2008

The Effects of Media Interactivity on Mood Regulation: An Experimental Study

Youngrak Park
FLORIDA STATE UNIVERSITY
COLLEGE OF COMMUNICATION

THE EFFECTS OF MEDIA INTERACTIVITY ON MOOD REGULATION:
AN EXPERIMENTAL STUDY

By
YOUNGRAK PARK

A Dissertation submitted to the
Department of Communication
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Degree Awarded:
Spring Semester, 2008
The members of the Committee approve the dissertation of Youngrak Park defended on December 13, 2007.

____________________________________
Arthur A. Raney
Professor Directing Dissertation

____________________________________
Susan Losh
Outside Committee Member

____________________________________
Gary R. Heald
Committee Member

____________________________________
Steven McClung
Committee Member

Approved:

____________________________________
Stephen D. McDowell, Chair, Department of Communication

____________________________________
John K. Mayo, Dean, College of Communication

The Office of Graduate Studies has verified and approved the above named committee members.
I would like to express my sincere appreciation and gratitude to my major professor Dr. Arthur Raney for his encouragement, expertise, and support as a mentor. I also would like to thank Dr. Susan Losh, Dr. Gary Heald, and Dr. Steven McClung for their help throughout the process.

I would like to express my gratitude to my friend Maria-Gracia Inglessis, Yarama Velazquez, and Monwipa Wongrujira, and many others for their patience, company, and support. My special thank goes to my trustful friend Ms. Yang, Jin-hee who helped me to create stimulus material.

I would also like to thank my family. I thank my parents, Park, Dong Il, and Yu, Soon Ja for their infinite wisdom, love and pray. My brother and sisters, I thank you very much for your warm support.

Heasook Joo, my wife, John and Matthew my kids, you are my all. I thank you and I love you.

Finally I thank God, my lord.
### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>vi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>Abstract</td>
<td>viii</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. LITERATURE REVIEW</td>
<td>4</td>
</tr>
<tr>
<td>Effects of Entertainment on Moods</td>
<td>4</td>
</tr>
<tr>
<td>Interactive Media</td>
<td>13</td>
</tr>
<tr>
<td>Video Game In Mood Management</td>
<td>24</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>31</td>
</tr>
<tr>
<td>3. METHOD</td>
<td>35</td>
</tr>
<tr>
<td>Participants</td>
<td>35</td>
</tr>
<tr>
<td>Procedure</td>
<td>36</td>
</tr>
<tr>
<td>4. RESULTS</td>
<td>41</td>
</tr>
<tr>
<td>Data Reduction: Independent Measures</td>
<td>41</td>
</tr>
<tr>
<td>Dependent Measures</td>
<td>45</td>
</tr>
<tr>
<td>Random Assignment Checks</td>
<td>48</td>
</tr>
<tr>
<td>Manipulation Checks</td>
<td>49</td>
</tr>
<tr>
<td>Statistical Analysis of Data</td>
<td>50</td>
</tr>
<tr>
<td>5. DISCUSSION</td>
<td>69</td>
</tr>
<tr>
<td>Summary and Discussion of Findings</td>
<td>69</td>
</tr>
<tr>
<td>Significance of the Study and Future Research Direction</td>
<td>78</td>
</tr>
<tr>
<td>Limitation</td>
<td>80</td>
</tr>
<tr>
<td>Conclusion</td>
<td>82</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>83</td>
</tr>
<tr>
<td>A HUMAN SUBJECT COMMITTEE APPROVAL LETTER</td>
<td>83</td>
</tr>
<tr>
<td>B INFORMED CONSENT FORM</td>
<td>84</td>
</tr>
<tr>
<td>C DISSERTATION EXPERIMENTS SCRIPT</td>
<td>85</td>
</tr>
<tr>
<td>D COMPUTER SCREEN CAPTURE OF MEDIA CONSUMPTION SURVEY</td>
<td>88</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1: Summary of group size ................................................................. 36

Table 2: Principal Component Solution with Direct Oblimin Rotation for Mood Items, Pre-test Results ................................................................. 42

Table 3: Principal Component Solution with Varimax Rotation for Enjoyment Items ................................................................................................ 46

Table 4: Principal Component Solution with Varimax Rotation for Involvement Items .......................................................................................... 47

Table 5: Random Assignment Checks: Means and ANOVA Results for Media Consumption by Media Conditions ............................................. 48

Table 6: Repeated Measure ANOVA Summary for Positive Mood in Video Game Condition ...................................................................................... 55

Table 7: Repeated Measure ANOVA Summary for Negative Mood in Video Game Condition ...................................................................................... 56

Table 8: Enjoyment Sample Statistics in Video Game Condition .......... 58

Table 9: Enjoyment while Playing Video Games Summary ...................... 58

Table 10: Repeated Measure ANOVA Summary for Positive Mood .......... 60

Table 11: Repeated Measure ANOVA Summary for Negative Mood ........... 63

Table 12: Positive Mood Change Statistics ................................................ 64

Table 13: Positive Mood Change with Video Game Skill ........................... 65

Table 14: Negative Mood Change with Video Game Skill ........................... 65

Table 15: Cross Media Effects on Enjoyment ............................................. 66

Table 16: Enjoyment Sample Statistics ......................................................... 67

Table 17: Summary of Backward Regression Analysis for Variables Predicting Enjoyment ................................................................................. 68
LIST OF FIGURES

Figure 1: Mood Management and Selective Exposure Research .......................... 14

Figure 2: Manipulation Check: Positive-Mood Change in General Media Condition
........................................................................................................................................ 51

Figure 3: Manipulation Check: Negative-Mood Change in General Media Condition
........................................................................................................................................ 52

Figure 4: Positive Mood Change in Video Game Condition ............................... 55

Figure 5: Negative Mood Change in Video Game Condition ............................. 56

Figure 6: Positive Mood Change in Media × Mood × Time Experimental Condition
........................................................................................................................................ 60

Figure 7: Negative Mood Change in Media × Mood × Time Experimental Condition
........................................................................................................................................ 63
ABSTRACT

The purposes of the study were to examine the potential of video games as mood changing tools, and to compare the effects of interactive media to mood and enjoyment with those of traditional media. Mood management theory was employed as a theoretical framework. Specifically, since interactive media require more cognitive intervention, this dissertation predicted 1) video games would enhance mood among members of the bad mood condition better than members of the good mood condition, and 2) video game would be more effective than DVD clips to change bad mood. A factorial design with two mood conditions (good vs. bad), media condition (video game vs. DVD clip) and time (pre- vs. post-media exposure) was employed to examine the predictions. The sample was recruited from large-lecture classes in the Department of Communication at FSU. Participants were randomly assigned to one of the four conditions.

It was found that video games were effective in changing mood. Specifically, consistent with mood management assumptions, members of the bad mood group reported greater positive mood increase and negative mood decrease than members of the good mood group. In a cross-medium setting, the expected mood and media interaction effect was not observed. However, when video game skill was used as one of the factors, mood management expectations were partially supported. Specifically, video game players increased their positive mood greater than DVD clip viewers, only when their video game skill was highly competent.

Based on these results, this dissertation concludes that 1) video games are media that can be considered as possible mood enhancers, 2) although media interactivity is often defined as the amount of technological features a medium provides, perceived interactivity may better explain the effect of interactivity on media users’ affective, cognitive and behavioral responses, 3) video game skill or familiarity with the game is a significant predictor of mood enhancement and enjoyment among video game players, 4) the intervention potential of a media message or a media type is a significant predictor of enjoyment in cross-medium comparison setting, and 5) enjoyment is obtained when positive factor of mood increased.
CHAPTER 1

INTRODUCTION

How do people make a decision of playing a video game over other media consumption? Much of the current state of knowledge in media choice motivation has been supported by mood management theory (Zillmann, 1988b; Zillmann & Bryant, 1985a, 1985b). The theory posits that media consumers select media content in order to obtain excitatory homeostasis. Specifically, people select television programs (Bryant & Zillmann, 1984a; Davies, 2004; Helregel & Weaver, 1989; Langley, O'Neal, Craig, & Yost, 1992), newspapers (Biswas, Riffe, & Zillmann, 1994), music (Carpentier, Knobloch, & Zillmann, 2003; Knobloch & Zillmann, 2002), and interactive media such as the Internet (Mastro, Eastin, & Tamborini, 2002) to minimize aversion and maximize gratification. Because individual media genres provide a wide range of entertainment fare, people can obtain their optimal mood state by consuming media content. Video games also have been discussed for their potential as mood changers. However, to date, the literature regarding mood management theory hasn’t empirically investigated the video game context. Therefore, the first purpose of this dissertation is to address this problem and expand our understanding of the motivations for media consumption.

Although the word “new” media is interchangeably used with “interactive” media, researchers have begun to focus on the effects of interactivity itself as well as the content of interactive media (Bryant & Davies, 2006b; Grodal, 2000; Mundorf & Laird, 2002; Mundorf & Westin, 1996; Vorderer, 2000; Vorderer, Bryant, Pieper, & Weber, 2006; Vorderer, Knobloch, & Schramm, 2001). It would be expected that challenge, interpersonal activity, and the diversity of difficulty and skill levels would produce different effects on users’ positive or negative affective mood state comparing to non or less interactive, traditional media (Vorderer, Bryant, Pieper, & Weber, 2006). In other words, media consumers may utilize not only the media content with variant hedonic valences, but also different media genres with variant levels of interactivity to regulate their mood states (Vorderer, Bryant, Pieper, & Weber, 2006). However, mood management researchers have focused on single medium genre circumstances. Therefore, this dissertation also aims to investigate mood management theory in a cross-media setting.
Despite the scarcity of cross-media exposure research from mood management perspectives, it has been documented that interactivity can induce more intense feeling of entertainment for media consumers. For example, Vorderer, Knobloch, and Schramm (2001) reported that participants with greater cognitive capacity felt more empathy, suspense, and entertainment when a movie was presented in an interactive way than a traditional way. A similar pattern was also found with video games. Vorderer, Hartmann, and Klimmt (2003) found that video game players gained higher arousal when they were offered more interactive features with numerous weapons and tools than when they were offered only a few possibilities to act. Generally speaking, video games’ interactivity provides competitiveness against the computer or other player, and that competitiveness can increase aggressive thoughts, behaviors, and hostility (Anderson & Morrow, 1995; Lange, Otten, Bruin, & Joireman, 1997; Williams & Clippinger, 2002).

Most of knowledge based on mood management theory has been accumulated using experimental research methods. With this in mind, this dissertation employs an experimental design to expand Zillmann and Bryant’s (1985a, b) mood management theory to cross-media settings. First, the study will experiment the possibility of video games as a mood regulation tool. Secondly, the effect of an interactive and non-interactive medium on mood and enjoyment will be compared.

In this dissertation, Chapter 2 reviews the prior literature concerning mood management. Particular attention is given to theoretical variables that influence media selection for mood regulation. This chapter also reviews the definition of interactivity to operationalize video games as interactive media. As interactive media, video game as a potential mood manager is also reviewed. Based on the literature review of mood management, this chapter hypothesizes that video games require more cognitive involvement than DVD clips. Thus, the chapter predicts that video games induce positive mood and enjoyment more effectively than DVD clips.

Chapter 3 outlines the methods that are used to complete an experiment using mood induction and media consumption. To manipulate mood, a facial expression test was used. According to the feedback from the computerized test, participants were placed either in good or bad moods. To examine the effect of interactivity on mood change, a video game and a DVD clip were used as an interactive and tradition medium, respectively. To avoid possible
recognition of the research purposes, individuals were led to believe they were participating in two research sessions.

Chapter 4 details the experimental results. Initially, factor analyses and reliability measures are employed to select variables that are used for analysis. Repeated measure ANOVA and t-test procedures are used to examine the effect of media interactivity on mood and enjoyment. Backward multiple regression procedure was also employed to identify predictors of enjoyment in both video game and cross-medium setting. This section concludes with considerations of main and interaction effects resulting from the experiment.

The final chapter, Chapter 5, discusses the study results. The hypotheses findings are outlined. In this section, the predicted and unanticipated findings are discussed and recommendations are made for future studies. This section concludes with discussion of the key limitations of this dissertation.
CHAPTER 2

LITERATURE REVIEW

Effects of Entertainment on Moods

A theory of affect-dependent stimulus arrangement proposed hedonic premise which stated that, in general condition, “individuals are motivated to terminate noxious, aversive stimulation” and “individuals are motivated to perpetuate and increase the intensity of gratifying, pleasurable experiential states” (Zillmann & Bryant, 1985a, p.158). Based on the hedonic premise, Zillmann (1988b) developed 11 propositions about the hedonic motivation for selecting communication contents that have served as the basis for most mood management studies. Zillmann (1988b) limited the hedonic premise to entertainment fare by stating that “to the extent that the control of external stimulation is limited to entertainment offerings, individuals arrange and rearrange their exposure so as to minimize aversion and maximize gratification” (p.149). It is emphasized that, in applying mood management theory, one should carefully consider different types of messages because each type may differently affect moods, and consequently, different selective exposure strategies are applied by the viewer (Zillmann, 1988a, 1988b; Zillmann & Bryant, 1985a, 1985b). Generally, Zillmann (1988a, 1988b) suggested that individuals are selecting entertainment message to decrease or avoid negative moods and increase or extend positive moods.

The theory considers (at least) four aspects of using media as a mood manager that differently affect mood: excitatory homeostasis, intervention effects, affinity between message and behavior, and hedonic valence (Bryant & Davies, 2006a, 2006b; Bryant & Zillmann, 1984b; Oliver, 2003; Zillmann, 1988a, 1988b; Zillmann & Bryant, 1985a). Based on these aspects, researchers have built mood management hypotheses and tested them. In this section, each concept will be explicated. Since mood management theory has been examined based on the message categories, major literatures corresponding to each message category will be introduced.

Excitatory Homeostasis

Excitatory homeostasis refers to the effect of entertainment message on physiological excitation and is defined as “sympathetic dominance in the autonomic nervous system.”
(Zillmann & Bryant, 1985a). The same concept has also been called excitation (Zillmann, 1988b), physiological arousal (Oliver, 2003) and arousal reaction (Bryant & Davies, 2006b; Davies, 2004). The basic assumption of mood management regarding excitatory homeostasis is that persons in states of extreme overstimulation will select calming or relaxing stimuli over exciting or arousing ones, whereas understimulated individuals will select arousing entertainment fare (Zillmann, 1988b).

To test this hypothesis, Bryant and Zillmann (1984b) conducted an investigation in which stress or boredom was induced in participants who were subsequently exposed to relaxing (i.e., nature program, orchestra concert of classical lullabies and a travelogue) or exciting entertainment programs (i.e., action adventure, football game, and quiz-show). The state of stress versus boredom was induced by randomly assigning participants to one of two different tasks for one hour. Stress was induced by having participants solve intellectual problems designed to always exceed the participants’ ability. Boredom was induced by having participants do monotonous jobs. The participants were informed that they could watch TV programs from any of six channels (three containing relaxing and three containing exciting programs) while waiting for the next session to begin. The researchers expected that bored people would be more likely to select exciting program, while stressed people would select relaxing ones in an attempt to manage their physiologically over- or under- evoked moods. Consistent with mood management predictions, individuals in a boredom state selected exciting programs almost twice as much as their stressed counterparts. Also, stressed individuals preferred relaxing programs over exciting program more than six to one. After the exposure to exciting programs, individuals in boredom states gained more physiological arousal (i.e., higher heart rate). Stressed individuals relieved their physiological arousal through watching relaxing programs. Thus, in short, the research confirms the hypothesis that exposure to entertainment contents can affect physiological arousal level.

**Intervention potential**

The mood management theory refers to intervention as the effect of a message on cognitive processing and is conceptualized as “the ability of a message to engage or absorb an aroused individual’s attention, or cognitive resources” (Davies, 2004, p.4.). Cantor (2003) argued that intervening media messages have greater mood altering potential. Zillmann (1988b) proposed that individuals in aversive states would seek absorbing types of messages to alleviate
their negative emotions, whereas persons in positive mood states will select less absorbing messages to maintain their affective state (Zillmann, 1979, cited in Zillmann, 1988b)

Bryant and Zillmann (1977) conducted an experiment to test the message intervention potential hypothesis. To manipulate the degree of cognitive intervention potential of communication, six TV clips were video taped and included two minimally involving programs (e.g., monotonous film, and nature scene), two non-humorous, non-aggressive segments (e.g., daytime quiz show, figure-skating), one humorous, non-aggressive segment (e.g., non-hostile comedy shows), and one non-humorous, aggressive segment (e.g., ice-hockey). The stimulus materials were pretested with three measures of cognitive intervention potential: recall test, signal detection test, and ratings of cognitive intervention scale. After listening to a speech about paper making, the participants were randomly assigned to one of the six communications. During the exposure to the stimulus material, participants were asked to respond to the signal detection test. The intervention potential of the message is measured in the frequency of errors made in the test. Upon finishing the media exposure, recall test about the paper-making speech was administered. Finally, participants were asked to rate the cognitive intervention potential of the communication messages and the scale included absorbing, eventful, demanding, boring, involving, interesting, and mind wander. The pretest resulted in four differentiations in cognitive intervention potential from minimal (monotonous film) to low (nature scene), to moderate (comedy show, figure-skating), to high (quiz show, ice-hockey). In the main experiment, participants were provoked and exposed to one of the six pretested communications. When the participants were given an opportunity to express their retaliation against their provoker, the individuals exposed to intervening messages showed significantly less aggression compared to individuals in a condition of minimal intervening messages. In contrast, less intervening messages did not affect mood change.

Davies (2004) also reported similar intervening message effects on positive and negative mood states in an investigation of interaction between mood state and the neurotic personality trait. To induce positive or negative mood state, participants were praised or criticized during an interview session, and later they were given opportunity to select varying degrees of absorbing TV programs. Inheriting Bryant and Zillmann’s (1977) procedure, six programs were categorized into two levels of intervention potential (low vs. high). The findings showed that individuals with high neuroticism who were in a positive mood state, compared to individuals in
negative moods, significantly exposed themselves longer to low intervention potential programs. The results are consistent with mood management considerations. However, the research failed to find the preference of high absorbing media contents from negatively affected participants. Thus, the research concluded that bad moods could be managed with highly intervening messages; however, the effect would be stronger especially when other message factors (e.g., lower level of affinity) were combined.

When individuals are in a negative mood state, they are motivated to repair their moods by distracting themselves from the initial mood state. One way of mood alteration is distracting one’s self from the negative moods by engaging in cognitive processing (Chang, 2006). In her study, Chang (2006) reported that participants in a negative affective state experienced greater mood enhancement when they were exposed to a pleasant ad. Not surprisingly, in a same experimental condition, negatively provoked participants engaged in greater cognitive effort to evaluate an advertised product.

Analogous results were also reported from survey research. Anderson et al. (1996), for example, attempted to find a relationship between a stressful life and TV viewing behaviors with a series of surveys. In one study, stressful events in life were significantly associated with TV addiction, especially for women. In a second study, adults with more stressful events consumed more comedy and game shows and less news and documentary programming. The results were consistent with Zillmann et al.’s (1980) earlier study, which concluded that negatively affected individuals preferred more absorbing programs such as short-formatted comedy and game shows. Furthermore, a third study showed that individuals with more stressful events in life were more likely to pay attention to TV. By engaging in more absorbing programs, individuals may feel (at least) temporary relief from their stressful daily life.

**Message-Behavioral Affinity**

Mood-message affinity refers to the effect of message on cognition and behavior and is conceptualized as “the degree of similarity between communication content and affective state” (Davies, 2004, p.4). According to the propositions of mood management, “a stimulus of high behavioral affinity is likely to perpetuate prior affect because it revives affect-maintaining cognitions” (Zillmann, 1988b, p.152). Thus, individuals in a negative mood state would avoid messages which might promote their aversive moods, while individuals in positive moods would seek messages to extend their good mood.
If a message has highly absorbing potential but the message is also associated with aggression or hostility, the message effect of diminishing bad mood will be decreased, especially for provoked individuals, because the hostility or aggressiveness of the message will reinforce the provoked individual’s initial stimulation (Bryant & Zillmann, 1977). The literature suggests that intervention of the message and message affinity function together to alter moods.

Zillmann, Hezel, and Medoff (1980) predicted that persons in negative affective states would prefer comedy and game shows over action drama because the former had more cognitively absorbing potential than the latter one, and therefore, had more mood altering potential. To test the hypothesis, participants were randomly assigned into one of the three conditions: negative, neutral, or positive affective state. The affective state was manipulated with a facial expression recognition test. In the negative affective condition, participants were led to believe their recognition ability was much lower than average; they were also verbally insulted by the experimenters. In the neutral affect state condition, participants were led to believe their performance was about average level and were treated neutrally. In the positive affect condition, participants were not only led to believe their performance was excellent, but were also praised for their performance. After the mood manipulation session, the participants were instructed to watch TV programs that varied in absorbing potential: short formatted comedy and game shows for highly intervening programs and long formatted action dramas for lowly absorbing ones. Unexpectedly, the researchers observed that individuals in negative affective state tended to avoid comedy programs. The researchers explained that although comedy was categorized as an involving message, primetime comedy shows were likely avoided by provoked individuals because most primetime comedies contain hostility. Exposure to the anticipated hostile comedy content might reinforce the participants’ initial annoyed mood, and thus, the participants tried not to expose themselves to mood reinforcing entertainment fare. The implication was supported in the successive investigation.

In a study by Medoff (1982), the participants were randomly assigned to neutral or negative affective state. Two negative conditions were created: simple failure of a task or a failure plus insult. Females in the failure plus insult condition watched more comedy low in ridiculing content than comedy that was high in ridicule content. On the contrary, participants in the failure condition watched comedy high in ridiculing content more than participants in the neutral or the failure plus insult conditions. In short, although negative affective state individuals
generally preferred comedy shows to neutral drama, if provoked and annoyed, the individuals tended to avoid ridiculing comedy shows that might reinforce their acute emotional state and related cognitions.

