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Master's Thesis

Since the inception of a computerized table tennis game called *Pong* in 1972, the near four-decade history of interactive computer games (ICG)¹ has been marked by rapid growth (Colwell & Payne, 2000) in both technological capability and consumer adoption.

Dill and Dill (1998, p. 408) indicate that Nintendo posted an astounding average sales rate of “three games every second of the 12 years from 1983 to 1995.” A recent industry report by the Interactive Digital Software Association (IDSA) reported annual sales of video and computer games for the year 2000 at \$6.02 billion (State of the Industry Report, 2000-2001). The same study also reveals that 60% of all Americans, a total of about 145 million people, play ICG on a regular basis. The proliferation of internet-based games as well as the introduction of new higher-powered home video game consoles (i.e. Sony’s Playstation 2, Microsoft’s X-box, & Nintendo’s Game Cube) will undoubtedly aid in further expansion of ICG use.

Recent trends not only indicate growth in interactive computer game use on the whole, but also reveal a notable increase in the adult audience for ICG. Pastore (1999) summarized results from a recent Yankee Group survey that indicates that adults are the primary video game user in 40% of video game households (i.e., households that own a video game console) and that adults who play video games spend an average of 3 hours and 17 minutes playing video games each week. The same study also found that video game households spend an average of more than \$200 annually on video games.

Interestingly, these numbers are based only on those households owning video game consoles, which excludes on-line game players, a growing context for adult playing of ICG.

The rise of ICG as a widely used mass medium has fueled concerns about possible effects. The relatively high amounts of widespread types of violence in video game content raises many concerns over effects on aggression among video game users (Dominick, 1984; Scott, 1995; Sherry, 2001b). Studies have also focused on the effects of playing video games on several important factors highly relevant in interpersonal interaction including self-esteem (Colwell & Payne, 2001) and friendship/companionship preferences (Colwell & Payne, 2001; Selnow, 1984). As ICG use continues to grow among adults in the population, scrutiny of the possible social and psychological effects has become a new context of media effects research.

While research on mass media effects provides critical points of interest for media scholars, explicating the process *how* media effects occur should be the ultimate goal of the researcher (Perse, 2001). Perse (2001, p. 1) summarizes “most current research attempts to improve our understanding of media effects by refining our theoretical explanations of the processes by which media effects occur.” Media research has consistently demonstrated that individuals’ use media in different ways and that media have varying influences on different individuals (Perse, 2001). Thus, any attempt to deduce an accurate pattern of media effects must include the consideration of individual differences (psychological, motivational, and sociological) as well as variations in media content.

Though individual variations in psychological, motivational, and sociological factors such as disposition, need for arousal, and socioeconomic status are critical to the study of media effects, simply gathering as much individual data as possible and testing for effects does not suffice as an exercise in scientific inquiry. The notion of an effect by

definition includes the concept of cause (i.e., cause-effect relationship). The cause-effect relationship is predicated on a time-order sequence (Pavitt, 2000). In other words, for an individual factor to influence effects of playing ICG, the individual factor must precede the experience of playing ICG.

While the time-order sequence of cause-effect may seem overtly logical, it sets up the foundation for the causal reasoning that underlies most media effects inquiry. Sherry (2001a) points out that much of the previous uses and gratifications research has focused heavily on creating motivation typologies that describe the relationship between individual motivations and patterns of media use while overlooking the etiological issue of where motives originate. Lack of attention to the psychological origins of motivation excludes key predictive components in the cause-effect sequence of media effects research and also defies the deductive process that is central to all social scientific inquiry. That is, by only examining the relationship between motivation and media use, one overlooks the question of how individual motivations are established.

The goal of the current study proposal is to answer the question: Why do people play ICG? Therefore, inquiry into potential effects of ICG will not be the aim of the current study. Rather, the objective is to examine the psychological origins of the reasons why individuals play video games in order to explicate patterns of ICG use. A better understanding of the various ways in which individuals play ICG will allow future researchers an opportunity to link various effects with certain patterns of use.

ICG as Mass Communication

A paramount consideration in the current study is clearly stating how it is that ICG fit into the study of mass communication. In posing an ample explanation to this

end, a definition of mass communication is the proper starting point. Although there are many different attempts to define mass communication, McQuail (2000) cites an earlier definition by Janowitz (1968) that encompasses the key components of mass communication. Janowitz (1968, cited in McQuail 2000, p. 13) articulates that “mass communications comprise the institutions and techniques by which specialized groups employ technological devices (press, radio, films, etc.) to disseminate symbolic content to large, heterogeneous and widely dispersed audiences.” McQuail (2000, pp. 13-14) further expounds on the use of the word communication in definitions of mass communication, stating that “In this, and similar definitions, the word ‘communication’ is really ‘transmission’, as viewed by the sender, rather than in the fuller meaning of the word, which includes the notions of response, sharing, and interaction.”

Several key points emerge from the definition by Janowitz (1968) and analysis by McQuail (2000). First, there is the emphasis on the existence of “institutions” which employ “techniques and technological devices” to disseminate symbolic content. The video game industry consists of large-scale producers that create and disseminate symbolic content in the form of software that is displayed via various technological devices (i.e., computers or game consoles). Second, the symbolic content must be delivered to a “large, heterogeneous, and widely dispersed audience.” Indeed, ICG content (in the form of software and on-line domains) is made available to a widespread and heterogeneous audience. This is imperative, as it does not suffice that ICG are simply displayed via technological devices. There are plenty of examples of transmission of information via traditional “mass media” technologies (i.e., personal e-mails, homemade videos, etc.). So indeed, use of “mass media-like” technology does not

suffice as grounds for inclusion in the domain of mass communication. Therefore, it is imperative to recognize the mass dissemination of ICG as a key distinguishing factor warranting the inclusion of ICG in the study of mass communication.

Another important distinction can be made that attends to concerns about how to distinguish regular games (i.e., board games, etc.) from ICG. In other words why study one and not the other? The scenario is analogous to the question of why mass communication researchers study television and movies, but do not study plays. There are several factors distinguishing ICG/movies versus board games/plays. First, there is the issue of asynchrony. When engaging in ICG/movies, individuals can engage in considerable time shifting and are free to control when to engage in ICG/movies. In the context of board games and plays, the events unfold in a live scenario, and individuals are exposed to synchronous communication. Second, the experience of ICG/movies is repeatable whereas playing board games and seeing plays represent unique experiences. Finally, time and space limitations evaporate in the context of ICG/movies, where such communications can occur in wide variety of times and spaces. Board Games/plays are limited to particular times and places.

An additional element that links the study of ICG closely with studies of other mass media is the convergence of content among various media. That is, it is often that case that many of the popular ICG titles feature content from feature films (i.e., *Tomb Raider*, *Star Wars*) and television sitcoms (i.e., *The Simpsons*). Interestingly, this convergence is not unidirectional, as feature films are developed from ICG content (i.e., *Tomb Raider*) and vice versa (i.e., the case of *Star Wars*) Of course, much of this content is also featured in large-scale advertising campaigns. Thus, in many cases ICG games

comprise just another arm of a large corporation disseminating symbolic content to a widespread audience.

Further evidence of the convergence between ICG and other more “traditional” mass media comes from the emergence of the cable television network called *G4-TV*. *G4-TV* features 24-hour-a-day programming devoted to covering the world of ICG, including new releases, trends, and innovations in the ICG community. One example of a *G4-TV* program that was strikingly similar to other television is a program that mirrored the popular “rank” or “top-ten” format found on cable networks such as *E!* or *MTV*. Instead of ranking the top-ten best dressed Hollywood Stars, the *G4-TV* program rated the top-ten best-dressed ICG characters. This type of overlap is becoming more common as ICG have become a mainstream form of entertainment for young adults.

Also important to the discussion of ICG relevance in the field of mass communication is the history of the study of video game studies in mass communication journals. Mass communication scholars have been particularly interested in the effects of video game violence, as well as other social consequences. Studies on video games have been published in various communication journals, including the Journal of Communication (i.e. Dominick, 1984; Funk & Buchman, 1996; Selnow, 1984) Human Communication Research (i.e. Sherry, 2001b;), and Communication Research (Kubey & Larson, 1990).

Finally, there is evidence that ICG play may displace other more traditional mass communication activities such as television and movies. A recent survey by the Interactive Digital Software Association (2001) found that 35.5% of 1,600 households surveyed chose video/computer games as the most fun entertainment activity, while

television (18.2%), going out to movies (11.1%), and renting movies (6.5%) were each less frequently rated as the most fun entertainment activity. A recent *Newsweek* article highlighted the emergence of the multi-player online ICG genre as “one of the biggest new trends in home entertainment” (Croal, 2002, p. 45). 20-year-old ICG player Paul Kim was quoted as saying “I would play Warcraft III [a popular on-line strategy ICG] over watching TV any night.” (Croal, 2002, p. 48). This echoes the sentiment that as the number of adults who grew up playing ICG continues to rise, there will be a corresponding increase in the proportion of individuals who seek out ICG for entertainment rather than “traditional” media (i.e., TV, Film, Radio). The possibility that ICG displaces other mass communication activities raises the notion that mass communication scholars should shift more attention to this emerging medium.

Theoretical Orientation

The proposed study merges the theoretic constructs of the uses and gratifications approach and several psychological theories to explore the motivations and specific use patterns for playing video games. The coalescence of the uses and gratifications approach with several psychological approaches and the existing ICG research allows for the formation of specific theory-based hypotheses. I have developed a survey method to gather data on several important predispositions and the relation of these variables to ICG use.

Uses and Gratifications

The essence of the uses-and-gratifications approach is best explicated by seven steps outlined by Katz, Blumler, and Gurevitch (1974). “They [uses-and-gratifications researchers] are concerned with (1) the social and psychological origins of (2) needs,

which generate (3) expectations of (4) the mass media or other sources, which lead to (5) differential patterns of media exposure (or engagement in other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones” (Katz et al., 1974, p. 20).

Unfortunately, this “ideal” conception of the uses-and-gratifications perspective is often not met. Particularly, Conway and Rubin (1991, p. 443) point out that uses-and-gratifications research is often criticized for its inability to “link media gratifications and their social and psychological origins.” Finn (1997, pp. 507-508) concurs, stating that “only a handful of empirical studies have taken up the broader challenge of mapping out what Katz et al. (1974, p. 20) originally described as ‘social and psychological origins . . . which lead to differential patterns of media exposure.’” This has resulted in the labeling of uses and gratifications approach as non-theoretical. Sherry (2001a, p. 276) contends that “this conclusion is more due to extant research than any deficit in the potential explanatory power of the model.” He goes on to purport that “the explanatory potential of the [uses and gratifications] model requires embracing the question of the etiology of media use motivations” (Sherry 2001, p. 276). There is an emerging body of research on media use (Conway & Rubin, 1991; Finn, 1997; Henning & Vorderer, 2001; Sherry, 2001a; Weaver, 1991) that has demonstrated the effectiveness of emphasizing pre-existing psychological factors as predictors of media behavior. This type of research lays the foundation for the current approach.

Audience Activity

A key component that facilitates the incorporation of the uses-and-gratifications approach in the study of ICG use is the concept of audience activity. A fundamental

assumption of uses-and-gratifications underlined by McQuail, Blumler, and Brown (1972) and stated by Katz et al. (1974, p.21) is that “the audience is conceived of as active, that is, an important part of mass media use is assumed to be goal directed.” Clearly, the selection of a particular ICG and the act of playing that ICG constitutes a much greater potential for audience activity than in more traditional media (e.g., television and radio). This factor enhances that relevance of the uses and gratifications perspective to the world of ICG playing.

ICG Users

One key element that is consistent across much of the existing literature on effects of ICG use is the emphasis on children and adolescents. Sherry (2001) cites that ICG are in roughly 80% of homes with boys ages 8-16 (Battelle & Johnstone, 1993) and that survey research estimates that 88% of adolescent boys and 64% of adolescent girls play ICG at least one hour per week (Funk, 1993).

