Game Player Characteristics and Interactive Content: Exploring the Role of Personality and Telepresence in Video Game Violence

Kenneth A. Lachlan & Erin K. Maloney

The methodological techniques used in past video game content analyses overlook player differences that might play an important role in generating violent content. The current study aimed to explore these differences in terms of personality type, trait hostility, perceived realism, and telepresence tendency. One hundred and sixty participants were assigned to play one of four video games after filling out a series of personality inventories. Content was then evaluated using coding techniques adapted from prior video game content analyses (Smith, Lachlan, & Tamborini, 2003). The findings indicated that game content is highly variable across player characteristics and telepresence tendencies.

Keywords: Aggression; Content Analysis; Video Games

Popular video games in the United States are rife with graphic violence (Smith, Lachlan, & Tamborini, 2003), leading social critics to argue the existence of a relationship between violent game play and aggressive behavior (Elmer-Dewitt, 1993). Most notably, American news media has associated video game play with the perpetrators of school shootings at Columbine High School and Westside Middle School (Gegax, Adler, & Pedersen, 1998). A large body of research has established a link between video game playing and aggression (Anderson & Dill, 2000; Ballard & Lineberger, 1999; Sherry, 2001), while a handful of studies have attempted to quantify
potentially problematic game content in terms of the frequency of violence and the context surrounding aggressive interactions. However, the methodological approaches taken in these content studies have been based almost entirely on techniques common in linear media (such as television) and fail to identify game user characteristics that may play an important part in generating violent content. The goal of the current study was to explore the links between user attributes (such as aggressive personality and telepresence tendency) and video game content. While the findings suggest potential links between user attributes and game content, they also raise a larger issue concerning the ways in which we conceptualize interactive content.

Video Game Use and Effects

Children, adolescents, and even adults spend a great deal of time playing video games. Adolescent males in particular engage in about eleven hours of interaction with their game consoles per week (Sherry, Lucas, Greenberg, & Lachlan, 2006). Most children in this country have access to a video game console, with about one-third having a game console in their bedrooms, where game play presumably goes unwatched (Kaiser Family Foundation, 1999). The knowledge that young audiences spend a large amount of time playing has led to a substantial amount of research exploring the relationship between game playing and aggression (Dominick, 1984). Wiegman and Van Shie (1998) found a relationship between preferences toward violent video games and reports of violent behavior. Numerous other correlational studies have produced similar findings in both children and adults (Anderson & Dill, 2000; Dominick, 1984; Gentile, Lynch, Linder, & Walsh, 2004; Krahe & Moller, 2004; Lin & Lepper, 1987). A substantive body of experimental research also has also provided evidence of a causal link between game play and immediate aggression, again finding evidence of this link in both adults and children (Anderson & Dill, 2000; Anderson & Ford, 1986; Ballard & Lineberger, 1999; Bartholow & Anderson, 2002; Panee & Ballard, 2002; Shutte, Malouf, Post-Gordon, and Rodasta, 1987; Uhlmann & Swanson, 2004).

Previous Content Analyses

Concern over the potential relationship between violent game play and aggressive behavior has more recently led to several content analytic studies attempting to quantify the rate at which violent acts take place in video games and problematic contexts that may be associated with this violence. Braun and Giroux (1989) performed an ad hoc content analysis of 21 arcade games in an effort to identify the frequency with which characters were killed or objects destroyed. They found that a little less than three quarters of their sample featured this kind of aggressive content, and that this content was commonly found in games centered on war and crime. Dietz (1998) attempted to identify violence in 33 Nintendo and Sega Genesis home video games, with similar results: 79% of the games in the sample featured aggression of some kind.
Smith, Lachlan, and Tamborini (2003) sought to extend the sophistication of video game content analyses by examining violent contexts that may moderate the relationship between violent media use and aggressive behavior. Their analysis revealed that video games rated for mature audiences were likely to contain repeated violence, gun violence, and fairly graphic violent content. Reanalysis of their data also revealed that video games may be more likely than television to present gun violence that is unrealistic, justified, and repetitive (Smith, Lachlan, Pieper, Boyson, Wilson, Tamborini, & Weber, 2004), and that violent perpetrators in video games are often characters that game players may find similar to themselves or with whom they may identify (Lachlan, Smith, & Tamborini, 2005).

In an attempt to identify problematic content in games rated for younger audiences and examine content taking place in different timeframes during the game, Haninger and Thompson (2004) analyzed the content of 81 popular “T” rated games, taping one hour of content from each game. Their analysis focused on the presence of sexual content, violent themes, and the abuse of controlled substances. Results revealed that about 90% of the games rated for teens forced the user to commit virtual violence, while 69% went so far as to require the game player to kill off other characters.