Different from the previous selective exposure patterns, it was reported that entertainment fare may not serve as an escape or relief to some provoked individuals. In an experimental study, Christ and Medoff (1984) observed that annoyed individuals avoid viewing any television programs. Instead, although it was not directly measured, the participants wrote letters, read newspapers, walked around the room, or looked out the window rather than watched television. When individuals are so preoccupied with their affective state, they may not be able to change their state with television entertainment fare, and thus look for other ways to reduce their annoyance. Taken together, Medoff and his colleagues’ studies (Christ & Medoff, 1984; Medoff, 1982; Zillmann, Hezel, & Medoff, 1980) argued that, at least in some circumstances, individuals select a media content not only based on its absorbing potential and hedonic valence, but also under the consideration of the level of similarity between the initial moods and message characteristics.

While previous researchers have reported negative association between the degree of mood-message similarity and mood altering potential of a message, a similar pattern of belief-message affinity was also reported by communication scholars (Masters, Ford, & Arend, 1983; J. Wakshlag, Vial, & Tamborini, 1983; Zillmann & Wakshlag, 1985). These studies reported that the greater similarity between a message and an individual’s belief about social justice, the less potential for mood alteration a message has (Zillmann & Bryant, 1985a, p. 182). The rationale came from Festinger’s (1957) cognitive dissonance theory, which suggests that individuals tend to seek belief-supporting messages and avoid belief-challenging messages when faced with cognitively challenging or stressful situations. The hypothesis was tested and supported by Wakshlag, Vial and Tamborini (1983).

Wakshlag and his colleagues (1983) reported that the degree of similarity between message and concern was a predictor of selecting messages to manage their moods. Participants were randomly assigned to view documentary films that would or would not provide apprehension of violent crime, and then were allowed to select films which were edited to describe victimization and justice. Participants who were exposed to violent crime were more apprehensive about crime and more concerned about the victimization. As a result, to avoid the
perpetuation of their concern, they avoided victimization films containing message-concern affinity.

The strategy for using informational aspects of entertainment fare as mood controllers are established early in childhood (Masters, Ford, & Arend, 1983). In an experimental study, four and five year old children were randomly assigned into one of three nurturance manipulation conditions. To manipulate social nurturance experience, the experimenter presented verbal statements of positive, neutral, or negative valence nine times. Afterwards, children were given an opportunity to watch kids’ television programs. The television programs were either nurturing (Mister Roger’s Neighborhood) or neutral (segments selected from news shows for children). Each child was able to watch only one program but for as long as they wished. Overall, children in the aversive social condition watched TV longer than children who experienced a positive or neutral condition. This would indicate that TV was used to overcome the negative state created in the aversive condition. Furthermore, boys in the non-nurturant social experience watched the nurturing program significantly longer time than boys or girls in any other conditions. The lack of such a strategic approach to reduce hostile experience among girls was explained by the thought that girls were more likely to ignore aversive situations and thus paid less attention to the aversive communication during the non-nurturing social experience.

**Hedonic Valence**

Hedonic valence refers to the positive or negative nature of a message (Davies, 2004, p.5). Theoretically, all media messages can be placed on a continuum of hedonic valence. Bryant and Davies (2006a) summarized the adjectives of positive hedonic valence as “uplifting, reassuring, amusing, happy” and negative hedonic message as “threatening, noxious, distressing, and sad” and so on (p. 27). Generally, it is expected that media content with a hedonically positive hedonic valence has more mood altering potential (Bryant & Davies, 2006a; Zillmann, 1988a). Thus, as previously stated, individuals in aversive mood state should select positive hedonic entertainment fare to reduce or eliminate their negative mood state.

The preference for positively valenced media content has been reported in various arenas. For example, Wakshlag, Day and Zillmann (1981) reported that educational programs containing humor were selected more often by children than programs without humor. Furthermore, fast paced humor within an educational program facilitated stronger influence on selective exposure than slow paced programs. Wakshlag, Reitz and Zillmann (1982) observed a similar
phenomenon. The involvement of appealing music with a fast tempo greatly influenced selective exposure among children. However, the effect of music on learning or acquisition was not observed. Using a survey, Perse (1998) reported that TV viewers tended to change channels when the program contents were not visually appealing. Generally, the research reveals that media consumers tend to make media choice based on the perceived hedonic valence of the entertainment contents. However, this research cannot necessarily support evidence of mood management because they do not measure initial mood state and change as a consequence of selective exposure.

The notion that positively valenced entertainment fare is frequently selected to manage mood was evidenced from women’s moods research. For women, the hormonal change due to menstrual cycles and pregnancy can negatively affect moods and can lead to the selecting or avoiding of some media contents. In a quasi-experimental study, Medowcroft and Zillmann (1987) researched selective exposure to comedy shows during women’s menstrual cycles. The results showed that women in the premenstrual and menstrual phases of the cycle preferred comedy over game shows and drama programs. The results supported the hedonic valence proposition. Due to hormonal mediation, women in the premenstrual and menstrual phase reportedly experienced irritable mood states, which they tried to overcome by selecting positive entertainment fare. Another natural event that may produce women’s physical, physiological, emotional, and mood change is pregnancy. Research concerning mood management during pregnancy revealed a similar pattern of selective exposure among pregnant and non-pregnant women (Helgrel & Weaver, 1989). Pregnant women who were experiencing noxiousness because of their physical and psychological discomforts strongly preferred comedy shows to other alternative media genre. Furthermore, women in the 26th week of pregnancy experienced positive affective states due to hormonal change, and their preference for comedy programs decreased and preference for action adventure programs increased significantly.

Knobloch and Zillmann (2002) evaluated and categorized music into high-low energy and joyfulness based on its fast-slow, sad-happy, soft-hard, and positive-negative nature. The researchers expected that highly energetic and joyful music would be selected by individuals in bad mood. Moreover, the research also tested a message absorption hypothesis by predicting that aversive state individuals would focus on their selected music, and thus they would change music less frequently in a given time. Participants were assigned to one of three experimental
conditions by inducing negative, neutral, or positive moods and were then asked to sample their favorite songs. As was expected, the results showed that persons in bad moods were more likely to select highly energetic and joyful music than neutral mood individuals. In turn, persons in neutral mood preferred energetic and joyful music over individuals in positive mood state. The second hypothesis was also confirmed: Individuals in bad mood states paid more attention to their music selection, and thus, less frequently changed their songs. As the results showed, the hedonic valence of music indeed has the potential to alter mood states. Additionally, message absorption potential propositions were also confirmed. Taken together, this research strongly supports that positive hedonic entertainment fare, especially comedy shows, have strong mood altering capacity.

Considering the argument that “all communication message can be classified on a continuum of positive and negative” (Davies, 2004, p.5), the hedonic nature of a message should not be limited to entertainment media content. For example, Biswas et al. (1994) argued that news reports differ in terms of hedonic valence, and mood was a factor influencing selective exposure to good or bad news stories. To support their argument, the researchers hypothesized persons (especially women) in negative affective states would be less likely to expose themselves to bad news. In contrast, the individuals in bad moods (especially women) would seek good news to terminate their bad mood and alleviate their mood to positive direction. These hypotheses were confirmed.

While most of the mood management literature reports that individuals choose positive messages to alleviate aversive moods, the social comparison perspective argues the opposite direction of mood management hypotheses. In an investigation of lonely and non-lonely elderly viewers, Mares and Cantor (1992) reported that non-lonely group members followed the prediction of mood management: They preferred to watch programs of positive hedonic valence which portrayed happy and successful life of older characters. On the contrary, lonely elderly viewers selected to view negative portrayals of elderly life. Furthermore, after exposure to negative portrayals, lonely elderly viewers reported that their moods improved after watching the programs. The results were consistent with the prediction of social comparison theory that suggests that people may enhance their moods by comparing themselves with socially worse situated individuals. Although the two explanations (mood management vs. social comparison)
appears contradictory in their results, the ultimate goals of the viewers are the same. In either, ultimately what was sought was the eliminating negative moods and perpetuating good moods.

Despite strong correlation between hedonic valence, selective exposure, and mood change, researchers have agreed that the relationship is likely true only under certain conditions (Bryant & Davies, 2006b). For example, it was argued that messages with a positive valence diminished the effects of negative mood if the message had low excitatory potential, but exacerbated aggressive reactions if the excitatory potential was high (Ramirez, Bryant, & Zillmann, 1982; Zillmann, Bryant, Comisky, & Medoff, 1981). Figure 1 presents a summary of mood management and selective exposure studies.

Interactive Media

Engaging in entertainment media contents as a tool of mood management was discussed in the previous section. Shortly, individuals have hedonic motivation to terminate or reduce negative mood and intensify or extend positive mood. This hedonic goal can be obtained when obnoxious individuals consume media contents which are a) excitationally opposite to their previous arousal state, b) cognitively involving enough to distract one’s self from previous mood state, c) not or little similar to their existing affective state so that the media messages can not revive negative moods, and d) hedonically more positive than their previous moods (Knobloch-Westerwick, 2006).

The entertainment value of interactive media has been well established. Specifically, entertainment media scholars have argued that interactivity is the key feature of new media for entertaining users (Klimmt, 2003). From the mood management perspective, interactivity has been proposed as potential mood changer because of its excitatory (Calvert & Tan, 1994; Fleming & Rickwood, 2001), intervening (Mastro, Eastin, & Tamborini, 2002; Vorderer, 2000) and hedonic (Anderson & Bushman, 2001) characteristics.

The concept of interactivity has been defined and applied in numerous ways to new media technologies. Among the various approaches of interactivity, media psychologists and communication researchers have agreed that interactivity is the unique capabilities of new media to facilitate reciprocal communication through media. The present section attempts to advance our understanding of video games as an interactive entertainment medium. As an initial step,
<table>
<thead>
<tr>
<th>Author (method)</th>
<th>Mood manipulation (independent variables)</th>
<th>Medium</th>
<th>Variable</th>
<th>Dependent measures</th>
<th>Results</th>
</tr>
</thead>
</table>
| Ancerson, Collins, Shmit, & Jacobvitz, 1996 (Survey) | • No mood manipulation  
• Gender  
• Social event (stressful life) | TV programs: | • Hedonic Valence  
• Message-behavioral affinity | Selective exposure to TV, and TV programs such as: Comedy, news, game, action and violent | Study 1  
• Stressed individuals watch more TV  
Study 2  
• Stress – comedy selection: positive correlation  
• Stress-new selection: negative correlation  
• Stressed women: more game  
• Stressed men: more action and violent program |
| Biswas, Riffe, & Zillmann, 1994 (Experiment) | Bad, neutral, vs. good moods (emotions expressed facially recognition test) | News Stories (boring/interesting, depressing/uplifting, pessimistic/optimistic, disturbing/pleasant) | Selective exposure to new stories  
The mean score of number of bad news selection was measured | Women in bad mood prefer good news  
Men doesn’t’ have such preference |
| Bleich, Zillmann, & Weaver, 1991 (Experiment) | • No mood manipulation  
• Rebelliousness (low,high)  
• Gender  
• Defiance expressed in rock music (absent, present) | Rock Music Videos | • Enjoyment of music videos: Exciting, good, good feelings, enjoyable, quality of singing, quality of lyrics, quality of band performance, likeness of the group  
• Measurement of consumption | Unexpectedly,  
• Highly rebellious students did not enjoy defiant rock videos  
• Highly rebellious students consumed significantly less amount of rock music |
| Bryant & Zillmann, 1977 (Experiment) | Provocation (Anger or happy moods induced by rude or nice experimenter) | TV programs (monotonous, nature, comedy, non aggressive sport, quiz, aggressive sport) | Intervention potential  
• Changes in sympathetic excitation  
• Displaced aggressiveness  
• Retaliatory behavior | For non aggressive communications,  
The higher the intervention potential, the greater the decrease of annoyance-produced excitation |
| Bryant & Zillmann, 1984b (Experiment) | Stress vs. boredom (GRE/SAT type tests vs. threading metal washer) | TV programs (three relaxing vs. three arousing) | • Hedonic valence  
• Mood-message affinity | Selective Exposure and Duration  
• Excitatory state  
• Enjoyment of television viewing and program | Stressed individual watched greater proportion of tranquil program  
• Bored individuals selected a greater amount of exciting fare. |
<table>
<thead>
<tr>
<th>Author (method)</th>
<th>Mood manipulation (independent variables)</th>
<th>Medium</th>
<th>Variable</th>
<th>Dependent measures</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpentier, Knobloch, &amp; Zillmann, 2003 (Experiment)</td>
<td>No mood manipulation Personality -trait rebelliousness -disinhibition -hostility</td>
<td>Music (defiant music vs. competing non-defiant music)</td>
<td>Selective exposure to music</td>
<td>Trait rebelliousness, disinhibition, hostility were found correlated with time spent listening to songs featuring defiant messages</td>
<td></td>
</tr>
<tr>
<td>Chang, 2006 (Experiment)</td>
<td>Sad vs. Neutral vs. Happy</td>
<td>Study 1 Pleasant vs. unpleasant product advertisement</td>
<td>Hedonic valence Mood message affinity</td>
<td>Mood change after the exposure to ads</td>
<td>Sad individuals experienced greater mood enhancement from exposure to a pleasant product ads</td>
</tr>
<tr>
<td>Davies, 2004 (Experiment)</td>
<td>Bad vs. good mood (criticized, praised) Personality (neurotic, non-neurotic)</td>
<td>Television Programs (3 highly intervening, 3 low intervening)</td>
<td>Intervention potential Hedonic Valence TV Selection</td>
<td>Participants high in neuroticism preferred low intervention potential when they were praised. Criticized participants avoided programs with high intervention potential and negative valence The intervention potential of TV affected recall and mood, but minimally influenced recognition</td>
<td></td>
</tr>
<tr>
<td>Knobloch &amp; Zilmmann, 2002 (Experiment)</td>
<td>Bad, neutral, vs. good moods (emotions expressed facially recognition test)</td>
<td>Music</td>
<td>Hedonic valence</td>
<td>Music selection and duration of listening to songs Enjoyment of the musical experience (11 points scale) Enjoyable Not at all - extremely Annoying Not at all - extremely</td>
<td></td>
</tr>
<tr>
<td>Mastro, Eastin, &amp; Tamborini, 2002 (Experiment)</td>
<td>Stress vs. neutral vs. boredom (GRE/SAT type tests vs. threading metal washer)</td>
<td>Internet (surfing speed, visiting websites)</td>
<td>Excitatory homeostasis, Mood-message affinity Intervention potential</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
however, it is necessary to discuss and define interactivity according to the purpose of the current research. Thus, the existing ideas and findings with regard to interactivity are reviewed. Subsequently, video games as interactive entertainment media will be reviewed and justified for the current dissertation.

**Interactivity**

Interactivity has been defined in various ways (Bucy, 2004; Kim, 2005). Largely, it has been summarized in four main views: — technology oriented, users’ perception oriented, communication process oriented, and multi-dimensional. In this section, various definitions of interactivity will be discussed based on the different perspectives.

**Interactivity from technological perspective.** These approaches have regarded interactivity as an attribute of technology (Sundar, 2003). The capacity of a medium to facilitate two-way communication is a key interest of this perspective (Rogers, 1986). Specifically, scholars suggest that new media provide a continuum of interactivity from facilitating passive, uni-directional communication to active and interactive mutual communication (Jensen, 1998; McMillan, 2002). Jensen (1998), for example, explained that a medium can provide four levels of interactive communication. The lowest level of interactive communication is termed transmissional interactivity. At this level, media provide users with choices of information without any request for selection. The second lowest level is consultational interactivity, which allows users to choose information through requests. The World Wide Web is an example of a consultational interaction, since a user must request web information and get a response from a web server. The third level of interactivity is conversational. A medium is conversational when it provides users opportunity to input their own information. The highest level of interactivity is registrational, which refers to the potential ability of a medium to register, request, and retrieve information. Since this perspective approaches interactivity as a technological feature, most of relevant research employed content analysis to identify and measure interactivity by counting the number of interactive features in a media content (Ha & James, 1998; Massey & Levy, 1999; Schultz, 1999).

While researchers endeavored to descriptively identify interactive features in websites, the empirical studies have posited that more interactive media would generate stronger effects on media users’ perception, attitude, and behavior. In general, it was reported that media users
would have more positive attitude toward media contents if the media provide more interactive features (Coyle & Thorson, 2001; Fiore & Jin, 2003; Marcias, 2003; Sundar, 2003).

In summary, the structural perspective views that a technology or medium itself is the determinant of level of interactivity. A series of content analysis studies identified interactive features of websites with different dimensions. Empirical studies found positive relationship between users’ perception and the measured level of interactivity. Although the researchers taking a structural perspective viewed interactivity on a degree of high and low, they suggested interactivity is best placed on a continuous spectrum from none to many. If there is quantitatively zero interactive features, then a given medium is non-interactive. Some researchers object to this argument. They suggest that interactivity should be viewed from the users’ perspective instead of the medium itself (McMillan, 2000; McMillan & Hwang, 2002; Newhagen, Cordes, & Levy, 1995).

**Interactivity as users’ perception.** Chen (1984), Bucy (2004), Wu (1994), McMillan and Hwang (2002) and Lee, Park, and Jin (2006) argued that interactivity resides in media users’ perceptions. Specifically, McMillan and Hwang (2002) suggested that individuals rated interactivity of media “on the basis of their perceptions of two-way communication, level of control, user activity, sense of place, and time sensitivity” (p.32). Empirically, it has been suggested that media users perceived a medium to be more interactive when they have greater ability to control the interactive features. For example, the use and efficiency of email was differently perceived by individuals based on their familiarity with the technology (Newhagen, Cordes, & Levy, 1995; Rice & Williams, 1984). Analogous results have been reported from websites interactivity investigation. McMillan (2000) argued that “interactivity reside in the eye of viewers’ holder” (p.77). She found that participants’ perceptions of interactivity are not positively correlated with technological richness. The perceived interactivity also influences users’ evaluation of web sites (Raney, Arpan, Pashupati, & Brill, 2003). The greater number of interactivity features was not found to be a predictor of users’ positive evaluation. Instead, features of traditional media entertainment, feature films for example, were factors predicting positive perceptions of a website.

In addition to consistent results of the effects of perceived interactivity reported, researchers have attempted to identify the factors that influenced the perception of interactivity. For example, users’ need for cognition and skill of navigation (Jee & Lee, 2002), evaluation of
the easiness to control, responsiveness of a medium and comfortableness to use a medium (Sohn & Lee, 2005) have been identified as predictors of perceived interactivity. Sohn and Lee (2005) also singled out the predictors of perception of interactivity. Users’ personality is one of the main factors of high interactivity perception. If one likes to engage in and enjoys thinking, he or she is more likely to detect interactivity in a given condition. Individuals’ certain level of knowledge and familiarity to a medium is another factor to predict interactivity perception. The more familiar with a medium, the more a user may perceive interactivity from it. The authors suggest that “one’s perception and evaluation of a medium is influenced by the characteristics of the social networks to which s/he belongs” (p.7). In short, the literature showed that interactivity is differently perceived and evaluated by users according to their psychological needs, familiarity with a medium, and social environment.

**Interactivity as communication process.** Rice and Williams (1984) defined interactivity as a function of new communication technologies which enabled two-way communication. In his term, two-way communication refers to the role exchange between message senders and receivers. Similarly, but more specifically, Rafaeli (1988) and Bucy (2004) suggested that an interactive medium is one that is most similar to face-to-face communication or the conversational setting. In the face-to-face conversational communication setting, messages flow mutually, and the message exchange is quick. Thus, Rafaeli (1988) valued the responsiveness between communicators as the most salient feature of interactivity. The writer carefully distinguished three levels of interactivity: “two-way (non-interactive) communication; reactive (quasi-interactive) communication, and fully interactive (responsive) communication” (p. 119). Two-way communication occurs when message flows mutually. However, if the messages are not responded to by the communication counterpart, the situation is non-interactive. When the messages are picked up by the other communicator and are given feedback, then the communication is seen as reactive, not fully interactive yet. Full interactivity, or responsiveness, occurs when the later message is related to the previous message. In short, in mediated communication settings, Rafaeli (1988) emphasized that responsiveness is the most important feature of interactive media. Responsiveness can be obtained only when subsequent messages are relevant to the previous messages.

Cho and Leckenby (1999) held similar views on interactivity by suggesting that new interactive media have two-way, interactive communication features. Different from the
formerly discussed two-way interaction, they suggested two different types of interaction: human-human interaction and human-message interaction. Human-to-human interaction is a two-way flow of information between message senders and receivers. Because two-way flow of information implies that communicators are exchanging their roles, the definition takes the position of Rice (1984) and Rogers (1986). Human-to-message interaction refers to the users’ control over the form and content of mediated message. According to Cho and Leckenby (1999), higher human-to-message interaction should produce better marketing effects. Focusing on these two dimensions, interactivity in advertising was defined as “the degree to which a person actively engages in advertising processing by interacting with advertising messages and advertisers” (p.164).

Because communication is a process of message transmission, defining interactivity as a communication process seems most appropriate to understand human-machine communication (Kim, 2005). Another advantage of the current perspective is it makes it easy to conceptualize interactivity by expanding existing communication theories (Kim, 2005). However, the problem of the perspective is difficulty with operationalizations (Kiousis, 2002). Responsiveness, for example, is definitely the nature of two-way communication. But empirically measuring responsiveness is not easy. As a result, not many empirical studies can be found that take this perspective.

**Multi-dimensional perspective.** Heeter (1989) is one of the first communication researchers who attempted to define interactivity by integrating structural, perceptual and communication procedural perspective. Based on the various literatures on interactivity, she proposed six dimensions of interactivity: complexity of choice available; effort users must exert; responsiveness to the user; monitoring information use; ease of adding information; and facilitation of interpersonal communication. Each dimension is not clearly categorized into the three perspectives discussed above.

Complexity and amount of choice available refers to the “extent to which users are provided with a choice of available information” (p. 222). The effort users must exert refers to “the amount of effort users must exert to access information” (p. 222). The first dimension definitely seeks interactivity from the characteristic of media. In a traditional media setting, TV for example, viewers were given only limited, if any, amount of choices: turning a set on and off, adjusting volume, and selecting channels. Video cassette recorder provided somewhat more
options, adjusting speed, selecting scenes or repeating scenes. New media such as the internet provide even more choices. At the same time, while a medium provides more interactive features, it also requires more active roles of media consumers. As more availability of diverse choices are provided, users are given more power of selection. Thus, the second dimension emphasizes active users’ role or their perception of interactivity; however, it should not be separately considered from the interactive structure of communication technologies.

