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Video Game Presence as a Function of Genre

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Abstract

While presence, or the sense of being there, is widely understood to be important in game play, it has not often been examined in relation to video game genre. This is important as presence in a game informs the absorption in play. In the present inquiry, self reported presence during a recently played game was examined as a function of genre. Presence was assessed using a version of the presence inventory developed by Lombard and Ditton (1997). The wording of the items was adjusted to conform to the video game just played. Additionally the self reported games just played were classified into genre. These included Action, Adventure, Driving, Miscellaneous (Casual), Role Playing, and Sport. Genre differences in presence were examined. It was found that Casual genres had the least presence overall, while the classically hard-core genres (Action, Adventure, Role Playing) were highest in overall presence. Sociability elements of presence differed as well across genre.

Author Keywords

Presence; genre; immersion.

Video Game Presence as a Function of Genre

Presence has been defined most simply as the sense of being in a mediated environment with the perception of non-mediation (Witmer & Singer, 1998; Lombard & Ditton, 1997). Although most often explored in the computer science literature as telepresence or as immersion in Virtual Reality (VR), it is also a concept familiar to literature and the arts as well as media studies (Moller & Barbera, 2006). The potential for presence is thought to lie at the heart of media experiences in general (Lee, 2004). Whether reading a book or watching a film, the individual is relating to characters, experiencing emotion, and in some manner projecting themselves into the experience.

Sanchez-Vives (2006) notes that VR systems, which are immersive, typically include at least some sort of head tracking device as well as devices to support other sensory modalities. This basic apparatus has been used in a wide variety of settings including psychotherapy, medicine, entertainment and the arts. Witmer and Singer (1998) found that high presence in VR occurred with increases in involvement, control, selective attention, perceptual fidelity and mimicking real

world experiences. The multidimensional nature of the phenomenon is common (Lombard & Ditton, 1997; Lee, 2004). It's interesting to note that these VR environments are not especially detailed in their representation of reality, yet they are quite capable of eliciting self-report, behavioral, and physiological responses consistent with what would be expected in reality, and thus indicative of a sense of presence (Slater & Sanchez-Vives, 2006).

All of these elements of presence, while best experienced in VR, are more widely available to the general public through video game play. In fact, presence, in a variety of forms is much sought after by gamers and developers alike (Schneider, Lang, Shin, & Bradley, 2004), despite eminent VR researchers' puzzlement at the call for realism in the gaming industry (Slater & Sanchez-Vives, 2006). Initially, VR researchers tended to focus on the sensory-perceptual system as the primary element of presence, but over time the personal and social aspects have also become more appreciated. It seems clear that the sense of presence in video games is due in part to their rich visual and auditory input as well as the social and intrapsychic components of play.

Presence Types
The various presence schemas seem to have commonalities, as pointed out by Tamborini and Skalski (2006), and typically include these typologies: spatial, social and self-presence. These schemas are increasingly being addressed by game designers. Thus self-identity is enhanced with the customization of electronic characters, where users can manipulate facial features, clothing, and other aspects as a way of transporting themselves into a game (e.g. through gender of avatar and aggression (Eastin, 2006)). Presence reports have been reported as positively related to prior game play history (Tamborini, Eastin, Skalski, Lachlan, Fediuk, & Brady et al, 2004; Nowak, Krcmar & Farrar, 2008; Lachlan & Krcmar, 2008). For instance, skilled chess players were more likely to experience presence in a virtual game than players with less skill (Hoffman, Prothero, Wells & Groen, 1998).

Spatial presence is enhanced with naturally-mapped control devices, such as a steering wheel used in a racing game (Skalski, Lange, Tamborini & Shelton, 2007) or motion-sensing controllers (Lyons, 2010). So too advancements in image quality, in particular the movement toward high-definition resolution, appear to increase presence in the self-reports of gamers (Campanella-Bracken & Skalski, 2005; Ivory & Kalyanaraman, 2007).

Tamborini & Skalski (2006) noted that social presence is enhanced by playing a game rather than simply observing one. Also viewed as co-presence and mutual awareness, the interactivity inherent in gaming increases social presence over traditional television. However, this difference has likely been somewhat mitigated in the new world of reality television where the audience not only affects television show outcomes, but chats online about these shows (Hall, 2009).

While research into presence and video game play has exploded, examinations of presence as a function of genre are less often seen. Because it has been recognized that presence informs motivations to play as well as the experience of play, its potential connection to genre should offer further insight into these fundamental questions regarding video game play and thus inform design and development.

Genre

Genre is the categorization of things by a loose set of criteria. It is widely used in the literary world and media studies but tends to have no fixed boundaries. Genre applied to video games is fundamentally different from other media applications. Specifically, video game genres have developed along the lines of the nature of the interactions rather than visual or auditory differences (Apperley, 2006). Unlike literary genres, a video game genre is argued to be independent of its game play content (Adams & Rollings, 2006). From this standpoint, a first person shooter set in the Wild West is comparable to one set in the far future. This categorization of game genres allows for comparisons across genres in order to better inform the gaming industry regarding design and playability issues. Thus, game genre has been used to look at game motivation (Tanis and Jansz, 2008), addiction (Huh, 2008) and cognitive load (Gackenbach & Rosie, 2009). Conceptual associations between genre and presence have been made (McMahan, 2003) and some empirical work has been done. In their review, Tamborini & Skalski (2006) pointed out that social presence is especially striking in the Massively Multiplayer Online Game (MMOG) genre while self presence seems highest for the First-Person Shooter (FPS) genre. Genre preference predicts spatial presence (Tamborini et al, 2004).

Unfortunately, as with conceptualizations of presence, genre definitions of video games can vary. Previous genre typologies include Bille (as cited in Brandtzæg & Heim, 2009), Sherry and Lucas (2003), Huh (2008) and Tanis and Jansz (2008). The strongest agreements among these sources is on sport, FPS and driving genres, while they diverge somewhat on classifications of action/adventure, puzzle/casual and role playing/MMOG. None offer music or rhythm games as a separate genre, nor do they consider the rapidly growing casual game genre (Hyman, 2006).

In the present inquiry, a measure of presence after playing a specific video game was administered to people who vary in their gaming history, in a variety of data collection settings. It was expected that overall presence would differ as a function of game genre with more casual games (i.e., puzzle games) showing less overall presence than the game genres which are most often associated with hard core gaming (i.e., Action, Adventure, Role Playing). In terms of the typology of presence used in this review of the literature, social presence should be highest in Role Playing Games (RPG) genre while self presence should dominate in action genre games. Spatial presence might be expected to be least pronounced in the casual game genre.