While the attention to adolescents is clearly warranted, emphasis on only adolescents excludes an ever-growing generation of young adults who grew up playing Nintendo (and/or other similar ICG systems) in the 1980s and early 1990s. This age cohort appears to be just as enthusiastic about what the new video game technologies have to offer. When comparing personal computer games and home console games, the Interactive Digital Software Association (IDSA) found that 72% of computer game players and 58% percent of home console game players are 18 years of age or older (Interactive Digital Software Association, 2001). Perhaps more surprising are the results from Hart Research associates indicating that 32% of computer and video game players are 35 and older and 13% are age 50 or older (Interactive Digital Software Association,

2001). The same study also found that 43% of game players are women, whose average age is 29. So, this study will focus on a sample of college undergraduates who meet the age criterion for the growing number of adult ICG players.

Salient Components

The previous paragraphs have implicated various shortcomings in prior uses and gratifications research and have also pointed out some of the ways to mitigate such shortcomings in the future. Attention to the suggestions of the aforementioned communication scholars as well as consideration of the process of playing ICG has led to the emergence of four salient components: predisposition, motivations, content of ICG, and context of ICG play. Discussion turns to these components.

Predisposition

The use of the term predisposition is employed to embody the psychological antecedents that precede behavior, specifically ICG use. The denotative definition of predisposition is a “previous inclination or tendency” (World Book Dictionary, 1983, p. 1642). A better understanding of how the term predisposition will be used in the current context is aided by considering the definition of the root word disposition. Disposition is defined in the World Book Dictionary (1983, p. 607) as “one’s natural way of acting toward others or of thinking about things” and “[disposition] applies to the controlling mental or emotional quality that determines a person’s natural or usual way of thinking and acting.” Thus, predisposition is conceptually defined here as an individual’s previous inclination or tendency to think and act.

The conceptual definition of predisposition is set up to establish a clear delineation of what is meant by “psychological antecedents” to behavior. However, this

clearly encompasses a broad range of psychological constructs, much too broad to cover in one study. In fact, the notion of an individual's overall predisposition is synonymous with concepts such as temperament and personality, which are the subject of volumes of research and discussion spanning over three-quarters of the twentieth century (such as the many works of H. J. Eysenck and S. B. Eysenck on personality). Therefore, the current study proposes to employ several specific predispositions that fall under the large umbrella of the general term predisposition.

The specific predispositions chosen for the current study proposal will be discussed in detail with theoretical rationale in later sections. However, it is important here to distinguish conceptually between predispositional states and traits.

Predispositional states or moods are relatively more fluent or changing than traits.

Factors such as being irritable, upset, or bored are all examples of psychological states that could influence ICG use. Zillmann and Bryant's (1985) work on mood management is an example of a body of research that examines the influence of mood on media use. However, mood appears to be only influential in the short-term in specific instances of mood-media use interaction. Predispositional traits, on the other hand, which include constructs such as extraversion and sensation seeking, all imply relatively more rigid characteristics that are not susceptible to rapid change over the life span. While there is certainly interaction between traits and states in determining an individual's behavior, the proposed study will employ predispositional traits, rather than states, as traits appear to hold the best potential in explicating long-term patterns of ICG use.

Support for the emphasis on psychological traits can be found in McGuire's (1974) compelling argument for the salient impact of psychological motives and

communication gratification. McGuire (1974) purports that initial media consumption might be more influenced by external circumstances (e.g., one's work schedule, media access) than by personal motivations. However, McGuire (1974) points out that attention should be given to continued exposure rather than initial exposure. His reasoning is based on the notion of social learning theory (Bandura, 1977) that continued exposure by definition must be reinforced. Why people engage in continued exposure to certain media content (i.e., the sources of reinforcement) becomes the central focus. McGuire (1974, p. 170) summarizes his position, stating that "subsequent discussion of the motivational aspects of communication consumption focuses more on what maintains continued exposure to certain kinds of material rather than on what precipitates initial exposure." Examining relatively stable predispositions, rather than states or moods, provides a more logical vehicle to examine continued use of ICG.

Motivations

The proposed study will capitalize on the insight laid out by past critics and scholars and aim to explicate specific predispositions and the relation of these variables to various motives of ICG use. Motivations cited in ICG literature include arousal (i.e., because it's thrilling, Perse, 2000), entertainment (i.e., because it entertains me, Perse, 2000), mastery (i.e., because I like to win, Morlock, Yando, & Nigolean, 1985; Perse, 2000), social utility (i.e., because it's something to do with friends, Colwell & Payne, 2000; Selnow, 1984, Perse, 2000), escape/solitude (i.e., so I can forget about school, work, or other things, Colwell & Payne, 2000; Selnow, 1984) relaxation (i.e., because it relaxes me, Perse, 2000), and learning (i.e., because it helps me learn things about myself and others, Perse, 2000; Selnow, 1984)². The current study will also add passing time as a

motivation as media use has traditionally played a large role in providing a way for individuals to fill time in a non-specifically directed way (i.e., just because there's nothing better to do). By comparing participant's predispositions (based on various personality scales) with reasons reported for playing ICG, the study will provide the important link between predispositions and motivations for use.

Content

The connection between predispositions and motivations is not the only theoretically salient dimension that exists in the study of video game use. It is also imperative to take inquiry a step further by not only soliciting responses of various motives for playing games but also gathering data on the types of games that are selected in accord with certain predispositions. There is great interest in uncovering a correlation between predispositions and various patterns of ICG use. There is a wide variety in the types of games offered in the world of ICG. Therefore, it is necessary to distinguish between the different genres of games. Whether an individual prefers playing a violent action game or an auto racing game will be important information in any attempt to piece together a meaningful correlation between predispositions and ICG playing behavior. Previous research (i.e., Perse, 2000) utilizes category schemes based on genre to identify various types of video games (i.e. fantasy, action-adventure, shooting).

The current study utilizes a 10-category genre scheme based on widely accepted ICG industry distinctions and specifically drawn from genres indicated on a *Yahoo!* Web site (http://dir.yahoo.com/Recreation/Games/Computer_Games/Genres/). Each of these categories will be listed and briefly defined.

Fighting ICG feature one-on-one conflict between two combatants. The object of the game is to defeat one's opponent utilizing an array of violent methods. *First-person shooter* ICG are characterized by an on-screen display aimed at simulating first-person participation in a series of battles with various opponents. Players do not control an avatar on the screen (i.e., third-person control), but rather navigate through the game using certain cues (i.e., a gun extended from the bottom of the screen) poised to create a player-as-participant scenario, erasing the distinction between avatar and ICG player. A high level of violence is synonymous with the first-person shooter genre.

Adventure ICG involve maneuvering an on-screen avatar through a series of levels with the purpose of achieving various micro-goals along the way while moving towards a final macro-goal. While some adventure ICG invoke a first-person display, the tendency for a majority of adventure games is to utilize a third-person display with on-screen avatar. Also, while violence is not absent from adventure ICG, there is considerably less overt violence in adventure ICG than in fighting and first person shooters. *Role-Playing* ICG often resemble the on-screen display of adventure games, however, there is an important distinction. In the role-playing genre, gamers achieve tasks in more abstract ways. That is, rather than manipulating an on-screen avatar through various levels, players instead act as more of a decision-maker, coordinating plans of action for the avatar to deal with obstacles, and then observing how decisions ultimately play out. Thus, a premium is placed more on mental faculties than on manual dexterity.

Sports simulation games mimic the action of various sports (football, baseball, basketball, hockey, etc.), allowing gamers to play different "virtual" sports. The most

popular games in this genre are licensed to feature on-screen avatars of the most popular sports figures in a given sport. Recently, sports games such as *John Madden Football 2002* have expanded user features to not only include the ability to participate “virtually” play a certain sport, but also to assume managerial duties of a sports franchise, conducting “off-the-field” activities such as drafting rookies, signing free-agents, and trading players. *Driving/Flying*³ games offer users the ability to control different vehicles/aircraft through a number of different scenarios. There are numerous different objectives included in such games, from racing (i.e., *Gran Turismo 3*) to eluding police officers in a high-speed chase (i.e., *Need for Speed 3*).

Simulation games give players a chance to act as a master-planner of a project/business. Gamers assume various managerial roles in designing, maintaining, and improving an entity in a given context. For example, in the popular simulation *Roller Coaster Tycoon*, players build and maintain a theme park, with the goal of generating a profit. A few of the major tasks include building rides, hiring staff, maintaining rides, setting ride fees, and upgrading rides/facilities when necessary, etc. *Strategy* ICG are rather similar to simulation in game play, separated mainly by the types of goals presented in each. *Strategy* games emphasize missions of conquest and control over vast resources (as is evidenced by the popular strategy game *Command & Conquer*), while *simulation* games stick to more benevolent themes.

The *Classic* genre includes games familiar to most via Microsoft Windows. Examples include solitaire, hearts, and although not featured in Microsoft Windows, chess (usually played on-line). *Classic* games have origins that precede the days of ICG, but have been adapted to an electronic format. *Puzzle* ICG challenge players to solve a

puzzle in electronic form. This genre has spawned original, made-for-electronic-format games including Tetris and minesweeper.

Context

Information on the content of ICG will be important to any study evaluating the use of ICG, however, the context in which ICG are played must not be overlooked. In fact, context may actually offer more important distinctions between ICG use patterns than content. For example, imagine an individual who plays *Soldier of Fortune* (a popular first-person shooter) alone for two hours a day versus computer-controlled opponents. Then imagine another individual who plays the same game for two hours a day, but competes against three other friends who come to his/her dorm room every night (instead of studying). There are some potentially meaningful differences between the two situations, despite the fact that the two individuals are playing the same game for the same amount of time. It appears that playing the game is a much more social event for the second individual than for the first. Thus, while for the solitary player, the ICG may be perpetuating isolation and curbing potential for social interaction, the second individual is using the same activity as a vehicle to stimulate social interaction. Consider a third context where an individual competes against human opponents, but online rather than in person, and it becomes quickly apparent that context must be taken into account as a differentiating factor in patterns of ICG use.

Other Factors

Several other important contributing factors to ICG use are demographic variables and the amount of time spent playing. The current study's use of a college sample produced a relatively homogeneous sample, and thus less attention was afforded to

controlling for demographic variables. As discussed, the amount of time spent playing ICG alone is clearly not a viable indicator of ICG use. However, it is viewed as a necessary rather than sufficient characteristic in explicating patterns of ICG use.

Study Structure

Each salient component has been discussed, but one must return again to the big picture of how the components relate. Specifically, (1) demographic data (i.e. gender, age, etc.) and (2) individual psychological predispositions will be analyzed in conjunction with (3) amount of time spent playing ICG, (4) motivations for playing, (5) context in which games are played (6) types of video games played. The following paragraphs will present various testable hypotheses based on these components.

Predispositions

Each of the following predispositions have been selected based on several characteristics. First, each is a psychological dimension (trait) that can be measured along a continuum. This allows all respondents to fit in along the various continua (i.e. the study will not focus only on individuals who rate “high” on a psychological dimension). Second, and perhaps more important, the chosen predispositions are judged to be theoretically salient to the study of ICG use. Certainly the proposed study does not contain an exhaustive collection of salient predispositions, however, the following are considered to hold potentially high explanatory value.