The third dimension, responsiveness to the user, is defined as “the degree to which a medium can react responsively to a user” (p. 223). The concept sheds light on the communication process of interactivity. More specifically, the dimension proposed that human-machine interactions should be considered as a new form of communication because its similarity with human-to-human interaction. For example, an internet user requests web information by typing uniform resource locator (URL) in the address bar. The browser accepts the request and sends the information to the main server which contains the web information. The web server responds to the local computer by sending the web information, and the browser interprets the information to display the requested web page. During the process of retrieving web information, a user is communicating with a machine or data system, and the machine reacts responsively to the user. In short, one dimension of defining interactivity includes the communication process between human and machine.

The fourth dimension of interactivity is “the potential to monitor system use” (p.224). In traditional media, a special agent must be used to measure the media users’ consuming behavior or pattern. As interactivity grows, the media themselves are capable of tracking the users’ behavior. Later, in the internet research, this dimension is conceptualized as a monitoring device by which a web site operator can record who has visited the site and/or which part of the site they visited (Kenney & Marshall, 2000).

The ease of adding information dimension defines interactivity as “the degree to which users can add information to the system that a mass, undifferentiated audience can access” (p. 224). It emphasizes both structural characteristic, and the capacity of two-way communication processes of new media. Unlike traditional media, interactive media provides tools of inputting users’ information to the system. This structural interactive feature facilitates a two-way flow of communication message, and as a result, the distinction between message sender and receiver is blurred (p. 232).
The last dimension is facilitation of interpersonal communication which refers to “the degree to which a media system facilitates interpersonal communication between specific users” (p.225). In face-to-face communication, messages flow bi-directionally, and the message exchange occurs synchronously. Interpersonal communication via communication technology should, therefore, include these two features: two way communication and synchronicity.

Heeter’s (1989) six dimensions were proposed without the consideration of perceptual, structural and communication procedural perspectives. However, all of those dimensions can be categorized as one or more of the three approaches discussed above (Kiousis, 2002). As mentioned, complexity of choice, ease of adding information, and facilitation of interpersonal communication can be thought of as the characteristic variable of communication technologies. The responsiveness to the users dimension certainly relates to the communication process. The effort users must exert dimension implies that interactivity can be found from users’ perception. The suggested dimensions were a unique contribution in conceptualizing interactivity. Although researchers edited, debated, and criticized Heeter’s (1989) perspective, most of the multi-dimensional interactivity research stems from Heeter’s contribution.

For example, Ha and James (1998) defined interactivity as “the extent to which the communicator and the audience respond to, or are willing to facilitate each other’s communication needs” (p.462). By adopting dimensional definition, they tried to identify interactive features in a website in terms of playfulness, complexity of choice, connectedness, and information collection.

Heeter’s (1989) six dimensions tried to capture the concept of interactivity from various perspectives. Although facilitation of interpersonal communication implies the concept of time, synchronicity was not clearly discussed in the definition of interactivity. Recently, researchers realized that speed or time is an important factor of interactivity.

Among Heeter’s (1989) six dimensions, Steuer (1995) focuses on the complexity users must exert and interpersonal communication facilitation. Specifically, he suggested that time dimension should be included to the structure of interactivity. In Steuere’s terms, interactivity is defined as “the extent to which users can participate in modifying the form and content of a mediated environment in real life” (p.46). Steuer especially stressed interactivity as defined by three factors: speed, which refers to how quickly a user can manipulate the mediated
environment; range, which refers to what degree a user can manipulate the environment; and mapping: how the actions of a user are related to reactions in the virtual environment (p.47).

Downes and McMillan (2000) also defined interactivity largely with two dimensions: characteristic of technology and users’ perception. In addition to Heeter’s dimensional approach, they added the concept of time and place to interactivity. For structural characteristics, they proposed that interactive media should provide tools that facilitate two-way communication. Interactive media also should provide a flexible time line. In some cases, users need immediate message exchange, and in other cases, asynchronous communication is also required. In a computer-mediated-communication environment, users often “visit” a website and “navigate” the “place,” instead of viewing information. Downse and McMillan (2000) suggested the last component of structure-based interactivity is a medium’s capacity to create a sense of place. With respect to users’ perception-based dimensions, the researchers suggested that interactivity grew when 1) communicators perceive they have greater control over message sending and receiving, 2) participants perceive the communication was responsive, and 3) participants perceive the goal of communication was oriented to message exchange rather than persuasion.

By integrating most of the discussions on interactivity, Kiousis (2002) attempted to provide the definition and suggest operational measures of interactivity that include the structure of a medium, the context of communication settings, and the perceptions of users. In a medium’s structural dimension, speed, range, timing flexibility, and sensory complexity are included. For the aspect of the communication context, third order dependency, which refers to “messages that refer to prior message transmission” and social presence, which refers to “messages when subjects explicitly refer to themselves” (p.376) were suggested. In respond to the perceived level of interactivity, proximity, sensory activation, perceived speed and telepresence were suggested. Proximity means the degree to which one feels the nearness when they are using a system. Sensory activation refers to the degree to which one feels the interaction stimulate sensory system such as sight, hearing, and touch. Perceived speed refers to the degree to which one feels how fast the machine allow the user react to the interaction. And telepresence refers to the extent to which one feels present in the mediated environment (pp. 375-377).

In a comprehensive literature review of interactivity definition, Kim (2005) identified the most often used interactive dimensions: responsiveness, user control, multimodality, and synchronicity or speed of response. Responsiveness, user control, and synchronicity were
adopted from Heeter’s (1989) and Steure’s (1995) definitions. In face-to-face communication, multimodality refers to the communication tools that compensate verbal or textual content. Any non-verbal cues such as gesture and facial expression and paralinguistic cues including voice quality, tone of voice, speed of speech were categorized as multimodality. In interactive media, she conceptualized multimodality as “multimedia or hypermedia, that afford multiple channels including text, picture, graphics, animation, sound and video to present information” (p. 35).

**Interactivity for the current dissertation.** As discussed above, the concept of interactivity has been approached from four perspectives: technology, perception, communication process, and multi-dimension perspectives. Each approach has been adapted and modified from various academic and industrial arenas. Even though perception-oriented approaches have been most popularly used recently (Lee, Park, & Jin, 2006), the perspective is problematic because even a (technologically) simple medium can be perceived more interactive by a user. For example, as Sundar (2003) argues, one may perceive surfing TV channels to be more interactive than chatting through a webcam because he or she is not confident with using the webcam technology. Similarly, one may feel less comfortable using a Play Station 3 controller than a TV remote controller. Skill level may cause different ranges of enjoyment or gratification (Vorderer, 2000); however, this should not be confused with interactivity (Sundar, 2003).

The communication process perspective, which stressed responsive communication, also has problems. Most of all, since the communication model inherited mediated interpersonal communication, the scope is not wide enough to fully cover human-machine interaction (Lee, Park, & Jin, 2006). Furthermore, the perspective assumes that a medium may never be interactive unless there is an actual process of communication. However, in reality, one may identify a video game console as an interactive machine because of its provisions of selection and control. As discussed earlier, difficulties of measuring responsiveness is also a source of the problem of communication process perspective.

The multi-dimensional perspective is a summary of various definitions rather than a suggestion of empirical studies. As evidences, scholars extract some concepts from Heeter’s suggestion and combine them with new concept to measure or define interactivity.

For these reasons, the technology-oriented approach has been widely accepted, in entertainment media research (Goertz, 1995, as cited in Vorderer, 2000; Raney, Smith, & Baker,
Goertz (1995) summarized interactivity as the degree of selectivity and modification, quantity of selection and modification, degree of linearity and number of different senses that are activated when using the media. According to Goertz, the more presentation of these features makes a medium more interactive. In terms of Goertz’s classification, as Raney et al. (2006) argue, video games provide limitless interactive features. For the present study, therefore, the definition of interactivity and interactive media will be adapted from the technology-oriented view of interactivity, that is “the extent to which the users is capable of influencing his or her media use” (Vorderer, 2000, p. 25). For the same reason, video games will be employed as an interactive medium, in comparison with video clips which will represent a non-interactive medium.

**Video Game in Mood Management**

From this perspective, media psychologists and entertainment theorists have considered interactivity as the unique capabilities of new media to entertain users and as a main way to differentiate it from other media (Klimmt, 2003). Generally, researchers have agreed that more highly interactive media provide higher arousal, excitement and enjoyment. For example, Rockwell and Bryant (1999) investigated the relationships among interactivity, involvement, and enjoyment. Participants were randomly assigned to one of the six conditions (low vs. high interactive story, and positive vs. neutral vs. negative dispositional story). In the analysis, the participants who observed high interactive TV contents responded that the story was more enjoyable and more involving. Vorderer, Hartmann, and Klimmt (2003) also reported that video game players enjoyed games that offered many different possibilities to act more than those that did not.

Analogous with the technological perspective of interactivity, Grodal (2000) suggested that video games provide a range of activity from passive to active to interactive. Passive interaction is the stage of observation. In this stage, a player is a mere spectator of the game screen; this is no different than TV viewership. At the next stage, a player actively explores space, actions and strategies to win the game. Last is interactivity: the player actually controls the virtual space to survive as a player in the game. As earlier mentioned, this interactivity is the key feature of new media to entertain users. Entertainment scholars identify the key dimensions
of video game enjoyment as achievement (Klimmt, 2003; Ritterfeld, Weber, Fernandes, & Vorderer, 2004; Vorderer, Klimmt, & Ritterfeld, 2004), involvement (Rockwell & Bryant, 1999; Vorderer, 2003; Vorderer, Knobloch, & Schramm, 2001), and escapism (Sherry, 2001, 2004; Sherry, Lucas, Greenberg, & Lachlan, 2006). It should be noted that players’ skill level has also been identified as a factor of enjoyment (Nelson & Carlson, 1985; Vorderer, Hartmann, & Klimmt, 2003). Regardless of the genre of the game, players obtain pleasure only when they are successful in or win the game.

Taken together, interactivity enables communication when using mass media. Although it has not been unanimously agreed, it is generally held that higher levels of interactivity lead to greater enjoyment in general. The effects of interactivity on enjoyment have been discussed in a variety ways. However, the application of traditional entertainment theories to interactive media has not received much scholarly attention. Specifically, considering that mood management theory focuses on the motives of choosing media contents, interactive media may be hard to use with the theory because video games are often naturally negative in their hedonic valence (i.e., violent content), arousing, and exciting (Vorderer, Bryant, Pieper, & Weber, 2006). In this study, the possibility of video games as a mood changer will be examined. However, because of the natural characteristics of video games, it makes more sense to compare the effects of video games with less-interactive media contents such as video clips. If interactive media are much more involving and entertaining, and in turn, if more involving and enjoyable media have more mood changing capacity, then interactive media will be more likely to be selected by individuals to alter moods for any purposes. In the following section, the potentials of electronic games as entertainment media and mood changer will be discussed.

**Excitatory Homeostasis**

Although little interactive media research has focused on selective exposure to video game for maintaining excitatory homeostasis, excitation has been identified as one of the key motives for playing video games and one of the main consequences of playing video games. A majority of young teenagers (12-16 year old) reported that they played games to gain enjoyment (Phillips, Rolls, Rouse, & Griffiths, 1995). Even though it has not been experimentally studied, Griffiths and Dancaster (1995) suggested that people play computer or video games to enjoy the physical act of playing or to terminate boredom. While excitation or emotional arousal has been
identified as a motive for consuming interactive media, arousal has been more frequently reported as the main result of interactive media effect.

Research consistently demonstrates the effects of interactive media on heart rate (Calvert & Tan, 1994; Fleming & Rickwood, 2001; Griffiths & Dancaster, 1995), blood pressure (Markovitz, Raczynski, Wallace, Chettur, & Chesney, 1998; Segal & Dietz, 1991), breathing (Denot-Ledunois, Vardon, Perruchet, & Gallego, 1998), hormonal change (Hebert, Beland, Dionne-Fournelle, Crete, & Lupien, 2005; Koepp et al., 1998) and self-reported arousal level (Feierabend & Klingler, 2003; Griffiths & Dancaster, 1995; Kubey & Larson, 1990; Mastro, Eastin, & Tamborini, 2002). Generally, it has been reported that consuming interactive media increases the speed of players’ heart rate. For example, Calvert and Tan (1994) reported that gamers showed higher levels of physiological arousal when they played violent video games compared to observing others play. Griffiths and his colleagues have argued that the computer game players become aroused while playing (Chumbley & Griffiths, 2006; Griffiths, 1993a, , 1993b; Griffiths & Dancaster, 1995), and Type A individuals who have a more competitive nature might be more easily addicted to the games because they experienced greater increase in heart rate (Griffiths & Dancaster, 1995). Similarly, among children aged 8 to 12, playing violent video games comparing to non-violent video games or paper-pencil games increased arousal measured by heart rate and self-reported arousal (Fleming & Rickwood, 2001).

Positive correlations between interactive media and blood pressure have been also reported. Playing the arcade game Ms.Pac-Man was reported to highly correlate with increased physiological arousal such as oxygen consumption, systolic and diastolic blood pressure, and heart rate (Segal & Dietz, 1991). Although most studies examined interactive media effects on excitation during a short period of time, one longitudinal study reported that playing video games was a significant predictor of increased blood pressure over a five year period of time (Markovitz, Raczynski, Wallace, Chettur, & Chesney, 1998). The literature discussed that cardiovascular reactivity to video games, especially in young men, was a reliable predictor of the future occurrence of hypertension. Playing video games can also increase cortisol level (Hebert, Beland, Dionne-Fournelle, Crete, & Lupien, 2005). Specifically, music was identified as a major source of stress during playing video games.

Besides physiologically measuring arousal, studies typically have participants also report their perceived arousal level while consuming media contents. When individuals successfully
master the stages of video or computer games, players report finding enjoyment, excitation, and
a good mood from the media consumption (Feierabend & Klinger, 2003, cited in Salisch, Opal,
reported that consuming interactive video media such as video cassettes and video games can
lead to higher physiological arousal than traditional media consumption (e.g., TV watching,
listening music, and reading). Specifically, arousal was greater during video game play than
with any other media activity. The positive correlation between excitation and the surfing speed
of the internet has also been observed (Mastro, Eastin, & Tamborini, 2002). In a pretest, surfing
websites rapidly was more likely to induce stress, whereas slower surfing speed was associated
with boredom induction. Consequently, the authors concluded that stressed individuals were
more likely to surf websites slowly to reduce their high excitation than neutral or bored
individuals.

In contrast, other studies report weak or even negative association between interactive
media consumption and physiological arousal. For example, Denot-Ledunois, Vardon, Perchet,
and Gallego (1998) examined the correlation between interactive levels in video games and
physiological arousal. Participants were instructed to play the game Tetris through all difficulty
levels from 1 to 10. Different from the previous research, no significant differences in heart rate
were observed as the difficulty level increased. Rather, it was observed that the video game
tended to decrease breathing frequency. Although the study seems to report contradictory results
to the most game-arousal researches, the researchers explained the phenomenon in two different
ways. First, emotional response, which is often measured as physiological arousal, may be
mainly caused by the novelty of the task. In this experiment, the participants played a familiar
game Tetris. Furthermore, all participants were familiar with the experimenter and the house
where the experiment was conducted. The familiarity of game and playing setting may have
functioned to reduce emotional arousal during the game play. Second, cognitive processing
normally counters with emotional loading (Shea, Andres, Paydarfar, Banzett, & Shannon,
1993). Focusing attention on the game may inhibit any movement, including breathing, and may
cause a decrease or no change in physiological arousal. In short, despite some contradictory
results, consuming interactive media in general is positively related to emotional arousal.
Message-Behavioral Affinity and Hedonic Valence

Few scholars have investigated video games in terms of message-behavioral affinity. Without considering initial mood state, however, negative correlations between self esteem and game playing (Colwell, Grady, & Rhaiti, 1995; Funk & Buchman, 1996) and positive correlations between trait aggression and game playing have been reported (Graybill, Krisch, & Esselman, 1985; Griffiths & Dancaster, 1995; Janet Wingrove, 1998; Scharrer, 2004).

Most video game related literature focused on the negative effect of video games on game players. In short, video games have been criticized for their notorious violence depictions. The literature has argued that playing video game can nurture aggression among (especially young) video game players, with support being offered by theories such as media priming, social cognitive processes and cultivation.

Despite the main purpose of video games (e.g., entertaining, challenging, and educational), most video games include violent content (Gentile & Anderson, 2003; Grodal, 2000). A recent content analysis illustrates that video games are one of the most violent media formats (Smith, Lachlan, & Tamborini, 2003). More than 90% of adult targeted video games contained violent features. On average, one can encounter 46 violent interactions in a 10-minute period. As violence infiltrates new media, and as more violence crimes are revealed to be related with video games, the research interest on the effect of the violent video games has increased (Anderson, 2004).

From the early studies about video games, the consistent result that exposure to video games can affect the players’ cognition, behavior, and attitude grew. In an early study of the video games, researchers found a significant influence of playing violent versus non-violent video games on children’s aggression fantasies (Graybill, Krisch, & Esselman, 1985). Children who played violent games were less defensive and more assertive than non-violent video game players. However, Graybill, Krisch, and Esselman (1985) failed to reveal the differences between the effects of violent versus non-violent video games on children’s aggression in daily life.

From the late 1980s, as the weakness of the methodological problems in new media studies began to be overcome (Anderson, 2004), researchers began to document the significant relationship of playing video games and its influence on daily life. Scott (1995), for example, found that playing video games significantly influenced the daily playing pattern among children.
Children who played a jungle hunt game played more with a similar real-life toy than other kids who played different games. The study also found that kids who played violent video games were more likely to be aggressive than other kids. Consistently, there has been evidence that violent video games have influence on users’ violence. According to Anderson’s meta-analysis (2004), exposure to violent video games is positively related to aggressive behaviors, aggressive cognitions, aggressive affect, and physiological arousal, while being negatively related to helping behaviors.

Furthermore, exposure to violent video games also affects school performance (Gentile, et al., 2004). High school students who spent greater amount time with violent video games were more hostile, reported getting into arguments with teachers more frequently, were more likely to be involved in physical fights, and performed more poorly in school. Similarly, others have reported the negative association between the amount of video game play and school performance among children, adolescents, and even college students (Anderson & Dill, 2000). Similarly, Uhlmann and Swanson (2004) suggested that playing violent video games can lead to the automatic learning of aggressive self-view.

**Intervention Potential**

Although TV programs clearly provide evidence of intervening message effects on moods, recent support for mood management predictions have also been found in new, interactive media consumption. For example, Mastro, Eastin, and Tamborini (2002) expanded an early Bryant and Zillmann’s (1984a) study to the internet. Participants were assigned into boredom or stress conditions. Boredom was induced by threading metal washers on a shoelace, and stress was induced by solving GRE-type test. After finishing the boredom and stress induction, participants were allowed to surf uninterrupted for 10 minutes while they were waiting for the next experiment process. During the web surfing, visited websites were captured and later coded and categorized as stimulating or relaxing websites, based on images, pictures, colors, text, and overall message.

The researchers hypothesized that bored participants would be more likely to seek arousing websites, and stressed participants would show an opposite preference. Furthermore, they expected that stressed individuals would more slowly surf the web than bored individuals, and stressed individuals would surf more websites in a given time. Over time, the researchers
also expected that, the participants would obtain excitatory homeostasis, and the surfing speed would similar for both conditions.

Stressed participants were significantly more likely to visit fewer websites than their bored counterparts. This finding indicated that mood may indeed be a predictor of web surfing behaviors. Neither the reduction of web surfing speed from over stimulated individuals nor increase of web surfing speed from under-stimulated was found over time. Although they failed to obtain statistically significant result for the corresponding hypothesis, they found that web surfing speed in both conditions were moving toward moderate. If more time had been given, the result implied that the respondents would gain optimal level of excitation and the surfing speed in both conditions would finally match over time. Seeking for relaxing or arousing websites based on excitatory state was not found either. The reason was explained by the user-friendly nature of websites. Overall, the research concluded that “use of the internet may disrupt the rehearsal process necessary to perpetuate unpleasant states of excitatory arousal” (Mastro, Eastin, & Tamborini, 2002, p.168). It was argued that stressed participants surfed slowly to minimize involvement so that they could escape from the aversive state. On the contrary, bored participants perhaps surfed quickly to maximize involvement so that they could escape from the boredom.

Scholars continued to attempt to describe interactivity in relation to more absorbing and intervening media messages, which arguably require more cognition to process (Garris, Ahlers, & Driskell, 2002; Vorderer, 2000; Vorderer, Knobloch, & Schramm, 2001; Wu, 2005). For example, Mundorf and Laird (2002) argued that “surfing or chatting on the Web may be more absorbing than watching television and help take their mind of the stress of work and personal life” (p. 586). Similarly, Rockwell and Bryant (1999) reported that the more interactive media contents, the higher involvement as well as entertainment can be perceived by children.

Although the study did not assess the preference of media choice based on an initial state of mood, Kubey and Larson (1990) analyzed young adolescents’ media consumption habits and affective emotional experiences during the consumption. Generally, traditional media including television, music and reading was reported to be more popular with kids than interactive new video media including music videos, VCRs, and video games. However, older kids were using more interactive media than younger ones. Because the interactive media provide more opportunities for active participation rather than passive consumption, participants needed more
cognitive attention to their action, and consequently the participants reported more arousal than they consumed traditional media. The correlation between the interactivity and attention was also observed elsewhere (Denot-Ledunois, Vardon, Perruchet, & Gallego, 1998).