These studies provide useful data in the extent and characteristics of violence found in popular video games. However, the methodological approaches taken in these content analyses have been based entirely on previous techniques germane to linear media, and have failed to consider the possibility that video game content may vary from one game player to the next (Braun & Giroux, 1989; Dietz, 1998; Haninger & Thompson, 2004; Lachlan, Smith, & Tamborini, 2005; Smith et al., 2003, 2004). Given the interactive nature of video games, it seems reasonable to believe that individual game players with differing personality characteristics may be more or less likely to engage in aggressive behavior in interactive environments or instigate aggressive acts on the part of computer-generated characters. Further, the abilities of individual game users to adapt to interactive environments and engage in specific aggressive tasks may profoundly impact the extent and nature of violent content. In this regard, it seems critical to examine the ways in which game content may be affected by both differences in personality attributes and telepresence.

**Telepresence**

Prior investigations of video game content have overlooked telepresence, despite the fact that several studies (Howe & Sharkey, 1998; Tamborini, 2000; Witmer & Singer, 1998) suggest that experienced telepresence will directly impact behaviors within interactive environments. Briefly, telepresence has been defined by Steuer (1992) as the extent to which we perceive that we are actually present in a mediated environment rather than being present in our natural physical environment. The extent to which we experience telepresence can vary from high to low as a function of individual differences in one’s susceptibility to these experiences, as well as situational differences in particular attributes of the environments created by different media.
Witmer and Singer (1998) identify involvement and immersion as psychological states that embody the essence of experiencing telepresence. According to Tamborini (2000), the vivid and interactive natures found in different media technology evoke feelings of involvement and immersion. The technology of today’s video games is inherently high on these attributes and should dramatically increase a user’s identification with aggressive characters, and thus heighten the impact of violent video games on hostile thoughts and acts (Tamborini, 2000; Tamborini, Eastin, Skalski, Lachlan, Fediuk, & Brady, 2004). In particular, the Tamborini et al. (2004) study posits that experienced presence may be expected to influence the degree to which hostile thoughts are primed, a notion consistent with earlier research exploring the relationship between game play and aggression (Anderson & Dill, 2000; Sherry, 2001). However, these studies do not consider the extent to which the priming of aggressive or hostile thoughts may in turn affect game play, producing content that varies depending on how much hostility has been primed and the extent to which a game player’s decisions are affected by that hostility. As such, identifying these media properties and an individual’s susceptibility to these psychological states may allow us to predict the outcomes anticipated from experiences in different media systems, including the content and nature of the interactive experience itself. If in fact the level of presence experienced by a game player has an impact on the degree to which they experience hostility, this may manifest itself in different game content outcomes.

Personality

Further, there is a substantive body of evidence that individual personality characteristics may moderate mediated experiences. While trait aggression has been largely overlooked in research on interactive media, there is some evidence that interactive experiences may be moderated by trait hostility or aggressiveness (Tamborini et al., 2004). In the realm of linear media, there is research supporting a link between perceived media realism and learning effects (Perse, 1986; Rubin, 1979), personality type and aggression responses (see Anderson & Bushman, 2002; Bartholow, Sestir, & Davis, 2005), and moral reasoning patterns and evaluation of media experiences (Raney & Bryant, 2002).

Given this rationale, the current research suggests that interactive video game content may not merely be a function of the game alone, but may be a combination of the game, personality characteristics of the individual user, and the user’s susceptibility to becoming fully immersed in the interactive environment. In order to accurately evaluate potentially risky violent content in popular video games, it is critical to simultaneously consider all of these factors. In order to do so, the current analyses aim to first establish whether or not violent content will vary in frequency and context from game player to game player, and provide insight into the extent of this variation. If it can be established that aggressive game content is variable from player to player, then subsequent research questions should address the relationship between content variability and attributes of the game player. To this end, the following research questions are proposed.
RQ1: How much variability exists in the frequency and context of aggressive games across multiple game players?

RQ2: What impact will telepresence tendencies have on the frequency and context of interactive violence produced in console game environments?

RQ3: What impact will trait personality characteristics related to aggression have on the frequency and context of interactive violence produced in console game environments?

Method

Participants

Approximately 160 research participants were recruited from an entry level communication class at a mid-size East Coast university. Participants were given research credit for their participation. The decision to use college students was based on two criteria. First, college students were obviously easily accessible to the current research. Second, there is a growing body of research suggesting that the use of college students in multivariate experimental designs does not threaten the validity of the research, and that underlying psychological processes tend to be consistent across a wide range of sampling frames (see Basil, 1996; Basil, Brown, & Bocarnea, 2002; Sparks, 1995).

Procedure

Prior to the laboratory procedure, surveys were administered to the participants during class asking them to respond to questions measuring a series of personality traits to be used as controls, as well as the demographic attributes of age, sex, ethnicity, and income. Approximately two weeks later, participants completed the laboratory procedure. Participants were then randomly assigned to one of four violent video game conditions. Decisions regarding the number of video games to be used and the specific games chosen were based on two criteria. First, it was determined that approximately 40 participants were necessary per game in order to fully explore potential variability in game content; given the research participants available, this limited the study to an examination of four games. Second, consistent with Smith, Lachlan, and Tamborini’s (2003) selection criteria, games were selected from among the top ten selling games for the two major home gaming platforms during 2004 (Microsoft X-Box and Sony PlayStation 2). After extensive pre-testing of eligible games, the specific games were selected based on thematic similarity (first-person shooter and crime adventure), their propensity for producing violent content, and the extent to which they could be easily learned in short period of time. Based on these criteria, Rainbow 6 (first-person shooter) and Grand Theft Auto 3 (crime adventure) were chosen for X-Box, while SoCom: Navy Seals (first-person shooter) and Grand Theft Auto: Vice City (crime adventure) were selected for PlayStation 2.

