

## ABSTRACT

Title of Dissertation: INDIVIDUAL DIFFERENCES IN EMOTIONAL AND PHYSIOLOGICAL RESPONSES TO TELEVISED SPORTS VIOLENCE:  
A TEST OF SENSATION SEEKING THEORY

Shu-Chen Lee, Doctor of Philosophy, 2006

Dissertation Directed By: Professor Bradley D. Hatfield  
Department of Kinesiology

**Purpose:** To test sensation-seeking theory as an explanation for individual differences in emotional and physiological responses to violence in televised sports and account for sex differences in those responses.

**Methods:** One hundred ten non-smoking subjects prescreened for the personality trait of sensation seeking were selected for the experiment. Subjects viewed two videos of plays from professional football games; one featuring violent action, the other showing little or no violence, and a video of natural scenery (neutral content) as a distraction between the two treatment videos to minimize any carry-over effects. Participants' emotional responses (levels of pleasure and arousal) were subjected to two separate 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (order of video treatment) ANOVAs, while participants' physiological reactions (heart rate, skin conductance, and respiration) were subjected to three separate 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (viewing period) x 2 (order of video treatment) ANOVAs to test the study's main hypotheses.

**Results:** Emotional (self-reported levels of pleasure and arousal) and physiological responses (heart rate, skin conductance, and respiration) were not different between high

and low sensation seekers for either high- or low-violence televised sports. However, high sensation seekers did report higher levels of pleasure (for both sexes) and exhibit faster mean respiration (for males only) when watching high-violence televised sports than neutral content, and the pleasure level was significantly higher for high sensation seekers (for both sexes) when watching low-violence televised sports than neutral content. Significant sex differences in self-reported levels of pleasure and arousal were observed; males reported higher levels of pleasure than females when watching high-violence televised sports, and males reported less arousal than females when watching low-violence televised sports. Sex differences in physiological responses were also found; however, the direction of the effect was inconsistent. In addition, viewers' self-reported pleasure and arousal increased with the degree of violence; nevertheless, this relationship was more pronounced in males than in females.

**Conclusions:** Sensation-seeking theory failed to account for individual and sex differences in emotional and physiological responses to sports violence; however, the data support the notion that high sensation seekers enjoyed arousing and exciting media content (both high- and low-violence football plays) more than milder themes (neutral content). Although previous studies have found that the preference for violent televised sports, such as football, is associated with sensation seeking, the results indicated there might be other characteristics besides violent content that account for sensation seekers attraction to football. Biological sex was found to be a strong predictor of spectators' responses to sports violence. In addition, this study provides support for previous research suggesting that violence contributes to viewers' arousal and enjoyment of televised sports, especially for male viewers.

INDIVIDUAL DIFFERENCES IN EMOTIONAL AND PHYSIOLOGICAL RESPONSES  
TO TELEVISED SPORTS VIOLENCE:  
A TEST OF SENSATION SEEKING THEORY

By

Shu-Chen Lee

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Advisory Committee:

Professor Bradley D. Hatfield, Chair  
Associate Professor David L. Andrews  
Associate Professor Ang Chen  
Dr. Colleen M. Farmer  
Professor Barry D. Smith  
Associate Professor Paul J. Smith

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## DEDICATION

To Dr. Marvin Zuckerman

for his continuing inspiration

and

To my husband, Theodore J. Parreco

for his love, devotion, encouragement, support, and sacrifices

and for always believing in me

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# CHAPTER I

## INTRODUCTION

### Media Violence

Media violence has been one of the most investigated areas in social science literature (Kiewitz & Weaver, 2001). Much of the work has focused primarily on the potentially harmful effects that exposure to violent content—especially on television—might have on viewers and society (Bushman & Huesmann, 2001; Gunter, 1994; Sparks & Sparks, 2002; Williams, 2003). A substantial body of research on the effects of media violence suggests that exposure to or preferences for violence are positively associated with increases in aggressive attitudes and behavior (e.g., Anderson & Bushman, 2001; Freedman, 1984; 2002; Huesmann & Eron, 1986; Huesmann, Moise-Titus, Podolski, & Eron, 2003; Johnson, Cohen, Smailes, Kasen, & Brook, 2002; McLeod, Atkin, & Chaffee, 1972a; 1972b; Paik & Comstock, 1994).