Method

Participants

Initially 384 subjects participated. Research participants who did not provide sufficient video game history information were deleted from subsequent analysis (n=10). Data was collected on these inventories from both face to face (F2F) (N = 250) and online (N = 124) sources. The online respondents were drawn primarily from gamers affiliated with online video game communities and related websites (i.e., Escapist Magazine) and from local gaming centers and activities (i.e., Fragapalooza 2008, a large Local Area Network), and also from a psychology research website (Psychological Research on the Net). These venues were tapped in order to get information from players who were serious about gaming. There was no payment or other incentive offered for the participation of these serious gamers.

Mass face-to-face testing of students for course credit at a western Canadian university provided the majority of the subject pool. Subjects who participated for course credit could have received the same credit by writing up a summary of any research from a journal. Thus there were options available for receiving credit that did not involve research participation. Institutional Review Board ethics approval was obtained for this project.

Sex of the 374 research participants was roughly evenly split: 173 (46%) were male and 53% were female. However, sample origin of the subjects evidenced a difference: sex x sample (online vs F2F) chi-square was significant (χ^2 (1) = 100.51, p < .0001; Male F2F = 70, Female F2F = 179, Male online = 103, Female online = 21). Young adults constituted the majority of participants across samples, falling between the ages of 18 and 25 (85%). Many fewer (N= 29) reported themselves as 26 to 30 years of age with the remaining 27 subjects reporting their ages as greater than 30. A t-test for sample source on age was not significant (t(372) = -.621).

Some college education was reported by 282, with 17 having post-graduate work or completed a graduate degree. Another 75 reported that high school or less was their highest level of education. A t-test for sample on highest education attained was not significant (t (372) = 0.965). Not surprisingly, occupation was most often stated as student, 77% (N = 287). The nonstudents included: 53 from various food service, trade or labor positions; 7 from healthcare positions; 6 from law enforcement, security, or military; 5 unemployed; 4 from education positions; 2 self-identified homemakers; and 2 from the video game industry. A chi-square on sample (online versus F2F) by occupational category (student versus nonstudent) was significant (χ^2 (1) = 30.38, p <.0001). The majority of the students (N = 211) came from the F2F data collection with 76 students reporting online. Nonstudent data came roughly equally from F2F (N = 33)[1] and online (N = 48)[2].

Of particular interest are those who filled out the presence inventory versus those who did not. A chi-square of that distinction by sample (online x F2F) was significant (χ^2 (1)=97.96, p<.0001), with the vast majority of the presence scales being filled out from the F2F sample (N=148) versus those who filled it out online (N=7). Those who did not fill out the presence survey came equally from both samples (F2F=102; Online=117).

Instruments
Five questionnaires were administered[3] but only two are discussed here: Video Game History and Presence Questionnaire.

The Video Game History Questionnaire (see Appendix A; Gackenbach, 2006) is a survey designed to gather various background information about research participants. While the focus of the survey is lifelong involvement with video games, demographic information is also gathered on sex, age, education and occupation. Game play information inquired about gaming session frequency, duration, number of games played and the age participants started gaming. Also included are questions about research participants' current favorite and most frequently played genre of game, as well as which gaming system(s) they own or use, information regarding whether they socialize during game play, preferred avatar characteristics and susceptibility to

motion sickness while playing. Finally, they were asked where they heard about the research project.

Four history questions, typically used in this research program to define high end gamers (Gackenbach, 2006; 2009), were examined in terms of the replies by the entire sample (N=374). Then those who did not supply presence answers about a game just played (N=219) compared to those who provided presence answers about a specific game just played (N=155) were examined in terms of these key history questions. The entire samples' game playing frequency was between several times a week to several times a month and from one to two hours per session. They played 20 to 50 games in their lifetimes and started playing on average between grades 4 and 6. When this larger sample was split into those who played a game prior to filling out the presence questionnaire and those who did not, there was one group difference, duration of play (t(372)=2.156, p<.03). Those who did not fill out the presence questionnaire played significantly longer (x=2.32) than those who did fill it out (x=2.10). There were no group differences in the other three key history variables (frequency of play t(372)=-.690; number of games played t(372)=1.1513; age began playing t(372)=-1.281). Additional information from this inventory for those who filled out both scales is offered in the results section.

The Presence Questionnaire (PQ) is a survey designed to gauge how "in the game" players felt while playing a recent video game. This survey is based upon The Temple Presence Inventory developed by Lombard and Ditton (1997, 2007; Lombard et al., 2000). All but five of the original items were included in this inquiry. As the original scale was geared to a more generic media experience, the wording in all items was changed to inquire about a recent video game played. This questionnaire required that participants had played any video game within 24 hours prior to filling out the PQ. It gathered information at the beginning about which game they played, how long they played, how often they play it, and their own explanation of what the objectives were. Also included at the start of the PQ were several hardware item queries.

The remainder of the questionnaire assessed presence with seven point Likert scales. The questions measure presence from several directions. Some questions address the sense of "being there" physically (i.e. "How much did it seems as if you could reach out and touch the objects or people you saw/heard?") as well as socialization (i.e. "How often did you want to or did you speak to a person you saw/heard in the video game environment?"). On his website, Lombard offers the factor structure of the original scale (Lombard, 2007). Items clustered into eight factors which are listed with standardized Cronbach's alpha: Spatial Presence (.91); Social Presence - Actor W/I Medium (Parasocial Interaction) (.90); Social Presence - Passive Interpersonal (.88); Social Presence - Active Interpersonal (.77); Engagement (Mental Immersion) (.90); Social Richness (.93); Social Realism (.75); Perceptual Realism (.79). Brief versions of all items used in the current inquiry are portrayed in the Table 3 factor analysis. They were all keyed to "high score is high presence", as in the original Lombard and Ditton scale, except the item on frequency of having played the game, which is reversed.

Procedure
All questionnaires were administered both online and in face-to-face settings. Surveymethods.com was the online software used to mount the questionnaires. In both cases, surveys were available to research participants either as separate links or sheets of paper. Data

was matched across surveys by asking subjects to provide aliases on each survey. This research project was brought to the attention of hard core gamers in several ways. The URL was made available to the potential subjects at a 3-day western Canadian gaming event. Additionally, posters were placed in ten local gaming centers (i.e., New Wave Gaming, EB Games). Project notices were posted online at websites related to gaming (i.e., xbox.com, Sony's PS3 page, World of Warcraft forums) and on a listing of psychology experiments online (http://psych.hanover.edu/research).