Although the researchers unanimously found the negative effect of violent video games, few have investigated video games in a mood management context. However, a series of assumptions can be predicted based on the video game literatures. Most of all, thanks to the immersive nature of video game playing, a great degree of cognitive effort should be needed to play a video game. As mood management scholars suggested, therefore, video game may have a high potential as a mood changer and may induce enjoyment in players. On the contrary, however, because of the negative contents presented in video games, playing games may exacerbate one’s negative mood state. The current project purposes to investigate the mood changing potential of playing video games. At the same time, because of interactivity, this study assumes different degree of effects between traditional and interactive media. In the following section, hypotheses will be proposed based on the review of literatures.

**Hypotheses**

**Mood regulation potential of playing a video game**

Mood management theory was originally developed to investigate the motives for selecting TV programs to maintain proper level of arousal (Bryant & Zillmann, 1984b), and it has been expanded to various media contents: selection of music (Knobloch & Mundorf, 2003), internet websites (Mastro, Eastin, & Tamborini, 2002), internet news magazine (Knobloch, Hastall, Zillmann, & Callison, 2003), and advertising (Chang, 2006). This project is attempting to expand the scope of mood management to the effects of playing video games and their comparison with traditional media consumption. The logic of the hypotheses development in this project is adopted from Chang’s (2006) study of mood alteration effects of advertising.

Entertainment as a major motive for playing a video game has been well documented by surveys (Fling et al., 1992; Phillips, Rolls, Rouse, & Griffiths, 1995), focus group interviews (Maxwell et al., 2003), experiments (Calvert & Tan, 1994; Fleming & Rickwood, 2001; Griffiths & Dancaster, 1995), and theoretical attempts to identify the motives of playing video games (Grodal, 2000; Klimmt, 2003; Raney, Smith & Baker, 2006; Vorderer, Bryant, Pieper, & Weber,
2006). For example, game players reported enjoying playing games more than observing others’ play (Hoffman, 1994), and one key dimension making video game enjoyable is interactivity (Vorderer, Hartmann, & Klimmt, 2003).

As the interactivity literature identified that interactive features of new media involve selectivity and controllability (Goertz, 1995, as cited in Vorderer, 2000), playing an interactive video game may elicit positive emotional response. Indeed, more opportunities for selection and control may increase involvement (Mastro, Eastin, & Tamborini, 2002), which is likely to elicit cognitive attention from annoyance experienced in a given situation (Chang, 2006; Zillmann, 1979).

Given the discussion above, it is reasonable to predict that when an individual is provoked or experiences a negative mood state, individuals should be motivated to reduce or terminate the negative mood state. Distracting from the negative state by exposing oneself to intervening communication is one of the efficient ways of reducing the negative mood state (Chang, 2006; Zillmann, 1979; Zillmann & Bryant, 1985a). In a video game playing context, individuals may give more effort to involve themselves in playing the stages of the game in order to distract their attention from the negative states provoked by stimulus material. Therefore, the following is proposed:

H1: Participants in a bad mood will report video game is more intervening than participants in a good mood.

Exposure to an absorbing and involving communication content decreases feelings of negative affective state and, consequently, enhances mood state (Zillmann, 1979). Due to their cognitively intervening potential, video games may enhance mood to a greater degree for negatively provoked participants than for those made happy (Bryant & Davies, 2006b).

H2: Playing a video game will elicit greater mood enhancement for participants in a bad mood than for those in a good mood.

As discussed above, mood management posits that individuals select communication with hedonic motivation (Knoblock-Westerwick, 2006; Oliver, 2003; Zillmann, 1988b). The
assumptions of Hypothesis 1 and 2 are that individuals in a negative mood will experience a
greater degree of mood enhancement when they play a video game. Although there is no full
explication of the concept of enjoyment (Raney, Smith, & Baker, 2006), it is reasoned to assume
that good moods and enjoyment are positively associated (Schreier, 2006). Playing a video game,
then, may elicit a greater degree of enjoyment for negatively provoked participants than for those
made happy by the experimenters. Therefore, the following hypothesis is proposed:

H3: Participants in a bad mood will enjoy the video game experience more than those in a good
mood.

Cross-media comparison

The second purpose of the current project is to investigate the mood management strategy
in a multiple media consumption context. Hedonic motivation leads media consumers to select
communication that contains positive hedonic valence—a message that is similar or dissimilar
with their initial moods state so that negative moods can be distracted and a positive moods can
be corroborated—and a message that is intervening enough to alter or maintain their moods
(Bryant & Davies, 2006a, 2006b). As suggested in Hypothesis 2, video games may have “a high
intervention potential because they are highly interactive, thereby demanding tactile as well as
cognitive engagement” (Bryant & Davies, 2006b, p. 185). To test whether an interactive
medium is involved in higher cognitive intervention so that it has higher potential of mood
alteration, it is necessary to directly compare the effects of consuming interactive media with
consuming traditional media.

Zillmann (1994) suggested that individuals in a negative affective state strongly
motivated to improve their mood respond better to communication that requires higher cognitive
involvement than to communication that requires less cognitive intervention. Accordingly, when
a video game and a video clip vary their intervention potential, controlling for other mood
management variables (e.g., hedonic valence, message arousal, and mood-message affinity),
annoyed participants may readily play a video game to divert from and repair their negative
mood. As a result, a greater degree of mood enhancement can be occurred. In contrast, happy
participants may not be as motivated to improve their moods and thus will experience less mood
enhancement (Chang, 2006).
H4: The interaction between affective state and media type will significantly influence degree of mood change. Participants in the bad mood group will experience greater mood enhancement when exposed to the video game than when exposed to the DVD clip, while mood change in the good mood group will not be affected by media type.

If annoyed participants experience a greater degree of mood enhancement when playing a video game than watching a video clip, with the same rationale of Hypothesis 3, it is plausible to expect that annoyed participants may experience a greater degree of enjoyment when they play a video game. Therefore, the following hypothesis is proposed:

H5: The interaction between affective state and interactivity will significantly influence degree of enjoyment. Participants in the bad mood group will experience greater enjoyment when exposed to the video game than when exposed to the DVD clip, while enjoyment in the good mood group will not be affected by media type.
CAHPTER 3

METHOD

Participants

To test the hypotheses regarding mood enhancement, 2 (mood condition: good vs. bad) × 2 (media condition: video game vs. DVD) × 2 (Time: pre-media exposure vs. post-media exposure) factorial design was employed. Measures were collected at pre-media consumption (media consuming behavior, induced mood, and demographic data) and post-media consumption (mood enhancement, enjoyment and involvement).

Sample size determination for each cell

According to Sparks, Sherry and Lubsen (2005), media enjoyment studies often determine the number of participants to detect a moderate effect size (f=.25). Assuming the effect size in this research, the number of participants per cell necessary to obtain estimated power .80 with an alpha level of .05, in a 2 way ANOVA is 44 (Cohen, 1977).

Sample

Participants were recruited from large lecture classes in Department of communication at Florida State University. For each recruitment, the researcher entered the classroom during the regular class session at a time agreed upon with the instructor, introduced the research as video game related study, and asked students to sign in a signing sheet to volunteer. Students received an email reminder a day before their scheduled participation. Each research session was capable of involving a maximum four participants at a time. Fifty two research groups were conducted over the course of two weeks. Research participants were 192 undergraduate students enrolled in communication courses at The Florida State University. Some participants received extra credit for their participation, while others counted participation in the project toward a research requirement in a course. Two students discontinued the participation after the first session of the study (mood inducing process). Also, because of similar questionnaires of moods pre and post media consumption, the possibility that participants might guess what the experiment was about was one of the concerns. In debrief session, none of the participants reported they could guess the relatedness of experiment session 1 and 2. Consequently, the total number of participants in
this study was 190. Of the participating students, 146 (or 76.8%) were female and 44 (or 23.2%) were male. In terms of ethnicity, 132 (or 73.1%) were White, 24 (or 12.6%) were Hispanic, 21 (or 11.1%) were Black, 5 (or 2.6%) were Asian, and 3 (or 1.6%) identified themselves as “Other.” The mean age of the participants was 20.51 years old ($SD=1.35$). In terms of experimental conditions, 94 (or 49.5%) were assigned to good mood condition, and 96 (or 50.5%) were assigned to bad mood; 97 (51.1%) were assigned to video game condition, 93 (48.9%) were assigned to DVD condition. The group sizes for the experimental conditions are shown in Table 1.

<table>
<thead>
<tr>
<th>Media condition</th>
<th>Mood Condition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVD</td>
<td>Good 44</td>
<td>93</td>
</tr>
<tr>
<td>Game</td>
<td>Bad 49</td>
<td>97</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>190</td>
</tr>
</tbody>
</table>

**Procedure**

**General Setting**

The research center was comprised of three adjacent rooms. In the room 1, participants were greeted, and asked to sign for consent form. Four computers were facilitated in the room 2. Mood induction with a facial expression test was conducted in this room. In the room 3, two Play Station 2s and two DVD players were installed to four TVs.

Upon entering the research room 1, participants were welcomed and lead to read an IRB-approved information sheet. Once verbal consent to continue was given, participants were told
they were going to participate in two research sessions. The first part was introduced as a test of ability to recognize facial expressions and the second part was introduced as enjoyment of sports media consumption. The researcher also addressed that participants would be asked to fill three questionnaires. At the end of each questionnaire, participants were instructed to write last four digits of social security number, and first four letters of the last name. Participants were informed that collecting the part of social security number and last name was going to be used for obtaining extra credit. However the purpose of the information was for matching three questionnaires to each other to maintain the data for each case number. Unbeknownst, participants were randomly assigned to one of four experimental conditions: annoyed and play a video game, annoyed and watch a video clip, happy and play a video game, or happy and watch a video clip. Also, the participants were informed that the participation is voluntary and told that the session would last 40 minutes.

**Mood Manipulation.** The first part of data collection (demographic information, general media use, and mood manipulation) was conducted in room number 2: a computer lab with four personal computers; up to four respondents were tested in one session. In this room, participants filled out computerized questionnaires. Initially, the computer screen only showed two icons: “question,” and “test.” Participants were directed to initiate the procedure by double clicking “question” button. Once the icon was double clicked, an online survey page for demographic variables and daily electronic media consumption was activated. After finishing the first questionnaire, participants were directed to close the window and double click “test” button. All further instructions and presentation of mood induction were fully automated via software. To prevent interaction among respondents, the experimenter was present in the lab.

Participants were lead to believe that higher scores on the test would show their non-verbal communication proficiency. However, the test actually served as a manipulation of initial mood. The design and procedure of mood induction session replicated Knobloch and Zillmann’s (2002) music selection study. On the screen, the instructions will show an emotion recognition test:

This is a test to assess your sensitivity to facial cues associated with particular emotional experiences. This test has been devised by Professor Paul Ekman of the University of California, one of the world’s leading authorities on facial expression.
The measured sensitivity is a crucial skill in human interaction. A person who is deficient in this skill lacks empathic sensitivity, which greatly handicaps him/her in achieving desired ends in interacting with others.

Twenty faces with extremely ambiguous expressions were presented on the screen. Participants were instructed to identify the emotions of the face: one of anger, disgust, fear, happiness, sadness and surprise. A large bar was presented to show the accomplishment from terrible (below 25%), poor (below 50%), good (below 75%) and excellent (above 75%). As soon as participants clicked one of the six emotions, the screen also showed “right” or “wrong” as the result of each task.

The performance evaluations were randomly predetermined. Since the facial expressions on the screen were not clear, the participants were lead to believe that their performances were either excellent or terrible. Accordingly, the results of the current task served as the mood manipulation. As with past research, it was assumed that participants who received positive feedback from the software would be placed in a good mood state, whereas participants who received negative feedback would be placed in bad mood state.

On completion of the mood manipulation, participants filled out a computerized questionnaire, in which they indicated their current mood. Thirty two items from Davies (2004) mood adjectives and five items from the UWIST mood adjective checklist (Matthews, Jones, & Chamberlain, 1990) were used to measure affective state. Davies’s (2004) mood check list originally contained 60 items, and he reduced it to 32 items as a result of two factor solution. Chang (2006) adopted 12 UWIST items. After removing cross listed items, five items from the UWIST list were added for the current study. In sum, 37 items of mood adjectives for positive and negative mood ranging from 0 to 10 were used. At the end of the questionnaire, participants were required to fill the last four digit of social security number and first four letters of the last name. Upon finishing the mood manipulation and mood measurement, participants were directed to an adjacent room by an assistant for video game effect test.

**Collection of Dependent Measures.** The design and the procedure of video game session replicated Park and Raney’s (2006) video game priming effects study. Upon entering the room, participants were instructed to sit in front of one of four 31” TV monitors. Two televisions were connected to video game consoles (Sony Play Station 2) and the other two were connected
to two DVD players. The experimenter emphasized that the first experiment was finished and a new experiment would be conducted in the room 3. The second portion of research session was introduced as a study about the enjoyment of sports media spectatorship. The experimenter explained the research team was comparing the enjoyment level of playing video game and watching DVD clips of sports related contents. The experimenter described the participants were assigned to consume car racing (NASCAR) game or clip out of five sports: football, tennis, basket ball, World Cup Soccer, and NASCAR. Although posters and video games and DVD cases of listed sports were strategically displayed in the room, only NASCAR game and clip were prepared. After demonstration of the second part of the experiment, participants in the gaming condition were instructed to play for 15 minutes and participants in the DVD condition viewed the clip for 15 minutes.

In terms of the contents of the video game and video clip, automobile racing with minimal presentation of violent and sexual contents were selected. For video game condition, “NASCAR 06 total team control” was selected. For DVD condition, the first 15 minutes of “IMAX NASCAR” DVD clip was selected. The DVD was about the description of NASCAR history. Although the portion was selected based on the minimum level of entertainment fare, it has to be noted that DVD clips contained narrations of NASCAR foundation.

There were several reasons why car racing contents were used as stimulus materials. First, because the current project investigates different capacity of media formats to engage and absorb media consumers, the game and TV program contents should be neither excessively intervening nor contain extreme levels of absorbing capacity. Non-aggressive sports programs have been shown to have relatively moderate absorbing effects on mood alteration: less absorbing than comedy, quiz or aggressive action sports, and more absorbing than monotonous or nature documentary shows (Bryant & Zillmann, 1977; Zillmann & Bryant, 1985a). Second, because the current project is not investigating the interaction of intervention potential with hedonic valence or mood message affinity of media contents, it is necessary to control the entertainment fare as best as possible. The media contents were carefully selected to exclude any emotional interaction with humor, violence, horror, and/or sexuality. However, despite the attempt to remove the entertainment fare, it is possible that the participants may perceive those emotional responses. Thus, humor, violence, horror, and sexuality were measured after the session to be statistically controlled.
Upon finishing the media consumption, the participants were given a booklet of three sets of questionnaire. The first questionnaire is a mood enhancement measurement. To measure mood enhancement after media consumption, 37 item mood adjective checklist developed for mood induction was used. To avoid the sensitivity of using same adjective list as the pretest, the questionnaire was presented on a paper with different orders of words.

The second questionnaire contained enjoyment items regarding previous exposure to the material. The post-exposure instrument contained 13 items adapted from previous entertainment research (Park & Raney, 2006) designed to measure enjoyment of and reaction to the video game played or the film clip viewed. Each item used an 11-point scale anchored by words “not at all” and “very much.”

The third questionnaire was to measure the cognitive absorption. To measure the cognitive effort of involvement, participants were asked to rate their experience on a seven-item cognitive intervention scale which was designed for previous entertainment research (Bryant & Zillmann, 1977; Davies, 2004). The questionnaire asked following questions: (1) “How absorbing was the video clip [game]?” (2) “How eventful was the video clip [game]?” (3) “To what degree was it necessary to concentrate to follow the video clip [game]?” (4) “How boring was the video clip [game]?” (5) “How cognitively involving was the video clip [game]?” (6) “How interesting was the video clip [game]?” and, (7) “To what degree did your mind wander while watching the program segment?” Following the suggestion of Davies’s (2004) study, all scales ranged from 0 to 100 and were anchored with the phrases “not at all” and “extremely.” At the end of the questionnaire, participants were required to fill the last four digit of social security number and first four letters of the last name.

Once they completed the questionnaires, participants were fully debriefed. The participants were asked and agreed not to discuss or speak out about the process with their classmates until the end of the semester.
 CHAPTER 4

RESULTS

Before conducting the main analysis of data, the cases were cautiously inspected for data-entry errors by comparing the filled questionnaire with SPSS input contents. Frequency distributions for items in the data were also used to detect any errors and missing data. No systematic pattern was detected in the data-cleaning process.

Data Reduction: Mood Measures

Pre-Mood
Participants in this study completed two mood adjective checklists: one assessing mood immediately following a facial expression recognition test (pre-exposure), and the other immediately after media consumption (post-exposure). The pre-exposure mood checklist was subjected to a principal components analysis with direct oblimin rotation. The specific rotation method was chosen because negative correlation between two factors were expected (Chang, 2006; Davies, 2004). As Table 2 indicated a two-factor solution was yielded; each factor carried an eigenvalue greater than 2.0, with a total of 49.5% variance explained. Items with loadings less than .50 were excluded. The two factors in the rotated solution accounted for 30.22% and 19.154%, respectively. The first factor was labeled Pre-Positive Mood, and produced loadings that ranged from .57 to .826. A reliability analysis yielded a Cronbach’s alpha of .94.

Seventeen items comprised the Pre-Positive Mood factor ($M = 4.13$, $SD = 1.88$): exhilarated, excited, optimistic, pleased, happy, confident, ecstatic, assured, bubbly, cheerful, satisfied, triumphant, clever, thrilled, comfortable, captivated, and contented. The second factor was labeled Pre-Negative Mood, and it consisted of 18 items: gloomy, empty, depressed, distressed, hostile, terrified, tense, frustrated, disturbed, down, agitated, low-spirited, sorry, frightened, horrified, numb, confused, and nauseated. The produced loadings ranged from .50 to .77. A reliability analysis of Pre-Negative Mood ($M = 1.66$, $SD = 1.67$) also yielded a strong Cronbach’s alpha of .92. As expected, the two mood factors were negatively correlated, $r = -.28$, $p < .01$. These findings mirror those observed in Davies (2004). As a result, all items in the
Table 2. Principal Components Solution with Direct Oblimin Rotation for Mood Items, Pretest Results

<table>
<thead>
<tr>
<th>Mood Adjectives</th>
<th>Factor 1 (Pre-Positive Mood)</th>
<th>Factor 2 (Pre-Negative Mood)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhilarated</td>
<td>.826</td>
<td>.213</td>
</tr>
<tr>
<td>Excited</td>
<td>.799</td>
<td>.095</td>
</tr>
<tr>
<td>Ecstatic</td>
<td>.765</td>
<td>.195</td>
</tr>
<tr>
<td>Pleased</td>
<td>.759</td>
<td>-.155</td>
</tr>
<tr>
<td>Optimistic</td>
<td>.757</td>
<td>-.195</td>
</tr>
<tr>
<td>Assured</td>
<td>.750</td>
<td>.043</td>
</tr>
<tr>
<td>Bubbly</td>
<td>.746</td>
<td>.060</td>
</tr>
<tr>
<td>Happy</td>
<td>.744</td>
<td>-.238</td>
</tr>
<tr>
<td>Confident</td>
<td>.741</td>
<td>-.217</td>
</tr>
<tr>
<td>Triumphant</td>
<td>.734</td>
<td>.101</td>
</tr>
<tr>
<td>Cheerful</td>
<td>.726</td>
<td>-.088</td>
</tr>
<tr>
<td>Satisfied</td>
<td>.720</td>
<td>-.148</td>
</tr>
<tr>
<td>Clever</td>
<td>.704</td>
<td>-.043</td>
</tr>
<tr>
<td>Thrilled</td>
<td>.701</td>
<td>.231</td>
</tr>
<tr>
<td>Captivated</td>
<td>.606</td>
<td>.170</td>
</tr>
<tr>
<td>Comfortable</td>
<td>.580</td>
<td>-.324</td>
</tr>
<tr>
<td>Contended</td>
<td>.574</td>
<td>-.107</td>
</tr>
<tr>
<td>Involved</td>
<td>.453</td>
<td>-.141</td>
</tr>
<tr>
<td>Gloomy</td>
<td>-.071</td>
<td>.769</td>
</tr>
<tr>
<td>Empty</td>
<td>-.003</td>
<td>.754</td>
</tr>
<tr>
<td>Hostile</td>
<td>-.099</td>
<td>.734</td>
</tr>
<tr>
<td>Terrified</td>
<td>.179</td>
<td>.733</td>
</tr>
</tbody>
</table>
### Table 2—Continued

<table>
<thead>
<tr>
<th>Mood Adjectives</th>
<th>Factor 1 (Pre-Positive Mood)</th>
<th>Factor 2 (Pre-Negative Mood)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed</td>
<td>-.118</td>
<td>.731</td>
</tr>
<tr>
<td>Distressed</td>
<td>-.079</td>
<td>.722</td>
</tr>
<tr>
<td>Tense</td>
<td>-.101</td>
<td>.699</td>
</tr>
<tr>
<td>Disturbed</td>
<td>.032</td>
<td>.685</td>
</tr>
<tr>
<td>Frustrated</td>
<td>-.248</td>
<td>.673</td>
</tr>
<tr>
<td>Frightened</td>
<td>.186</td>
<td>.652</td>
</tr>
<tr>
<td>Down</td>
<td>-.183</td>
<td>.640</td>
</tr>
<tr>
<td>Sorry</td>
<td>-.037</td>
<td>.639</td>
</tr>
<tr>
<td>Horrified</td>
<td>.181</td>
<td>.639</td>
</tr>
<tr>
<td>Agitated</td>
<td>-.182</td>
<td>.637</td>
</tr>
<tr>
<td>Low-Spirited</td>
<td>-.148</td>
<td>.631</td>
</tr>
<tr>
<td>Numb</td>
<td>.095</td>
<td>.576</td>
</tr>
<tr>
<td>Confused</td>
<td>-.145</td>
<td>.533</td>
</tr>
<tr>
<td>Nauseated</td>
<td>-.040</td>
<td>.500</td>
</tr>
<tr>
<td>Exhausted</td>
<td>.103</td>
<td>.370</td>
</tr>
<tr>
<td><strong>Eigenvalue</strong></td>
<td>11.18</td>
<td>7.12</td>
</tr>
<tr>
<td><strong>Variance Explained</strong></td>
<td>30.21%</td>
<td>19.25%</td>
</tr>
<tr>
<td><strong>Chronbach’s alpha</strong></td>
<td>.94</td>
<td>.92</td>
</tr>
</tbody>
</table>
Pre-Positive and Pre-Negative mood factors were averaged for each participant, yielding a Pre-Positive and Pre-Negative mood score for each participant.