Sensation-Seeking

A psychological concept that is most fitting to the notion of audience activity and ICG play is sensation seeking. Zuckerman (1979, p. 10) states that “sensation seeking is a trait defined by the need for varied, novel and complex sensations and experiences and

the willingness to take physical and social risks for the sake of such experience.” More succinctly, Kremer and Greene (1999, p. 27) summarize the construct by stating that “Sensation-seeking, both theoretically and empirically, is related to individuals’ need for stimulation.” Sensation-seeking individuals are those who have a higher need for stimulation and exhibit a tendency to seek highly arousing activities. Indeed, the need for stimulation and heightened arousal are key factors highlighting the sensation-seeking concept. Previous uses-and-gratifications research has been somewhat unclear on how sensation seekers utilize more traditional media such as television. Conway and Rubin (1991) found that sensation seeking was positively correlated with using television to escape or pass time. However, Kremer and Greene (1999) point out that this finding only holds true for one (disinhibition) of the four components of sensation seeking. Moreover, a logical proposition is that individuals high in sensation seeking would rather have first-hand experience of arousing activity rather than experience it in mediated form. Yet, the thrust of this proposition rests on research that has almost exclusively looked at television use and sensation seeking.

The fact that little research has been conducted to examine the relationship of the sensation seeking and ICG play raises some interesting concerns. Dominick (1984) argues that while television is essentially a passive activity, playing video games is a highly active endeavor, requiring intense concentration and physical activity. Clearly, few would argue that watching television involves that same constant level of attention and concentration that is needed to participate in an ICG. With this being the case, it appears that in the case of mediated experience, ICG provide the most opportunity to engage in highly active behavior.

The current knowledge on sensation seeking promotes the emergence of several hypotheses. First, sensation-seekers' penchant for high levels arousal indicates that arousal may be a key motivational factor for sensation-seekers. Thus:

H1: Sensation-seeking will be positively related to arousal motivation for playing ICG.

The motivation for sensation-seekers to increase arousal while playing ICG prompts a need for arousal-producing content. A defining characteristic of the sensation-seeking trait is the dimension of thrill and adventure seeking (TAS). Therefore, it is plausible that sensation-seekers will prefer specific genres of ICG that meet the arousal-producing criterion. The following research question addresses this issue:

RQ1: Will sensation seeking be positively related to playing certain genres of ICG?

Conway and Rubin's (1991) finding that television was used by sensation-seekers to escape or pass time insinuates that mass media may be a way for high sensation-seekers to fill time when they are unable to participate first-hand in exhilarating activities. Thus, Hypothesis 2 predicts that

H2: Sensation Seeking will be positively related to pass time motivation for playing ICG.

The fact that sensation-seekers probably prefer first-hand experience of exhilarating activities rather than vicarious experience through ICG implies that:

H3: Sensation Seeking will be inversely related to the amount of time spent playing ICG.

Aggressivity

Aggression has been used to describe a number of related phenomena. The most prevalent use is to describe behavior, although, the term is sometimes used to refer to an attitude. For example, Webster's New Collegiate Dictionary (1975, p. 22) defines aggression as "hostile, injurious, or destructive behavior or outlook." This definition refers to both overt behavior and a general outlook or attitude. Further confusion arises when *aggressiveness*, *aggressive behavior*, and *aggressive tendencies* are substituted interchangeably to describe behavioral, attitudinal, and predispositional aspects of aggression. In order to alleviate this confusion, the current proposal will employ the term *aggressivity*. The denotative definition of *aggressivity* is "the quality or condition of being aggressive" (World Book Dictionary, 1983). Bech and Mak (1995 p. 26, citing Spielberg et. al, 1980, 1985) state that "aggression can be measured in trait versus states." The term *aggressivity* will be used in the current context to refer to the predispositional trait of aggression.

The relationship between aggression and ICG is far and away the most scrutinized topic when it comes to social scientific research on ICG. This should not come as a surprise, considering the fact that in the early 1980s, then Surgeon General C. Everett Koop warned "that the [video] games could encourage children to mimic the violence on the screen, and that these games have adverse physical and mental effects on teenagers" (Orlofsky, 1982, cited in Winkel, Novak, & Hopson, p. 212). Such an authoritative statement certainly bolsters any defense against questions concerning the relevance or importance of studies of ICG and aggression. The following paragraphs will examine the knowledge accumulated from efforts to explicate the ICG/aggression relationship.

Games such as *Quake III*, which feature various weapons for human-destruction including a nail-gun, and *Mortal Kombat*, consisting of bloody hand-to-hand combat, are contemporary examples of the types of games that are of particular concern to scholars. Efforts to address these concerns have been manifested in various effects studies (Dominick, 1984; Graybill, Kirsch, & Esselman, 1985; Winkel, Novak, & Hopson, 1987). Each of these studies shares a similar structure. Correlational research is conducted analyzing post-test aggression scores of participants exposed to violent ICG. Clearly, the emphasis on post-exposure analysis fits well with the notion of media effects research, however, omits the potential influence of aggressive temperament on individuals' ICG use and level of aggressiveness. While discussing results in their study on aggression, video games, and children, Fling, Smith, Rodriguez, Thornton, Atkins, and Nixon (1992) summarize this dilemma. Fling et. al (1992, p. 43) state that "Correlational results, however, could mean that more aggressive children are drawn to video games rather than and/or in addition to their aggression being a result of this activity." Similarly, and more recently, Perse (2000, p. 25) concurs that "It might be that more aggressive players are more likely to seek out aggressive games." The current study explores the potential of aggressive temperament as a predictor of violent ICG use. However, before specific hypotheses are proposed, a more extensive look at previous research on aggression and ICG is necessary to provide adequate rationale for hypotheses.

Even with the existence of games with high amounts of extreme violence, research on effects on aggression has been unclear. After analyzing data on the relation between video game playing and aggression, Dominick (1984, p. 146) remarked that "the

data indicate that video-game playing is neither the menace that many of its critics have portrayed it to be nor necessarily without possible negative consequences.” Scott (1995) points out the possible over-emphasis on negative consequences in much of the prior video game research. Scott (1995, p. 128) argues that “the interactions between variables are obviously complex, and glib statements relating aggression to game playing, whether appearing in the mass media or in scientific journals, seem totally unwarranted.”

In his meta-analysis of over 30 studies on the effects of violent video games on aggression, Sherry (2001b) comments on several methodological inconsistencies that may contribute to inconclusive findings linking game playing and aggressive behavior. He cites the difference in methods of inquiry (experimental vs. survey), variations on operationalizations of what constitutes violent video content, and incongruent definitions of aggression as important factors hindering a clear outcome from the body of research dealing with effects of violent video game content (Sherry, 2001b). After conducting a meta-analysis on the various studies, Sherry (2001b) reported a significant, yet relatively small positive effect ($r = .15$) of video game play on aggression. Interestingly, Sherry (2001b) also found that human and fantasy violence games were more strongly associated with aggression than sports violence and that in general, longer playing times resulted in less aggression (a possible desensitization effect?). These findings are of particular relevance here, as it points out that amount of time spent playing and the type of game played appear to function as key roles in determining heightened aggression among game players.

Though it seems the only certainty concerning the relationship between aggression and video games is the lack of a strong positive relationship, there is little

doubt that a significant positive correlation exists between aggression and violent ICG.

The circularity of such a correlation is probably the most pervasive reason for the lack of clarity. Specifically, the confusion centers on whether ICG players who are more aggressive display a higher tendency to seek out violent ICG or whether players of violent ICG experience increases in personal levels of aggression. Despite this uncertainty, it is still appropriate to purport that theory suggests the existence of a relationship between aggressive individuals and violent ICG.

The following hypotheses follow this notion:

H4: Aggressivity will be positively related to playing of *first-person shooter* games.

H5: Aggressivity will be positively related to playing of *fighting* games.

Need for Cognition

As stated, much of the prior research on ICG tends to emphasize the possible negative effects of ICG. Some scholars argue that this may be eliminating focus on some of the possible positive effects that may be associated with ICG. For example, Scott (1995, p. 129) cites the expansion of “fun-laden educational software” over the last decade as an indication of the positive potential of interactive game playing. Also, some contend that hand-eye coordination is better among ICG users versus non-users.

Regardless of the validity of these specific claims, it is prudent for researchers to refrain from taking a one-sided approach. The psychological construct “need for cognition” holds some explanatory potential that may help to elaborate on patterns of ICG use that are quite different than those encompassed in sensation-seeking and aggression.

Cacioppo, Petty, Feinstein, and Jarvis (1996, p. 197) state that “need for cognition in contemporary literature refers to an individual’s tendency to engage in and enjoy effortful cognitive endeavors.” This definition implicates several heuristic notions in terms of possible ICG use. A recent study by Henning and Vorderer (2001) aimed at predicting the amount of television viewing based on individual variations in need for cognition. The main hypothesis in the study posited that because television is a primary instrument in the psychological escapism (i.e., taking one’s mind off of thinking), those high in need for cognition would watch less television. Henning and Vorderer (2001) did indeed find a negative correlation between television viewing and need for cognition. In relation to ICG use, this supports the notion that those high in need for cognition will not be motivated to play ICG for escape. Thus:

H6: Need for cognition will be negatively related to escapist motivation for playing video games.

Interestingly, because NFG reflects an orientation toward complex mental activity, need for cognition is positively related to higher G.P.A. and higher measures on general intelligence scales (Cacioppo et. al, 1996). The motivation to engage in effortful cognitive activity and correlations with intelligence and education indicates a significant aptitude for learning. Thus:

H7: NFC will be positively related to learning motivation for playing ICG.

The concept of need for cognition also implicates a drive to be challenged. mentally, which should have implications as to what genres ICG users high in need for cognition will select. The following research question addresses this:

RQ2: Do individuals who play ICG and are high in need for cognition select *simulation, role-playing, and puzzle* games more than *fighting, first-person shooter, and adventure* games?

More specifically, it appears that solving puzzles is a significant characteristic of the NFC dimension. The short NFC scale (Cacioppo, Petty, & Kao, 1984) includes the item “I prefer my life to be filled with puzzles that I must solve.” Thus, it should be expected that:

H8: NFC will be positively related to playing *puzzle* ICG.

Extraversion-Introversion

Extraversion-introversion is a personality variable that has been frequently used in past research examining the interaction of individuals’ personality and behavior (Morris, 1979). Morris (1979, pp. 5-6) points out three characteristics of the extraversion-introversion continuum that make it particularly conducive and relevant to the current study proposal. First, “the presence of extraverted and introverted tendencies in one’s behavior is pervasive in nature, that is, it applies to his or her behavior in a variety of situations and may be seen in expressed in various areas of life” (Morris, 1979, p. 5). “Second, extraverted and introverted tendencies appear earlier in childhood and evidence more stability through the developmental years than most personality characteristics” (Morris, 1979, p. 5). “Third, individual differences ranging along a continuum from one extreme to the other are clearly identifiable, allowing the possibility that one’s uniqueness can be partially identified by his or her placement on the continuum” (Morris, 1979, pp. 5-6). The extraversion-introversion continuum certainly does not reveal the entirety of one’s personality. However, the “pervasive” influence of the introversion-

extroversion dimension in many contexts, along with the stability and clear identifiable behavioral differences that can be identified, make extraversion-introversion a potentially salient indicator in the realm of ICG use. Consistent with this logic, Finn (1997, pp. 508-509) states that extraversion (later referred to as the extraversion-introversion continuum) “is not only the most robust personality trait but it provides a compelling conceptual framework for mass media researchers.”

There have been various conceptions of the extraversion-introversion continuum, but most of the discourse on the subject is based on the work of Carl Jung or Hans Eysenck (Morris, 1979). Jung’s (1923) approach states that extraversion and introversion compose two opposing tendencies during in an individual’s personality (Morris, 1979). Extraversion is the tendency to pay attention to the outside world, stressing involvement with the environment (Morris, 1979). Introversion is the tendency to attend to one’s inner world, which involves introspective thought and reflection (Morris, 1979). While Jung contends that it is healthy to develop both, most individuals show a tendency to lean towards one or the other.