For the face-to-face group testing sessions carried out at the university site, upon signing up for a testing session, potential participants were informed that they were expected to play a video game on the day prior to reporting for testing. Participants were asked that next day if they had any further comments, and their responses (total n = 91) were analyzed to find additional support for having played a game recently. Forty comments contained direct reference to the games or distinct game features, 20 comments indirectly referenced video game features, and 31 comments were not related to any specific game (i.e. "It was a great way to relax."). It should be pointed out that recent game play was assessed in two places, in the video game history questionnaire and as the first item in the presence questionnaire.

The five inventories and an informed consent form were packaged inside an envelope which the administrator distributed to each participant. Participants were given one hour to complete the surveys. Aliases were used in lieu of names on each survey. The consent sheets were separated from the completed packages. In both online and F2F data collection, an informed consent was signed or electronically agreed to prior to the presentation of the surveys. Following participation, subjects were given a debriefing statement which included contact information for the investigators.

Results

While subjects were asked to play a video game in the 24 hours prior to taking the questionnaires in the face to face setting, those who answered it online were simply asked if they had played one in the previous four hours before filling out the surveys. Of the 374 subjects for whom there was data, only 155 reported playing a game prior to filling out the surveys and provided game and at least some presence information.

These individuals can be collectively further characterized as fairly evenly distributed in their favorite game genres and what they currently play (first person shooter = 20.5%/19.9%[4]; role playing/strategy = 32.1%/29.5%; driving/sports = 28.8%/26.3%; puzzle/card/board = 13.5%/14.7%; none of the above = 5.1%/9.6%). Game systems they played on (with multiple responses possible) included: Xbox (47.4%); Playstation (51.9%); Nintendo/Wii (60.3%); Personal Computer (65.4%); Handheld game unit (26.9%); cell phone (26.9%); and personal digital assistant (1.9%).

Another three items were compared as to genre group differences, with none reaching conventional levels of statistical significance (motion sickness during gaming $t(371)=-.784$; gaming online with others $t(371)=-1.096$; socialize online while gaming $t(371)=.369$). All

research participants seldom to never experienced motion sickness while gaming, sometimes gamed online with others and seldom to sometimes socialized online while gaming.

Features of game characters were also queried in the history of video game questionnaire. Of the 15 features inquired about (see Appendix A), one-third evidenced group differences and in all five features the group who reported presence questionnaires found these features more appealing: courage $t(367)=-2.488$, $p<.013$; individuality $t(368)=-2.398$, $p<.017$; danger $t(366)=-2.658$, $p<.008$; hopeful $t(366)=-2.039$, $p<.042$; and moral $t(242)=-2.010=p<.046$.

It should be noted again that games played prior to research participation was inquired about in two places. First was in the video game history questionnaire and second was as the first item in the presence questionnaire. While correlated significantly ($r(374)=.22$, $p<.0001$), the magnitude of the correlation is modest. This could be because participants could fill out the questionnaires separately and not everyone filled out both questionnaires. Additionally, since participants had been asked this question before filling out the presence inventory, they may have decided to not answer the question again. In any case, only those who listed a game played recently on the presence questionnaire (N=155) were included in the genre/presence analysis to follow.

Genre Classification

In order to identify genres within which games should be included, categories used on the website GameSpot.com were assigned to each game evaluated. This website's classification was selected because of its comprehensive listing of game information with 158 genres identified. The use of this industry website allows a less arbitrary genre identification: here the tricky problem of genre identification can be standardized and easily accessed by all researchers.

Gamespot's system of genre identification begins with eight general categories which can be found in their site map (http://sitemap.gamespot.com/?tag=footer;link). Each general category is further subdivided. When finding a game on Gamespot, the genre is listed reading backwards from the classification list. Thus Halo 3 for Xbox falls under "Action > Shooter > First-Person > Sci-Fi" but is identified on the Halo 3 for Xbox Gamespot page as simply "Sci-Fi First-Person Shooter"[5].

In order to simplify genre identification, Gamespot's eight general categories were used: action, adventure, driving, miscellaneous, role-playing, simulation, sports, and strategy. The FPS genre is part of action. It was decided to not separate out sub-genres as the number per cell would become too small. Of the 155 games listed with presence information, six could not be identified on Gamespot or using a Google search, and two were dropped as more than one game was listed as played prior to filling out the presence questionnaire. Of the remaining 147 games, all but three were classified into a genre based on the Gamespot categories. All but two Gamespot general genres – simulation and strategy - had sufficient numbers to progress further in this analysis. While there were games that could be seen as simulation, in Gamespot's organizational framework the simulation element was subsumed under one of the other top level genre classifications (i.e., baseball game would be classified as a sim at the lowest level of genre classification with sport as the most general level of classification). That left 146 games identified into six genres. As noted earlier, this collapse of genre is justified based on the notion

that gaming genres are more about the nature of the activity than the background into which it is placed (Apperley, 2006). Table 1 lists the genre identifications for all games for each genre.

General Genre	Total # games in genre	More than one game/genre (#) listed alphabetically	All other games in each genre with an incidence of one each listed alphabetically
Action	38	Call Of Duty[6] (6), Halo (5), Little Big Planet (2), Smash Brothers (3)	Battlefield Shooter 2, Blush, Counterstrike, Force Unleashed, Half-Life 2, Left 4 Dead, Lego Indiana Jones, Lemmings, Mario 3, Mass Effect, Metal Gear Solid, Mirrors Edge, Rayman 3, SOCOM Confrontation, Soul Caliber 4, Street Fighter 4, Super Mario 64, Super Princess Peach, Team Fortress 2, Time Crisis, Warhawk 2, Yoshi's Island
Adventure	14	Grand Theft Auto (2), Zelda (2)	Donkey Kong, Indiana Jones, Infamous, Jericho, Lego Batman, Myst, Phoenix Wright: Ace Attorney, Resident Evil 5, Saints Row 2, Silent Hill 4
Driving	14	Crash Bandicoot Racing (2), Mario Kart (9)	Driving, Midnight Club, Racing
Miscellaneous (Casual)	38	Bejeweled (2), Brick Breaker (6), Bubble Breaker (2), Guitar Hero (5), Pool (2), Rock Band (3), Sims (2), Solitaire (2), Tetris (4)	Agatha Christie, Animal Crossing: Wild World, Brain Age, Brick-Builder, Bubble Spinner, Mario Party 4, Same Ball 2, Shape Shifter, Sudoku, Word Mole
Role Playing	18	Final Fantasy (2), World of Warcraft (10)	Fable 2, Fallout 3, Fire Emblem, Heroes of Might and Magic, Pokemon Blue, Runescape
Sports	24	NHL 09 (12), Tiger Woods Golf (4), Wii Fit (2)	Fishing Game, Hot Shots Golf 3, Madden 09, MLB the Show 09, Tennis, UFC 2009