Participants were given a brief overview of the game and controller functions upon entering the laboratory. Following this procedure, they were left alone to play the games from their beginnings for a period of twenty minutes. During this time, signals
from the television monitors attached to the games were routed through a VCR and recorded for later analysis.

**Personality Measures**

All personality measures used in the current study were verified for internal consistency and reliability using Confirmatory Factor Analysis (Hunter & Gerbing, 1982). Analysis of the factor loadings and error terms led, when necessary, to the dropping of items in order to produce an internally consistent scale. A brief description of each of the personality measures and their reliability within this sample follows. Instances of scale modification (e.g. deletion of items) are noted.

**Perceived realism**

Perceived realism was measured using a scale first developed by Rubin (1981). This was included given that their past studies (Perse, 1986; Rubin, 1979) have established a link between perceived media realism and learning. Five Likert-type items, such as “Media let me see what happens in other places as if I was really there,” tapped this construct. Coefficient alpha for the scale was found to be .71 after dropping two items.

**The Buss-Perry Aggression Questionnaire**

The Buss-Perry Aggression Questionnaire (BPAQ) measures four aggression subtraits: physical aggression, verbal aggression, anger, and hostility (Buss & Perry, 1992). All four subtraits, hostility ($\alpha = .72$), physical aggression ($\alpha = .76$), verbal aggression ($\alpha = .69$), and anger ($\alpha = .74$), were found to be internally consistent and adequately reliable.

**The Revised Eysenck Personality Questionnaire**

The Revised Eysenck Personality Questionnaire (REPQ) measures four personality “types”: extroversion, neuroticism, psychoticism, and social desirability. Extroversion is considered a measure of social adaptability. Psychoticism is considered an individual’s “lack of restraint, responsibility, need for cognitive structure, and willingness to live by society’s rules and mores (socialization)” (Zuckerman, Kuhlman, & Camac, 1988, p. 104). Neuroticism involves an individual’s level of anxiety, emotionality, and social isolation. Social desirability measures an individual’s likelihood to participate in acts that may be deemed socially inappropriate. Confirmatory factor analyses performed on psychoticism ($\alpha = .72$), social desirability ($\alpha = .78$), extroversion ($\alpha = .80$), and neuroticism ($\alpha = .78$) were found to be internally consistent.

**The Social Justice Questionnaire**

The Social Justice Questionnaire (Raney & Bryant, 2002) is designed to measure vigilantism, approval of punishment, and empathic concern for others in need. Analyses
revealed acceptable internal consistency and reliability, with alphas of .93 for vigilan-
tism, .78 for approval of punishment, and .80 for empathy (with one item removed).

**Presence Measure**

*Telepresence tendency* was measured using The Immersive Tendencies Questionnaire
(Witmer & Singer, 1998). This scale was selected based on work demonstrating its
relationship with reported telepresence, and is included here to explicate the con-
struct of susceptibility to the experience of presence as a standing personality charac-
teristic. Examples of scale items tapping this construct include “Do you ever become
so involved in a television program or book that people have problems getting your
attention?” and “Do you ever become so involved in a video game that it is as if
you are inside the game rather than moving a joystick and watching the screen?”
Coefficient alpha for this scale was found to be .75.

**Content Measures**

*Definition of violence*

The definition of violence utilized in the current study is “...any overt depiction of a
credible threat of physical force or the actual use of such force intended to physically
harm an animate being or group of being. Violence also includes certain depictions of
physically harmful consequences against an animate being/s that results from unseen
violent means” (Smith et al., 1998, p. 30).

*Units of analysis*

While Smith, Lachlan, & Tamborini (2003) measured violence at both the interaction
and segment level, the current coding scheme is limited to counting the number of
interactions that feature particular content characteristics. This decision was made in
order to simplify the coding scheme and focus on variability in the incidence of partic-
ular types of violent acts. A violent interaction was defined as a harmful exchange
that takes place between a unique perpetrator committing an act against a unique tar-
get. Whenever the perpetrator, act type, or target changes, a new interaction occurs.
For example, in the game *Rainbow 6*, if the game player opened fire on a visible group
of enemies, this would constitute one unit of analysis. If the group of enemies then
returned fire, this would count as another act. If either the game player or enemies
were joined by other in the firefight, this would designate yet another unit of analysis,
as would the use of some type of new weapon such as a bomb or grenade.