The work of Eysenck (i.e., Eysenck & Eysenck 1969) takes a more biological and behavioral approach than Jung’s perspective (Morris, 1979). However, both are complementary. Eysenck indicates that the root of the extraversion-introversion dimension of personality lies in the reticular activation system of the brain (Morris, 1979). This system monitors incoming impulses from environmental stimuli and either stimulates or inhibits responses of the brain, which essentially controls the arousal level of the cortex of the brain (Morris, 1979). Eysenck (1976) holds that extraverts and introverts have differences in the relative strength to excite and inhibit arousal and that

introverts tend to have higher levels of cortical arousal than extraverts (Morris, 1979). Presuming that a person's optimal level of arousal is at a moderate level, introverts will try to reduce external stimulation that increases arousal just as extraverts will try to increase environmental stimulation that increases arousal (Morris, 1979). Morris (1979) indicates that there is a large body of research in various contexts that support Eysenck's (1976) biological theory. McCroskey, Heisel, and Richmond's (2001) recent report of three correlational studies examining relationships between Eysenck's Big Three and communication traits indicates a trend towards the inclusion of biologically-based personality factors in communication research. McCroskey et. al (2001, p. 360) state that "over the past decade, communication scholars have increasingly considered biological contributions to the ways in which we communicate."

There are several hypotheses that can be deduced from Eysenck's (1976) biological perspective on the extraversion-introversion dimension. Assuming that extraverts wish to increase external stimulation:

H9: Extraversion will be positively related to arousal motivation for playing ICG.

Morris (1979) indicates that there are important behavioral differences between extraverts and introverts that are clearly evident in social situations. Particularly, since the presence of other people and social events are generally arousing, they are more likely to be sought out and relished by extraverts than introverts. This is important when considering the role of context while playing ICG. Specifically, extraversion-introversion could be a major factor in determining the context in which ICG are played. The following hypotheses address this issue based on the knowledge about social tendencies of extraverts versus introverts .

H10: Extraversion will be positively related to playing ICG with other people physically present.

H11: Extraversion will be negatively related to playing ICG alone.

A context that presents an interesting challenge to the notion of extraversion-introversion is on-line ICG play with other people. While at first glance, it may seem that playing on-line with other people would be attractive to extraverts, Finn (1997) points out several previous studies on media use that may implicate otherwise. Previous examinations of talk radio (Armstrong & Rubin, 1989), movie going (Palmgreen, Cook, Harvill, & Helm, 1988), and book reading (Nell, 1988) all indicate that these types of activities may be especially attractive to introverts (Finn, 1997). The reasoning is that these experiences offer introverts special opportunities to meet personal needs while maintaining a comfortable level of control of the external environment (Finn, 1997). In the case of talk radio, Armstrong and Rubin (1989) comment that this format is attractive to individuals who want to become involved in topics, but fear the risk or embarrassment of face-to-face communication (Finn, 1997).

Playing on-line ICG with other people appears to offer a similar opportunity for introverts to balance meeting social and personal needs while not risking public embarrassment or the intimidation of face-to-face communication. It is presumable that extraverts will prefer face-to-face versus mediated interaction, and thus:

H12: Extraversion will be negatively related to playing on-line ICG with other people.

In terms of overall use of ICG and the introversion-extraversion continuum, Finn's (1997) study on the relationship between media use and personality yields some

interesting results. Specifically, Finn (1997) found a significant inverse correlation between extroversion and mediated activities (TV viewing and pleasure reading) and a positive correlation between extroversion and nonmediated activities (partying and spectator sports). These findings supported the hypotheses that extroversion would be positively related to a preference for nonmediated activities and inversely related to a preference for mediated activities (Finn, 1997). Factor analysis by Eysenck and Eysenck (1985, pp. 20-21) relates a more global view of findings such as Finn's (1997). Of particular interest are the relatively strong positive factor loadings between extraversion and statements such as "Do you usually take the initiative in making new friends? (.59)" and "Would you be very unhappy if you were prevented from making social contacts? (.64)." The characteristics of extraversion coupled with the research findings by Finn (1997) lend support for the following hypothesis:

H13: Extraversion will be inversely related with overall time spent playing ICG.

Method

Procedure

The design of this study was correlational. To explore the relationships between several psychological predispositions and individual motivations for ICG play, ICG genre preferences, and ICG contextual preferences, a survey consisting of independent and dependent measures was administered to 235 undergraduates at the University of Delaware. The majority of the sample ($n = 202$) was obtained via a large undergraduate communication class. In order to ensure an adequate sample size as well as an ample number of ICG players, participants from the large undergraduate communication class

were asked to bring an ICG-playing friend not enrolled in the communication class. Students received extra credit in exchange for bringing a partner and participating in the study. The survey was conducted at the end of spring semester of 2002 in the University of Delaware Communication Department data lab. The survey was self-administered and took approximately 15 to 20 minutes to complete. The rest of the sample ($n = 33$) was collected from several small undergraduate business communication courses and an on-line distance learning course. The University's Human Subjects Review Board approved the administration of the survey.

Of the 235 students surveyed, 35 reported no ICG use. Since the primary focus of this study was to examine why people play ICG, the 35 non-gamers were excluded from further statistical analysis.

The survey was designed to measure the following: gender, age, major, computer-use, sensation-seeking, need for cognition, aggression, extraversion, motivations for playing ICG, amount of time spent playing ICG, genre of ICG played, type of ICG played, and context in which ICG is played.

Gender

Respondents were asked to identify their gender. The sample was 43% ($n = 86$) male and 56.5% ($n = 113$) female.

Age

Each respondent's age was gathered by asking "How old are you as of your last birthday?" Ages ranged from 18 to 25 with a mean of 20.66 ($SD = 1.67$).

Major

Respondents were asked to identify their major by answering the open-ended question, “What is your major?” There were a total of 42 different majors cited in the responses. The most frequent majors reported were communication (38.7%), finance (6.5%), and marketing (5.5%). None of the other majors made up more than 5% of the sample.

Computer-Use

Respondents were asked to report on several dimensions of their computer use behavior. Of 199 respondents, 98.5% ($n = 197$) reported having a computer and 96.50% ($n = 193$) reported having Internet access at their current residence. Since part of the logic behind this study is the notion that this college sample represents part of the “Nintendo generation” that has grown up with computer-based technologies as a significant part of their childhood, participants were asked “How long have you been a computer user?” The mean of the valid responses ($n = 182$) was 8.79 years ($SD = 3.35$). There was no significant difference between males and females for the length of time being a computer user. Respondents were also asked to rate their “own expertise with computers in general” on a 5-point scale ranging from novice (1) to expert (5). The mean of valid responses ($n = 199$) was 3.72 ($SD = .92$). Males reported significantly higher expertise ($m = 3.98$) than females ($m = 3.52$, $t(197) = 3.55$, $p < .001$)

To assess on-line computer behavior, participants were asked to report how many times per week they went on the World Wide Web along with the number of times they logged on per week to check e-mail. Respondents ($n = 195$) went on the WWW an average of 18.33 ($SD = 33.75$) times a week. Participants ($n = 198$) reported logging on

to check e-mail 3.30 ($SD = 3.00$) times on average per week. There were no significant gender differences for reported WWW and e-mail use.

Sensation-Seeking

To measure sensation seeking, participants completed a modified version of Zuckerman's (1979) 40-item Form V sensation-seeking scale. Instead of using the force-choice format presented in Zuckerman's original scale, five-point Likert scales ranging from strongly agree (5) to strongly disagree (1) were presented for each of Zuckerman's original 40 items. The 40-item scale consists of four 10-item sections that measure four dimensions including thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (DIS), and boredom susceptibility (BS). Because this study's hypotheses focus only on the overall measure of sensation seeking, the scores to all 40 items were averaged. Average SS scores ranged from 1.4 – 4.3 ($M = 3.12$, $SD = .51$, $\alpha = .91$). Males reported significantly higher sensation seeking ($M = 3.25$) than females ($M = 3.03$, $t(197) = 3.14$, $p < .002$). Table 1 presents the means and standard deviations for each of the 40 sensation seeking items.

Table 1: Means and Standard Deviations for Sensation Seeking Items

<u>Sensation-Seeking Items</u>	<u>M</u>	<u>SD</u>
1. I often wish I could be a mountain climber	2.04	1.15
2. I like some of the earthy body smells	1.98	1.05
3. I like wild " uninhibited " parties	3.24	1.25
4. I can't stand watching a movie that I've seen before	2.05	1.00
5. I sometimes like to do things that are a little frightening	3.31	.99
6. I like to explore a strange city or section of town myself even if it means getting lost	3.10	1.20
7. I enjoy the company of real " swingers "	2.56	1.14
8. I get bored seeing the same old faces	2.60	1.05
9. I would like to take up the sport of water skiing	3.16	1.23
10. I have tried marijuana or would like to	3.76	1.32

11. I often like to get high (drinking liquor or smoking marijuana)	3.60	1.35
12. When you can predict almost everything a person will do and say, he or she must be a bore	2.57	.99
13. I would like to try surfboard riding	3.43	1.28
14. I would like to try some of the new drugs that produce hallucinations	2.13	1.28
15. I like to have new and exciting experiences and sensations even if they are a little unconventional or illegal	3.07	1.21
16. I usually don't enjoy a movie or play when I can predict what will happen in advance	2.68	1.06
17. I would like to learn to fly an airplane	3.20	1.31
18. I would like to try new foods that I have never tasted before	3.80	1.08
19. I like to date members of the opposite sex who are physically exciting	4.35	.83
20. Looking at someone's home movies or travel slides bores me tremendously	2.76	1.08
21. I would like to go scuba diving	3.96	1.15
22. I would like to take off on a trip with no preplanned or definite routes or timetables	3.77	1.14
23. Keeping drinks full is the key to a good party	3.43	1.11
24. I prefer friends who are excitingly unpredictable	3.52	.87
<u>Sensation-Seeking Items</u>	<u>M</u>	<u>SD</u>
25. I would like to try parachute jumping	3.59	1.29
26. I would like to make friends in some of the "far-out" groups like artists or hippies .	2.71	1.16
27. A person should have considerable sexual experience before marriage	3.21	1.04
28. I get very restless if I have to stay around home for any length of time	3.44	.96
29. I like to dive off the high board	3.44	1.32
30. I would like to meet some persons who are homosexual (men or women)	2.74	1.08
31. I could conceive of myself seeking pleasures around the world with the "jet set" . .	2.99	1.09
32. The worst social sin is to be a bore	2.72	1.04
33. I would like to sail a long distance in a small but seaworthy craft	2.31	1.23
34. I often find beauty in the "clashing" colors and irregular forms of modern painting	2.82	1.16
35. I enjoy watching many of the "sexy" scenes in movies	3.79	.644
36. I like people who are sharp and witty even if they do sometimes insult others	3.59	1.00
37. I think I would enjoy the sensation of skiing very fast down a high mountain slope	3.51	1.24
38. People should dress in individual ways even if the effects are sometimes stranger	3.50	.94
39. I feel best after taking a couple of drinks	3.06	1.12
40. I have no patience with dull or boring persons	2.82	1.00

Aggressivity

Aggressivity was measure by asking respondents to fill out the Buss-Perry aggression questionnaire (Buss & Perry, 1992). The 29-item questionnaire measures four aspects of aggression, including physical aggression (PA), verbal aggression (VA), anger (A), and hostility (H). The Buss-Perry measure is derived directly from the Buss-Durkee hostility inventory (Buss & Durkee, 1957), which is not only the most commonly used aggression questionnaire but was also developed as a measure trait aggression using college students (quite apropos for the current study, Bech & Mak, 1995). Responses range from “extremely characteristic of me (5)” to “extremely uncharacteristic of me (1).” Once again, because this study’s hypotheses focused on aggressivity as a whole, scores for the 29 items were averaged. Aggressivity scores ranged from 1.24 – 4.34 ($M = 2.63$, $SD = .68$. $\alpha = .92$). Males reported significantly higher aggressivity ($M = 2.90$) than females ($M = 2.42$, $t(197) = 5.31$, $p < .001$). Table 2 displays individual means and standard deviations for each aggression item.