Table 1: General genre classification as a function of number of evaluations with all games categorized

These six genre groups were then compared in terms of the player's sense of presence experienced during their recent game play session. Because they differed in terms of several hardware considerations and play conditions, these variables were used as covariates in all subsequent analyses. Specifically, one-way ANOVAs on the six genre groups were computed. Respondents were asked if they had played the game before ($F(5, 140)=1.85$, ns) and if so had they played the same level ($F(5,131)=1.67$, ns). Most reported having played the game and the level before. Respondents were also asked how long their playing session was ($F(5,138)=11.73$, $p<.0001$), with action and RPG genre's lasting significantly longer than the other four genres. Finally, the size of their viewing screen during play was inquired about ($F(5,140)=11.07$, $p<.0001$). The largest viewing screen tended to be for sports genre games followed by action, adventure and driving genre games. The miscellaneous (casual) genre games were played on significantly smaller screens than all other game genre. It can be argued that these variables contribute to presence. Controlling for them allows comparisons across genres which otherwise would possibly be confounded by such hardware considerations.

An ANCOVA was performed. Game genre was the independent variable, with both game history questions, hours of play and monitor size as covariates. Presence sum scores on the Media Questionnaire was the dependent variable ($F(5,111)=2.56$, $p<.03$, partial eta=.10). The same analysis without the covariates also produced a significant main effect for presence ($F(5,124)=5.04$, $p<.0001$, partial eta=.17). Some cases were lost when calculating a presence sum score because some participants did not fill out all items on the presence scale. The relative presence of each genre differed both across genre and whether or not covariates were used. These are portrayed in Table 2 along with cell sizes and standard deviation for the unadjusted means.

When the means are unadjusted, the classically hard core games were rated as highest in overall presence: action, adventure, and RPG. When the means were adjusted for hardware differences, a slightly different picture emerged. The same three were highest in presence but the top one was adventure and not action. More than any other genre the miscellaneous genre seems to have benefited most from the hardware adjustment.

In order to further refine understanding of the relationship between genre of game and presence, a factor analysis with a varimax rotation was computed on the presence items. While the Lombard and Ditton scale offers subscales from their factor analysis, the content of the present items is focused on video games and not a more generic media experience. Additionally, some items were not used in this inventory. This procedure allows a refinement of the concept of presence in this sample with subsequent factor scoring. When all presence items were loaded, nine factors emerged with Eigen values above 1.0. These accounted for a total of 70.09% of the total variance with the first factor accounting for about half. This varimax rotated factor matrix is shown in Table 3.

genre groups	Unadjusted Means	Adjusted Means[7]	Std. Deviation for Unadjusted means	N for unadjusted means
Action	105.9429	99.015[a]	35.83864	35
Adventure	98.5455	115.522[a]	31.39543	11
Miscellaneous/Casual	69.5161	85.023[a]	32.56263	31
Driving	75.0000	79.444[a]	29.48343	12
RPG	95.4706	88.268[a]	34.68090	17
Sport	88.2917	82.806[a]	24.12194	24

Table 2: Adjusted and Unadjusted Presence Sum Score Means as a Function of Game Genre

	Component								
	1	2	3	4	5	6	7	8	9
Objects/People Come to You	.290	.119	.760	.169	.154	.131	.112	.078	-.065
Touch Objects/People?	.210	.205	.726	.050	.107	.089	.038	.128	-.071
Move out of Object's Way?	.380	.240	.381	.007	-.137	.004	-.003	.376	.092
"Being There" in Environment	.246	.335	.602	.193	.167	.163	.199	.167	-.078
Movie Screen or Window	-.044	.087	.249	.067	.181	.088	.089	.726	.044
People See/Hear You?	.636	.127	.291	.069	.069	-.118	-.010	.408	.070
Interacting With People/Person	.671	.084	.437	.199	.037	.041	.055	.273	.134
People Leave/Go to New Place	.450	.106	.508	.138	-.099	.161	-.040	.267	.204
People Together; Same Place	.382	.156	.685	.253	.080	.141	.078	.182	.048
People Talking Directly to You	.616	.193	.433	.201	.121	.157	-.056	.250	-.013
Eye Contact	.314	.114	.256	.125	.015	.343	.000	.579	-.166
Control Over Interaction	.685	-.035	.172	.199	.021	.105	-.013	-.020	-.179
…the body language of the people you saw/heard?	.166	.073	.221	.194	.151	.767	.188	.161	.051
…the facial expressions of the people you saw/heard?	.144	.214	.059	.148	.131	.750	.246	.195	.006
…changes in the tone of voice of the people you saw/heard?	.464	.327	.019	.036	.093	.514	.130	.117	.073
…the style of dress of the people you saw/heard?	-.040	.126	.381	.228	.119	.682	.110	-.124	.005
Sound Out Loud?	.603	.451	.166	.124	.176	.040	.111	-.056	.079
Smile in Response	.661	.387	.015	.133	.065	.366	.026	-.137	-.030