**Post-Mood**

In order to facilitate comparison of mood states prior to and following exposure to media conditions, it was necessary to create post-exposure positive and negative mood factors. Two factors were labeled Post-Positive Mood and Post-Negative Mood, respectively. The Post-Positive Mood factor was created from the post-exposure mood checklist. The same 17 items from the pretest were used. Likewise, the Post-Negative Mood factor was created from the post-exposure mood checklist, and 18 items comprised the Post-Negative Mood. Strong reliability assessments were obtained for the Post-Positive Mood ($\alpha = .94$, $M = 4.24$, $SD = 1.83$) and Post-Negative Mood ($\alpha = .92$, $M = 1.14$, $SD = 1.35$). However, negative correlation of these two factors was minimal ($r = -.1$, $p = .24$).

Chang (2006) tried to create one pre-mood scale by collapsing positive mood and reverse-coding negative mood. The study, however, didn’t report appropriate reliability results. For basic research, it was argued that the minimum level of reliability is .7 or higher (Nunnally, 1967; Pedhazur & Schmelkin, 1991). This study exercised the same attempt as Chang; however, the Cronbach’s alpha was below the accepted level (alpha=.42). The reliability was even lower in the post-mood scale (same procedure as pre mood) with Cronbach’s alpha level of .321. Therefore, in this data analysis, positive and negative moods were separately considered rather than creating single pre- and post-mood variables. Therefore, all items in the Post-Positive and Post-Negative mood factors were averaged for each participant yielding a Post-Positive and Post-Negative mood score for each participant.

**Mood Change**

In addition to examining mood changes with repeated measure, one of the hypotheses (H2) proposed to compare the size of mood change between two mood conditions. Following Chang (2006) and Davies (2004), a positive mood change variable was created by subtracting Pre-Positive mood scores from Post-Positive mood source. A negative mood change variable was also calculated using the same procedure with the Pre- and Post-Negative mood scores.
Dependent Measures

Enjoyment

The thirteen items assessing enjoyment of media consumption were collapsed across all four conditions and subjected to a principal components analysis. Because correlation between factors was not expected (Raney, 1998), a varimax rotation was used. Factors with eigenvalues less than 2.00 were eliminated. Items from factors that had loading less than .50 or that cross-loaded with another factor with values greater than .40 were eliminated. Consequently, as Table 3 indicates, the analysis suggested a two-factor solution. The first factor was labeled Enjoyment, and produced loadings that ranged from .55 to .91, and accounted for 36.28% of variability. A reliability analysis yielded a Cronbach’s alpha of .91. Seven items comprised the Enjoyment factor (M = 4.20, SD = 2.13): arousing, enjoy, enjoy the subject matter, enjoy the genre, memorable, exciting, and suspenseful. The second factor grouped four hedonic valence items and accounted for 17.82% of variability; however, it did not achieve sufficient reliability (α = .45) and was eliminated from subsequent analyses. Indeed, enjoyment has been created and analyzed as a single factor (Knobloch & Zillmann, 2002; Raney, 1998). The result of the analysis, therefore, replicates previous enjoyment studies.

Involvement

The seven items assessing cognitive involvement during media consumption were collapsed across all four conditions and subjected to a principal component analysis. Because correlation between factors was not expected (Davies, 2004), a varimax rotation was used. Factors with eigenvalues less than 2.00 were eliminated. Items loading at less than .50 were eliminated. Two items (how boring, how much did you wander) which were negatively correlated with other items were reversed. Consequently, as Table 4 indicates, the analysis suggested a one-factor solution with 56.1% of the variability explained by the model. The result mirrors previous researches which treated involvement as a single score variable (Bryant & Comisky, 1978; Davies, 2004). The factor was labeled as Involvement. A reliability analysis yielded a Cronbach’s alpha of .88. Six items comprised the Involvement factor (M = 57.82, SD = 21.64): how interesting the medium consumption was; how absorbing the medium consumption was; how eventful the medium consumption was; how boring the medium consumption was; to
what degree the mind wander during the medium consumption; and how cognitively involving the medium consumption was.

Table 3. Principal Components Solution with Varimax Rotation for Enjoyment Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Enjoyment</th>
<th>Perceived Hedonic Valence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting</td>
<td>.911</td>
<td>.032</td>
</tr>
<tr>
<td>Enjoy Subject Matter</td>
<td>.875</td>
<td>-.044</td>
</tr>
<tr>
<td>Enjoy Genre</td>
<td>.870</td>
<td>-.081</td>
</tr>
<tr>
<td>Memorable</td>
<td>.742</td>
<td>.166</td>
</tr>
<tr>
<td>Suspenseful</td>
<td>.712</td>
<td>.236</td>
</tr>
<tr>
<td>Enjoy Entire Movie/Game</td>
<td>.661</td>
<td>-.149</td>
</tr>
<tr>
<td>Annoying</td>
<td>-.583</td>
<td>.579</td>
</tr>
<tr>
<td>Arousing</td>
<td>.552</td>
<td>.280</td>
</tr>
<tr>
<td>Frustrating</td>
<td>-.266</td>
<td>.663</td>
</tr>
<tr>
<td>Violent</td>
<td>.175</td>
<td>.661</td>
</tr>
<tr>
<td>Disgusting</td>
<td>.006</td>
<td>.639</td>
</tr>
<tr>
<td>Sexual</td>
<td>.097</td>
<td>.571</td>
</tr>
<tr>
<td>Funny</td>
<td>.332</td>
<td>.423</td>
</tr>
</tbody>
</table>

Eigenvalue                  4.71      2.31
Variance Explained          36.28% 17.82%
Chronbach’s alpha           .91      .48
### Table 4. Principal Components Solution with Varimax Rotation for Involvement Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>How interesting was the video game/ DVD clip?</td>
<td>.90</td>
</tr>
<tr>
<td>How absorbing was the video game/ DVD clip?</td>
<td>.88</td>
</tr>
<tr>
<td>How eventful was the video game/ DVD clip?</td>
<td>.86</td>
</tr>
<tr>
<td>How boring was the video game/ DVD clip? (-)</td>
<td>.79</td>
</tr>
<tr>
<td>To what degree did your mind wander while watching the video game/ DVD clip? (-)</td>
<td>.74</td>
</tr>
<tr>
<td>How cognitively involving was the video game/ DVD clip?</td>
<td>.54</td>
</tr>
<tr>
<td>To what degree was it necessary to concentrate to follow the video game/ DVD clip?</td>
<td>.39</td>
</tr>
<tr>
<td><strong>Eigenvalue</strong></td>
<td>3.93</td>
</tr>
<tr>
<td><strong>Variance Explained</strong></td>
<td>56.12</td>
</tr>
<tr>
<td><strong>Cronbach’s alpha</strong></td>
<td>.88</td>
</tr>
</tbody>
</table>

*Note.* (-) items were reverse coded.
Random Assignment Checks

Research participants were randomly assigned to one of the four experimental conditions. Two-way ANOVA (media × mood) procedures were completed to ensure that the conditions contained equal representation of participants on the media use variables. As Table 5 indicates, no statistically significant differences were found across the four experimental conditions for spending time on the TV watching, DVD or video watching, video game playing and video game skill. This is as one would expect given the random assignment of participants to group.

Table 5. Random Assignment Checks: Means and ANOVA Results for Media Consumption by Conditions

<table>
<thead>
<tr>
<th>Mood Condition</th>
<th>Good</th>
<th>Bad</th>
<th>F(3,189)**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DVD</td>
<td>Game</td>
<td>DVD</td>
</tr>
<tr>
<td>TV watching (hrs/week)</td>
<td>9.91 (7.94)*</td>
<td>10 (7.54)</td>
<td>10.53 (6.44)</td>
</tr>
<tr>
<td>DVD/video watching (hrs/week)</td>
<td>4.30 (4.40)</td>
<td>3.08 (2.65)</td>
<td>4.00 (3.45)</td>
</tr>
<tr>
<td>Video game playing (hrs/week)</td>
<td>.77 (2.67)</td>
<td>.24 (.62)</td>
<td>.71 (2.17)</td>
</tr>
<tr>
<td>Video game skill (0-10)</td>
<td>4.02 (2.35)</td>
<td>4.72 (2.66)</td>
<td>4.96 (2.67)</td>
</tr>
</tbody>
</table>

Note. * = Mean (Standard Deviation)  
** p > .05 for all test
Manipulation Checks

Two items were used to examine whether the manipulation of pre-mood through the facial recognition test was successful. Here, it is reasonable to expect to find differences between the conditions. As one might expect, a t-test for two independent samples revealed that participants who received positive feedback from the test and were therefore in a good mood state (\(M = 4.63, SD = 1.86\)) reported significantly higher pre-positive mood scores than participants who received negative feedback from the test and were therefore in a bad mood state (\(M = 3.64, SD = 1.78\)): \(t(188) = 3.73, p < .001\) (one-tailed). The bad mood state group (\(M = 2.02, SD = 1.67\)) reported they obtained statistically greater pre-negative mood than good mood group (\(M = 1.12, SD = 1.08\)), \(t(163) = -4.42, p < .001\) (one-tailed). Thus, it is concluded that the mood manipulation process was successful.

To investigate the relative success of mood enhancement after media consumption, two paired sample t-tests were conducted. A paired sample t-test revealed that media consumption enhanced positive mood; however, the difference between pre (\(M = 4.13, SD = 1.91\)) and post (\(M = 4.24, SD = 1.83\)) media consumption was not statistically significant: \(t(172) = .774, p = .220\) (one-tailed). Participants reported their negative mood decreased significantly after media consumption: pre-negative mood (\(M = 1.56, SD = .1.45\)); post-negative mood (\(M = .99, SD = 1.18\)); \(t(174) = -6.04, p < .001\) (one-tailed). Communication scholars have reported that people in bad mood struggle harder to get rid of the obnoxious state than people in pleasant mood state (Chan & Vorderer, 2006; Silvia Knobloch-Westerwick, 2007). The results of the manipulation check in this dissertation mirrored the previous findings. Thus, it is concluded that the mood enhancement through media consumption was successful without considering experimental conditions.

To further examine the relative success of mood enhancement by consuming media by the mood condition, \(2 \times 2\) ANOVAs with repeated measures, which were composed of one between-subject (good vs. bad mood state) and one within-subject (pre vs. post media consumption) test, were employed. Since the participants responded to the same mood questionnaire for pre- and post- media consumption, one might expect a high positive correlation between the two mood variables. In a repeated-measure design, Mauchly’s test is often used to examine sphericity, which assumes that correlations are equal across all pairs of outcomes taken
from the same participants (Howell, 2002). This assumption applies only when more than two points were repeatedly measured from the same participants (Field, 2005). Thus, the report of the sphericity assumption test was omitted. Although a statistically significant univariate within-group difference was not found, $F(1, 171) = .692, p = .407$, partial $\eta^2 = .004$, observed power = .131, the repeated ANOVA revealed a significant interaction effect between mood condition and time, $F(1, 171) = 16.692, p < .001$, partial $\eta^2 = .089$, observed power = .982, which indicates that the effect of mood condition works differently on positive mood change across the time of media consumption. Figure 2 shows that positive mood decreased among members of the good mood condition group whereas positive mood increased among the members of the bad mood condition over time.

In terms of negative mood change in both mood conditions, a statistically significant univariate within-group difference was found: $F(1, 173) = 37.834, p < .001$, partial $\eta^2 = .179$, observed power = 1.0. In addition, a significant interaction effect between mood condition and time was also found: $F(1, 173) = 14.469, p < .001$, partial $\eta^2 = .077$, observed power = .966. Similar to positive mood change, the effect of mood condition on negative mood change depends on the time of media consumption. Figure 3 shows negative mood decreased after media consumption in both mood conditions; specifically, the pattern was clearer in bad mood condition. In general, therefore, it is concluded that the media stimulus reduced negative mood and increased positive mood successfully. Specifically, mood enhancement was more clearly observed in the bad mood group than in the good mood group. In both conditions, negative mood reduction was greater than positive mood increase.

**Statistical Analysis of Data**

Hypotheses 1 through 3 were designated to examine the effect of playing video games on mood change and enjoyment. Therefore, the responses from 94 video game participants were selected by utilizing the “select cases” command in SPSS to be subject to the analyses.
Figure 2. Manipulation Check: Positive-Mood Change in General Media Conditions

*Note.* a: $M = 4.65$, $SD = 1.86$; b: $M = 3.61$, $SD = 1.82$; c: $M = 4.25$, $SD = 1.83$; d: $M = 4.22$, $SD = 1.84$
Figure 3. Manipulation Check: Negative-Mood Change in General Media Conditions

Note. a: $M = 1.16, SD = 1.11$; b: $M = 1.94, SD = 1.63$; c: $M = 0.95, SD = 1.13$; d: $M = 1.03, SD = 1.23$
Video Game Effect on Intervention

An independent sample t-test was conducted to test the first research hypothesis (H1), stating *playing a video game will elicit greater intervention for participants in bad mood than for those in good mood*. In other words, an independent sample t-test was performed to compare the degree of cognitive intervention of playing video game in good versus bad mood state. For the degree of intervention, although participants in the bad mood condition ($M = 55.8$, $SD = 20.5$) reported higher involvement while playing the video game than participants in the good mood condition ($M = 51.31$, $SD = 24.04$), the difference was not statistically significant: $t(92) = -.97$, $p > .05$ (one-tailed). Therefore, H1 was not supported, which reflects there was no significant difference of involvement while playing video games between the two mood conditions.

Video Game Effect on Mood Change

ANOVAs with repeated measures, composed of one between-subject (good vs. bad mood state) and one within-subject (pre vs. post media consumption) test and independent sample t-tests with mood condition as independent variable and positive and negative mood change as dependent variables, were employed to test the second hypothesis, stating that *playing a video game will elicit greater mood enhancement for participants in a negative affective state than for those in a positive state*.

Firstly, a repeated-measure ANOVA was conducted to examine positive mood change before and after playing the video game. The result is summarized in Table 6. Levene’s test of equality of error variance was not significant for both variables, thus the homogeneity of variance assumption was fulfilled. For the change of positive mood in both mood conditions, the test result was significant ($p < .001$), and it indicates that pre- and post-positive moods were intercorrelated. In a repeated measure design, Mauchly’s test is often used to examine sphericity, which assumes that correlations are equal across all pairs of outcomes taken from the same participants (Howell, 2002). This assumption applies only when more than two points were repeatedly measured from the same participants (Field, 2005). Thus, report of sphericity assumption test was omitted. The main effect of the between-group variable (mood condition) was significant: $F(1, 87) = 6.329$, $p < .05$, partial $\eta^2 = .068$, observed power = .70. The main effect of the within-group variable was not significant: $F(1, 87) = .416$, $p > .05$, partial $\eta^2 = .005$, observed power = .098. A significant within-group interaction effect was present for the interaction of time $\times$ mood condition: $F(1, 87) = 10.99$, $p < .01$, partial $\eta^2 =.112$, observed power
To sum up, pre- and post-positive moods were different in the experimental mood condition. Regardless of mood condition, positive mood did not change significantly across the two points. However, the size of positive mood change between the two mood conditions was affected by time. Specifically, positive mood decreased among good mood group, whereas positive mood increased among members of the bad mood group members (Figure 4).

To examine the negative mood enhancement of playing a video game, a two-way ANOVA for repeated measures (mood condition \( \times \) time) was conducted. The results are summarized in Table 7. The homogeneity of error variance assumption was fulfilled with non-significant results of Leven’s test. For the change of negative mood in both mood conditions, a significant result of main effect of mood condition (between group) was reported: \( F(1, 85) = 5.48, p < .05, \text{partial } \eta^2 = .061, \text{observed power} = .639 \). The within-group procedure (time) revealed significant effect on negative mood change: \( F(1, 85) = 7.46, p < .01, \text{partial } \eta^2 = .118, \text{observed power} = .915 \). The within-group interaction with mood condition was also statistically significant: \( F(1, 85) = 5.15, p < .01, \text{partial } \eta^2 = .081, \text{observed power} = .771 \). As Figure 5 indicates, negative mood decreased greater in the bad mood condition whereas it remained almost the same in the good mood condition. In short, mood condition, time, and the interaction between mood condition and time all revealed significant effects on negative mood change.

As reported, playing the video game enhanced mood, and the mood increased greater for those in a bad mood state after playing the video game. To directly compare the size of mood change between mood conditions, two independent sample t-tests were conducted with mood conditions as independent variable and positive mood change (Post-Positive mood — Pre-Positive mood) and negative mood change (Post-Negative mood — Pre-Negative mood) as dependent variables. For positive mood change, participants in the bad mood condition reported significantly greater mood change \( (M = .77, SD = 1.81) \) than those in the good mood group \( (M = -.52, SD = 1.85) \): \( t(87) = -3.315, p < .001 \) (one-tailed). For negative mood change, the bad mood group \( (M = -.77, SD = 1.08) \) reported statistically greater mood change compared with the good mood group \( (M = -.08, SD = 1.25) \): \( t(87) = 1.86, p < .05 \). Thus, \( H2 \) was supported.
Table 6. Repeated Measure ANOVA Summary for Positive Mood in Video Game Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>88</td>
<td>5,366.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>36.39</td>
<td>36.39</td>
<td>6.33*</td>
</tr>
<tr>
<td>Ss w/in Groups</td>
<td>87</td>
<td>500.24</td>
<td>5.75</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td>89</td>
<td>165.151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>.70</td>
<td>.70</td>
<td>.42</td>
</tr>
<tr>
<td>Time × Mood</td>
<td>1</td>
<td>18.45</td>
<td>18.45</td>
<td>10.99***</td>
</tr>
<tr>
<td>Time × Ss w/in groups</td>
<td>87</td>
<td>146.01</td>
<td>1.68</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>177</td>
<td>5,531.411</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05, ***p < .001

Figure 4. Positive Mood Change in Video Game Condition

Note. a: M = 4.74, SD = 1.99; b: M = 3.19, SD = 1.99; c: M = 4.22, SD = 1.90; d: M = 3.96, SD = 1.90
### Table 7. Repeated Measure ANOVA Summary for Negative Mood in Video Game Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>18.35</td>
<td>18.35</td>
<td>5.48*</td>
</tr>
<tr>
<td>Ss w/in Groups</td>
<td>85</td>
<td>284.48</td>
<td>3.35</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>7.83</td>
<td>7.83</td>
<td>11.35***</td>
</tr>
<tr>
<td>Time × Mood</td>
<td>1</td>
<td>5.15</td>
<td>5.15</td>
<td>7.46**</td>
</tr>
<tr>
<td>Time × Ss w/in groups</td>
<td>85</td>
<td>58.61</td>
<td>.69</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>374.42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *p* < .05, **p** < .01, ***p** < .001

### Figure 5. Negative Mood Change in Video Game Condition

*Note.* a: $M = .94$, $SD = 1.10$; b: $M = 1.93$, $SD = 1.86$; c: $M = .86$, $SD = 1.15$; d: $M = 1.16$, $SD = 1.49
Video Game Effect on Enjoyment

An independent sample t-test was conducted to test the third research hypothesis, stating participants in a bad mood will enjoy the video game experience more than those in a good mood. In other words, an independent sample t-test was performed to compare the enjoyment of playing a video game between the two mood groups. As expected, the bad mood group reported greater enjoyment of playing the video game ($M = 3.87$, $SD = 2.19$) than the positive mood group ($M = 3.69$, $SD = 2.09$); however, the result was not statistically significant: $t(95) = -.402, p > .05$ (one-tailed).

Scholars have previously described enjoyment as “a set of subcomponents: physiological, affective, and cognitive aspects that heavily intertwined” (Vorderer, Klimmt, & Ritterfiled, 2004, p. 389). Given that theoretical assertion, it is suggested that an individual’s mood enhancement experience and video game skill will impact his/her enjoyment of video game experience. To that end, it was determined that a multiple regression analysis should be conducted with positive mood change, negative mood change, and video game skill as independent variables and enjoyment as dependent variable. The means, standard deviations, and correlations for all variables are given in Table 8.

There were 8 missing data for the variables of interest, and the cases were deleted for the analysis. No outlier was identified, with studentized residuals approximately less than 2.5. Visual inspection of a plot of the model residuals versus the predicted outcomes did not suggest any violations of the regression assumptions of correct fit, constant variance, or normality. The model $R^2$ of .25, reflecting the overall strength of the relationship between enjoyment and the independent variables, was statistically significant at the .05 level ($F = 9.03, F(.05;4,85) = 2.53, p < .0001$). The adjusted $R^2$, more accurate goodness of fit measure than $R^2$, was .22, reflecting a relatively modest overall strength of relationship. The standard error of estimate was 1.89.

The effects of the individual independent variables on enjoyment are summarized in Table 9. The effect of video game skill, marginally significant at $p = .052$, reflects an estimated .17 enjoyment unit increase for every unit change in video game skill controlling for other variables. The effect of positive mood change, significant at .0001 level, reflects an estimated change of .48 enjoyment units for every unit change in positive mood change, controlling for other variables. The effect of negative mood change was not statistically significant.
To summarize, **H3** was not supported, which reflects there was no significant difference of enjoyment while playing video game between the two mood conditions. A follow-up multiple regression analysis suggested that video game skill and positive mood change are a positive predictor of enjoyment while playing a video game.