Table 2: Means and Standard Deviations for Aggressivity Items

<u>Aggressivity Items</u>	<u>M</u>	<u>SD</u>
1. Once in a while I can't control the urge to strike another person	2.09	1.28
2. Given enough provocation, I may hit another person	2.55	1.39
3. If somebody hits me, I hit back	3.53	1.27
4. I get into fights a little more than the average person	1.73	1.08
5. If I have to resort to violence to protect my rights, I will	2.91	1.37
6. There are people who pushed me so far that we came to blows	2.28	1.39
7. I think of no good reason for ever hitting a person	2.58	1.23
8. I have threatened people I know	2.21	1.31
9. I have become so mad that I have broken things	2.74	1.50
10. I tell my friends openly when I disagree	3.90	.99
11. I often find myself disagreeing with people	2.98	1.01
12. When people annoy me, I tell them what I think of them	3.17	1.11
13. I can't help getting into arguments when people disagree with me	2.85	1.09
14. My friends say that I'm somewhat argumentative	2.58	1.23

15. I flare up quickly but get over it quickly	2.95	1.31
16. When frustrated, I let my irritation show	3.25	1.12
17. I sometimes feel like a powder keg ready to explode	2.43	1.26
18. I am an even-tempered person	3.53	.97
19. Some of my friends think I'm a hothead	2.14	1.15
20. Sometimes I fly off the handle for no good reason	2.21	1.21
21. I have trouble controlling my temper	2.14	1.20
22. I am sometimes eaten up with jealousy	2.71	1.29
23. At times I feel I have gotten a raw deal out of life	2.36	1.22
24. Other people always seem to get the breaks	2.69	1.25
25. I wonder why sometimes I feel so bitter about things	2.51	1.25
26. I know that "friends" talk about me behind my back	2.32	1.23
27. I am suspicious of overly friendly strangers	2.56	1.28
28. I sometimes feel that people are laughing at me behind my back	2.19	1.14
29. When people are especially nice, I wonder what they want	2.42	1.20

Need for Cognition

To assess need for cognition (NFC), participants completed Cacioppo, Petty, and Kao's (1984) 18-item need for cognition scale. Cacioppo et. al (1984) present the scale as an efficient alternative to the original 34-item need for cognition scale. Results from a sample of 527 students yielded a strong and significant correlation ($r = +.95, p < .001$) between scores calculated from the 34-item scale and 18-item scale, lending support to the validity of the shortened measure (Cacioppo, Petty, & Kao, 1984). Responses range from "Exactly (5)" to "Not at All (1)." Responses to the 18-item NFC scores were averaged. NFC scores ranged from 1.33 – 4.72 ($M = 3.24, SD = .50, \alpha = .85$). There was no significant gender difference for NFC. Table 3 shows the means and standard deviations of participant responses to the 18-item NFC scale.

Table 3: Means and Standard Deviations for NFC items

<u>NFC Items</u>	<u>M</u>	<u>SD</u>
1. I would prefer complex to simple problems	2.94	.96
2. I like to have the responsibility of handling a situation that requires a lot of thinking .	3.17	.91
3. Thinking is not my idea of fun	2.49	1.00
4. I would rather do something that requires little thought than something that is sure to challenge my thinking ability	2.60	.95
5. I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something	2.44	.88
6. I find satisfaction in deliberating hard and for long hours	2.76	.98
7. I only think as hard as I have to	2.68	1.01
8. I prefer to think about small, daily projects to long-term ones	3.11	1.04
9. I like tasks that require little thought once I've learned them	2.99	1.02
10. The idea of relying on thought to make my way to the top appeals to me	3.52	.81
11. I really enjoy a task that involves coming up with new solutions to problems	2.49	.86
12. Learning new ways to think doesn't excite me very much	2.33	.99
13. I prefer my life to be filled with puzzles that I must solve	2.95	.91
14. The notion of thinking abstractly is appealing to me	3.26	.98
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought	3.35	.84
<u>NFC Items</u>	<u>M</u>	<u>SD</u>
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort	3.08	1.05
17. It's enough for me that something gets the job done; I don't care how or why it works	2.58	.94
18. I usually end up deliberating about issues even when they do not affect me personally	3.24	.94

Extraversion-Introversion

The short extraversion questionnaire presented by Eysenck, Eysenck, and Barrett (1985) was used to measure extraversion-introversion. The scale contains 12-items that make up one dimension of the Eysenck personality questionnaire (EPQ). Responses range from (5) usually to (1) never. Average Extraversion scores ranged from 1.5 – 5.0 ($M = 3.96$, $SD = .65$, $\alpha = .92$). No significant gender differences were found. Table 4 shows the means of the 12 responses.

Table 4

<u>Extra/Intro Items</u>	<u>M</u>	<u>SD</u>
1. Are you a talkative person?	4.05	.93
2. Are you rather lively?	4.16	.83
3. Do you enjoy meeting new people?	4.34	.81
4. Can you let yourself go and enjoy yourself at a lively party?	4.39	.80
5. Do you take the initiative in making new friends?	3.96	1.01
6. Can you easily get some life into a rather dull party?	3.75	.99
7. Do you tend to keep in the background on social occasions?	2.65	1.08
8. Do you like mixing with people?	4.34	.80
9. Do you like plenty of bustle and excitement around you?	4.18	.80
10. Are you mostly quiet when you are with other people?	2.45	.95
11. Do other people think of you as being very lively?	3.83	.84
12. Can you get a party going?	3.68	1.01

Amount of Time Playing ICG: General Indicators

Several indicators of the amount of time respondents play ICG were employed on the survey. Participants answered a series of open-ended questions related to the amount of time spent playing ICG. Table 8 summarizes responses to these questions. There were significant gender differences for each item. Males reported significantly higher months experience playing ICG ($M = 140.81$) than females ($M = 105.65$, $t(190) = 4.41$, $p < .001$). When asked “Yesterday, how long did you play any kind of video/computer game?”, males averaged significantly more time (in minutes, $M = 44.30$) than females ($M = 19.70$, $t(194) = 3.00$, $p < .003$). Finally, males also reported significantly higher average weekday amounts of ICG play (in minutes, $M = 113.60$) than females ($M = 69.5$, $t(190) = 2.16$, $p < .05$).

Table 5: ICG Use

<u>Question</u>	<u>N</u>	<u>M</u>	<u>SD</u>
1. How long have you been playing any kind or video/computer games?	193	120.53 months (approx. 10 ½ years)	57.32
2. Yesterday, did you play any kind of video/computer game(s)? YES NO If so, how long did you play?	197	30.34 minutes	58
3. For any given weekday, how long on average do you play any kind of video/computer game(s)?	193	88.95 minutes	141.71

Amount of Time Playing ICG: Content & Context

Participants were presented with 10 genres of ICG accompanied with three examples of popular games from each genre listed. Participants were asked how often they played each type on a five-point scale ranging from (5) usually to (1) never. Of the 235 respondents, 200 indicated playing some type of ICG. Table 6 reports the means and standard deviations for the 10 genres. Since there were some missing responses, the number of responses is included for each item.

Table 6: Means and Standard Deviations for Game Genres

<u>Genres</u>	<u>N</u>	<u>M</u>	<u>SD</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002)	200	2.4	1.4
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer)	200	2.2	1.15
Adventure (Blood Omen, Project Eden, Tomb Raider)	200	1.88	1.15
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	200	1.97	1.26
Role-playing (Final Fantasy, Everquest, Diablo)	198	1.83	1.17
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	192	2.26	1.29
Puzzle (Minesweeper, Tetris, Gubble)	199	2.61	1.13
Strategy (Age of Empires, Command & Conquer, Starcraft)	200	1.66	1.02
Simulation (Roller coaster Tycoon, SimCity, Ski Resort Tycoon)	200	1.7	.96

Classic games (Chess, Solitaire, hearts)	200	3.08	1.01
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There were significant gender differences for 9 of the 10 ICG genres. Males were significantly more likely than females to play sports simulations, driving-flying, first person shooter, role-playing, fighting, strategy and simulation ICG. Females were significantly more likely than males to play classic games. These results are detailed in table 7.

Table 7: Gender Differences for ICG Genres

<u>ICG Genres</u>	<u>M - Males</u>	<u>M - Females</u>	<u>t-test</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002)	3.5	1.56	$T(197) = 13.36, p < .001^*$
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer)	2.84	1.73	$T(197) = 7.58, p < .001^*$
Adventure (Blood Omen, Project Eden, Tomb Raider)	2.44	1.45	$T(197) = 6.65, p < .001^*$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	2.81	1.34	$T(197) = 10.09, p < .001^*$
Role-playing (Final Fantasy, Everquest, Diablo)	2.33	1.46	$T(195) = 5.48, p < .001^*$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat) .	2.99	1.68	$T(189) = 8.04, p < .001^*$
Puzzle (Minesweeper, Tetris, Gubble)	2.51	2.68	$T(196) = -1.03, p < .304$
Strategy (Age of Empires, Command & Conquer, Starcraft)	2.07	1.35	$T(197) = 5.31, p < .001^*$
Simulation (Roller coaster Tycoon, SimCity, Ski Resort Tycoon)	1.91	1.54	$T(197) = 2.72, p < .007^*$
Classic games (Chess, Solitaire, hearts)	2.83	3.26	$T(197) = -3.04, p < .003^*$

Participants were asked to report how often they played different types of game systems. Table 8 shows responses to the six types of game systems presented on the survey. Possible answers ranged from (5) usually to (1) never. There were significant

gender differences on two of the game types. Males reported playing game systems significantly more ($M = 3.86$) than females ($M = 2.43$, $t(195) = 9.68$, $p < .001$). Males also indicated playing online games versus other human competitors significantly more ($M = 2.12$) than females ($M = 1.71$, $t(195) = 2.32$, $p < .05$).

Table 8: Means and Standard Deviations for ICG Type

<u>Game Type</u>	<u>n</u>	<u>M</u>	<u>SD</u>
Arcade videogames	199	2.13	.90
Game Systems	198	3.06	1.24
Hand-held videogames	198	1.88	.92
Computer videogames	199	2.76	1.14
Online videogames w/ humans. . . .	198	1.89	1.22
Online videogames alone	199	1.88	1.10

Respondents also indicated how often they played ICG in the three different contexts ranging from (5) usually to (never). Results are displayed in table 9.

Table 9: Means and Standard Deviations for ICG Contexts

<u>Context</u>	<u>n</u>	<u>M</u>	<u>SD</u>
With other people (in person with friends/others	192	3.18	1.33
With other people online (with/versus friends/others)	192	1.86	1.11
Alone	192	2.85	1.06

Gender differences were found for all 3 contexts. Males responses produced significantly higher means than females on all three contexts. These gender differences are summarized in table 10.

Table 10: Gender Differences for ICG Contexts

<u>Context</u>	<u>M – Males</u>	<u>M – Females</u>	<u>T-test</u>
With other people (in person with friends/others) . . .	3.80	2.71	$T(189) = 6.05, p < .001$
With other people online (with/versus friends/others)	2.20	1.60	$T(189) = 3.83, p < .001$
Alone	3.16	2.62	$T(189) = 3.59, p < .001$

Motivations

Motivations for playing ICG were explicated from 43-items presented as reasons for playing ICG. Each of the items related to one of the motivational categories outlined in the study proposal. These items were drawn from prior research (i.e. Perse, 2000) that explored the relationship between individual motivations and ICG use. Participants replied to each motive on a 5-point scale ranging from (5) exactly to (1) not at all.