Speak to a Person In-Game	.730	.249	.298	.028	.013	.088	.007	-.094	.047
Mentally Immersed?	.200	.683	.358	.126	.056	.161	-.065	.011	.205
Game Involving?	.259	.762	.194	.274	.094	.109	.003	.007	.100
Senses Engaged?	.109	.748	.229	.343	.092	.123	.152	.040	.118
Sensation of Reality	.247	.593	.312	.177	.178	.185	.113	.217	-.206
Relaxing or Exciting	.220	.704	.099	.190	.143	-.021	.215	.127	-.039
Story Engaging?	.142	.503	.032	.247	-.015	.337	.092	.209	-.147
Impersonal – Personal	.268	.353	.086	.540	.285	.249	.085	.083	-.023
Unsociable – Sociable	.539	.242	-.011	.475	.076	.108	.209	.143	.193
Dead – Lively	.002	.210	.114	.732	.019	.100	.301	.000	.058
Unresponsive – Responsive	.234	.271	.244	.752	.130	.116	.112	.044	.014
Unemotional – Emotional	.152	.399	.104	.543	.083	.269	-.051	.132	.034
Remote – Immediate	.275	.218	.245	.740	.122	.057	.013	.008	.063
The way in which the events I saw/heard occurred is a lot like the way they occur in the real world.	.032	.134	.181	.079	.822	.126	-.075	.099	.024
The events I saw/heard could occur in the real world.	.080	.091	.063	.113	.886	.078	.103	.039	.033
It is likely that the events I saw/heard would occur in the real world.	-.005	.037	-.011	.088	.935	.014	.071	.005	.015
…sound like they would if you had experienced them directly?	.217	.210	.374	.242	.515	.239	.135	.051	.180
...look like they would if you had experienced them directly?	.054	.083	.543	.065	.485	.180	.166	.145	.237
Game Play Frequency (reversed)	.056	.108	.015	.126	.132	.016	.092	-.003	.873
Game Personally Relevant?	.115	.173	.048	.469	.312	.264	.104	.347	.048
Picture Quality	.002	.059	.146	.078	.017	.101	.802	.098	.142
Sound Quality	.076	.176	.085	.272	.058	.217	.725	.065	-.043
Comfortable Viewing Position?	.011	.071	.012	.048	.083	.103	.754	-.046	.005
Overall Satisfaction	-.041	.550	-.037	.424	.081	.178	.209	.067	.295

Table 3: Varimax Rotated Factor Matrix on the Presence Questionnaire Items

Items that loaded above .5 were used to name each factor. Some of the nine factors approximated those derived by Lombard and Ditton (2007). That is, the first factor accounted for 36.2% of the variance and loaded above .5 items which could be considered indicative of Active Social Interactions. Summaries of each factor are offered in Table 3 and key items are in Table 4. The second factor accounted for 7.99% of the variance and paralleled their Engagement factor. Spatial Presence items characterized factor three with 6.22% of the variance while factor four

seems most similar to their Social Richness factor and accounted for another 4.76% of the variance. The fifth factor paralleled their Perceptual Realism factor accounting for 3.62%. Also coming in from 2.6% to 3.4% of the variance were the last four factors named in order: Observing Social Interactions, Play Setting, Window to Self (eye) and Media, and Game Playing Frequency. These nine factors accounted for 70.6% of the variance.

Nine additional ANCOVAs were computed, with the same covariates used in the ANCOVA on the presence sum score. The names of the factors or subscales, key items loading on each and the ANCOVA results are listed in Table 4.

Factor/Subscale Number and Name	Highest loading item(s) for each factor	ANCOVAs on Genre groups for each subscale
Factor1: Active Social Interaction	Speak to person in game; Control over interaction	$F(5,110)=2.83$, $p<.02$, partial eta=.11
Factor 2: Engagement	Game involving; Senses engaged.	$F(5,110)=0.32$, ns
Factor 3: Spatial Presence	Objects/people come to player; Touch objects/people	$F(5,110)=0.81$, ns
Factor 4: Social Richness	Game experience is responsive and immediate	$F(5,110)=1.92$, $p<.096$, partial eta=.08
Factor 5: Perceptual Richness	It is likely that the events I saw/heard would occur in the real world.	$F(5,110)=14.57$, $p<.0001$, partial eta=.399
Factor 6: Observing Social Interactions	During game able to observe body language and facial expressions	$F(5,110)=0.95$, ns
Factor 7: Play Setting	Picture quality; seating position comfortable	$F(5,110)=0.86$, ns
Factor 8: Window to Self(eye) and Media	Game experience like looking in a window; Eye contact observed	$F(5,110)=0.82$, ns
Factor 9: Game Playing Frequency	Frequency of playing game in past	$F(5,110)=2.29$, $p<.05$, partial eta=.094

Table 4: Factor Names, Key Items and Results of ANCOVA's on Game Genre

Four of the nine ANCOVAs resulted in game genre differences including the highest variance scale (Factor 1). The adjusted presence factor score means are portrayed in Figure 1 as a function of game genre. Factor scores are actually z-scores so that the positive and negative values represent deviations from the mean.
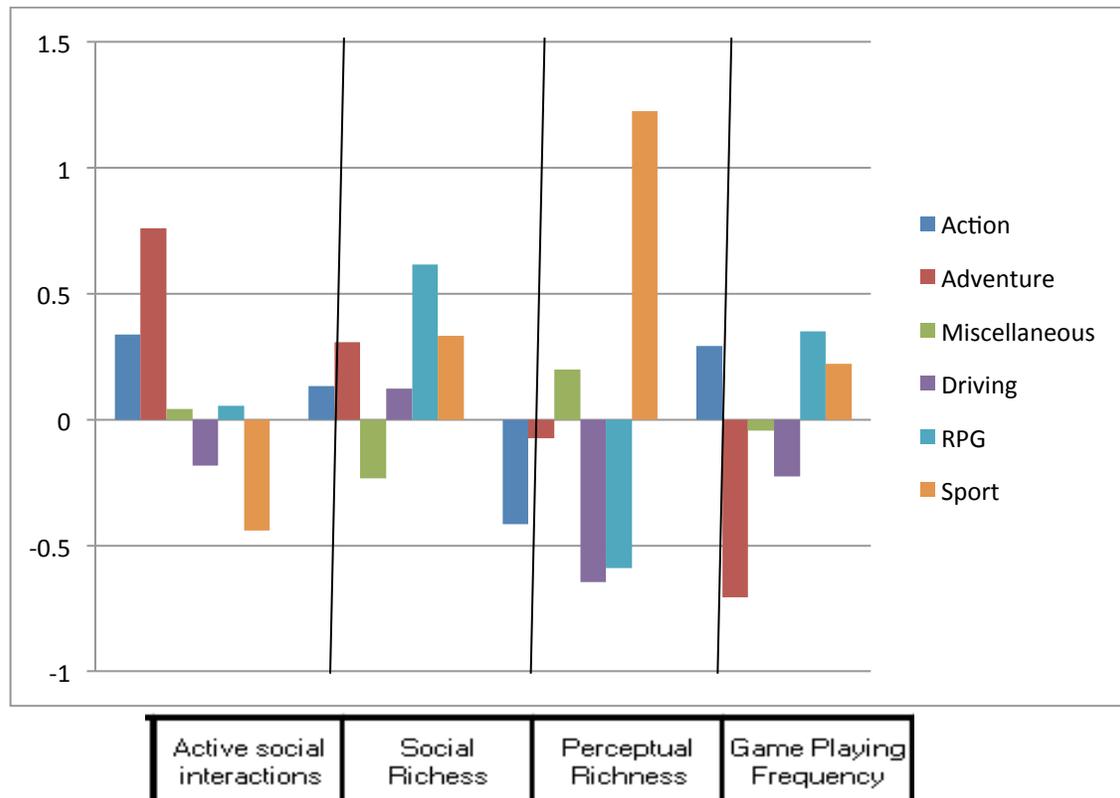
Figure 1. Game genre as a Function of Adjusted Mean Scores for Four Presence Subscales