*Prevalence*

The first variable under consideration is prevalence of violence. This was simply a
count variable of the number of violent exchanges taking place over a 20-minute
game play session. This measure was included as a basic indicator of the degree
to which the number of violent interactions in a given time frame may shift across
different game players.
**Interaction variables**

Several contextual variables were also assessed by counting the number of times a particular type of act took place. Because responses to aggressive stimuli may vary based on perceived justification for the act (Berkowitz & Powers, 1979), coders identified the number of instances of each of following motives within each 20-minute session: protection of life, protection of property, anger, retaliation, personal gain, mental instability, and other/unknown (see Smith, Lachlan, & Tamborini, 2003, for detailed operational definitions). For purposes of later analysis, protection of life, protection of property, and retaliation were collapsed into “justified.” Any interactions motivated by other reasons (i.e., personal gain, mental instability, other) were collapsed as “not justified.”

The second interaction variable was means of violence. Coders were asked to identify the number of interactions per game-play segment that featured violence committed in different ways or with different weapons. Means were identified as natural (i.e., kicking, punching), unconventional weapon (i.e., anvil, baseball bat), conventional handheld non-firearm (i.e., mace, knife), handheld firearm (i.e., rifle, pistol), heavy weaponry (i.e., bazookas, rocket launchers), bombs, or other weapon. Conventional weapons were later dropped from the analysis due to their infrequent occurrence.

Violent consequences associated with the interactions were also identified and counted. Specifically, depicted harm to victims of violence was coded as none, mild, moderate, or extreme. Again, adapting Smith, Lachlan, & Tamborini’s (2003) coding scheme, no depicted harm was defined as interactions in which no indication of harm could be detected. Mild harm was defined as any verbal or non-verbal indication of harm that was not accompanied by any visual indicator of further harm. Harm depicting blood, or visible injury was coded as moderate. Extreme harm was defined as damage that included large quantities of blood, disfiguring injuries, or death.

**Coder Training and Reliability**

Three undergraduates from the same university who did not participate in the study were recruited to code the game content. Coders completed four weeks of training to master the codebook and underwent four reliability tests to verify the consistency of their judgments. Using Cronbach’s alpha for continuous data, the final intercoder reliability coefficients are as follows: number of violent acts (.92), protect life (.87), protect property (.91), retaliation (.93), anger (.84), personal gain (.91), mental instability (.78), unknown (.77), natural means (.94), unconventional weapon (.74), conventional non-firearm (.85), handheld firearm (.98), heavy weaponry (.97), bombs (.86), other weapon (.72), no harm depicted (.92), mild harm depicted (.94), moderate harm depicted (.88), and extreme harm depicted (.99).

**Results**

**Descriptive Analyses**

To address research question one, a simple set of descriptive statistics was produced for each game in the analysis. Specifically, the total number of violent acts, weapon
categories, graphicness categories, and justification of motive were examined in terms of the number of times each type of act occurred within a 20-minute timeframe. The results overwhelmingly indicate a great deal of variability within each game across different users (see Table 1).

**Global Regression Analyses**

Research questions two and three were examined through multiple regression analysis. First, a set of regression analyses were performed on all subjects in the data set, examining the impact of multiple game player characteristics on game content