Table 8. Enjoyment Sample Statistics in Video Game Condition

<table>
<thead>
<tr>
<th></th>
<th>Enjoyment</th>
<th>Video game skill</th>
<th>Positive mood change</th>
<th>Negative mood change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video game skill</td>
<td>.32**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive mood change</td>
<td>.44***</td>
<td>.28**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Negative mood change</td>
<td>-.073</td>
<td>.03</td>
<td>-.42***</td>
<td>1</td>
</tr>
<tr>
<td>Mean</td>
<td>3.68</td>
<td>4.42</td>
<td>.10</td>
<td>-.43</td>
</tr>
<tr>
<td>SD</td>
<td>2.14</td>
<td>2.56</td>
<td>1.94</td>
<td>1.36</td>
</tr>
</tbody>
</table>

*Note.* The sample size is 86.
***p < .001. **p < .01. *p < .05.

Table 9. Enjoyment while playing video game results summary

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE.B</th>
<th>β</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video game skill</td>
<td>.17*</td>
<td>.09</td>
<td>.20</td>
<td>-.002, .34</td>
</tr>
<tr>
<td>Positive mood change</td>
<td>.48***</td>
<td>.12</td>
<td>.43</td>
<td>.23, .72</td>
</tr>
<tr>
<td>Negative mood change</td>
<td>.16</td>
<td>.17</td>
<td>.10</td>
<td>-.17, .50</td>
</tr>
</tbody>
</table>

*Note.* ***p < 0.001.
Comparison of Cross Media Effects on Mood Change

Hypotheses 4 and 5 were designated to examine the interaction effect of game condition and media condition on mood and enjoyment. Therefore, the responses for 190 participants were subject to the analysis for the following analyses.

In order to test $H4$—stating that bad mood group will experience greater positive mood enhancement when exposed to video game than when exposed to DVD clip, while mood change in good mood group will not be affected by media type—two 2 (mood condition: good vs. bad) $\times$ 2 (media condition: video game vs. DVD) $\times$ 2 (time: pre vs. post exposure) repeated-measure ANOVAs were conducted.

With regard to the positive mood change, the summary table is presented in Table 10. Levene’s test of equality of error variance was not significant for both variables; thus, homogeneity of variance assumption test was fulfilled. With the same rationale as the $H3$ analysis, Mauchly’s sphericity assumption test was not reported. The main effect of mood condition was significant: $F(1, 169) = 4.58, p < .05, \eta^2 = .03$, observed power = .57. The main effect of media condition was not significant: $F(1, 169) = 1.46, p > .05, \eta^2 = .01$, observed power = .23. Contrary to expectations, the interaction between mood and media condition had no significant effect on positive mood change: $F(1, 169) = 2.21, p > .05, \eta^2 = .01$, observed power = .32.

Despite its insignificance, an examination of the means revealed individuals in the bad mood condition reported that video game play enhanced their positive mood greater than DVD watching, whereas positive mood decreased greater in the good mood condition (Figure 6). The main effect of the within-group variable was not significant: $F(1, 169) = .78, p > .05, \eta^2 = .005$, observed power = .14. A significant within-group interaction with mood condition was present: $F(1, 169) = 16.35, p < .0001, \eta^2 = .09$, observed power = .98. The within-group interaction with media condition was not significant: $F(1, 169) = .02, p > .05, \eta^2 = .000$, observed power = .05. The within-group interaction with mood and media condition was not significant: $F(1, 169) = 1.13, p > .05, \eta^2 = .007$, observed power = .20.

To summarize, positive mood was not significantly changed over time. Media type by itself did not significantly influence positive mood change after general media consumption.
Table 10. Repeated Measure ANOVA Summary for Positive Mood

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>172</td>
<td>952.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>24.64</td>
<td>24.64</td>
<td>4.59*</td>
</tr>
<tr>
<td>Media Condition</td>
<td>1</td>
<td>7.83</td>
<td>7.83</td>
<td>1.46</td>
</tr>
<tr>
<td>Mood × Media</td>
<td>1</td>
<td>11.87</td>
<td>11.87</td>
<td>2.21</td>
</tr>
<tr>
<td>Ss w/in Groups</td>
<td>169</td>
<td>907.84</td>
<td>5.37</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td>173</td>
<td>71.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>1.05</td>
<td>1.05</td>
<td>.78</td>
</tr>
<tr>
<td>Time × Mood</td>
<td>1</td>
<td>22.01</td>
<td>22.01</td>
<td>16.35***</td>
</tr>
<tr>
<td>Time × Media</td>
<td>1</td>
<td>.02</td>
<td>.02</td>
<td>.015</td>
</tr>
<tr>
<td>Time × Mood × Media</td>
<td>1</td>
<td>1.68</td>
<td>1.68</td>
<td>1.25</td>
</tr>
<tr>
<td>Time × Ss w/in groups</td>
<td>169</td>
<td>83.37</td>
<td>.69</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>345</td>
<td>1,023.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p<.05, ***p<.001

Figure 6. Positive Mood Change in Media × Mood × Time Experimental Condition
Initial mood significantly influenced positive mood changes; however, it functioned independently from media type.

The summary for negative mood is presented in Table 11. Levene’s test of equality of error variance was not significant for both variables; thus, the homogeneity of variance assumption was fulfilled. With the same rationale as H3 analysis, Mauchly’s sphericity assumption test was not reported. The main effect of mood condition was significant: $F(1, 171) = 5.88, p < .05$, partial $\eta^2 = .03$, observed power = .67. The main effect of media condition was not significant: $F(1, 171) = .46, p > .05$, partial $\eta^2 = .003$, observed power = .10. Interaction between initial mood and media had no significant effect on negative mood: $F(1, 171) = 1.70, p > .05$, partial $\eta^2 = .01$, observed power = .26. Contradictory to the prediction, an examination of the means revealed DVD viewers decreased negative mood greater than video game players in both mood conditions (Figure 7). The main effect of the within-group variable (time) was significant: $F(1, 171) = 37.71, p < .0001$, partial $\eta^2 = .18$, observed power = 1.00. Significant interaction between mood condition and time was reported: $F(1, 171) = 13.73, p < .0001$, partial $\eta^2 = .07$, observed power = .96. The within-group interaction with media condition was not significant: $F(1, 171) = 2.17, p > .05$, partial $\eta^2 = .013$, observed power = .31. The within-group interaction with mood and media condition was not significant: $F(1, 171) = .01, p > .05$, partial $\eta^2 = .000$, observed power = .05. In sum, the media type by itself did not significantly influence negative mood change after media consumption. Initial mood significantly influenced negative mood change. However, the expected interaction between mood and media conditions over time was not found.

As suggested in the H3 analysis, video game skill may play a significant role for mood enhancement. To examine the proposition, the video game skill variable ($M = 4.55, SD = 2.56$) was recoded as a dichotomous variable for regrouping the sample according to their self reported video game skill. As a result 103 participants (or 54.1% of the sample) were categorized into the low competency group and 87 participants (or 45.8% of the sample) were categorized into the high competency group. Two 2 (media condition) × 2 (mood condition) × 2 (game skill) ANOVAs were then conducted with positive mood change and negative mood change as dependent variables.
In terms of positive mood change, the means, standard deviations, and cell size are given in Table 12 and a summary is presented in Table 13. The homogeneity of variance assumption was satisfied with nonsignificant results of Levene’s test. No significant main effect of media condition \([F(1,173) = .13, p > .05, \text{partial } \eta^2 = .001, \text{observed power} = .06]\], interaction effect of media and mood condition \([F(1,173) = 1.84, p > .05, \text{partial } \eta^2 = .01, \text{observed power} = .27]\], and interaction effect of media condition, mood condition, and video game skill \([F(1,173) = .000, p > .05, \text{partial } \eta^2 = .00, \text{observed power} = .05]\) were reported. The main effect of mood condition was significant: \(F(1,173) = 18.847, p < .0001, \text{partial } \eta^2 = .10, \text{observed power} = .991\). The main effect of video game skill was significant: \(F(1,173) = 4.923, p < .05, \text{partial } \eta^2 = .03, \text{observed power} = .60\). Specifically, positive mood decreased among the participants with initially good moods after media consumption in general \(M_{VG} = -.52, SD_{VG} = 1.85; M_{DVD} = -.27, SD_{DVD} = 1.27\), and positive mood increased among the participants in initially bad moods, \(M_{VG} = .77, SD_{VG} = 1.81; M_{DVD} = .46, SD_{DVD} = 1.55\). The effect of the interaction between media condition and video game skill was significant: \(F(1,173) = 4.73, p < .05, \text{partial } \eta^2 = .03, \text{observed power} = .58\). Specifically, positive mood change was affected by video game skill among video game players, whereas it was not the case among DVD viewers. For negative mood change, the interaction effects of video game skill with mood state or media type were not significant (Table 14).

To sum up, \(H4\) was not supported, which reflects there was no interaction effect between media type and mood condition on mood enhancement. A follow-up analysis revealed that positive mood change was significantly influenced by the interaction between video game skill and media type. That is, people with high video game skill reported greater positive mood increase than people with low video game skill and people who watched DVD.

**Comparison of Cross Media Effects on Enjoyment**

In order to test \(H5\)—stating that *bad mood group will experience greater enjoyment when exposed to video game than when exposed to DVD clip, while enjoyment in good mood group will not be affected by media type*—a 2 (mood condition: good vs. bad) \(\times\) 2 (media condition: video game vs. DVD) ANOVA was conducted with enjoyment as a dependent variable. The summary is presented in Table 15. The homogeneity of variance assumption was satisfied with nonsignificant results of Levene’s test. Contrary to expectations, the interaction between mood...
Table 11. Repeated Measure ANOVA Summary for Negative Mood

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>174</td>
<td>473.00</td>
<td>15.54</td>
<td>5.89*</td>
</tr>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>15.54</td>
<td>15.54</td>
<td>5.89*</td>
</tr>
<tr>
<td>Media Condition</td>
<td>1</td>
<td>1.21</td>
<td>1.21</td>
<td>.46</td>
</tr>
<tr>
<td>Mood × Media</td>
<td>1</td>
<td>4.51</td>
<td>4.51</td>
<td>1.71</td>
</tr>
<tr>
<td>Ss w/in Groups</td>
<td>171</td>
<td>451.74</td>
<td>2.64</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td>175</td>
<td>65.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>27.15</td>
<td>27.15</td>
<td>37.71***</td>
</tr>
<tr>
<td>Time × Mood</td>
<td>1</td>
<td>9.89</td>
<td>9.89</td>
<td>13.74***</td>
</tr>
<tr>
<td>Time × Media</td>
<td>1</td>
<td>1.56</td>
<td>1.56</td>
<td>2.17</td>
</tr>
<tr>
<td>Time × Mood × Media</td>
<td>1</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Time × Ss w/in groups</td>
<td>171</td>
<td>123.09</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>349</td>
<td>538.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05, ***p < .001

Figure 7. Negative Mood Change in Media × Mood × Time Experimental Condition
Table 12. Positive Mood Change Statistics

<table>
<thead>
<tr>
<th>Media</th>
<th>Mood</th>
<th>Skill</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Game</td>
<td>Good</td>
<td>Low</td>
<td>-1.03</td>
<td>2.24</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>-.07</td>
<td>1.32</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>-.52</td>
<td>1.85</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>Low</td>
<td>.26</td>
<td>1.47</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>1.52</td>
<td>2.03</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>.77</td>
<td>1.81</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Low</td>
<td>-.34</td>
<td>1.96</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>.57</td>
<td>1.80</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>.09</td>
<td>1.93</td>
<td>89</td>
</tr>
<tr>
<td>DVD</td>
<td>Good</td>
<td>Low</td>
<td>-.23</td>
<td>1.39</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>-.36</td>
<td>.85</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>-.27</td>
<td>1.24</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>Low</td>
<td>.38</td>
<td>1.70</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>.53</td>
<td>1.43</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>.46</td>
<td>1.55</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Low</td>
<td>.03</td>
<td>1.54</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>.23</td>
<td>1.32</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>.11</td>
<td>1.45</td>
<td>84</td>
</tr>
</tbody>
</table>
Table 13. Positive Mood Change with Video Game Skill

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>48.86</td>
<td>48.86</td>
<td>18.85***</td>
</tr>
<tr>
<td>Media Condition</td>
<td>1</td>
<td>.33</td>
<td>.33</td>
<td>.13</td>
</tr>
<tr>
<td>Mood × Media</td>
<td>1</td>
<td>4.77</td>
<td>4.77</td>
<td>1.71</td>
</tr>
<tr>
<td>Video Game Skill (VGSkill)</td>
<td>1</td>
<td>12.76</td>
<td>12.76</td>
<td>4.92*</td>
</tr>
<tr>
<td>Mood × VGSkill</td>
<td>1</td>
<td>.85</td>
<td>.85</td>
<td>.33</td>
</tr>
<tr>
<td>Media × VGSkill</td>
<td>1</td>
<td>12.27</td>
<td>12.27</td>
<td>4.73*</td>
</tr>
<tr>
<td>Mood × Media × VGSkill</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Error</td>
<td>165</td>
<td>427.74</td>
<td>2.59</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>494.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. *p < .05, ***p < .001

Table 14. Negative mood change with video game skill

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>11.66</td>
<td>11.66</td>
<td>5.48*</td>
</tr>
<tr>
<td>Media Condition</td>
<td>1</td>
<td>.45</td>
<td>.45</td>
<td>.21</td>
</tr>
<tr>
<td>Video Game Skill (VGSkill)</td>
<td>1</td>
<td>4.77</td>
<td>4.77</td>
<td>.12</td>
</tr>
<tr>
<td>Mood × Media</td>
<td>1</td>
<td>.02</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Mood × VGSkill</td>
<td>1</td>
<td>.08</td>
<td>.08</td>
<td>.04</td>
</tr>
<tr>
<td>Media × VGSkill</td>
<td>1</td>
<td>.20</td>
<td>.20</td>
<td>.09</td>
</tr>
<tr>
<td>Mood × Media × VGSkill</td>
<td>1</td>
<td>.20</td>
<td>.20</td>
<td>.09</td>
</tr>
<tr>
<td>Error</td>
<td>173</td>
<td>368.17</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>437.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. *p < .05
state and media type had no significant effect on enjoyment: $F(1,189) = .02, p > .05$, partial $\eta^2 = .000$, observed power = .05. Media type provided a significant effect on enjoyment: $F(1,189) = 8.61, p < .01$, partial $\eta^2 = .04$, observed power = .83. However, DVD viewers reported greater enjoyment than video game players in both the good mood [$M_{DVD} = 4.61, SD = 1.87; M_{VG} = 3.79, SD = 2.10$] and the bad mood conditions [$M_{DVD} = 4.75, SD = 2.20; M_{VG} = 3.89, SD = 2.20.$] Thus, Hypothesis 5 was not supported.

Table 15. Cross Media Effects on Enjoyment

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood Condition</td>
<td>1</td>
<td>1.17</td>
<td>1.17</td>
<td>.27</td>
</tr>
<tr>
<td>Media Condition</td>
<td>1</td>
<td>37.97</td>
<td>37.97</td>
<td>8.62**</td>
</tr>
<tr>
<td>Mood × Media</td>
<td>1</td>
<td>.02</td>
<td>.02</td>
<td>.004</td>
</tr>
<tr>
<td>Error</td>
<td>186</td>
<td>819.30</td>
<td>4.41</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>189</td>
<td>859.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. **$p < .01$**

In this study, enjoyment was measured with several questions as responses to media consumption. In addition to the hypotheses, the present study sought to determine the extent to which media type and initial mood state affects the enjoyment of media consumption. Indeed, communication scholars have defined enjoyment as a multi-faceted concept including affective and cognitive components (e.g., Nabi & Krcmar, 2004). With the theoretical assertion in mind, a regression equation with all variables predicting enjoyment was tested without regard to experimental condition. As a result, enjoyment was modeled with five independent variables: video game skill, media condition, positive mood change, negative mood change and involvement. The means and correlations for all variables are given in Table 16. Twenty five missing cases were identified and deleted from the initial analysis. Five outliers were identified with studentized residuals greater than 2.5 and also eliminated from the analysis. Therefore, 160 cases were subject to the analysis. The multiple Rs generated by the models were significant.
Overall, the final equation accounted for 71.5% of the observed variance. The adjusted $R^2$, compensating for the positive bias in $R^2$, was .711.

The effects of the individual independent variables on enjoyment are summarized in Table 17. Positive mood change and involvement were positive predictors of enjoyment.

### Table 16. Enjoyment Sample Statistics

<table>
<thead>
<tr>
<th></th>
<th>Enjoyment</th>
<th>VGSkill</th>
<th>Positive mood change</th>
<th>Negative mood change</th>
<th>Media condition</th>
<th>Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGSkill</td>
<td>.22**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive mood change</td>
<td>.43***</td>
<td>.22**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative mood change</td>
<td>-.04</td>
<td>.04</td>
<td>-.30***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media condition</td>
<td>.23**</td>
<td>-.01</td>
<td>.01</td>
<td>-.09</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>.82***</td>
<td>.20**</td>
<td>.31**</td>
<td>-.02</td>
<td>.30**</td>
<td>1</td>
</tr>
<tr>
<td>Mean</td>
<td>4.12</td>
<td>4.51</td>
<td>1.50</td>
<td>.06</td>
<td>-.49</td>
<td>57.05</td>
</tr>
<tr>
<td>SD</td>
<td>2.10</td>
<td>2.56</td>
<td>.50</td>
<td>1.71</td>
<td>1.36</td>
<td>21.44</td>
</tr>
</tbody>
</table>

*Note. The sample size is 164.*

**p<.001. **p<.01. *p<.05.
Table 17. Summary of Backward Regression Analysis for Variables Predicting Enjoyment (N=162)

<table>
<thead>
<tr>
<th>Model 1</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>Adj. $R^2$</th>
<th>Δ Adj. $R^2$</th>
<th>F</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG Skill</td>
<td>.01</td>
<td>.04</td>
<td>.02</td>
<td>.35</td>
<td>.711</td>
<td>.711</td>
<td>79.18**</td>
<td>5, 154</td>
</tr>
<tr>
<td>Positive Mood Change</td>
<td>.26</td>
<td>.06</td>
<td>.21</td>
<td>4.44***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Mood Change</td>
<td>.06</td>
<td>.07</td>
<td>.04</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media Condition</td>
<td>.27</td>
<td>.18</td>
<td>.06</td>
<td>1.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>.07</td>
<td>.01</td>
<td>.74</td>
<td>15.86***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 2</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>Adj. $R^2$</th>
<th>Δ Adj. $R^2$</th>
<th>F</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Mood Change</td>
<td>.26</td>
<td>.06</td>
<td>.22</td>
<td>4.61***</td>
<td>.712</td>
<td>.001</td>
<td>99.50***</td>
<td>4, 155</td>
</tr>
<tr>
<td>Negative Mood Change</td>
<td>.06</td>
<td>.07</td>
<td>.04</td>
<td>.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media Condition</td>
<td>.27</td>
<td>.19</td>
<td>.06</td>
<td>1.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>.07</td>
<td>.01</td>
<td>.74</td>
<td>16.12***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 3</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>Adj. $R^2$</th>
<th>Δ Adj. $R^2$</th>
<th>F</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Mood Change</td>
<td>.25</td>
<td>.06</td>
<td>.20</td>
<td>4.54***</td>
<td>.713</td>
<td>.001</td>
<td>132.45***</td>
<td>3, 156</td>
</tr>
<tr>
<td>Media Condition</td>
<td>.25</td>
<td>.18</td>
<td>.06</td>
<td>1.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>.07</td>
<td>.01</td>
<td>.72</td>
<td>15.42***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 4</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>Adj. $R^2$</th>
<th>Δ Adj. $R^2$</th>
<th>F</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Mood Change</td>
<td>.24</td>
<td>.06</td>
<td>.20</td>
<td>4.44***</td>
<td>.715</td>
<td>-.002</td>
<td>196.73***</td>
<td>2, 157</td>
</tr>
<tr>
<td>Involvement</td>
<td>.07</td>
<td>.01</td>
<td>.76</td>
<td>17.05***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5

DISCUSSION

The basic purpose of this study was to 1) examine the mood changing potential of video game, and 2) compare the effect of interactive and traditional media consumption on mood and enjoyment. This study was guided by mood management theory. A factorial design with two between groups (media condition and mood condition) and one within group (time) factors was used. Based on the mood management literature, several hypotheses were proposed.

This chapter will first summarize the results and then discuss these findings and their implications. Limitations and future research directions will also be discussed.

Summary and Discussion of the Findings

Video Game Effects on Involvement

Previous research suggested that media consumers tend to select intervening messages to dissipate their negative affective states. If selective exposure opportunities are not provided, individuals can involve themselves in media consumption to divert their attention from the negative states. As a result, H1 predicted that video game players in negative mood state would report greater intervention potential than positive mood video game players. As expected, video game players in negative mood state experienced more involvement than did those placed in a positive mood. However, the difference was not statistically significant. Possible explanations are presented here.

The first explanation for the nonsignificant difference of cognitive involvement between positive and negative mood states during video game play might be taken from the measurement of mood (Matthews, Jones, & Chamberlain, 1990). According to the mood measurement, mood is composed of hedonic tones, anger, tense arousal, and energetic arousal. Based on the mood state, mood management literatures have suggested different strategies of media message consumption. For physiologically understimulated individuals, for example, highly energetic and active messages were more efficient to overcome the previous mood (Atkin, 1985; Biswas, Riffe, & Zillmann, 1994; Bryant & Zillmann, 1984b; Wegener & Petty, 1994; Zillmann, Hezel, &
Medoff, 1980); for hedonically negative mood, happy and pleasant messages were selected (Helregel & Weaver, 1989; Hills & Argyle, 1998; Meadowcroft & Zillmann, 1987; Wegener & Petty, 1994). Highly intervening messages have been selected to repair anger and reduce retaliation behaviors (Baron, 1974; Bryant & Zillmann, 1977; Ramirez, Bryant, & Zillmann, 1982; Rusting & Nolen-Hoeksema, 1998). Thus, media message involvement may be more expected among people in annoyed states.