Several theories have been proposed to account for the effects of media violence on viewers' aggressive behavior. For instance, *social learning theory* posits that viewers imitate aggression or learn to act aggressively after exposure to the violent actions of others, whether in real life or in the media (Bandura, 1973; 1977; 1994; 2002; Bandura, Ross, & Ross, 1963). *Priming effects* suggest that repeated exposure to media violence leads to prime semantically aggressive-related thoughts in viewers and, in turn, increases the tendency to act aggressively (Berkowitz, 1974; Jo & Berkowitz, 1994; Roskos-Ewoldsen, Roskos-Ewoldsen, & Dillman Carpentier, 2002). *Desensitization theory*

proposes that repeated exposure to mediated violence leads to reduced sensitivity to violence on the screen and greater acceptance of violence in the real world (Linz, Donnerstein, & Adams, 1989; Linz, Donnerstein, & Penrod, 1988). *Excitation transfer theory* maintains that exposure to media violence increases viewers' physiological arousal and thereby intensifies their subsequent aggressive behavior in real life (Zillmann, 1971; 1979; 1983; Zillmann & Bryant, 1974; for a recent review of excitation transfer theory, see Bryant & Miron, 2003). *Cultivation theory* holds that the media, especially television, shapes people's perceptions of reality; therefore, heavy television viewers perceive the world as more violent because of television's frequent representations of violence (Gerbner, Gross, Morgan, & Signorielli, 1994; Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002).

Although a number of theories have been proposed to account for the harmful effects of media violence on viewers, relatively few studies have been conducted to explain why audiences relish such violence in the first place (Goldstein, 1998; 1999; Krcmar & Greene, 1999; Sparks & Sparks, 2002). Researchers have suggested that a comprehensive understanding of the effects of media violence on viewers must first establish the reasons for viewers being attracted to such content (Sparks & Sparks, 2002). Oliver (2003) states that "future research would benefit from a greater exploration of viewer enjoyment, as any complete understanding of the effects that media violence may have on its audience must also account for why some viewers find this type of fare particularly gratifying" (p. 96-97). This study, then, focuses on the aspect of media enjoyment because that experience is "the primary effect that is sought out and pursued for the benefits that it entails" (Bryant & Miron, 2002, p. 577).

## Televised Sports

Violence is a major theme in certain televised sporting events (Kinkema & Harris, 1998). Guttman (1998) noted that, “in many sports, physical violence is the core if not the name of the game” (p. 7). Physical contact between competitors is usually the nature of contact sports (Goldstein, 1983; Sullivan, 1991). Violence in contact sports is typically viewed as “part of the game” (Goldstein, 1983, p. 2).

At the same time, researchers have argued that the mass media plays a significant role in the popularity of violent sports (Bryant & Zillmann, 1983; Goldstein, 1989; Trujillo, 1995). For example, Bryant and Zillmann (1983) suggested that the media exploit sports violence by expanding their coverage of the roughest and most violent plays, by replaying violent plays multiple times, and by featuring clips of particularly violent action from previous games in the segments promoting upcoming contests. Bryant and Zillmann also maintained that the media place a strong emphasis on acts of violence and aggression in sport competitions rather than focusing on the skill, performance, and strategies used by the athletes and coaches.

Researchers have suggested that the media’s emphasis on violence in sporting events is based on the notion that “violence sells” (Wann, Melnick, Russell, & Pease, 2001, p. 41), and that the especial popularity of combative sports reveals that “at least a good portion of sports spectators enjoy bruising activities” (Zillmann & Paulus, 1993, p. 606). Scholarly research on the enjoyment of televised sports also supports the thesis that audiences are attracted to violence in sport competitions—both the physically violent play (e.g., Bryant, Comisky, & Zillmann, 1981; Rayburn, 1998) and the dramatic

commentary that accompanies violent plays (e.g., Comisky, Bryant, & Zillmann, 1977; Sullivan, 1991). However, the reasons for such attraction remain mostly a matter of conjecture. Researchers have called for further investigation to identify the factors that contribute to this enjoyment of violence in sports events (Bryant et al., 1981; Rayburn, 1998).