### Table 1  Descriptive Statistics for Content Variables

<table>
<thead>
<tr>
<th></th>
<th>Rainbow 6</th>
<th>SoCom</th>
<th>GTA: 3</th>
<th>GTA: VC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of violent acts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>36.44</td>
<td>43.14</td>
<td>27.00</td>
<td>19.50</td>
</tr>
<tr>
<td>SD</td>
<td>13.01</td>
<td>19.93</td>
<td>24.87</td>
<td>16.32</td>
</tr>
<tr>
<td>Justified</td>
<td>27.54</td>
<td>39.26</td>
<td>4.08</td>
<td>4.89</td>
</tr>
<tr>
<td>SD</td>
<td>18.96</td>
<td>23.34</td>
<td>5.74</td>
<td>9.98</td>
</tr>
<tr>
<td>Not justified</td>
<td>8.70</td>
<td>4.64</td>
<td>21.86</td>
<td>17.04</td>
</tr>
<tr>
<td>SD</td>
<td>12.45</td>
<td>10.19</td>
<td>19.97</td>
<td>11.61</td>
</tr>
<tr>
<td><strong>Means</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural means</td>
<td>37.00</td>
<td>0.69</td>
<td>9.44</td>
<td>7.33</td>
</tr>
<tr>
<td>SD</td>
<td>8.70</td>
<td>2.84</td>
<td>14.43</td>
<td>7.21</td>
</tr>
<tr>
<td>Unconventional</td>
<td>4.41</td>
<td>2.73</td>
<td>15.41</td>
<td>5.80</td>
</tr>
<tr>
<td>SD</td>
<td>9.31</td>
<td>4.69</td>
<td>15.14</td>
<td>7.80</td>
</tr>
<tr>
<td>Handheld firearm</td>
<td>27.46</td>
<td>40.83</td>
<td>1.28</td>
<td>2.16</td>
</tr>
<tr>
<td>SD</td>
<td>20.04</td>
<td>18.41</td>
<td>3.03</td>
<td>4.46</td>
</tr>
<tr>
<td>Heavy weaponry</td>
<td>1.04</td>
<td>0.35</td>
<td>0.02</td>
<td>0.14</td>
</tr>
<tr>
<td>SD</td>
<td>1.93</td>
<td>1.18</td>
<td>0.16</td>
<td>0.54</td>
</tr>
<tr>
<td>Bombs</td>
<td>0.98</td>
<td>0.00</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>SD</td>
<td>0.30</td>
<td>0.00</td>
<td>0.16</td>
<td>0.00</td>
</tr>
<tr>
<td>Other</td>
<td>0.78</td>
<td>0.52</td>
<td>1.41</td>
<td>4.41</td>
</tr>
<tr>
<td>SD</td>
<td>3.48</td>
<td>2.38</td>
<td>4.93</td>
<td>7.03</td>
</tr>
<tr>
<td><strong>Consequences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No harm</td>
<td>6.65</td>
<td>6.85</td>
<td>4.13</td>
<td>5.97</td>
</tr>
<tr>
<td>SD</td>
<td>8.59</td>
<td>5.97</td>
<td>3.72</td>
<td>6.93</td>
</tr>
<tr>
<td>Mild harm</td>
<td>3.63</td>
<td>5.76</td>
<td>3.36</td>
<td>3.00</td>
</tr>
<tr>
<td>SD</td>
<td>4.87</td>
<td>5.03</td>
<td>4.40</td>
<td>3.41</td>
</tr>
<tr>
<td>Moderate harm</td>
<td>12.68</td>
<td>7.14</td>
<td>2.38</td>
<td>2.58</td>
</tr>
<tr>
<td>SD</td>
<td>13.23</td>
<td>10.29</td>
<td>3.03</td>
<td>4.27</td>
</tr>
<tr>
<td>Extreme harm</td>
<td>12.85</td>
<td>20.11</td>
<td>17.55</td>
<td>9.14</td>
</tr>
<tr>
<td>SD</td>
<td>8.29</td>
<td>9.43</td>
<td>15.22</td>
<td>9.00</td>
</tr>
</tbody>
</table>
across all four games. The content variables in the descriptive analysis were regressed upon several predictor variables: demographics, perceived realism, the factors of the Buss-Perry Aggression Questionnaire (physical aggression, verbal aggression, anger, and hostility), the factors of the Revised Eysenck Personality Questionnaire (extraversion, neuroticism, psychoticism, and social desirability), the factors of the Social Justice Questionnaire (empathy, vigilantism, and punitiveness), and telepresence tendency.

Across all four games, multiple regression produced statistically significant models for only three dependent variables: the number of unjust acts of violence, $F(17, 148) = 1.79, p < .05, R^2 = .19$; the number of violent acts involving handheld firearms, $F(17, 148) = 2.04, p < .02, R^2 = .21$; and the number of acts in which no harm to the victim was observed, $F(17, 148) = 2.06, p < .01, R^2 = .21$. For unjust violence, the individual regression coefficients for income, hostility, and psychoticism achieved significance. For gun violence, anger, empathy, and immersive tendencies were significant predictors. For the number of acts with no depicted harm, only psychoticism achieved significance. Significant models were not detected for the total number of violent acts committed, the number of justified acts, violence through natural means, violence through unconventional weapons, non-gun violence, heavy weapon use, the use of bombs, other weapons, and instances of mild, moderate, or extreme depicted harm (see Table 2).

Table 2  Significant Content Predictors across All Games

<table>
<thead>
<tr>
<th></th>
<th>Unjust acts</th>
<th>Gun use</th>
<th>No harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.084</td>
<td>-.043</td>
<td>-.080</td>
</tr>
<tr>
<td>Sex</td>
<td>-.104</td>
<td>-.106</td>
<td>-.105</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.127</td>
<td>-.182</td>
<td>.005</td>
</tr>
<tr>
<td>Income</td>
<td>.201*</td>
<td>-.088</td>
<td>.127</td>
</tr>
<tr>
<td>Perceived realism</td>
<td>-.003</td>
<td>-.049</td>
<td>-.023</td>
</tr>
<tr>
<td>Hostility</td>
<td>-.201*</td>
<td>.024</td>
<td>.187</td>
</tr>
<tr>
<td>Physical aggression</td>
<td>.070</td>
<td>.089</td>
<td>-.029</td>
</tr>
<tr>
<td>Verbal aggression</td>
<td>.084</td>
<td>-.043</td>
<td>.080</td>
</tr>
<tr>
<td>Anger</td>
<td>-.012</td>
<td>.270*</td>
<td>.153</td>
</tr>
<tr>
<td>Psychoticism</td>
<td>.196*</td>
<td>.027</td>
<td>.180*</td>
</tr>
<tr>
<td>Social desirability</td>
<td>-.032</td>
<td>.088</td>
<td>.055</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.129</td>
<td>-.064</td>
<td>.166</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.173</td>
<td>-.132</td>
<td>-.64</td>
</tr>
<tr>
<td>Vigilantism</td>
<td>.057</td>
<td>.054</td>
<td>.063</td>
</tr>
<tr>
<td>Punitiveness</td>
<td>-.120</td>
<td>.009</td>
<td>.002</td>
</tr>
<tr>
<td>Empathy</td>
<td>-.045</td>
<td>.220†</td>
<td>.131</td>
</tr>
<tr>
<td>Telepresence tendency</td>
<td>.077</td>
<td>-.160*</td>
<td>-.070</td>
</tr>
</tbody>
</table>

Standardized regression coefficients: * $p < .05$, † $p < .01$. 