Although the current study sought to produce good or bad moods with a facial expression test, individuals’ bad moods might have resulted in frustration with their poor performance rather than anger. In fact, despite the successful bad mood inducement, the current data didn’t produce significant differences on anger items between good \((M = 3.04, SD = 2.59)\) and bad groups \((M = 3.15, SD = 3.06)\): \(t(95) = -.19, p = .48\) (one-tailed). To produce anger, Zillmann et al. (1980) verbally criticized the poor performance of facial expression test participants. Following Knobloch and Zillmann’s (2002) experimental process, however, the current study omitted the provocation process after bad mood induction. This decision may have been a mistake. Because anger tends to be reduced with intervening message, the current expectations might have been more efficiently found among annoyed people rather than simply bad mood condition. This proposition should be examined in future studies.

Secondly and more importantly, the explanation of the result may reside in the misleading concept of involvement. In the study, involvement was conceptualized as the degree to which the individual gives cognitive effort to consume a medium or its message. To measure this concept, the study should have been able to address attention, awareness, comprehension and recall during and after the media consumption (Wirth, 2006). Davies (2004) used a secondary signal detection task and recall test, in addition to the cognitive intervention scale which was employed in the current project. The secondary signal detection task was designated to measure the degree to which an individual was able to focus on watching television. The more errors the participants made, it was determined, the more the participants were cognitively involved with the media message. After the signal detection task, the participants were also asked to report the recall of the consumed message and perceptions of cognitive intervention. Davies (2004) reported consistency among these three tests. To elaborate, participants who viewed programs containing high intervention potential committed more errors in the signal detection task, recalled fewer facts about a speech that they heard prior to viewing television program, and rated
higher on a cognitive intervention scale than participants who viewed programs with low intervention potential.

Based on the Davies’s (2004) results, the current study assumed the cognitive intervention scale could represent video gamers’ cognitive effort exerted during media consumption. However, what the scale apparently measured was the intervention potential of a medium or its message, rather than participants’ cognitive involvement. Message intervention, engaging messages, absorption, or involvement of message are all synonyms to define the capacity of the message to draw individual’s attention. Since intervening messages were rank ordered based on the genre of TV programs, message involvement has been identified as one of the predictors of recovery from anger and retaliation against the annoyer (Bryant & Zillmann, 1977; Chang, 2006; Davies, 2004; Mastro, Eastin, & Tamborini, 2002; Zillmann, 1983). Specifically, Zillmann (1979) suggested exposure to greater intervening message would lead to a better chance of recovery from anger or retaliation against annoyers. Message intervention, thus, should be a predetermined characteristic of message genre or media type rather than a user’s cognitive effort to be involved in the media consumption.

**Video Game Effect on Mood Change**

Previous research suggested that individuals in a negative affective state were motivated to repair their mood. One of the effective ways of mood improvement is selective exposure to pleasant or/and engaging media messages. In nature, all media messages have a certain level of potential to change mood due to their hedonic valence. Unlike many previous studies which provided message selection opportunities from various range of hedonic valence and intervention potential, this study assigned participants to a video game condition under the assumption that exposure to interactive media would increase positive mood and decrease negative mood. As expected, video game experience did induce mood change.

For the good mood group, video game experience seemed to have a small effect on negative mood improvement. Even positive mood decreased after game play among good mood individuals. The fact that positive mood improvement was not observed with members of the good mood condition would not be surprising on its face. Previous research has consistently argued that happy and neutral individuals were not necessarily hedonically motivated to improve their moods (Chang, 2006; Rusting & Nolen-Hoeksema, 1998). Indeed, the mood management
literature has focused on the improving, disrupting, or managing of unpleasant mood (Knobloch-Westerwick, 2006) exclusively.

Compared to the good mood group, members of the bad mood group repaired their affective state by reducing negative mood and improving positive mood in the video game experimental condition. This finding is supportive of Zillmann’s mood management theory. In his summary of mood management, Zillmann (1988) argued that negative mood can be repaired with the consumption of pleasant, uplifting, and involving messages. To the negative mood individuals, interactive media consumption surely demands cognitive and emotional engagement which may disrupt their initial mood state.

In short, the current data found a video game to be an effective mood changer. However, it is too early to assume that the effects of all video games are consistent with those of traditional media in terms of mood management. First, controversy surrounds many video games because of their negative and anti-social contents. The current study selected a NASCAR racing game to control the interaction of negative hedonic valences such as violence and sexuality. However, video games in the real world are flooded with violence, dangerous situations, and sexuality (Grodal, 2000; Weber, Ritterfeld, & Kostygina, 2006) with violent depictions in video game being blamed for negative effects such as overstimulation, aggressive thoughts, feeling, and antisocial behaviors (Graybill, Krisch, & Esselman, 1985; Weber, Ritterfeld, & Mathiak, 2006). Thus, to examine the effect of video games on mood in a general setting, selective exposure designs with various level of aggression, violence, sexuality, and educational components of video games must be used.

Secondly, the current study only focused on the intervention potential of the video game. However, as Bryant and Davies (2006b) suggested, it is almost impossible to find content with which the mood management elements of excitatory homeostasis, intervention potential, message-behavioral affinity and hedonic valence can be isolated. In terms of selective exposure, stepwise expansion of video game contents starting with intervention potential is suggested for future investigations.

And lastly, the results concerning mood repair are possibly a simple regression toward the mean over time. That is, one can argue that bad mood recovers due to a time effect rather than as the effect of playing a video game. The best way to refute the rival explanation is to directly compare the mood change of an experiment group with a neutral-mood group. However,
the current data don’t provide such information as a control group was excluded from the research design. Thus, in future research, direct comparison of mood change within experimental groups with a control group should be considered. As Chen, Zhou, and Bryant (2007) pointed out, mood management theory has neglected the mood regulatory process over time. Therefore, the patterns of mood repair over time also should be considered in future research.

**Video game Effects on Enjoyment**

Hypothesis 3 predicted that the bad mood individuals would enjoy the video game experience more than the good mood individuals. Although members of the bad mood group reported greater enjoyment from playing the video game than good mood, the difference was not statistically significant. The prediction stemmed from the assumption of positive correlation between mood enhancement and enjoyment (Schreier, 2006); however, no empirical evidence has been provided yet to support this claim. Rather than general mood enhancement, however, it has been suggested that hedonically positive mood factors and enjoyment are positively associated (Wirth, 2006). Also, it was reported that individuals enjoyed video game when they succeeded to defeat competitors: other players, machine, or even record of player him/herself (Weber, Ritterfeld, & Mathiak, 2006). Those arguments were well supported by my follow up regression analyses. Enjoyment, video game skill, and positive mood change had strong positive association with each other (see Table 8). Furthermore, without considering initial mood state, positive mood change and game skill significantly predicted enjoyment, whereas negative mood change was not a significant predictor.

In this study, the enjoyment scale was used to simply measure video game players’ liking of the game experience. However, recently scholars defined enjoyment as a multi-faceted compound of physiological, cognitive and affective factors (Nabi & Krcmar, 2004; Vorderer, Klimmt, & Ritterfeld, 2004). In terms of cognition and physiology, video game may be enjoyable when players have little frustration caused by low-competent play. The current research revealed that video game players enjoyed the play greater when they had better game skills. Based on this finding, it is also reasonable to expect that better achievement or satisfaction of a game may increase enjoyment. However, unfortunately, the current data were not able to provide such information, as game success was not measured. Thus, in future research, video game players’ perceived success should be included as a predictor variable.
In terms of affective factors, this study explained mood enhancement with both positive mood increase and negative mood decrease. Only positive mood increase was revealed as a predictor of enjoyment. Considering the fact that enjoyment is often linked to affectively positive terms such as pleasure, delight, and joyfulness (Vorderer, Klimmt, & Ritterfeld, 2004), the finding provides empirical evidence of the mood and enjoyment association. However, according to Zillmann’s (2003) argument, “all moods can be mapped along a continuum ranging from depression to elation.” (p.543). If it is true, it is also necessary to develop a single mood checklist which includes all moods. Investigation of when enjoyment happens along the continuum of mood change is also suggested for future research.

**Comparison of Cross Media Effects on Mood Change**

To examine the effect of interactivity on mood change, the dissertation directly compared the effects of playing a video game with viewing a DVD clip. Hypothesis 4 predicted that individuals who were in a bad mood were more likely to experience greater mood enhancement when exposed to a video game than a DVD clip. In general, mood repair through media consumption was better observed in the bad mood condition, which is consistent with previous mood management literature. However, expected cross-media differences on mood change were not observed. That is, the video game did not appear to elicit greater mood enhancement than the DVD clip. There was no interaction between mood condition and media condition for positive and negative mood change either. Furthermore, although statistically insignificant, negative mood reduction was better observed with DVD viewers than video game players. This is unexpected given the abundant research on interactivity and mood management.

Given the definition of technology-oriented interactivity, video games should be a highly interactive media, with limitless interactive feature. Following previous mood management literature, this dissertation proposed that interactivity required more cognitive engagement, and should induce better experiences of enjoyment, and should have resulted in better mood enhancement by reducing negative mood and increase positive mood.

In the video game condition, the proposition seemed to be the case in this experiment. In other words, the video game played the role of mood changer with the same mechanism as traditional media. Specifically, mood enhancement was better observed among the people in a bad mood state, whereas the video game barely affected mood change among the people in a good mood. Hence, it was concluded that interactivity per se required cognitive engagement,
which interrupted media users’ initial negative mood, and resulted in negative mood reduction and positive mood enhancement.

Given this explanation, the fact that an interaction between media condition and mood condition was not reported is somewhat curious. In terms of the interactivity in this dissertation, obviously a video game is more interactive than a DVD clip, and if this is the case, then a mood management mechanism should be better observed among video game players. Although the research finding didn’t support these predictions, possible explanation can be found within mood management theory. The first possible explanation is related to message-behavioral affinity. For the bad mood condition, if an individual was able to master a stage without much difficulty, the person could be immersed in game contents and play. However, if the player was not successful, video game play itself could actually function as a stressor. According to the propositions of mood management, messages those with greater similarities with previous mood states tend to have less potential to alter those moods because they revive affect-maintaining cognitions (Zillmann, 1988b). Zillmann, Hezel, and Medoff (1980) found that provoked individuals avoided hostile comedy shows. Even though comedy shows were categorized as hedonically positive messages, the hostility of prime time comedy was aggressive enough to recall a noxious initial mood. The same pattern of hostile message avoidance was observed elsewhere (Davies, 2004; Medoff, 1982).

For the participants in this study, unsuccessful video game play may have been perceived similarly as failure in the facial expression test. The similar noxious experience may have exacerbated the intervention potential of the interactive medium. The current data didn’t provide any information about participants’ success in the game experience. However, descriptive variables implied that most of the participants were novices or non-video game players: more than 80% of the sample responded they played video game less than one hour within a week, with an average of 0.6 hours. In the video game context only, the provided stimulus might be interactive enough to induce engagement. Compared with the DVD, however, the video game might be too difficult to overcome their stress gained during the facial expression test.

Similarly, greater negative mood reduction among DVD viewers may be explained by excited homeostasis. Previous research has shown that individuals in overstimulation preferred calming or relaxing communication (Bryant & Zillmann, 1984b). Comparing with video games, which possibly reinforced negative feelings of failure in the test, watching the DVD was less
arousing, or exciting, so that stress could be relatively better removed. Mastery of the video
game, thus, should be considered as a predictor variable of mood change in future research.

A second explanation of this observation can be found in the literature on transportation
theory. Transportation is defined as “the process of fully engaged in a story” (Green, Brock, &
Kaufman, 2004, pp. 311-312). According to the theory, media messages with narratives have
better potential for transportation, and transporting experiences are likely to be “the most
effective at managing moods, and thus most likely to be experienced as enjoyable by recipients”
(p. 319). In this data analysis, it was reported that DVD watching repaired bad moods as much
as video games did. Although the result was not statistically significant, the DVD appeared to be
a better mood changer than the video game. The contents shown in the DVD were similar to the
ones in video game, but the DVD clip contained narration describing the foundation of
NASCAR organization. This narrative in the DVD, as well as the interactivity of video game,
may have cued individuals to equally engage in the media consumption.

Most of the hypotheses in this study were based on the assumption that interactive media
required more cognitive engagement and thus had better mood repairing potential than traditional
media. The corroborate positive correlation between interactivity and involvement has been
suggested by the communication literature (Green, Brock, & Kaufman, 2004; Grodal, 2000; Lee,
Park, & Jin, 2006; Vorderer, 2000), and involving messages as a key factor of mood
enhancement has been consistently reported (Chang, 2006; Davies, 2004; Zillmann, 1988b). If
this is indeed the case, another explanation of the findings might reside in the definition of
interactivity. As previously reviewed, the concept of interactivity has been approached from
various perspectives: technology oriented, users’ perception oriented, communication process
oriented, or combination of these. Among the introduced definitions, this dissertation adopted
the technology-oriented perspective, which defines interactivity as the degree of selection and
modification a medium provides. Considering the game experience and involvement results in
this data, it seemed reasonable to expect that individuals in DVD condition consumed media
non-interactively and passively. However, based on the findings for the H4, it is also possible to
suggest that video game consumption may not be perceived more interactively than DVD
consumption. In other words, low competent game players may feel the video game was
minimally interactive, whereas highly competent game players may have found greater
interactivity from the video game.
Indeed, a follow-up ANOVA test indicated that video game players with high self-reported video game skill enhanced their positive mood significantly more than their DVD watching counterparts (see Table 12, 13). The assumption that video game players with better skill would perceive video games as more interactive than lower game skilled individuals cannot be tested in this data. Furthermore, measures of game experience satisfaction might provide better observation of perceived interactivity rather than overall video game skill. However, this information was not available from the current data either. The shortfall may come from a misoperationalization of interactivity. As other empirical studies have argued, the findings of this study suggest that interactivity is evaluated by media users according to their familiarity with a medium and ability to control it, rather than the technological richness of the medium (McMillan, 2000; Sohn & Lee, 2005). Thus, the current study suggests that future investigation should examine perceived interactivity in the video game experience and its relevance to mood enhancement.

Comparison of Cross Media Effects on Enjoyment

Hypothesis 5 predicted that participants in bad moods would enjoy video games more than DVD clips, whereas such a pattern would not be observed among good mood individuals. Contrary to the expectation, the interaction effect between media type and mood condition was not found. Without considering initial mood state, DVD viewers more enjoyed their media consumption than video game players. Although the analysis didn’t support the predictions, the results were consistent with those of Hypotheses 3 and 4. The fifth hypothesis stems from the proposition that interactive media are more enjoyable than traditional ones thanks to interactivity. However, based on the analysis of the current data, the proposition was not supported. The competing proposition, “there is no interactivity independent of the user but rather interactive ways of using the media” (Vorderer, 2000, p.26), should be examined. The results of Hypotheses 3 and 4 suggest that competent video game players experienced positive mood enhancement more than individuals in any other conditions. However, whether they perceived the media consumption more interactively was, by no means, evidenced.

Likewise for video game enjoyment, a follow-up multiple regression analysis identified positive mood change as one of the predictors of enjoyment. It can thus be argued that the positive factor of mood change is more responsible for general media enjoyment than initial mood state. Involvement was also revealed as a predictor variable. As discussed in Hypothesis
analysis, involvement in this study measured the intervening nature of the medium or its message rather than media users’ cognitive effort to be involved. In other words, the intervening potential of a medium is a key factor of media enjoyment. This explanation would seem more appropriate if one could find a positive association between intervention potential and perceived interactivity of a medium.

**Significance of the Study and Future Research Direction**

The findings of this study suggest a possible positive effect of playing video games. Playing video games has been blamed for its negative effects on aggressive affect (Anderson & Dill, 2000; Fleming & Rickwood, 2001), aggressive behavior (Cooper & Mckie, 1986; Graybill, Krisch, & Esselman, 1985), aggressive thoughts (Bushman, Baumeister, & Phillips, 2001), physiological arousal (Griffiths, 1993a), and addiction (Griffiths & Dancaster, 1995; Lee & Peng, 2006). However, Lee and Peng (2006) suggested that video games may be able to play a positive role of training, sociability, and education. Given the present findings, education software developers should recognize that employment of interactivity and entertainment is imperative to develop cognitive skills as well as educational learning among students.

In more theoretical terms, the findings are certainly consistent with the proposal that exposure to video games can improve initially negative moods. It has been suggested that one of the main motives of playing video games is enjoyment (Phillips, Rolls, Rouse, & Griffiths, 1995), and through game playing, a player can achieve optimal levels of arousal (Grodal, 2000). However, not a single study could be found that empirically tested video games with mood management considerations. Because this research tests the effects of video games on mood, it augments the theory by analyzing video games as a potential tool of mood regulation. In the traditional setting, initial mood state is one of the main motives for selecting media messages. Compare to the DVD watching condition, mood enhancement was better observed from skilled video game players. On the contrary, failure in the game experience seemed to result in relatively negative consequences. Thus, the current study also identified gamers’ competence as significant factors for changing mood and achieving enjoyment.

Following the tradition of the mood management theory, the researcher induced two mood states: good and bad. Whether video games can be used as a mood changer in other
negative mood states is an interesting question for future study. For example, with traditional media, understimulated individuals looked for exciting media contents, whereas overstimulated individuals selected calming communication to escape from their affective state (Bryant & Zillmann, 1984b). Also, distraction strategies including selecting intervening messages are known to be more effective for relieving anger than simply a negative mood state (Bryant & Zillmann, 1977). The same concept may be also applied to the video game context.

This dissertation has addressed the effects of interactivity on mood and enjoyment as a cross-medium comparison. In defining interactivity, the dissertation used the technological approach, which defined interactivity as a technological characteristic of a medium. Although the technology-oriented definition of interactivity has been popularly used, the current dissertation implied that individuals may consider video games “as having different level of interactivity according to the way it is actually used by an individual” (Lee, Park, & Jin, 2006, p. 260). Thus, the findings of this dissertation provide partial support for the view that interactivity is a perceived characteristic of a communication act. In terms of media use, this means that we can expect differences in how people deal with interactive media to select and ultimately manage their mood according to their perceptions of interactivity. Future research should determine if people who perceived the video game interactively prefer video games over other traditional media as a mood management tool. In other words, cross-medium studies in a selective exposure context should add to the theoretical development of mood management.

As mentioned earlier, media enjoyment is a process of evaluating positive disposition toward media experience through affective, cognitive and behavioral routes (e.g., Nabi & Krcmar, 2004). To video game players, their perceived familiarity with the medium was a significant predictor of enjoyment. Without regard to media type, the intervention potential of the communication message or media type was revealed as an important factor to explain enjoyment. In other words, in general, media consumption is an effective way of maintaining good mood and dissipating bad mood; however, the routes of getting enjoyment can be different from one medium to another. In using interactive media, for example, involvement can be driven by the success of controllability, competition, and defeating opponents (Grodal, 2000), whereas narrativity is a key dimension of involvement in traditional media use (Green, Brock, & Kaufman, 2004). How different are interactive media from traditional media in eliciting
enjoyment? Though some confidence can be inferred from the current study, the question remains unanswered.

Furthermore, one of the purposes of the study was to address the relationship between mood and enjoyment. In terms of mood, enjoyment has been defined as “having been placed into a lingering, highly desirable mood state” (Zillmann, 2003). This claim was, though reasonable, just speculation. The findings of the current dissertation empirically support the argument by revealing positive association between positive mood change and enjoyment. However, the causal relationship between these two variables is still questionable. One may argue that enjoyment is the consequence of mood enhancement as the current data implied. Some may contest that idea by arguing that enjoyment is an instant response to media or consumption, whereas mood is an affective experience occurring during the long duration of time without consummatory targets (Zillmann, 2003). To them, the causal sequence may be opposite. Theoretical considerations about which one comes first and leads to the other, or whether they are same concept with a different name, would make the mood management theory more elaborate.

**Limitations**

The present study has its limitations. The first limitation concerns the characteristics of the sample. The participants were conveniently recruited from a population of college students, who may not be representative of all video game players. Most of the participants played video game ‘zero’ or less than an hour within a week. Also, gender differences are often reported in the mood management literature (Knobloch, 2007) and within the video game context (Dominick, 1984; Griffiths, 1993a; Phillips, Rolls, Rouse, & Griffiths, 1995; Williams, 2006), and unfortunately, this sample was dominated by female participants (76.8%). To generally cover the concern of video games and its effect, the same design should be re-conducted with adolescents with a more gender-balanced sample.

Second, few entertainment studies have reported effect sizes. Despite the moderate effect sizes reported in Sparks, Sherry, and Luben (2005) on which the research based its initial power analysis, the effect sizes in this study are not large. For example, partial $\eta^2$ s for the mood and media conditions with negative mood change were .03 and .003, respectively. A possible
explanation might reside in the duration of media consumption. As Chen, Zhou, and Bryant (2007) suggested, individuals may be involved more in mood repair behaviors as time goes by. By giving longer opportunities for media consumption, larger effects may be observable.

Third, this study used an intervention potential scale, an indirect measure of cognitive involvement, which may not fully reflect the cognitive effort exerted by the media consumer. Even though secondary signal detection tasks and recall tests have been used in the past, they have typically been used to pretest the degree to which a medium has the capacity to get media users involved, rather than directly measuring users’ cognitive involvement. To the best of this researcher’s knowledge, to date, there has been no verified, direct measure of involvement related to video games. Even though a systematically developed involvement scale would make the study stronger, it was considered beyond the scope of this dissertation.

Fourth, the decision to utilize technology-oriented definition of interactivity negate the chance to collect significant factors of interactivity. For example, the self evaluation of the media consumers’ satisfaction might have been able to provide more abundant information than video game skill. Perceived interactivity of video game and DVD might support this discussion as well.

Fifth, even though the NASCAR game and the DVD clip were chosen to control for hedonic valence, the design failed to avoid other possible interactions with mood management factors. Comparatively speaking, the DVD clip contained narrations which depicted the foundation of NASCAR organization. The way the film was edited may have affected the viewers’ assessment of the DVD differently from the video game. Graphics in the video game were less spectacular than those in DVD clip also. As Bryant and Davies (2006) suggested, finding games that are similar on multiple dimensions but vary on a specific feature is a persistent challenge for the video game researcher.