### Audience Research for Televised Sports

Quantitative research on televised sports audiences has been derived mainly from two social-psychological models, “effects” research and the “Uses and Gratifications” (U & G) paradigm (Kinkema & Harris, 1998). Research using the “effects” model has primarily focused on the impact that watching televised sport contests has on viewers. However, most of those studies focused on the effects of “content” variables of sports contests. Little research has been conducted to investigate the influence that individual differences in viewers’ characteristics, such as personality traits, have on media exposure and effects (Rayburn, 1998). As Oliver (2002) argued, “individual differences are often treated as ‘noise’ or error variance, with researchers typically accounting for these variations either through random assignment to experimental conditions or through the treatment of individual difference variables as covariates” (p. 517). Consequently, there is little understanding of viewer characteristics that might predispose them to enjoy watching particular media content, such as violent sports. The lack of viewer-oriented research is a serious deficiency in our knowledge about televised sports audiences, especially when viewer predisposition has been found to be an important predictor of media uses and effects (e.g., Black & Bevan, 1992; Bushman, 1995; Celozzi, Kazelski, & Gutsch, 1981; Russell, 1992; Weaver, 1991; 2000; 2003). Wober (1986) asserted that an

“adequate, let alone full understanding of how individuals interact with mass media will not be reached without a good account of those individuals’ fundamental attributes” (p. 206).

Research within the traditional “U & G” paradigm has primarily explored audiences’ viewing motivation and their experiences with televised sports. The “U & G” studies have found that watching televised sports serves some psychological functions for viewers, such as to get “psyched up”, to “let loose” (Gantz, 1981), or for arousal purposes (Rubin, 1981a). However, a major criticism of research using the “U & G” approach has been its failure to link media gratification to its psychological origins (Katz, Blumler, & Gurevitch, 1974; Palmgreen, Wenner, & Rosengren, 1985). Krcmar and Greene (1999) argued that, with a few exceptions, “uses-and-gratifications studies...have not thoroughly examined the psychological correlates of media exposure. This leaves the role of personality in determining content and genre preferences largely unexplored” (p. 25). In addition, most studies in the “U & G” research tradition have largely depended on self-reports of individuals’ viewing motivation and their experiences with media consumption (Wimmer & Dominick, 2000). However, the validity of the self-report technique, using questionnaires or interviews to determine motives, has been challenged (Ruggiero, 2000; Severin & Tankard, 2001). For example, the technique assumes that audiences are aware of what determines their motivation for media consumption and can articulate their rationales when asked (Katz et al., 1974; Zillmann & Bryant, 1994). Elliott (1974) argued, “there is no evidence to show that people are ‘aware of their needs’” (p. 255). Rosenstein and Grant (1997) pointed out that “people may have little direct introspective access to the higher order cognitive processes which mediate their behavior” (p. 328).

Some researchers (e.g., Conway & Rubin, 1991; Krcmar & Greene, 1999; Perse & Rubin, 1990; Potts, Dedmon, & Halford, 1996; Weaver, 1991) recognized the flaw of self-reporting and employed “indirect investigative techniques” by “assessing the personality correlates of exposure to media content.” That allowed the investigators to uncover the underlying self-report motivation of media consumption “without directly triggering participants’ demand characteristics” (Krcmar & Greene, 1999, p. 25). Therefore, the use of the personality characteristics of sport spectators to investigate why they are attracted to and enjoy sport violence appears to be a promising methodology for understanding the underlying motivation. As Zuckerman (2002) suggested, “personality traits represent expressions of more basic motivational, cognitive, or emotional traits” (p. 388).

### The Personality Trait of Sensation Seeking

Zuckerman’s sensation-seeking theory asserts that a need for stimulation and arousal may account for a person’s preferences for, enjoyment of, and responses to media violence (Goldstein, 1999; McDaniel, 2003; Zuckerman, 1994; 1996a). According to Zuckerman (1979a; 1983a; 1984; 1994), sensation seeking is a biologically determined personality trait that has been defined as the need for “the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience” (Zuckerman, 1994, p. 27).