When presence was broken into factors, four genre differences were found. Active Social Interactions, accounted for the most variance, and loading items, referring to specific elements of a social interaction like seeing people or talking to people, was rated above the mean for action and adventure games but below the mean for sport games. Social Richness[8], which amounts to personality descriptors of the player's evaluation of the video game experience, was highest for RPG and then sport games. Given the question that asks respondents to answer in terms of a series of bipolar traits ("For each of the pairs of words below, please circle the number that best describes your evaluation of the video game experience."), a better factor name might be Self Presence. This might seem like a contradiction regarding sport games, but not if you think about what happens in such games; the experience is personal, lively, responsive, emotional and immediate for the player while the purely social elements of play are best captured in Factor 1. RPG's have a slightly different pattern when comparing these two socially relevant factor scores. In both cases RPG's are above the norm, if slightly in the first factor. Action and Adventure

games are both above the mean for these social factors while miscellaneous (casual) are at and below the mean.

If we turn to the Perceptual Richness factor, which is about how the game is like the real world, sport genre games dominate, with the opposite being true of RPG's and driving. The driving genre being less than the mean may be because, as can be seen in Table 1, the vast majority of the games in this genre for this sample are cartoon type games. Finally, the game frequency factor was above the mean for action RPG and Sport but below the mean for adventure and driving.

Discussion

Presence, or sense of being there, is important to the video game industry and to game studies in that it offers some explanation for why a game might be repeatedly played and why it is enjoyed. This linkage is through the concept of "flow", which occurs during activities that require focus, commitment, and skill (Csikszentmihalyi & LeFevre, 1989). One such activity is video game playing, which has been reported to induce flow-like states of mind (Brockmyer et al., 2009; Dickey, 2005). Several researchers, including Sherry (2004), have offered theoretical models of computer use and video game play embracing flow (Finneran & Zhang, 2003; Sharafi, Hedman, & Montgomery, 2006).

Several video game researchers have found a positive relationship between video game play and flow (Voiskounsky, Mitina, and Avetisova, 2004; Choi and Kim, 2004; Chou and Ting, 2003). Chou and Ting (2003) examined self-reports of flow on a scale they developed among the "membership of virtual communities devoted to Internet games" (p. 666). Using the scale developed by Chou and Ting, Gackenbach (2008) found that frequent game players reported more flow experiences while playing video games along several dimensions than did infrequent players. Flow is not possible without sustained attention to and absorption in an activity which is facilitated by presence (Gackenbach & Bown, in press). Thus, inquiry into presence and gaming informs playability as well as future sales in the game industry.

In the present inquiry games were classified into genres based upon an industry website, Gamespot. Research participants who had played a video game prior to filling out several surveys evaluated that game in terms of the degree of presence the game provided. Overall presence was highest for the classical hard core game genres, i.e., action, adventure, and RPG, when hardware considerations were not controlled. When such considerations were controlled, the order of superiority in presence changed, but remained with these three hard core game genres. Without hardware considerations, the miscellaneous/casual genre was reported as having the least overall presence while, with hardware considerations factored in, the lowest became the cartoon-type driving genre.

In a factor analysis of the presence items, nine factors emerged and many echoed the Lombard and Ditton (2007) factor structure. These factors could also be conceptualized along the lines of Tamborini and Skalski's (2006) presence typologies: Spatial, Social and Self. Specifically, Factors 1, and 6 (see Table 4) tap Social elements while Factors 2, 4[9], 8 and 9 tap Self Presence elements of presence. The Spatial elements are evident in factors 3, 8 and 9. Factor scores (z-

scores) were saved and entered into a series of analyses comparing genres. Four showed a significant genre difference while five showed no such difference. These were one each from Social, Self and Spatial typology with the fourth viewed as either Social or Self (Lombard & Ditton, 2007). Thus it can be argued that these genre distinctions cover the range of ways of viewing experiences of "being there" in a video game.

There are several limitations to this research that need to be mentioned. First is the classification of genre. Given the confusion in the research literature about what games go into what genre, and yet the wide use of genre in game studies, it is clear that a centralized, well-justified and easily accessed source is needed. The case is made here that such a source can be found at the Gamespot website. Their hierarchy of genre classifications offers various levels at which analyses of games can be undertaken. However, in the present study the oft cited separate genre of FPS is folded into the action genre. While it could be argued that it should stand alone, the problem of cell size and clarity of genre label would have been compromised in the current study had that been done. Another issue with genre is the category of miscellaneous or casual games. It is clear when reading the games that go into this genre that they are primarily casual games, however a case could be made that the music/rhythm type games should constitute a separate genre. Thus while this is an early look at genre and presence clearly more work must be done in this area.

Another limitation of this inquiry is the reliance on college students. While this was partly addressed through solicitations from serious gaming groups, the actual numbers of non-college student participants who filled out both inventories was small.

In summary, based upon these presence evaluations, three general categories of game play preferences seem apparent; casual play (miscellaneous genre), hard core play (action, adventure, and RPG) and real world play (sport). The driving genre might be considered real world if such games were classified in it, but since in this study the driving games were cartoon type, inclusion of driving into the real world play category would not be appropriate. Not surprisingly, the hard core play genres were generally higher in presence with one exception being spatial presence, which was dominant in the real world play games (sport genre). A recent industry concern is with the various issues surrounding a turn away from the development from hard core games towards casual games, due to the rapidly growing market the latter represent. Presence can be viewed as a reason that people game and continue to game, so that the relative lack of presence in the miscellaneous/casual genre may be concerning to the gaming industry and perhaps should be addressed if that market segment is to continue to grow.