Because this study's hypotheses focus on only 7 reasons for playing ICG, items assessing these reasons were used to create 7 average scales. To establish reliable scales for hypothesis testing, a factor analysis was performed on data collected from the 44-item list. 11 items were excluded from further analysis. Seven motivational clusters emerged from the remaining 33 items. Learning ranged from 1.00 – 4.00 ($M = 1.5, SD = .68, \alpha = .77$). Social Utility ranged from 1.00 – 4.67 ($M = 2.16, SD = .98, \alpha = .78$). Companionship ranged from 1.00 – 5.00 ($M = 1.77, SD = .84, \alpha = .79$). Arousal ranged from 1.00 – 5.00 ($M = 2.16, SD = 1.00, \alpha = .92$). Escape ranged from 1.00 – 4.17 ($M = 2.38, SD = .79, \alpha = .81$). Relaxation ranged from 1.00 – 5.00 ($M = 2.74, S = 1.00, \alpha = .88$). Pass time ranged from 1.13 – 5.00 ($M = 3.00, SD = .75, \alpha = .85$). There were

gender differences for six of the seven motivational factors. Table 11 details these differences.

Table 11 – Gender Differences for Motivational Factors

<u>Motivation</u>	<u>M – Males</u>	<u>M – Females</u>	<u>T-test</u>
Learning	1.70	1.34	$T(195) = 3.80, p < .001^*$
Pastime	3.18	2.86	$T(195) = 3.12, p < .002^*$
Arousal	2.71	1.73	$T(195) = 7.73, p < .001^*$
Relaxation	3.09	2.47	$T(195) = 4.56, p < .001^*$
Escapism	2.46	2.18	$T(195) = 4.25, p < .001^*$
Companionship	1.83	1.73	$T(195) = .85, p < .40$
Social Utility	2.18	1.74	$T(195) = 7.95, p < .001^*$

Table 11 details the structure of each of the 7 dimensions.

Table 11: Structural Depiction of Motivational Variables

<u>Items</u>	<u>M</u>	<u>SD</u>
<u>Learning</u>		
Because it helps me learn things about myself and others	1.42	.75
So I can learn how to do things that I haven't done before	1.67	.95
So I can learn about what could happen to me	1.40	.77
<u>Social Utility</u>		
Because it's something to do with friends	2.79	1.34
So I can talk with other people about the games	1.65	.99
So I can be with other members of the family or friends who are playing	2.07	1.19
<u>Companionship</u>		
When there's no one else to talk to or be with	2.08	1.14
So I won't have to feel alone	1.57	.89

Because it makes me feel less lonely	1.68	.98
<u>Arousal</u>	<u>M</u>	<u>SD</u>
They stimulate my imagination	2.16	1.18
I feel powerful when I play games	1.77	1.05
I like feeling part of the action	2.04	1.15
Because it peeps me up	1.94	1.16
Because it's exciting	2.62	1.29
Because it's thrilling	2.42	1.29

<u>Items</u>	<u>M</u>	<u>SD</u>
<u>Escape</u>		
So I can forget about school, work, or other things	3.08	1.20
So I can get away from the rest of the family or others	1.92	1.11
To feel like I'm in a fantasy world	1.67	.945
So I can get away from what I'm doing	2.82	1.18
To avoid studying	3.16	1.19
I like pretending to be another person or in a different place	1.64	1.00
<u>Relaxation</u>	<u>M</u>	<u>SD</u>
Because it relaxes me	2.86	1.11
Because it allows me to unwind	2.85	1.19
Because it's a pleasant rest	2.61	1.20
To help release my stress	2.65	1.19
<u>Pass Time</u>	<u>M</u>	<u>SD</u>
Just because they're there	3.17	.97
When I have nothing better to do	3.60	.88
Just to waste time	3.31	1.09
When there's no one else to talk to or be with	2.08	1.14
Because it passes the time away, particularly when I'm bored	3.38	1.03
Because it's a habit, just something I do	2.31	1.17
Because I just like to play	2.96	1.15
Because it gives me something to do to occupy my time	3.18	1.14

Results

Sensation Seeking

Hypothesis 1 predicted a positive relationship between sensation seeking and arousal motivation for playing ICG. Results supported this hypothesis with a positive correlation coefficient ($r = .33, p < .01$) between sensation seeking and arousal motivation for playing ICG.

RQ1 explored the relationship between sensation seeking and each of the ten ICG genres. Correlation analysis showed that sensation seeking is positively related to playing eight ICG genres. There was a significant positive correlation between sensation seeking and playing sports simulations ($r = .21, p < .05$), driving-flying ICG ($r = .16, p < .05$), adventure ICG ($r = .19, p < .01$), first-person shooters ($r = .26, p < .01$), role-playing ICG ($r = .28, p < .01$), fighting ICG ($r = .24, p < .01$), strategy ICG ($r = .25, p < .01$), and simulation ICG ($r = .14, p < .05$). Table 12 details these relationships.

Table 12: Pearson Correlation Coefficients for RQ1

	<u>Sensation Seeking</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002) .	.21*
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer) .	.16*
Adventure (Blood Omen, Project Eden, Tomb Raider)19**
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)26**
Role-playing (Final Fantasy, Everquest, Diablo)28**
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)24**
Puzzle (Minesweeper, Tetris, Gubble)06
Strategy (Age of Empires, Command & Conquer, Starcraft)25**
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)14*
Classic Games (Chess, Solitaire, Hearts)09

** $p < .01$ (2-tailed)

* $p < .05$ (2-tailed)

Hypothesis 2 predicted a positive relationship between sensation seeking and pass time motivation for playing ICG. A positive correlation ($r = .24, p < .01$) was found between sensation seeking and pass time motivation for playing ICG, supporting H2.

Hypothesis 3 predicted an inverse relationship between sensation seeking and amount of time spent playing ICG. There was no support for H3. In fact, a significant correlation was found in the opposite direction. There was a positive correlation ($r = .19, p < .01$) between sensation seeking and the amount of time spent playing ICG.

Aggressivity

Hypothesis 4, which predicted a positive correlation between aggressivity and playing the *first-person shooter* game genre, was supported. There was a significant positive correlation coefficient between aggressivity and playing *first-person shooter* ICG ($r = .23, p < .01$).

Hypothesis 5 predicted a positive relationship between aggressivity and playing the *fighting* game genre. Hypothesis 5 was supported. There was also a positive correlation between aggressivity and playing *fighting* ICG ($r = .34, p < .01$).

Need for Cognition

There was no support for hypothesis 6, which predicted a negative relationship between NFC and escapist motivation for playing ICG. However, the relationship did approach significance ($r = -.11, p < .06$).

Hypothesis 7, predicting a positive relationship between NFC and learning motivation was not supported ($r = -.10, p < .07$).

Research question 2 (RQ2) asked if individuals who play ICG and are high in need for cognition select *simulation*, *role-playing*, and *puzzle* games more than *fighting*,

first-person shooter, and *adventure* games? There was no evidence for any such pattern.

Table 13 details the results.

Table 13: Pearson Correlation Coefficients for NFC and Game Genres

<u>Genre</u>	<u>NFC</u>	<u>P</u>
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)	$r = .01$	$p < .90$
Role-playing (Final Fantasy, Everquest, Diablo) . . .	$r = .11$	$p < .13$
Puzzle (Minesweeper, Tetris, Gubble)	$r = .08$	$p < .28$
Adventure (Blood Omen, Project Eden, Tomb Raider) . .	$r = .10$	$p < .14$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	$r = .08$	$p < .26$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	$r = .06$	$p < .40$

Hypothesis 8, predicting a positive correlation between NFC and playing *puzzle* ICG, was not supported. A small, nonsignificant positive correlation was found for the relationship between NFC and playing *puzzle* ICG ($r = .08, p < .28$).

Extraversion

Hypothesis 9 forecasted a positive relationship between extraversion and arousal. Hypothesis 9 was not supported ($r = -.02, p < .37$). Hypothesis 10, which forecasted a positive relationship between extraversion and playing ICG with other people in person, was supported. Pearson's correlation for extraversion and playing ICG in with other people in person was $r = .14, p < .02$. No significant findings were found for hypotheses 11 and 12, which predicted negative relationships between (H11) extraversion and

playing ICG on-line with other people and (H12) extraversion and playing ICG alone.

Each of the results produced inverse, but non-significant relationships

(**H11**: $r = -.08, p < .14$; **H12**: $r = -.09, p < .11$).

Hypothesis 13 predicted an inverse relationship between extraversion and the overall amount of time spent playing ICG. There was no support for hypothesis 13 ($r = .09, p < .11$).

Tables 14a,b,c,d provide overall data on the study including genres, amount of time playing by SS, Aggressivity, NFC, and Extraversion/Introversion.

Table 14a: Pearson Correlation Coefficients for
sensation-seeking by amount of time playing/genres

	<u>Sensation-Seeking</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002) .	$R = .21, p < .01$
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer) .	$R = .16, p < .05$
Adventure (Blood Omen, Project Eden, Tomb Raider)	$R = .19, p < .01$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	$R = .26, p < .01$
Role-playing (Final Fantasy, Everquest, Diablo)	$R = .28, p < .01$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	$R = .24, p < .01$
Puzzle (Minesweeper, Tetris, Gubble)	$R = .06, p < .40$
Strategy (Age of Empires, Command & Conquer, Starcraft)	$R = .25, p < .01$
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)	$R = .14, p < .05$
Classic Games (Chess, Solitaire, Hearts)	$R = .09, p < .22$

Amount of time played (as reported “on an average weekday”)	$R = .17, p < .05$
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Table 14b: Pearson Correlation Coefficients for aggressivity by amount of time playing/genres

	<u>Aggressivity</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002) .	$R = .26, p < .01$
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer) .	$R = .28, p < .01$
Adventure (Blood Omen, Project Eden, Tomb Raider)	$R = .24, p < .01$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	$R = .23, p < .01$
Role-playing (Final Fantasy, Everquest, Diablo)	$R = .25, p < .01$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	$R = .34, p < .01$
Puzzle (Minesweeper, Tetris, Gubble)	$R = .17, p < .05$
Strategy (Age of Empires, Command & Conquer, Starcraft)	$R = .31, p < .01$
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)	$R = .28, p < .05$
Classic Games (Chess, Solitaire, Hearts)	$R = .19, p < .01$
Amount of time played (as reported “on an average weekday”)	$R = .13, p < .07$

Table 14c: Pearson Correlation Coefficients for
Need for cognition by amount of time playing/genres

	<u>NFC</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002) .	$R = -.04, p < .55$
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer) .	$R = .07, p < .36$
Adventure (Blood Omen, Project Eden, Tomb Raider)	$R = .10, p < .14$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	$R = .08, p < .26$
Role-playing (Final Fantasy, Everquest, Diablo)	$R = .10, p < .13$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	$R = .06, p < .40$
Puzzle (Minesweeper, Tetris, Gubble)	$R = .08, p < .28$
Strategy (Age of Empires, Command & Conquer, Starcraft)	$R = .10, p < .16$
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)	$R = .01, p < .90$
Classic Games (Chess, Solitaire, Hearts)	$R = .01, p < .88$
Amount of time played (as reported “on an average weekday”)	$R = .05, p < .48$

Table 14d: Pearson Correlation Coefficients for
Extraversion/introversion by amount of time playing/genres

	<u>EXT/INT</u>
Sports simulations (Madden NFL 2002, NHL 2002, NBA Live 2002) .	$R = .03, p < .72$
Driving-Flying (Crash Team Racing, Gran Turismo 3, Ridge Racer) .	$R = -.01, p < .91$

Adventure (Blood Omen, Project Eden, Tomb Raider)	$R = -.00, p < .98$
First-Person Shooter (Half-Life, Quake, Soldier of Fortune)	$R = -.06, p < .42$
Role-playing (Final Fantasy, Everquest, Diablo)	$R = .02, p < .77$
Fighting (Virtua Fighter 4, Tekken, Mortal Kombat)	$R = -.01, p < .93$
Puzzle (Minesweeper, Tetris, Gubble)	$R = -.03, p < .72$
Strategy (Age of Empires, Command & Conquer, Starcraft)	$R = .05, p < .47$
Simulation (Roller Coaster Tycoon, SimCity, Ski Resort Tycoon)	$R = .08, p < .26$
Classic Games (Chess, Solitaire, Hearts)	$R = .10, p < .14$
Amount of time played (as reported “on an average weekday”)	$R = .07, p < .31$

Discussion

Since this research was conducted, there has been additional evidence to the emergence of ICG as a salient medium. Figures from a December, 2002 *Entertainment Weekly* story (Jensen, 2002) entitled “Video Game Nation” estimated the 60 percent of Americans (over 145 million people) play video games and that the average age of these players was 28. Furthermore, the article reports that over \$6.35 billion of computer and video game software was sold in 2001 (Jensen, 2002).