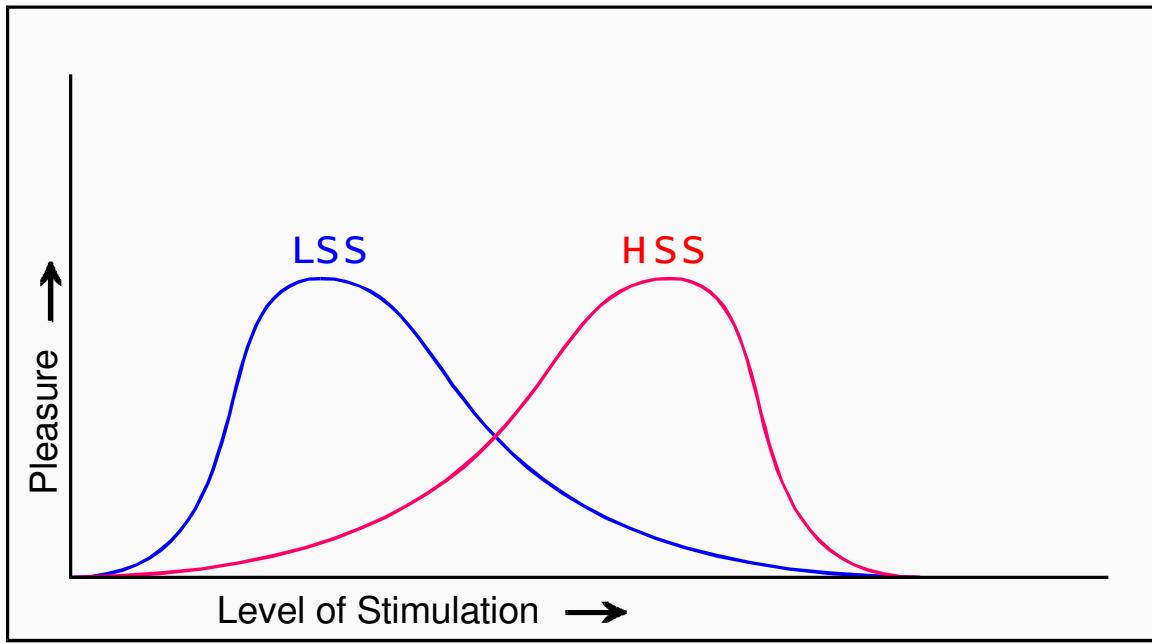
The theory of sensation seeking was initially grounded in the notion that “every individual has characteristic optimal levels of stimulation (OLS) and arousal (OLA) for

cognitive activity, motoric activity, and positive affective tone” (Zuckerman, 1969, p. 429). Zuckerman (1994; 1996a) suggested that individual differences in OLS and OLA might be the source of peoples’ preferences for and attraction to media violence. The OLS and OLA are considered to be the degree of stimulation and arousal that are most comfortable for the individual at a given time (Raju, 1980; Steenkamp & Baumgartner, 1992; Zuckerman, 1988; 1994). Individuals are most comfortable when their stimulation and arousal levels are at their optimal levels. Conversely, if individuals’ stimulation and arousal levels are above or below their optimal levels, they will feel less comfortable, even unpleasant (Raju, 1980; Steenkamp & Baumgartner, 1992; Zuckerman, 1988; 1994). Accordingly, individuals tend to seek out arousing stimulation when their environment provides less than their preferred OLS and OLA. Conversely, they tend to avoid stimulation when their environment provides more than the desired optimal level (Raju, 1980; Steenkamp & Baumgartner, 1992; Zuckerman, 1988; 1994).

Zuckerman (1994; 1996a) later modified the OLA model, suggesting that individual differences in optimal levels of arousal or arousability might be the basis to differentiate between high and low sensation seekers. Compared to low sensation seekers (LSS), high sensation seekers (HSS) might have higher optimal levels of arousal, or have lower arousal levels in an unstimulated condition, or be less arousable (have low arousability) in response to external stimuli, and thus need more stimulation to feel and function better. In contrast, LSS need less stimulation to feel and function better because they either have lower optimal levels of arousal, or have higher arousal levels in an unstimulated condition, or because they are more easily aroused (have high arousability)

in response to external stimuli. Figure 1 depicts the relationship between levels of pleasure and levels of stimulation for high and low sensation seekers.

Figure 1-1. The Relationship between Levels of Pleasure and Levels of Stimulation for High and Low Sensation Seekers



Empirical evidence shows strong sex and age differences in the sensation-seeking trait. Males generally exhibit higher levels of sensation seeking than females in all countries and at all ages (Zuckerman, 1979a; 1988; 1994; Zuckerman, Eysenck, & Eysenck, 1978). The sensation-seeking tendency increases from infancy to adolescence and declines steadily with age, after peaking in the late teens and early twenties (Zuckerman, 1994).