References

Adams, E., & Rollings, A.(2006). *Fundamentals of game design* Prentice Hall.

Apperley, T. H. (2006). Genre and game studies: Toward a critical approach to video game genres. *Simulation & Gaming, 37*(1), 6-23.

Brandtzaeg, P. B., & Heim, J. (2009). Children's electronic gaming content preferences and psychosocial factors: Is there a connection? *Nordicom Review, 30*(2), 69-86.

Campanella-Bracken, C., & Skalski, P. (2008). Presence reactions to video games: The impact of image quality and skill level. Proceedings from *International Communication Association,* New York City, New York.

Choi, D., & Kim, J. (2004). Why people continue to play online games: In search of critical design factors to increase customer loyalty to online contents. *CyberPsychology & Behavior, 7*(1), 11-24.

Chou, T. J., & Ting, C. C. (2003). The role of flow experience in cyber-game addiction. *CyberPsychology & Behavior, 6*(6), 663-675.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*, 815-822.

Dickey, M. D. (2005). Engaging by design: How engagement strategies in popular computer and video games can inform instructional design. *Educational Technology Research and Development, 52*(2), 67-83.

Eastin, M. S. (2006). Video game violence and the female game player: Self- and opponent gender effects on presence and aggressive thoughts. *Human Communication Research, 32*, 351-372.

Finneran, C. M., & Zhang, P. (2003). A person-artefact-task (PAT) model of flow antecedents in computer-mediated environments. *International Journal of Human-Computer Studies, 59*, 475-496.

Gackenbach, J. I. (2006). Video game play and lucid dreams: Implications for the development of consciousness. *Dreaming: Journal of the Association for the Study of Dreams, 16*(2), 96-110.

Gackenbach, J. I. (2008a). The relationship between perceptions of video game flow and structure. *Loading, 1*(3), Nov. 18, 2008.

Gackenbach, J. I. (2009). Electronic media and lucid-control dreams: Morning after reports. *Dreaming, 19*(1), 1-6.

Gackenbach, J. I., & Bown, J. (in press). Mindfulness and video game play: A preliminary inquiry.

Gackenbach, J. I., & Rosie, M. (2009). Cognitive evaluation of video games: Players perceptions. *Future Play 2009,* Vancouver, BC.

Hall, A. (2009). Perceptions of the authenticity of reality programs and their relationships to audience involvement, enjoyment, and perceived learning. *Journal of Broadcasting & Electronic Media, 53*(4), 515-531. doi:10.1080/08838150903310468

Hoffman, H., Prothero, J., Wells, M., & Groen, J. (1998). Virtual chess: Meaning enhances users' sense of presence in virtual environments. *International Journal of Human-Computer Interaction, 10*(3), 251-263.

Huh, S. (2008). The influence of genre, perception, and personality on dependent video game use. Proceedings from *International Communication Association,* New York, N.Y.

Hyman, P. (2006). State of the industry: Casual games. *Game Developer.* Retrieved from: http://www.gdmag.com/archive/feb06.htm

Ivory, J. D., & Kalyanaraman, S. (2007). The effects of technological advancement and violent content in video games on players' feelings of presence, involvement, physiological arousal, and aggression. *Journal of Communication, 57*, 532-555.

Lachlan, K., & Krcmar, M. (2008). Experiencing telepresence in video games: The role of telepresence tendencies, game experience, gender, and time spent in play. Proceedings from *National Communication Association,* New Orleans, Louisiana.

Lee, K. (2004). Presence, explicated. *Communication Theory, 14*, 27-50.

Lombard, M., & Ditton, T. B. (2007). Measuring presence: The Temple Presence Inventory (TPI). Message posted to http://matthewlombard.com/

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *The Journal of Computer Mediated Communication, 3*(2), Nov. 18, 2006. Retrieved from: http://jcmc.indiana.edu/vol3/issue2/lombard.html

Lombard, M., Ditton, T. B., Crane, D., Davis, B., Gil-Egui, G., Horvath, K., Park, S. Measuring presence: A literature-based approach to the development of a standardized paper-and-pencil instrument. Paper presented at the *Third International Workshop on Presence,* Delft, The Netherlands. Retrieved from http://www.temple.edu/ispr/abstracts/lombard00.html

Lyons, E. J. (2010). Presence predicting sensory and control effects of home console video games. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 71*(5-B), 3004.

McMahan, A. (2003). Immersion, engagement and presence. In M. Wolf and B. Perron (Eds.), *The video game theory reader* (pp. 67-83). New York: Routledge.

Moller, H. J., & Barbera, J. (2006). Media presence, consciousness, and dreaming. In G. Riva, M.T. Anguera, B.K.Wiederhold and F.Mantovani (Ed.), *Communication to presence: Cognition, emotions and culture towards the ultimate communicative experience* (pp. 97-123). Amsterdam: IOS Press.

Nowak, K. L., Krcmar, M., & Farrar, K. M. (2008). The causes and consequences of presence: Considering the influence of violent video games on presence and aggression. *Presence, 14*(3), 256-268.

Sanchez-Vives, M. (2006). The use of virtual reality in the study of consciousness. Proceedings from *Towards a Science of Consciousness,* Tucson, AZ.

Schneider, E., Lang, A., Shin, M., & Bradley, S. (2004). Death with a story: How story impacts emotional, motivational, and physiological responses to first-person shooter video games. *Human Communication Research, 30*(3), 361-375.

Sharafi, P., Hedman, L., & Montgomery, H. (2006). Using information technology: Engagement models, flow experience, and personality orientations. *Computers in Human Behavior, 22*(5), 899-916.

Sherry, J. L. (2004). Flow and media enjoyment. *Communication Theory, 14*(4), 328-347.

Sherry, J., & Lucas, K. *Video game uses and gratifications as predictors of use and game preference.* Unpublished manuscript.

Skalski, P., Lange, R., Tamborini, R., & Shelton, A. (2007). Mapping the road to fun: Natural video game controllers, presence, and game enjoyment. *International Communication Association,* San Francisco, CA.

Slater, M., & Sanchez-Vives, M. (2006). Presence and consciousness in virtual environments. Proceedings from *Towards a Science of Consciousness,* Tucson, AZ.

Tamborini, R., Eastin, M., Skalski, P., Lachlan, K., Fediuk, T., & Brady, R. (2004). Violent virtual video games. *Journal of Broadcasting and Electronic Media, 48*, 335-357.