As discussed earlier, it is worth noting that this current research induced good and bad mood to compare the impact of initial mood state upon mood repair through media consumption. One could argue that initial mood can be repaired by the effect of time rather than the effect of media consumption. Thus, it is desirable that future investigations experimentally compare the mood management process among initially positive or negative mood with neutral mood state.
Conclusion

The purposes of the study were to examine the potential of video games as mood changing tools, and compare the effects of interactive media to mood and enjoyment with those of traditional media. Mood management theory was employed as a theoretical framework. Specifically, since interactive media require more cognitive intervention, this dissertation predicted 1) video games would enhance mood among members of the bad mood condition better than members of the good mood condition, and 2) video game would be more effective than DVD clips to change bad moods. A factorial design with two mood conditions (good vs. bad), media condition (video game vs. DVD clip) and time (pre- vs. post-media exposure) was employed to examine the predictions. The sample was recruited from large-lecture classes in the Department of Communication at FSU. Participants were randomly assigned to one of the four conditions.

It was found that video games were effective in changing mood. Specifically, consistent with mood management assumptions, members of the bad mood group reported greater positive mood increase and negative mood decrease than members of the good mood group. In a cross-medium setting, the expected mood and media interaction effect was not observed. However, when video game skill was used as one of the factors, mood management expectations were partially supported. Specifically, video game players increased their positive mood greater than DVD clip viewers, but only when their video game skill was highly competent.

In conclusion, the present findings demonstrate that 1) video games are media that can improve negative mood and maintain or reduce positive mood, 2) although media interactivity is often defined as the amount of technological features a medium provides, perceived interactivity may better explain the effect of interactivity on media users’ affective, cognitive and behavioral responses, 3) video game skill or familiarity with the game is a significant positive predictor of mood enhancement and enjoyment among video game players, 4) the intervention potential of a media message or a media type is a significant predictor of enjoyment in cross-medium comparison setting, and 5) enjoyment and positive factor of mood are positively correlated.
APPENDIX A: HUMAN SUBJECT COMMITTEE APPROVAL LETTER

Florida State
UNIVERSITY

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8633· FAX (850) 644-4392

REAPPROVAL MEMORANDUM

Date: 5/24/2006

To:
Arthur Raney
MC 1531

Dept: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Reapproval of Use of Human subjects in Research:
   Exposure to interactive Media as a Predictor of Subsequent Media Content Selection

Your request to continue the research project listed above involving human subjects has been approved by the Human Subjects Committee. If your project has not been completed by 5/23/2007 please request renewed approval.

You are reminded that a change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must report to the Chair promptly, and in writing, any unanticipated problems involving risks to subjects or others.

By copy of this memorandum, the Chairman of your department and/or your major professor are reminded of their responsibility for being informed concerning research projects involving human subjects in their department. They are advised to review the protocols of such investigations as often as necessary to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

Cc: Youngrak Park
HSC No. 2006.0452-R
APPENDIX B: CONFIRMED CONSENT FORM

THE FLORIDA STATE UNIVERSITY
Department of Communication
Researchers: Youngrak Park

I freely and voluntarily and without element of force or coercion, consent to be a participant in the following research project. This research is being conducted by Youngrak Park, who is a doctoral student in the Department of Communication at the Florida State University. I understand the purpose of this research project is to better understand motives of selecting media.

I understand that if I participate in the project, the session may take about 40 minutes and I will be asked to answer several questions including my demographic information and general media consumption habit. I understand that the survey will be digitally stored by the researchers in order to analyze data and all the data will be stored in secured computer database in the Department of Communication at the Florida State University that only the researchers will have access to and they will be removed from the database and destroyed by August 31, 2008.

I understand that I will be asked to complete some questionnaires for this study, as well as consume some media content.

I understand that I may stop participation at any time without any penalty and I will receive a credit for the course where I was recruited for the study after the participation of the study. I understand that there are no foreseeable risks or discomforts if I agree to participate in this study. I understand that the result of this research study may be published but my name or identity will not be revealed and the information obtained during the course of the study will remain confidential, to the extent allowed by law.

I understand that I may have an opportunity to ask questions about this study before consenting and I may contact either Mr. Youngrak Park, Florida State University, Department of Communication, UCC 3118, by phone, 850-645-4877 or by his email, yp03e@fsu.edu or Dr. Arthur A. Raney his professor, by phone, 850-644-9485 or by email, araney@fsu.edu or the chairman of Institution of Review Board (IRB) by phone, 850-644-8633 for any questions about this research project or my rights and group result of this study will be sent to me upon my request.

I have read and fully understand this consent form.

Name __________________________ Signature __________________________

84
APPENDIX C: DISSERTATION EXPERIMENTS SCRIPT

First of all, I want to thank each of you for volunteering to participate and showing up today. We may as well get started. My name is Youngrak Park; I’m a doctoral student here in the Department of Communication. Today we will be participating two experiments. The first session is about your ability to figure out others’ emotions expressed by their faces. This research is a part of cooperative departmental project with psychology department. It’s going to take about 15 minutes. The second session is about enjoyment of sports media consumption. We are circulating 5 different sports at daily base: Football, tennis, basket ball, NASCAR driving, and World Cup Soccer. And today, you will be asked to play or watch NASCAR related game or Video clip. It will take another 15 minutes. So, the total time will be less than 40 minutes. Each session includes some questionnaires.

I will now distribute informed consent form. <DISTRIBUTE FORMS>. Please carefully read the informed consent letter, and if you voluntarily agree to continue in the project, then complete the form providing the appropriate information.

When you have completed that form, please pass it to me. <COLLECT FORMS>.

<LEAD PARTICIPANTS TO THE FIRST RESEARCH ROOM (COMPUTER LAB) AND RANDOMLY ASSIGN INDIVIDUALS AT COMPUTER NUMBER 1 THROUGH 4>.

Please sit at number 1 (or 2,3,4) computer.

In this lab, we are going to test your ability to recognize others’ emotions. The score is highly related with your interpersonal communication skill. Before taking the test, however, the computer will ask about your media consuming patter. From your computer, please open the left button (online survey about media consumption).

<QUESTIONNAIRE COMPLETED>

Now, you completed the online survey. Please close the browser.

This time, please open the right icon on your computer. The program will lead you to the end, and at the end of the test, another survey (about your current moods) will be automatically utilized. When you are finished, please wait for my further instruction.

<TEST COMPLETED>
Now you finished the first session. Please close the survey window. Thank you for participating the first session. Now we are going to move to the next room.

**<LEAD PARTICIPANTS TO NEXT ROOM>**

In the room, you are going to either play a video game or watch a video clip. The contents of the game or video clips are sports related. Today, you are assigned to consume Driving Sports (NASCAR) content.

Please be seated in front of the TV which has same number with your computer (computer 1 -> TV 1; computer2 -> TV 2).

Now you can start your consumption. **<HELP PEOPLE TO PLAY VIDEO GAME OR WATCH DVD AND LET THEM PLAY 10 MINUTES>**

**<10 MINUTES LATER>**

Your time is up. Now I am going to ask you to fill up this survey questionnaires about your enjoyment of sports media consumption.

**<DISTRIBUTE SURVEY QUESTIONNAIRE: TV1(POSITIVE, GAME) -> GREEN, TV2 (POSITIVE, DVD) -> BLUE, TV3 (NEGATIVE, GAME) -> LINK, TV4 (NEGATIVE, DVD) -> YELLOW>**

**<SURVEY COMPLETED AND COLLECTED>**

**<DEBRIEFING>**

Thank you again for your participation in today’s research session. The purpose of today’s research project is to better understand the motivation of media consumption. You participated two research sessions as you were told prior to the participation, however, those two sessions were actually one research. In the first facial expression recognition test session, you were told that higher scores on the test will show your non-verbal communication proficiency. However, the performance evaluation was randomly predetermined and the test actually served as of initial mood manipulation (higher score: positive mood state vs. lower score: negative mood state). In the second session of the research, we actually measured the level of mood enhancement and enjoyment based on the initial mood manipulation. Ultimately, what we are interested in is determining if and/or how playing video games impact the mood change and enjoyment comparing to watching video clips. To that end, the research team will take your responses to the questionnaires and analyze them along with others from other research sessions. Do you have any questions about the purpose of the study?
If you do not want the information that you put on the questionnaires included in this project, please let me know. I will discard your responses immediately. Again, does anyone have questions about anything that has happened during this research session?

Thank you again for your time and cooperation.
### APPENDIX D: COMPUTER SCREEN CAPTURE OF THE MEDIA CONSUMPTION SURVEY

<table>
<thead>
<tr>
<th>I. Television viewing (does not include DVD/Video tape viewing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how many hours do you spend watching television?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the television programs you regularly watch contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. DVD/Video tape viewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how many hours do you spend watching DVDs or video tapes?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the DVDs or video tapes you regularly watch contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. In-theater film viewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how many hours do you spend in the theater?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the films you regularly watch contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV. At-home video game playing (does not include computer or online games)</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how many hours do you spend playing video games?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the video games that you play contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
<tr>
<td>On a scale of 1 (poor) to 10 (great), how would you rate your overall video game skills?</td>
</tr>
<tr>
<td>Poor: 1 2 3 4 5 6 7 8 9 10 Good</td>
</tr>
<tr>
<td>Select:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V. Arcade video game playing</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how often do you go to an arcade game station?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the arcade video games that you play contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VI. Computer media use</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a typical week, how many hours do you spend surfing the Internet?</td>
</tr>
<tr>
<td>Select:</td>
</tr>
<tr>
<td>On average, what percentage of the computer or online games that you play contain:</td>
</tr>
<tr>
<td>some violent content?</td>
</tr>
<tr>
<td>some sexual content?</td>
</tr>
<tr>
<td>On a scale of 1 (poor) to 10 (great), how would you rate your overall...</td>
</tr>
<tr>
<td>Poor: 1 2 3 4 5 6 7 8 9 10 Good</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Computer Game Skills?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>online or computer game skills?</td>
</tr>
</tbody>
</table>
VI. Computer media use
During a typical week, how many hours do you spend surfing the internet?

--- Select ---

During a typical week, how many hours do you spend playing computer or online games?

--- Select ---

On average, what percentage of the computer or online games that you play contain:

some violent content?

--- Select ---

On a scale of 0 (“poor”) to 10 (“great”), how would you rate your overall:

point 0 1 2 3 4 5 6 7 8 9 10

VI. Demographic Information
The university has provided an "at-risk" list of demographic information. To match your demographic information (but not your name) to your responses, provide the following information. Note: All instructors will use this information to assign credit as well.

What is your gender?

--- Select ---

What is your ethnicity?

--- Select ---

What is your age?

--- Select ---

Last four digits of your social security number

--- Select ---

First four letters of your last name

--- Select ---

Continue
APPENDIX E: COMPUTER SCREEN CAPTURE OF FACIAL EXPRESSION RECOGNITION TEST

First Page: Subject Number Entry

Please enter subject number (always three digit). Then press Return button.

111

Subject number

111
Second Page: Random Selection of Face Order

Third Page: Description of the test

Now we are getting to the next study included in this session:

**Emotion Recognition Test**

This is a test to assess sensitivity to facial cues associated with particular emotional experience.

This test has been devised by Professor Paul Ekman of the University of California, one of the world’s leading authorities on facial expression.

The measured sensitivity is a crucial skill in human interaction. A person who is deficient in this skill lacks empathic sensitivity, which greatly handicaps him/her in achieving desired end in interacting with others.

The next page will inform you how the test works.
Fourth Page: Description of the Test

Facial Expression Recognition Test Screen Shots
Test Result (Positive Mood Induction)

"Excellent! Your score is 85"

Test Result (Negative Mood Induction)

"Terrible! Your score is 20"
Now we have some questions about your feeling.
Click the below link when you are ready.
APPENDIX F: COMPUTER SCREEN CAPTURE OF MOOD SCALE (PRE-MOODS)

![Computer Screen Capture of Mood Scale](image)

The university has provided a "no-risk" list of demographic information. To match your demographic information, please fill out your name, and the following information. Note: All instructors will use this information to assign credit as well.

- Last four digits of your social security number
- First four letters of your last name

Thank you for your help.

Please contact mailto:help@real for any questions regarding the survey.
### APPENDIX G: MOOD SCALE (POST-MOOD)

**Instructions:** Please mark the box which represents your moods right now

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>1.</td>
<td>Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Tense</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Triumphant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Assured</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Bubbly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Optimistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Nauseated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Frustrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Happy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Excited</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Depressed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Exhilarated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Comfortable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Gloomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Confused</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Pleased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Sorry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Low-spirited</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Ecstatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Disturbed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Horrified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Numb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Exhausted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Thrilled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Hostile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Empty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Satisfied</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Contented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Clever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Cheerful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Distressed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Terrified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Agitated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Frightened</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Involved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Captivated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX H: ENJOYMENT SCALE (VIDEO GAME)

Instructions: Please answer the following questions as best you can. We encourage you to answer the items as truthfully as possible so that we can get the most accurate picture of your mood after media consumption. Remember, all of this information is anonymous.

1. How much did you **enjoy** the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

2. How much did you **enjoy** the **subject matter** of the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

3. How much did you **enjoy** the **genre** (i.e., driving, soccer, football, etc) of the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

4. How **exciting** was the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

5. How **suspenseful** was the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

6. How **violent** the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

7. How **arousing** the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

8. How **funny** the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

9. How **annoying** the video game that you played?
   - Not At All
   - Very Much
   - 0 1 2 3 4 5 6 7 8 9 10

10. How **memorable** the video game that you played?
    - Not At All
    - Very Much
    - 0 1 2 3 4 5 6 7 8 9 10

11. How **frustrating** the video game that you played?
    - Not At All
    - Very Much
    - 0 1 2 3 4 5 6 7 8 9 10
12. How **sexual** the video game that you played?

Not At All | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Very Much | 10

13. How **disgusting** the video game that you played?

Not At All | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Very Much | 10
APPENDIX I: ENJOYMENT SCALE (DVD)

Instructions: Please answer the following questions as best you can. We encourage you to answer the items as truthfully as possible so that we can get the most accurate picture of your mood after media consumption. Remember, all of this information is anonymous.

1. How much did you **enjoy** the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

2. How much did you **enjoy** the **subject matter** of the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

3. How much did you **enjoy** the **genre** (i.e., comedy, drama) of the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

4. How **exciting** was the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

5. How **suspenseful** was the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

6. How **violent** the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

7. How **arousing** the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

8. How **funny** the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

9. How **annoying** the video clip that you viewed?
   Not At All
   0 1 2 3 4 5 6 7 8 9
   **Very Much**

10. How **memorable** the video clip that you viewed?
    Not At All
    0 1 2 3 4 5 6 7 8 9
    **Very Much**

11. How **frustrating** the video clip that you viewed?
    Not At All
    0 1 2 3 4 5 6 7 8 9
    **Very Much**
12. How **sexual** the video clip that you viewed?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Very Much</th>
<th>10</th>
</tr>
</thead>
</table>

13. How **disgusting** the video clip that you viewed?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Very Much</th>
<th>10</th>
</tr>
</thead>
</table>
APPENDIX J: COGNITIVE INTERVENTION SCALE (VIDEO GAME)

Instructions: Using the scale illustrated below, please rate the program on the following questions. Please write your answer in the space provided.

Not at all     | Extremely
0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100

How absorbing was the video game? ______________ (0-100?)

How eventful was the program video game? ______________ (0-100?)

To what degree was it necessary to concentrate to follow the video game? ______________ (0-100?)

How boring was the video game? ______________ (0-100?)

How cognitively involving was the video game? ______________ (0-100?)

How interesting was the video game? ______________ (0-100?)

To what degree did your mind wander while watching the video game? ______________ (0-100?)

Instructions: The university has provided us a "no-risk" list of demographic information. To match your demographic information (but not your name) to your responses, provide the following information. Note: All instructors will use this information to assign credit as well.

Last four digits of your Social Security Number

First four letters of your last name
APPENDIX K: COGNITIVE INTERVENTION SCALE (DVD)

**Instructions:** Using the scale illustrated below, please rate the program on the following questions. Please write your answer in the space provided.

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

How absorbing was the video segment? ______________ (0-100?)

How eventful was the program video segment? ______________ (0-100?)

To what degree was it necessary to concentrate to follow the video segment? ______________ (0-100?)

How boring was the video segment? ______________ (0-100?)

How cognitively involving was the video segment? ______________ (0-100?)

How interesting was the video segment? ______________ (0-100?)

To what degree did your mind wander while watching the video segment? ______________ (0-100?)

---

**Instructions:** The university has provided us a "no-risk" list of demographic information. To match your demographic information (but not your name) to your responses, provide the following information. Note: All instructors will use this information to assign credit as well.

Last four digits of your Social Security Number

First four letters of your last name
REFERENCES


McMillan, S. J. (2000). Interactivity is in the eye of the beholder: Function, perception, involvement, and attitude toward the Web site. In M. A. Shaver (Ed.), *Proceedings of the*
American Academy of Advertising (pp. 71-78). East Lansing, MI: Michigan State University.


BIOGRAPHICAL SKETCH

Youngrak Park

EDUCATION

Ph.D. candidate in Mass Communication, Florida State University, College of Communication, Tallahassee, Florida.
Dissertation title: The Effects of Media Interactivity on Mood Regulation: An Experimental Study, Defended on December 13, 2007

MA in Mass Communication, Temple University, Department of Broadcasting, Telecommunication,

BA in English Linguistics, Chung-Ang University, Department of English, Korea, graduated August 1998.

RESEARCH INTEREST

Social and Psychological Impacts of media interactivity
Mood regulation strategy in cross-media setting
Use of interactive media in intercultural context

CONFERENCE PAPERS

First Place, Advances in Entertainment Theory and Research Symposium: Park, Y., & Raney, A.A. (2008, April). The Effects of Media Interactivity on Mood Regulation: An Experimental Study. To be presented at the annual meeting of the Broadcast Education Association, Las Vegas, NV.


Hong, C., Park, Y., & Kim, K. (2005, August). Content analysis of automotive company websites as Internet advertising: A cross-cultural study. Presented at the annual meeting of the Association for Education in Journalism and Mass communication, San Antonio, TX.

newspapers. Presented at the annual meeting of the Association for Education in Journalism and Mass Communication, San Antonio, TX.


HONORS & AWARDS
April 2008  First place, research paper competition, Broadcast Education Association
April 2007  Recognized as the ’07 Outstanding Graduate Research Assistant in the College of Communication at Florida State University.
January 2001  Second place, Graduate Research Forum, School of Communication, Temple University

TEACHING EXPERIENCE
An introductory course designed to help students gain knowledge, skill, and use of the computer hardware and software in the design, production, and delivery of multimedia communication. The tools and techniques are relevant in publishing, advertising, entertainment, and education in both print and web based communication. The class format includes lecture, demonstration, and hands-on practical experiences with multimedia computers and multimedia production software.

COM 4330 Communication and the Internet, Lead instructor, Spring 2005- Fall 2007
An advanced course designed to help students develop technical and communication skills in Internet-based communication technologies. Hands-on survey of Internet technologies with focus on communication issues, problems and competencies. Lecture and lab

COM 3120 Communication for Organization, Online mentor, Fall 2006
A theory and application course dealing with the various forms (conflict, gender, leadership, frame of references, e.g.) of communication within an organization.

SPC 4445 Group Dynamic and Leadership, Online mentor, Summer 2006
An intensive course designed to help students improve understanding of how members in a group can best collaborate while working on information technology projects.

SPC 3210 Contemporary Human Communication, Teaching Assistant, Fall 2006
An introductory course designed to help students gain knowledge of the theory and process of human communication across various aspects of communication including interpersonal, media, group, and culture through readings, class discussions, research, and experiential/reflective activities.

RTV 3003 Elements of Broadcasting, Teaching Assistant, Spring 2006,
An introductory course of electronic mass communication. The course covers media ownership, convergence, and digital divide.

INVITED PRESENTATION & LECTURES
“Mass Communication Theories” presented in Contemporary Human Communication (COM 3210), October 2006.
“Computer Mediated Communication: Internet as Hybrid Medium of Interpersonal and Mass
Communication” presented in Elements of Broadcasting (RTV 3003), March 2006.
“Online Survey” presented in Measurement of Listener and Viewer Attitude (COM 5314),
June 2006.

SELECTED COURSE TAKEN

**Communication Theories:**

- BTMM 0400 Introduction to Communication Concepts (Temple University)
- BTMM 0520 Communication Institutions (Temple University)
- BTMM 0560 Communication in Organizations (Temple University)
- COM 6400 Entertainment Theory (FSU)
- MMC 5600 Mass Communication Theory and Effects (FSU)
- MMC 6469 Diffusion of Innovation (FSU)
- SPC 5545 Studies in Persuasion (FSU)

**Research Method:**

- BTMM 0411 Mass Communication Research Method (Temple University)
- BTMM 0512 Quantitative Communication Research Method (Temple University)
- COM 5314 Measurement of Listener-Viewer Attitude and Response (FSU)
- COM 5316 Statistical Methods in Communication Research (FSU)
- COM 5317 Content Analysis in Communication Research (FSU)
- COM 5331 Computers in Communication Research (FSU)
- COM 5340 Historical Critical Methods of Research (FSU)
- EDF 5401 General Linear Modeling (FSU)
- EDF 5402 Advanced Topics in Analysis of Variance Applications (FSU)
- EDF 5406 Multivariate Analysis Applications (FSU)
- EDF 5410 Non-Parametric Analysis Applications (FSU)

**Applied Media**

- BTMM 0775 Cyber-Media Workshop (Temple University)
- JOURN 0457 Internet Web Publishing (Temple University)
- RTV 5253 New Communication Technology Theory and Research (FSU)

**Certificate**

Mentor Certificate for Distance Learning: Awarded 2004 from the Office for Distributed &
Distance Learning (ODDL) at Florida State University

**Professional Experience**

May 2003 ~ Present

Instructor and Teaching/Research Assistant, Department of Communication,
Florida State University

January 2002 ~ May 2004

Assistant Web Designer and co-web master of NAIAM (North America Inland Asian Mission) [http://www.naiam.org](http://www.naiam.org) (inactive)

August 1999 ~ August 2000

English Instructor at Eaton English Academy, Seoul, Korea
: Teaching GRE, TOEFL, and SAT to college and high school students