## Research on Sensation Seeking and the Consumption of Televised Sports

Research on sensation seeking has investigated the trait's impact on individuals' preferences for and enjoyment of specific types of media content (e.g. Hirschman, 1987; Rowland, Fouts, & Heatherton, 1989; Schierman & Rowland, 1985). Research findings suggest that HSS prefer media content that is highly stimulating and arousing, whereas soothing media content is more appealing to LSS (Zuckerman, 1988; 1994). However, most of the studies attempting to use sensation seeking to understand media-content preferences found that interest in watching televised sports, which depict some of the most arousing forms of television programming, is not related to the sensation-seeking trait (i.e., Hirschman, 1987; Perse, 1996; Potts, Dedmon, & Halford, 1996; Rowland, Fouts, & Heatherton, 1989; Schierman & Rowland, 1985). McDaniel (2003) argued that the non-significant relationship between sensation seeking and audience preferences for such programming might result from a lack of differentiation of the televised sports content. With a few exceptions (i.e., Krcmar & Greene, 1999; Lee, McDaniel, & Newhagen, 2001; McDaniel, 2003), most of the studies investigating the relationship between sensation-seeking trait and audience viewing preferences have treated all televised sport as belonging to a single, broad, homogenous category. That approach fails to acknowledge the wide variation in the stimulus intensity and in the arousal potential provided by different types of televised sports (McDaniel, 2003). While some sports contain competitive, aggressive, and violent content, others employ style, skill, and grace without violence (Sargent, Zillmann, & Weaver, 1998; Lee, McDaniel, & Newhagen, 2001; McDaniel, 2003). For example, the type and amount of stimulation and arousal a viewer receives from watching a boxing match is much different from

viewing a figure skating competition. Wenner and Gantz (1998) suggested, “sports was too broad a concept.” Therefore, “asking people about a generic — sports on television — was not a fruitful strategy” for studying televised sports audiences (p. 236). Particularly, studies have found that viewers perceived unique characteristics of sporting events (e.g., the level of violence and suspense) that could influence their enjoyment (e.g., Bryant, Comisky, & Zillmann, 1981; Bryant, Brown, Comisky, & Zillmann, 1982; Bryant, Rockwell, & Owens, 1994).

Researchers have suggested that at least some aspects of violence in sports differ significantly from that in other entertainment genres, such as in horror films and television dramas (Bryant et al., 1981; Zillmann, 1998). For example, winning is the ultimate objective in sport competitions; it is socially acceptable—even expected—that athletes and coaches to be as aggressive as the rules permit in order to win the game (Goldstein, 1989). Therefore, the use of violence in sport is a means to win a competition rather than the end. By contrast, violence portrayed in other entertainment fare is typically “the ultimate goal — not a byproduct” (Bryant et al., 1981, p. 261). Additionally, in sport competitions, “violence is legitimized by ‘the rules of the games’” (Bryant et al., 1981, p. 261). Athletes are lauded for aggressive actions in contests. Furthermore, violent behavior falls under the “mutual consent of combatants” in an approved setting and is anticipated by combatants, who normally wear appropriate protective equipment “designed to reduce the likelihood of severe injury” (Bryant et al., 1981, p. 261). The use of aggression or violence in sporting events typically involves no intent to inflict injury. On the other hand, the violence in televised dramas and much of

the other non-sports programming is scripted to harm “unprepared and defenseless persons” (Bryant, et al., 1981, p. 261).

Considering the possibly unique characteristics of sports violence, Bryant et al. (1981) suggested that viewers’ reactions to sports violence might differ from their reactions to violence in other entertainment fare. Although a connection between sensation seeking and the consumption of, preference for, and response to graphic violence has been established in studies using horror films (Edwards, 1991; Hirschman, 1987; Johnston, 1995; Tamborini & Stiff, 1987; Zuckerman, 1988; 1996a; Zuckerman & Little, 1986), action films (Schierman & Rowland, 1985; Slater, 2003), action and adventure films (Aluja & Torrubia, 1998; Perse, 1996), X-rated movies (Hirschman, 1987; Schierman & Rowland, 1985), violent films (Aluja, 2000), violent television (Krcmar & Greene, 1999; 2000), violent cartoons (Aluja & Torrubia, 1998), and violence-oriented websites (Slater, 2003), additional research is needed to validate the relationship between sensation seeking and the attraction of televised sports violence.