Tamborini, R., & Skalski, P. (2006). The role of presence. In Vorderer, P., & Bryant,J. (Eds.), *Playing computer games: Motives, responses, and consequences*. Mahwah, NJ: Lawrence Erlbaum Associates.

Tanis, M., & Jansz, J. (2008). Gaming for different reasons: What motivates people to play a specific video game? Proceedings from *International Communication Association,* Montreal, Quebec.

Voiskounsky, A. E., Mitina, O. V., & Avetisova, A. A. (2004). Playing online games: Flow experience. *PsychNology Journal, 2*(3), 259-281.

Witmer, B., & Singer, M. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence, 7*(3), 225-240.

Appendix A: Video Game Play History Questionnaire (Gackenbach, 2006)

In this study you are asked about your history of video game play.

Part 1. Demographic Information

Your Alias or other identifier that you will be able to recall each time you fill out a questionnaire on this website. This should NOT be your name. _____

1. Sex:

    a. Male

    b. Female

2. Age:

    a. 18 or 19 years old (please do not continue if you are less than 18 years of age)

    b. 20 to 25 years old

    c. 26 to 30 years old

    d. 31 to 35 years old

    e. 36 to 40 years old

    f. 41 to 45 years old

    g. 46 to 50 years old

    h. 51 to 55 years old

    i. 56 to 60 years old

    j. 61 or more years old

3. Education (check highest achieved):

    a. Less than high school
    b. High school diploma
    c. One or two year post high school but not college
    d. One or two year diploma from a trade or professional school but not college
    e. Some college or university education
    f. College or university degree (Bachelors)
    g. Post graduate work
    h. Post graduate degree

4. Occupation (if a full time student say student): _____

Part 2: Video Game Habits/Experiences (A video game is any game played with a media interface, such as TV, computer, game console, or hand held device).

5. How often do you typically play video games?

      a. daily

      b. several times a week

      c. several times a month

      d. several times a year

      e. rarely or never

6. How long is your typical playing session?

      a. less than an hour

      b. 1 to 2 hours

      c. 2 to 4 hours

      d. 4 to 6 hours

      e. 6 to 8 hours

      f. 8 to 10 hours

      g. 10 to 12 hours

      h. 12 hours or more

7. How many different video games in any format have you played to date?

      a. none

      b. one - five

      c. six to 20

      d. 20 to 50

      e. 50 to 100

      f. over 100

8. How old were you when you played your first video game? (skip if you've never played a video game)

      a. after left/finished secondary schooling

      b. grade 10 to grade 12

c. grade 7 to grade 9

d. grade 4 to grade 6

e. kindergarten to grade 3

f. before kindergarten

9. Which of the following types of video game is your favorite?
    a. First person shooter
    b. Role playing/ Strategy
    c. Driving/Sports
    d. Puzzle/Card/Board
    e. None of the above

10. Which of the following types of video game do you <u>currently</u> play the most often?
    a. First person shooter
    b. Role playing/ Strategy
    c. Driving/Sports
    d. Puzzle/Card/Board
    e. None of the above

11. What platform(s) do you game on? Check all that apply:

    a. Xbox console
    b. Playstation console
    c. Nintendo /Wii console
    d. Personal computer
    e. Handheld game unit
    f. Cell phone
    g. Personal digital assistant

12. How often do you get motion sickness while playing a video game?

    a. Always
    b. Often
    c. Sometimes
    d. Seldom
    e. Never

13. How often do you game online with others, as opposed to playing alone?

    a. Always
    b. Often

    c. Sometimes
    d. Seldom
    e. Never

14. How often do you socialize online while gaming?

    a. Always
    b. Often
    c. Sometimes
    d. Seldom
    e. Never

15. Were you playing a video game in the four hours prior to filling out this questionnaire?
    a) Yes
    b) No

16. If you answered yes to question #14, name all the games you played in the last four hours, if you played more than five games, pick the five that you played the longest:

    1) _____
    2) _____
    3) _____
    4) _____
    5) _____

17. What features of game characters appeal to you?

    1= not at all appealing   4 = neutral   7= very appealing

courage

1 2 3 4 5 6 7

individuality

1 2 3 4 5 6 7

morality

1 2 3 4 5 6 7

danger

1 2 3 4 5 6 7

vague

1 2 3 4 5 6 7

seductive

1   2   3   4   5   6   7

protective

1   2   3   4   5   6   7

hopeful

1   2   3   4   5   6   7

spiritual

1   2   3   4   5   6   7

evil

1   2   3   4   5   6   7

sleepy

1   2   3   4   5   6   7

perfection

1   2   3   4   5   6   7

wisdom

1   2   3   4   5   6   7

enchanting

1   2   3   4   5   6   7

moral

1   2   3   4   5   6   7

18. Did you answer this questionnaire during Fragapalooza 2008 or hear about it through Fragapalooza?

   a) Yes
   b) No (if no go to question 19)

19. Where did you hear about this questionnaire? _____

20. What is your alias? If you prefer to not provide your alias or you do not have one please provide some easy way that you can identify yourself for each of the questionnaires on this web site that you decide to take. Please do NOT give your name: _____

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[1] These are self designations so while all face to face participants had to be students to get into the research study they may have been only part time students or did not identify themselves primarily as college students.

[2] The identification of online participants as students could be because they were graduate students or students involved in gaming activities but not participating for course credit.

[3] All five scales are: Video Game History, Kentucky Inventory of Mindfulness Skills, Mindful Attention Awareness during Video Game Play Scale, Immersive Tendency Questionnaire, and Presence Questionnaire. The relationship between all five scales with a mindfulness focus is discussed in Gackenbach and Bown (in press).

[4] First percentage is favourite genre while the second is currently most often played genre percentage.

[5] http://www.gamespot.com/xbox360/action/halo3/index.html

[6] Sometimes different versions of a game were listed. So in the case of Call of Duty both versions 4 and 5 were listed.

[7] a. Covariates appearing in the model are evaluated at the following values: Played Game Before? = 1.04, Played Level Prior? = 1.14, Prior Session Duration = 1.60, Screen Size = 3.71.

[8] The name comes from Lombard and Ditton (2007).

[9] While this factor is labelled "Social Richness" that is because of the similarity to Lombard and Ditton's (2007) factor of the same name. However, upon closer examination it seems more to reflect Self presence as personality descriptors of the gaming experience.