Analyses by Game

While the global analyses indicate that telepresence tendency and personality differences may be minimally related to video game content, it is also the case that these relationships may vary across different video games. In order to explore the possibility that different user characteristics may predict different content across different games, the above regression analyses were repeated within subjects who played each of the four games. The results indicate that the key predictors of violent content outcomes may vary from game to game.

Rainbow 6

In order to examine the relationship between player attributes and content outcomes solely within those subjects playing Rainbow 6, the regression analyses were repeated for only these subjects. Two significant regression models were produced: for the number of acts featuring justified motives, $F(17, 38) = 1.91, p < .08, R^2 = .61$, and those interactions in which no harm to the intended victim is portrayed, $F(17, 38) = 3.03, p < .01, R^2 = .71$. For justified violence, the individual regression coefficients for physical aggression ($\beta = .79, t = 2.68, p < .01$) and empathy ($\beta = -.48, t = -2.40, p < .02$) achieved significance. For violent interactions featuring no harm to victims, coefficients for age ($\beta = -.41, t = -2.61, p < .01$), verbal aggressiveness ($\beta = .39, t = 1.94, p < .06$), and vigilantism ($\beta = .40, t = 1.97, p < .06$) were found to be significant.

SoCom: Navy Seals

For SoCom: Navy Seals, only one significant model was detected across the dependent variables in question. Notably, for this game, the critical variable concerning the total number of violent interactions over twenty minutes was related to personality and demographic predictors, $F(17, 38) = 1.87, p < .08, R^2 = .76$. Individual regression coefficients found significant included perceived realism ($\beta = -.36, t = -2.22, p < .03$), psychoticism ($\beta = -.64, t = -3.42, p < .002$), extroversion ($\beta = .62, t = 3.13, p < .005$), social desirability ($\beta = .59, t = 2.73, p < .01$), and empathy ($\beta = .37, t = 1.97, p < .06$).

Grand Theft Auto 3

Two significant models were detected for Grand Theft Auto 3: predicting the number of unjustified acts committed, $F(17, 34) = 2.20, p < .05, R^2 = .69$, and the number of violent interactions using natural means, $F(17, 34) = 2.93, p < .01, R^2 = .74$. For unjustified violence, the regression coefficient for trait hostility was found significant. Several significant coefficients emerged for the number of acts using natural violent means, including age, perceived realism, hostility, verbal aggressiveness, anger, extroversion, vigilantism, and immersive tendency (see Table 3).

Grand Theft Auto: Vice City

No regression models were found to be significant for Grand Theft Auto: Vice City. Demographics, perceived realism, physical aggression, verbal aggression, anger,
hostility, extroversion, neuroticism, psychoticism, social desirability, empathy, vigilantism, punitiveness, and telepresence tendency failed to predict any of the content outcomes under consideration when considered simultaneously.

**Discussion**

The goal of the current study was to examine the ways in which user attributes may be linked to video game content and in which this content may vary across different game players. The findings suggest relationships between user attributes and game content, but also suggest that understanding video game content may be a much more complicated task than previously thought. Not only does the frequency of violent interactions and particular contexts fluctuate, but these fluctuations vary across different games, and are sometimes predicted by different player attributes. Further, some of the findings concerning the link between user characteristics and generated content are rather counterintuitive, and suggest deeper consideration of the underlying psychological processes that may take place during game play. A discussion of these implications follows.

**Variability in Game Content**

Research question one asked about the extent to which game characteristics would vary across users. The descriptive analyses reveal that across multiple game players,

---

**Table 3** Significant Content Predictors for Grand Theft Auto 3

<table>
<thead>
<tr>
<th></th>
<th>Unjust acts</th>
<th>Natural means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.029</td>
<td>−.372*</td>
</tr>
<tr>
<td>Sex</td>
<td>−.118</td>
<td>.039</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.132</td>
<td>.145</td>
</tr>
<tr>
<td>Income</td>
<td>.470</td>
<td>.322</td>
</tr>
<tr>
<td>Perceived realism</td>
<td>−.101</td>
<td>.430†</td>
</tr>
<tr>
<td>Hostility</td>
<td>.520†</td>
<td>−.370</td>
</tr>
<tr>
<td>Physical aggression</td>
<td>.390</td>
<td>.279</td>
</tr>
<tr>
<td>Verbal aggression</td>
<td>.132</td>
<td>.470†</td>
</tr>
<tr>
<td>Anger</td>
<td>−.310</td>
<td>.510†</td>
</tr>
<tr>
<td>Psychoticism</td>
<td>.199</td>
<td>.598</td>
</tr>
<tr>
<td>Social desirability</td>
<td>.098</td>
<td>.227</td>
</tr>
<tr>
<td>Extroversion</td>
<td>.198</td>
<td>.380*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.112</td>
<td>.124</td>
</tr>
<tr>
<td>Vigilantism</td>
<td>.233</td>
<td>−.500†</td>
</tr>
<tr>
<td>Punitiveness</td>
<td>−.561</td>
<td>−.100</td>
</tr>
<tr>
<td>Empathy</td>
<td>.237</td>
<td>−.96</td>
</tr>
<tr>
<td>Telepresence tendency</td>
<td>−.072</td>
<td>−.430*</td>
</tr>
</tbody>
</table>