Jeff Jensen, author of the “Video Game Nation” feature story, suggests that these numbers are a result of a new generation of young adults who grew up playing video games. He writes “video games grew up into legitimate entertainment, thanks to a generation that has never put down the joystick (unless it was to pick up a *joypad*)”

(Jensen, 2002, p. 23). World-famous pro-golfer Tiger Woods echoed this sentiment while expressing his penchant for ICG. “I’ve played videogames since I was in elementary school – from the Atari 2600 up the ladder. When I’m on tour and I’m staying at the house of a family I know, I’ll bring the PlayStation with me.”

Woods is not only part of the trend of young adult gamers, but he is also a major part of the tremendous convergence between reality and the world of ICG. Woods is the star of a popular *EA Sports* golf simulation ICG called “*Tiger Woods PGA Tour*” (Jensen, 2002, p. 23). Woods reflected, “It’s hard to imagine even to this day that I have my own video game” (Jensen, 2002, p. 26). The convergence trend is not only relative sports and ICG, but also to Hollywood films and ICG. David Hayter, screenwriter of the comic-book-based *X-Men* movie, commented that “Hollywood has recognized the financial importance of video games” (Jensen, 2002, p. 28). Perhaps the most interesting example of the ability of film and ICG to mix comes from the creation of the box-office smash *The Matrix*. Lorenzo di Bonaventura, a former Warner Brothers executive who helped lead the making of *The Matrix*, recalls “When we first had the script for *The Matrix*, I realized how difficult it was going to be to get it made in to a movie. So I went into the then heads of Warner Brothers and said, ‘Why don’t we make a game out of this first, build a brand, *then* turn it in to a movie?’ Because it just seemed so applicable” (Jensen, 2002, p. 28). Not surprisingly, there will be a ICG based on *The Matrix* released in accord with the movie sequel in 2003.

The continued growth in popularity of ICG among adults along with the convergence of and mixing between media are issues that remain salient to the field of mass communication scholarship. If these trends hold, mass communication researchers

will face the task of explicating the many significant phenomena that accompany the rise of ICG.

Theoretical Implications: Refining the Uses and Gratifications Paradigm

The salience of this research related not only to the apparent growing cultural influence of ICG, but more importantly to the further development of theoretical research. Specifically, the quest of the study was to employ the uses and gratifications approach *as it was originally conceived*. That is, “(1) the social and psychological origins of (2) needs, which generate (3) expectations of (4) the mass media or other sources, which lead to (5) differential patterns of media exposure (or engagement in other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones” (Katz et al., 1974, p. 20). Several scholars (Conway & Rubin, 1991; Finn, 1997; Haridakis, 2002; Henning & Vorderer, 2001, Sherry, 2001a; Wevaer, 1991) have emphasized the need to focus more on psychological origins of media behavior in uses and gratifications research. A recent uses and gratifications study (Haridakis, 2002) investigating the relationship between viewer characteristics, exposure to television violence, and aggression underscores the effectiveness of personality traits as predictors of media effects. Haridakis (2002, p. 344) notes that “an important finding was that viewer personality and background (i.e., disinhibition, locus of control, experience with crime, and male gender) were the strongest predictors of aggression outcomes, often independent of motivation and exposure.” Haridakis (2002, p. 344) concludes “these results also reinforce uses and gratifications notions of the important influence of individual social and psychological factors on effects.”

By successfully linking psychological factors, motivations, and patterns of ICG use, this thesis study further supports the viability of the original conception of the uses and gratifications perspective in explaining patterns of mass media use. A better understanding of the contribution of the current research to mass communication is found by drawing on the broad aim of mass communication research outlined earlier by Perse (2001). Perse (2001, p. 1) states that “most current research attempts to improve our understanding of media effects by refining our theoretical explanations of the processes by which media effects occur.” This study uses psychological predictors to explain the processes of media behavior. The study by Haridakis (2002) exemplified the effectiveness of using psychological characteristics to predict media effects. In concert, each of these studies supports the notion that the emphasis on psychological characteristics of individuals may lead to better explanation of the “processes (i.e., the current ICG research) by which media effects (i.e., Haridakis, 2002) occur” (Perse, 2001, p. 1).

The stated focus of this study was to assess how four psychological factors, namely sensation seeking, aggressivity, need for cognition, and extraversion, related to patterns of ICG use. The subsequent sections present detailed discussion findings for each of the four dimensions. Then, the following paragraphs will examine the theoretical implications of this study, along with limitations and directions for future research.

Sensation Seeking

Results implicate that sensation seeking may be a useful predictor in terms of ICG use. The support for H1 suggests that the potential for increased arousal is a motivating factor for sensation seekers to play ICG. There was also support for H2, which links

sensation seeking and pass time motivation to play ICG. This concurs with Conway and Rubin's (1991) finding positively correlating sensation seeking and pass time motivation in the context of television viewing. Together, these results support the broader notion that ICG is a viable source of arousal for sensation seekers when they are not engaged first-hand in sensation seeking activities (i.e., when they are passing time). Perse's (1996) research on sensation seeking and the use of television for arousal found that sensation seekers changed channels in order to create a "stimulant environment." The support for H1 indicate that sensation seekers use ICG as a way to create an environment with a lot of arousal, even while passing time (H2).

Further implications of the aforementioned pass time-arousal relationship are found from the findings from RQ1 and H3. Results from RQ1 indicated that sensation seeking was positively related to playing eight of the ten game genres in the study. Also, the lack of support for H3 becomes interesting here because the results revealed a significant relationship in the opposite direction. H3 predicted an inverse relationship between overall amount of ICG play and sensation seeking under the presumption that sensation seekers would prefer spending more time involved first-hand in arousal-producing activities (skiing, sky-diving, etc.). While that still may be the case, the significant positive relationship between amount of ICG play and sensation seeking further implies that ICG play is an attractive option for sensation seekers to pass time.

In their study of sensation seeking and television viewing, Potts, Dedmon, and Halford (1996, p. 1081) remarked "contrary to previously-reported results, high sensation seekers did not watch less television or rate it as less important in their lives." Furthermore, Potts et. al (1996) found that sensation seekers did differentiate television

viewing based on content. Those individuals defined as “high” watched more music videos, daytime talk shows, stand-up comedy programs, documentaries and animated cartoons and fewer news casts and drama series as compared to “low” sensation seekers. This relates to the current findings from RQ1 analyzing ICG genre and sensation seeker preferences. It appears that high sensation seekers know what types of content provide the desired sensation seeking outcomes. Thus, content is an important factor in the sensation seeker-media use relationship, not just the type of medium. Whether ICG play is another option on par with other sensation-producing activities or a secondary alternative to pass time between other higher sensation-producing activities is an interesting question for future research.

Aggressivity

Hypotheses 4 and 5 were both supported, highlighting a positive correlation between aggressivity and *first-person shooter* games ($r = .23, p < .001$) as well as aggressivity and *fighting* games ($r = .34, p < .001$). These results also support the trends in many previous studies in meta-analyses of research conducted by Sherry (2001b) and Anderson & Bushman (2001) on aggression and video games. Namely, a positive correlation between aggressivity or aggression and violent media content. However, this correlation is not in and of itself informative as to the nature of the aggression-violent content relationship. There is a dilemma between the “playing-violent-ICG-leads-to-aggression” notion versus the “aggression-leads-to-playing-violent-ICG” position.

Smith, Lachlan, and Tamborini (2003) point out that there have been many studies on the relationship between video game violence and aggression that support a causal link between playing violent video games and aggressive thought or behaviors

(Anderson & Dill, 2000; Anderson & Ford, 1986; Calvert & Tan, 1994; Kirsch, 1998, Schutte, Malouff, Post-Gorden, & Rodasta, 1988; Silvern & Williamson, 1987).

Anderson and Dill (2000) have actually devised the General Affective Aggression Model (GAAM) to examine and explain the short-term and long-term effects of playing violent ICG on aggression. The roots of this model appear in the mold of Bandura's Social Learning Theory (1977). Anderson and Dill (2000) suggest that repeated playing of violent ICG, violent scripts for social problem solving, leading to violently biased perceptions, attitudes, and beliefs about aggression. Interestingly, Anderson and Dill's (2000) model also posits that the effects of violent ICG may be increased for the characteristically aggressive. Furthermore, a recent longitudinal study by Huesmann, Moise-Titus, Podoloski, and Eron (2003) found that childhood exposure to media violence along with identification with aggressive TV characters and perceived realism of TV violence predicted later aggression among males and females. This implies that user interpretation along with exposure was instrumental in predicting aggression.

In a recent effort to further expound on the salience of identification with aggressive characters, Eyal and Rubin (2003) between identification and trait aggression or the disposition to behave aggressively. Eyal et. al (2003, p. 77) define aggressive dispositions as "trait characteristics that develop over time and are stable across situations and time." Therefore, Eyal et. al are using a characteristic very similar to the aggressivity trait presented in this thesis study.

Eyal et. al (2003, p. 77) indicate that "in general, researchers have found support for the view that more aggressive people are influenced by exposure to media violence (e.g., Door & Kovaric, 1980)" and also note Huesmann's and Eron's (1986) findings that

aggressive “trait” tendencies predict serious adult antisocial behavior. While Eyal et. al (2003, p. 77) concede that “people who are not aggressive in nature also may be influenced by media violence” they claim that “the nature and extent of the effects are likely to be different from the effects on more aggressive viewers.” They conclude that while “media violence may teach nonaggressive viewers asggressive attitudes, it is likely to do this and more (e.g. reinforce existing aggressive attitudes) for aggressive persons. (Eyal et. al, 2003, pp. 77-78).

Eyal et. al (2003) also cite other research that suggest that aggressive disposition influences the type of television content viewed, with a particular penchant for violent content (Diener & Defour, 1978; Gunter, 1983, 1985; Hellter & Polsky, 1976 Robinson & Bachman, 1972). This research is can be explained theoretically through Zillman & Bryant’s (1985) selective exposure (Eyal et. al, 2003). According to selective exposure, people are selective in the types of media content they chose. They chose content that is supportive of their thoughts, feelings, or actions and discard non-supportive messages.

In their study, Eyal et. al utilized social cognitive theory (based on social learning theory) to frame hypotheses predicting relationships between viewers’ aggressive dispositions and identification with violent TV characters. Social cognitive theory suggests that there are a host of factors the mediate the relationship between viewing aggression and learning and imitating violent behaviors. One salient factor is the degree to which a viewer identifies with a violent character. Eyal et. al (2003) found that aggressive dispositions predicted identifications with aggressive personae.

In this case, aggressivity, which was explicated and defined as a relatively stable trait, serves as the “psychological origin.” This is analogous to the “trait aggression”

used in by Eyal and Rubin (2003). Thus, the data for H4 and H5 lend support to the idea that aggressivity leads to playing violent ICG. This does not contradict the notion that playing ICG lead to heightened states of aggression. Rather, it insinuates that aggressivity is a key psychological origin that leads to playing violent ICG and identification with aggressive personae. The GAAM model along with findings cited by Eyal et. al (2003) hold that the effects of violent ICG may be heightened for the characteristically aggressive. Thus, aggressivity may not only be a predict of exposure to violent content, but the main catalyst in facilitating the learn-imitate process defined in social learning theory and refined in social cognitive theory.