### Sex Differences in the Consumption of Televised Sports

Biological sex differences in the consumption of entertainment are well documented in the media literature (see Oliver, 2000 for a review), including televised sports. For example, research found that men generally reported more interest in watching televised sports and spent more time than women watching televised sports (e.g. Hawkins et al., 2001; Rowland, Fouts, & Heatherton, 1989). Moreover, men enjoyed watching violent, aggressive, and combative sports, such as football and ice hockey, while women preferred sports emphasizing graceful and artistic movement, as in

figure skating and gymnastics (e.g., Sargent, Weaver, & Zillmann, 1998). Male audiences reported a greater overall appreciation of the sport after watching televised competitions, and were more likely to enjoy highly violent plays and suspenseful outcomes, and they (e.g., Bryant, Comisky, & Zillmann, 1981; Gan et al., 1997; Sullivan, 1991).

Previous studies, however, provide no theory-based explanation for males and females responding differently about their media experiences. Researchers suggested that one possible explanation might be individual differences in the personality trait of sensation seeking (McDaniel, 2003; Zuckerman, 1988; 1994; 1996a). Research on sensation seeking found that HSS tended to favor graphically violent media content (e.g., Aluja, 2000; Aluja & Torrubia, 1998; Hirschman, 1987; Schierman & Rowland, 1985; Zuckerman & Little, 1986). That finding was consistent with sex differences in media preferences, in that violent content was preferred more by males than by females (e.g., Schierman & Rowland, 1985; Zuckerman & Little, 1986). Given those congruent findings of biological sex and sensation-seeking based preferences in the literature, and given that males tend to exhibit higher levels of sensation seeking than females, Zuckerman (1988) suggested, “Whatever it is that accounts for these differences in media preferences of high and low sensation seekers may be the same thing that accounts for the gender differences in media tastes” (p. 180).

The theory of sensation seeking, which in part describes biologically based differences in the stimulation needs between men and women, might account for the biological sex differences in media preferences, selection, and consumption (Lee, McDaniel, & Newhagen, 2001). In other words, the personality trait of sensation seeking

might be the biological source of differences between males and females in their responses to televised sports violence. Therefore, the present study attempts to not only test sensation seeking theory to explain spectators' responses to televised sports violence, it also seeks to test this theory's ability to account for biological sex differences in reactions to televised sports violence.

### Research Rationale

As mentioned above, most media research has treated televised sports as one broad genre and has failed to find an association between the sensation-seeking trait and audience preferences for such programming (i.e., Hirschman, 1987; Perse, 1996; Potts, Dedmon, & Halford, 1996; Rowland, Fotts, & Heatherton, 1989; Schierman & Rowland, 1985). Some recent investigations, which recognized the heterogeneity of televised sports programming, found a link between sensation seeking and audience preferences for certain sport telecasts (i.e., Krcmar & Greene, 1999; Lee, McDaniel, & Newhagen, 2001; McDaniel, 2003). It should be noted, however, that those studies were limited by their methodology. Rather than being directly exposed to actual televised sports, the participants were asked to recall their reactions to past experiences of watching their favorite televised sports (i.e., Lee, McDaniel, & Newhagen, 2001), or to estimate their interest in viewing different types of televised sporting events (McDaniel, 2003), or to report the frequency of their televised sports viewing as the measure of media exposure (i.e., Krcmar & Greene, 1999). That type of assessment is somewhat problematic, since the relationship between self-reported preferences and actual viewing responses is unknown (Webster & Wakshlag, 1985). Although it is possible that audiences' self-report interests might lead to exposure to such media content and result in emotional

satisfaction, researchers have argued that “using program preferences to measure actual exposure in the field is highly questionable” (Webster & Wakshlag, 1985, p. 39).

Weaver (2003) suggested, “direct behavioral assessments should offer considerable potential for future research into the impact of personality characteristics in the various stages of media selection, use, and consequence” (p. 1435). The present study advances previous research on the relationship between sensation seeking and televised sports viewing by directly assessing their psychological and physiological reactions while participants actually watch video clips from televised sports competitions.