Standardized regression coefficients: *p < .05, †p < .01, ‡p < .06.
the content characteristics of a single game may be substantially different in terms of both the total number of violent acts depicted and the contexts in which these acts take place. The standard deviations associated with the means for various outcomes suggest a wide range of content generated by different users. For example, the range of scores for total number of violent acts depicted in Grand Theft Auto 3 ran from 0.00 to 108.00, with a mean score of 27.00 and a standard deviation of 24.87.

This variability raises two critical points in our understanding of game content. First, it verifies the suggestion that game content may be highly variable. Second, it calls into question the way game content is conceptualized. While previous content analyses have attempted to create a “snapshot” of violent attributes in any one game by analyzing content generated on one occasion by a single game player, perhaps there is a different approach that may present a truer representation of game content. This approach may involve thinking about content as a dependent variable, determined in part by user characteristics, presence, game play experience, etc. As a continuous dependent variable, perhaps a useful conceptualization of game content is one grounded more in behavioral research than in traditional content analyses. Instead of treating game content as a static variable, researchers may treat game content characteristics as estimates of true scores in a population of content experiences. In this conceptualization, traditional inferential statistical approaches utilizing means and standard deviations may present a picture of game content that is more representative of gaming experiences in the aggregate. Not only would measures of central tendency provide a better estimate of the frequency of game content elements, but comparisons between games, game systems, game genres, and games rated for different audiences could then be made using conventional inferential procedures involving mean comparisons (t-tests, ANOVA, etc.).

Variability Based on Presence

Research question two asked what impact telepresence tendencies would have on variability in game content from player to player. The results are somewhat surprising in a way that raises further questions about the psychological processes taking place during game play.

For the most part, presence tendencies were not strongly related to content generated by different game players. However, in the instances in which presence tendencies were a factor, they negatively predicted the frequency of certain types of aggressive exchanges. Across all four games, immersive tendencies negatively predicted the number of unjust acts of violence that were committed, while within Grand Theft Auto 3, they negatively predicted the frequency of violence committed through natural means. While these results may appear counterintuitive, further consideration of these relationships raises issues about the role of presence in aggressive interactive behavior.

Anecdotally, the authors and research assistants noticed that those who were “good” at playing the games went through the required game play tasks in a very clinical way. Game players that were uncomfortable with the controls, inexperienced
with video games, and generally apprehensive about playing were more likely to “shoot at anything that moves,” while those that seemed adept at the games focused their aggressive efforts on a series of tasks critical to success in the game. Those who adapt well to interactive environments may adopt a more task-oriented approach to game play, in which violence is used as a means to an end and random violence is less common. This would explain the negative predictive power of telepresence on unjust violence across all four games, as those experiencing immersion in the game environment would be less likely to aggress for non-normative reasons. This would also explain the negative relationship with violence through natural means in *Grand Theft Auto 3*. In this particular game, players must make a great effort to punch or kick another character because much of the task-oriented aggression is committed using weapons. Again, this commentary is purely speculative, and further empirical research should explore the role of presence in predicting aggressive outcomes within game play and the underlying processes that may lead to this type of content.

*Variability Based on Personality Differences*

Research question three asked what impact the personality characteristics of game users would have on the amount of aggression displayed and frequency of violence created, both across all four games in the study and within individual games. While the results generally indicate that personality characteristics may be occasionally related to different content outcomes, the link between personality and content varies across different games in terms of the related content outcomes, the types of personality characteristics associated with these outcomes, and even the direction of the relationship between personality and content. This creates a complicated scenario in which personality attributes are important only for some games and some types of content, and may vary in their impact from game to game. While this is only a preliminary study examining a small number of games, it gives us cause for concern regarding conventional notions of the relationship between game play and aggression. If the findings of this study can be replicated across a larger number of games, there may be evidence that previous conceptualizations of game content may not be adequate, and that conventional understandings of the relationship between game play and aggression might be incomplete.

