review of gaming have suggested the possibility of negative outcomes resultant from the competitive and compulsive aspects of play and the non-reality of the virtual fantasy and adventure aspects of gaming. There is a need to begin foundational research on the affective affirming aspects of gaming and on their potential for developmental growth.

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