Considering this along with the current study findings, if aggressive individuals are more likely to play violent ICG, as the findings for H4 and H5 suggest, than it should come as no surprise that researchers almost uniformly find a positive correlation between exposure to violent ICG and aggression.

Another factor that helps keep attention on the relationship between individuals and violent ICG content is the prevalence of such content. Smith et. al (2003) found that a full 68% of ICG in their sample contained one or more violent acts. Earlier, Dietz (1998), using a more liberal interpretation of violence, found that 79% of another sample of games featured violence.

Need for Cognition

While none of the hypotheses about NFC were supported, several trends emerge that perhaps explain the results. H6, predicting an inverse relationship between NFC and escapist motivation to play ICG, narrowly fell short of significance ($r = -.11, p < .06$). The hypothesis was based on prior research by Henning and Vorderer (2001), who found

and inverse relationship between NFC and escapist motivation to watch television. Given this, it would be wise not to dismiss this hypothesis altogether. Testing H6 on new samples in future studies would be a positive step in clarifying whether the NFC-escapism relationship applies in the realm of ICG. Also, perhaps pass time motivation should be tested, as it is somewhat similar in functionality to the escapist motivation.

Although we cannot accept the null hypotheses, several perceptions stem from the lack of support for H7, RQ2, and H8. First, there is the lack of a relationship between learning motivation to play ICG and NFC. I did not find a salient learning motive in my ICG research. Perhaps learning is not present as a motive or individuals simply do not turn to ICG for a learning experience. The recreational nature of ICG coincides with this line of thinking. This idea is further advanced by the findings for RQ2 and H8, which revealed that NFC was not significantly related to playing *puzzle* ICG or the five other genres included in RQ2. In fact, NFC was not significantly related to playing any of the 10 genres included in this study. Also, post-hoc analysis shows that NFC was not significantly related to the amount of time spent playing ICG. All of these findings point to the fact that NFC may not be a viable predictor of ICG. This may be primarily because ICG is not an activity that is incongruent with the needs and gratifications sought related to NFC.

Hawkins et. al (2001) attempted to link need for cognition with several genres of television viewing. Findings indicated that need for cognition was inversely related to attention to television dramas and situation comedies and unrelated to other genres and factors analyzed in the study. Hawkins et. al (2001, p. 258) conclude, “These results may reflect an underlying truth in an old stereotype of television: There may not be enough

that is mentally stimulating in most television to reward the thoughtful.” Perhaps ICG shares the same deficiency in providing the type of mental stimulation sought by those “high” in need for cognition.

Extraversion-Introversion

Several potential implications for the Extraversion-Introversion/ICG relationship are apparent from the findings in this study. Results from H9 and H10 are particularly telling of the nature of the extraversion-introversion continuum as it relates to playing ICG. H9, which predicted a positive relationship between extraversion and arousal motivation to play ICG, was not supported ($r = -.02, p < .37$). A significant relationship ($r = .14, p < .02$) was found for H10, supporting a positive relationship between playing ICG with other people present and extraversion. This finding is in accord with previous studies (Argyle & Lu, 1990; Finn, 1997) documenting extroverts’ preference for direct social contact when faced with the choice between interpersonal and mediated forms of communication. This reinforces the notion that the extraversion as a concept is more strongly associated with a penchant for social interaction rather than simple arousal or stimulation. Thus, extraversion may be a much more viable predictor in relation to the social contexts that ICG are played.

The link between extraversion and context of ICG play was further analyzed in H11 and H12. H11 and H12 predicted negative relationships between (H11) extraversion and playing ICG on-line with other people and (H12) extraversion and playing ICG alone. The results were not significant (H11: $r = -.09, p < .11$; H12: $r = -.08, p < .14$). However, in terms of the extraversion-context relationship, there are several emerging reasons that endorse further study of this dynamic. Specifically, the fact that a significant

relationship was established for live human interaction (H10) while no significant relationship was found for computer-mediated on-line interaction (H10) lends at least tacit support to the rationale that face-to-face interaction and computer-mediated interaction are not functionally identical. Moreover, previous research has noted the link between introversion and certain mediated forms of communication including talk radio (Armstrong & Rubin, 1989) and movie going (Palmgreen, Cook, Harvill, & Helm, 1988).

Also furthered by these findings is the importance of context in communication behavior. While the findings revealed that extraversion was positively related to ICG play in social situations with other people in person (groups of friends, etc.), the lack of a relationship between extraversion and ICG play alone or on-line with other people is notable. Coupled with introverts; penchant for certain mediated forms of communication, these findings signify the distinct differences between contexts. Thus, all ICG play is not created equal. This is an imperative point for future research on ICG use.

Given the discussion in the previous paragraphs the lack support for H13, which predicted an inverse relationship between ICG and amount of time spent playing ICG ($r = .09, p < .11$), is not surprising. Due to the apparent impact of context in determining the extraversion/ICG play relationship, the relationship between overall ICG play and extraversion is cloudy. Once again, this reaffirms the notion of extraversion as a very socially-oriented concept and emphasizes the role of context in examining relationships between extraversion and ICG play.

Limitations

The sampling method used presents several limitations. As stated, the sample was composed of students from a large undergraduate communication course along with an ICG-playing partner (not enrolled in the communication class) selected by each participant from the communication class. The use of a college sample alone presents limitations on the generalizability of the results to the general population. Still, there are further potential limitations that must be noted.

Recent estimates (Jensen, 2002) suggesting the mean age of ICG players at 28 imply that it is necessary to include participants that are older than typical college students. Therefore, by exclusively using 18-22 year olds, this study overlooks the wider adult population of ICG. Furthermore, the use of the “ICG-playing friend” to ensure an adequate sample of ICG players further negates a chance to assess the wider impact of ICG use in the general population. That is, the limited scope of the sample coupled with the emphasis on gaining an ample number of ICG players to conduct meaningful social scientific inquiry eliminated any chance to obtain a measure of the level of ICG play on the whole. Thus, this study is unable to shed light on the true level of ICG play in the general population.

Even as statistics (Jensen, 2002) suggest an aging ICG population, the demographics of ICG players are not the only area of ICG that is changing. The constant flux in the landscape of ICG content and technology can render descriptions of the ICG outdated or obsolete. Specifically, this study’s current typology of game genres may become unable to adequately define the latest landscape of ICG. Therefore, this may inhibit the use of the suggested typology in future research. However, the current

typology still provides a framework upon which future researchers can update as changes occur.

Directions for Future Research

There are numerous avenues of future inquiry that grow out of the current study. Broadly and perhaps most importantly, future studies should build on the current attempt to use the refined uses and gratifications paradigm. This paradigm better reflects the original conception of the uses and gratifications perspective.

ICG: A Functional Alternative?

As discussed previously, the current study's focus on attaining an adequate number of ICG players excluded any attempt to comment on the broader influence of ICG in terms of overall use. Specifically, is ICG a functional alternative to more traditional forms of mass media like television, movies, etc.? Or, will ICG become a functional alternative to these other forms of mass media? These will be very important questions in determining how influential ICG will be in the broader population. In turn, it will also determine just how salient ICG research of this nature will be to the field of mass communication research. Studies examining ICG as a functional alternative to television will be imperative.

The current study's findings suggest that there is potential for ICG to become a viable choice among other forms of mass media. The tremendous growth in the ICG industry noted throughout is one aspect that points to this trend. Also, respondents in this study reported playing ICG for nearly an hour and a half (88.95) on an average weekday. Finally, the convergence of various forms of media including the Internet,

television, and ICG may perhaps lead to a time when all three are combined in the same “box.” (Perse, 2003, personal communication).

Gender Differences

Results from the current study suggest that males are significantly more likely to play ICG on an overall level, as well as in eight of the ten genres (see Table 7) and all contexts (Table 10). This is not surprising, given that the world of ICG has been a male-dominated area in terms of ownership, designers, etc. Games traditionally have been dominated by male protagonists and tend to take on themes (i.e. violence, sports) that tend to be more popular among men. However, the current study did find that females were significantly more likely than males to play classic games (i.e. solitaire, hearts). This supports the notion that women are not adverse to the technology, but rather that the software content has been heavily slanted towards male interests.

There is some evidence that this is changing. The tremendous popularity of *Tomb Raider* character Lara Croft (later played by Angelina Jolie in a major motion picture) may signal that women are beginning to claim a spot on the ICG stage. An online organization for women called *WomenGamers.com* offers gaming information, news, and demos specifically for women, or as they say “for gamers, by gamers.” According to *WomenGamers.com*, “While it was certainly true in the past that many more males played computer games than females, the gap has been closing for some time now. Currently, there is only a 7%-15% margin between the number of males who play games versus the number of females” (womengamers.com, 2003).

This trend is further echoed in a story from BBC news that noted the tremendous female appeal in the snowboarding game *SSX Tricky*. Reporter Alfred Hermida (2001)

writes “the appeal of *SSX Tricky*, released last week, to women is challenging the perception that video games are just boys' toys.” The success of *SSX Tricky* may help jumpstart what computer consultant Bill Thompson calls “an untapped market.” Thompson states “having seen my daughter and her friends playing these games, it is obvious there is an untapped market there.”

The emergence of *SSX Tricky* as a popular female game not only signals the growth in women gamers, but perhaps gives insight to the overall path of ICG development. Bernadette LaCarte, who was a visual designer of *SSX Tricky*, comments “What men as well as women look for is interesting games, rich characters and storylines, immersive experiences, giant landscapes.” If this is indeed the case, the future may hold tremendous convergence among women and men in terms of genre selection. Future researchers should pay attention to these changing trends. Future studies should examine if the gap between male and female ICG play erodes.

Psychological Characteristics

Four psychological factors were examined in an attempt to answer the question why people play ICG. Future studies can build on the knowledge attained in this preliminary study. Sensation-seeking, aggressivity, and extraversion were successful in predicting motives as well as ICG playing behavior. Need for cognition, on the other hand, was not a significant predictor. These results can be refined and further examined to see if they hold in various demographics and over the course of different samples.

Also, there are perhaps other psychological characteristics that may be viable predictors not used in this study. These may provide more insight and explain more variance.

Considering psychological factors, it is also advantageous to determine whether an overall measure of personality (i.e., temperament) versus individual characteristics provides better insight. Overall measures of personality may offer the advantage of an all-encompassing and parsimonious model. Yet, an overall measure of personality may lack the predicting power and insight gained from individual psychological characteristics. Also, it may be difficult to hypothesize using an overall measure of personality. This issue will be salient to anyone using the uses and gratifications paradigm to examine ICG behavior.

Conclusion

As ICG play continues to grow over the 21st century, it is imperative to follow the communicative phenomena that correspond with this growth. This particularly relevant as ICG become more widely used across a larger demographic of the population. The current study is foundational in nature in the realm of ICG as it attempts to lay groundwork for further study in the area of ICG. This has been done within the existing uses and gratifications paradigm, and thus fits in with the ever-developing stream of used and gratifications research on mass communication issues. This is important not only for the current study, but for future studies. As scholars continue to study mass communication phenomena, it is the hope that this study not only lends insight to the realm of ICG, but that it reinforces the vitality of the uses and gratifications approach in explaining and understanding the rapidly changing mass communication issues in the 21st century.

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¹ The term “interactive computer game (ICG)” is adapted from Perse’s (2000) definition of “interactive computer-based games” which include video games (played on systems connected to television monitors), hand-held game systems, arcade games (played outside the home), computer games (played on personal computers), and online games (played on the World Wide Web).

² The short definitions of motivations (i.e., because it’s thrilling) are taken from items on the survey used in Perse’s (2000) study on IC G use.

³ The Yahoo! category *driving* was expanded to *driving/flying* to include games that are similar in display but feature different vehicles (i.e., planes versus automobiles).