For instance, let us consider the role of psychoticism, long considered to be a personality variable closely related to aggressive behavior. Intuitively, one would think that those higher in psychoticism would generate more aggressive content. Across all four games, psychoticism positively predicts the incidence of unjust violence and violence with no visible damage to the victim. However, within *SoCom: Navy Seals*, psychoticism negatively predicts the total number of violent interactions that take place. Perhaps there is something about the game itself that explains this relationship. Though a first-person shooter game, *SoCom: Navy Seals* is one in which the game play requires gamers to use stealth when attacking their enemies; revealing oneself to the enemy usually results in death. Given that psychotics tend to lean toward action tendencies that may go against social mores (such as fair fighting),
the stealth aspect of the game may be especially appealing to psychotics. They may become adept at being silent killers, leading to a reduction in the total number of violent acts committed (both by themselves and by others in retaliation). This is one example where a highly specific aspect of game play—in this case, the type of aggression that may be advantageous given the game parameters—may interact with personality to produce a specific outcome concerning one content characteristic. In a broader sense, there may be an interaction between a particular game player attribute and the parameters of the game itself that elicits a particular decision making process. This decision making process may then affect not only the content of the game, but also the type and degree of hostile response that might be enacted by the game player if subsequently provoked in real life.

Another example concerns the impact of trait hostility. While one might expect hostility to be positively related to various aggressive acts, it is negatively related to the frequency of unjustified violence across all four games, and to violence committed through natural means in *Grand Theft Auto 3*. It may be the case that those who are high in hostility may be prone to express aggressive responses when provoked; this would again limit aggressive responses to those directed at characters that present some type of threat, thus classified as justified. As previously mentioned, aggression through natural means in *Grand Theft Auto 3* requires the game player to go out of his or her way to interact with another character. Those who respond in a hostile manner to provocation may be less inclined to engage in aggression when it involves a character that may not already be actively engaging the game player.

Other examples can be seen throughout the results of instances in which personality attributes and their predictive power vary in terms of both the content outcomes and directionality. Empathy positively predicts gun violence across all four games and the total number of violent acts in *SoCom: Navy Seals*, while it negatively predicts justified violence in *Rainbow 6*. Anger and verbal aggression frequently predict aggression outcomes, but physical aggressiveness only predicts justified violence in *Rainbow 6*. Essentially, this cursory examination of the relationship between game player personality and content outcomes suggests that different games may have distinctive characteristics that engender different personality-based responses across individual game players.

**Conclusions**

Taken together, the findings call into question conventional understandings of game content. While previous “snapshot” approaches have attempted to quantify game content in the descriptive figures commonly used to describe television and movies, this approach to examining video game content may require reexamination. The current study, while only looking at 160 game players across four games, offers the following suggestions.

First, game content is highly variable from user to user. The fluctuation in content scores alone, regardless of the factors that predict them, suggest that we may have to
revisit our conceptualizations of game content. An approach that treats game content as an estimation of scores in a population may be the best way of doing this.

Second, experienced presence may sometimes play a role in violent content. Telepresence tendencies were, on several occasions, negatively associated with various violent content outcomes. This suggests the need for further research addressing the role of presence in habituation to video games, task-oriented virtual aggression, and perhaps even our central concerns as we evaluate video game content. Who are we more concerned about, the game player who doesn’t adapt well to the environment and experiences a hundred acts of violence, or the game player that adapts so well that he or she can use violence well to accomplish tasks, thus experiencing only a handful of aggressive interactions?

Finally, the relationship between personality and content is one that will require a great deal of disentanglement. The link between innate characteristics and specific content outcomes is almost entirely inconsistent across this very small sample of games. Across three games, the personality characteristics that are related to aggressive content, the types of aggressive content they are related to, and the direction of these relationships are entirely different. Analysis of one game (Grand Theft Auto: Vice City) revealed no relationship between these player characteristics and the frequency of violent content. It may be the case that the links between player personality and interactive content are almost entirely a product of the specific conditions, parameters, and rules of each individual game.

If this is the case, prior understandings of behavioral outcomes associated with aggressive game play may also be seriously limited. While there is a substantive body of experimental research suggesting a link between game play and aggressive attitudes and behaviors, the underlying logic in much of this research has (much like previous content research) been grounded in assumptions derived from fifty years of research on the relationship between television and aggression. Simple multiple groups comparisons, producing conclusions such as “more violent games elicit more aggressive responses,” may be incomplete explanations without consideration of game player attributes, experienced presence, and subsequent fluctuations in game content. It should be cautioned that this is only one study, and one that does not examine a large number of games or game players. However, the value of the current results may be in the questions that are raised and suggested directions for future research. Video game researchers should at least consider the findings in light of the conceptual questions that are raised concerning the role of game player attributes in interactive environments, the role of presence in interactive decision making, fluctuation in content from player to player, and the ultimate implications that all of these factors may have for our understanding of the relationship between game play and aggression.

Note

[1] The observant reader will notice that traditional intercoder reliability statistics were not used in the coder training procedures. This decision was made due to the fact that as count variables, the data are continuous. More typical intercoder reliability statistics, such as Cohen’s
kappa and Scott’s pi, are intended for evaluating exact agreement between coders on categorical data (see Cohen, 1960; Krippendorf, 1980). Given the continuous nature of the data, the current study used Cronbach’s alpha to assess intercoder reliability, treating each of the coders as a separate indicator of the same variable and evaluating their consistency.

References


Copyright of Communication Quarterly is the property of Eastern Communication Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder’s express written permission. However, users may print, download, or email articles for individual use.