Researchers have suggested that there is considerable variation between, as well as within genres (Palmgreen, Wenner, & Rosengren, 1985). Even though some studies have differentiated between contact and non-contact sports, there is still a wide variance within types of sports. Previous studies on the relationship between sensation seeking and televised sports were limited by focusing simply on the different types of events (e.g., violent contact sports vs. stylistic sports), rather than systematically manipulating the levels of violence shown in sport telecasts, and therefore have the limitation of failing to control for other attributes in such programming. For example, previous studies that used survey techniques found that sensation seeking is positively related to combative-violent sports (Krcmar & Greene, 1999; McDaniel, 2003). However, one cannot necessarily infer that it was the violence itself that sensation seekers are attracted to. As Freedman (2002) argued:

“You cannot show one group a film of a prizefight and another group a film of canal boating and argue that the only difference between the two films is the amount of violence” (p. 195).

Although previous studies that recognized the heterogeneity of televised sports programs have found a link between viewer preferences for violent sports (e.g. football, hockey) and the sensation-seeking trait (e.g., Krcmar & Greene, 1999; McDaniel, 2003), many of the findings derived from survey research should be examined in a controlled experiment before they are accepted as conclusive.

The present research was designed to address the shortcomings inherent in previous studies by conducting an experiment to examine the relationship among the viewers' sensation-seeking trait, biological sex, and reactions to sports violence. If the current research finds a significant difference in the way sensation seekers respond to different levels of violence in televised sports, it would provide researchers with more confidence that the differences were actually the result of the violence depicted. Thus, the present study advances existing sensation-seeking literature on media consumption by employing a controlled experiment designed to examine the independent contributions and interaction effects of the personality trait of sensation seeking and biological sex on viewers' emotional reactions (pleasure and arousal) and physiological responses (heart rate, skin conductance, and respiration) to televised sports violence. Measuring such physiological reaction, as researchers have suggested, would "provide nonverbal, objective, relatively bias-free indices of human reaction" (Shapiro & Schwartz, 1970, p. 89-90).

### Purpose of the Study

The purpose of this study is to test the ability of sensation-seeking theory to explain individual differences in emotional and physiological responses to violence in televised sports, as well as to test that theory's ability to account for sex differences in those responses. More specifically, this study seeks to determine whether viewers' emotional and physiological responses to violence in televised football games differ between males and females and among individuals having different levels of the sensation seeking personality trait.

The present study might also provide further confirmation of Krcmar and Greene's (1999) and McDaniel's (2003) findings that spectators' preferences for combative-violent televised sports was related to their sensation-seeking characteristics. In addition, this study might provide further empirical support for the findings of Bryant et al. (1981) and Rayburn (1998), in which spectators were found to enjoy higher levels of violent play, and males reported enjoying higher levels of violence in televised football than did females.

### Hypotheses

Based on the theoretical framework of sensation-seeking theory and corresponding literature review, this study hypothesizes that, when watching high levels of sports violence, high sensation seekers (HSS) would report higher levels of pleasure and arousal and would elicit stronger physiological responses—heart rate (HR), skin conductance (SC), and respiration (RSP)—than both low sensation seekers (LSS)

watching high levels of sports violence and HSS watching low levels of sports violence. On the other hand, when watching low levels of sports violence, HSS would report lower levels of pleasure and arousal and would elicit lesser physiological responses than LSS. The magnitude of differences in pleasure levels, arousal levels, and physiological responses between viewing high-violence and low-violence televised sports was expected to be greater in HSS than in LSS. The same directional predictions would hold for males and females as with HSS and LSS, respectively. In addition, it was hypothesized that study participants would report higher levels of pleasure and arousal and would elicit stronger physiological responses when watching high levels of sports violence, compared to watching low levels of violence. Thus, the following hypotheses were formulated and tested:

H1: Participants' self-reported levels of pleasure differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.

H1a: HSS will report significantly higher levels of pleasure when watching high-violence televised sports compared to low-violence.

H1b: HSS will report significantly higher levels of pleasure when watching high-violence televised sports compared to LSS.

H1c: HSS will report significantly lower levels of pleasure when watching low-violence televised sports compared to LSS.

H1d: Male participants will report significantly higher levels of pleasure when watching high-violence televised sports compared to watching low-violence televised sports.

H1e: Male participants will report significantly higher levels of pleasure when watching high-violence televised sports compared to female participants.

H1f: Male participants will report significantly lower levels of pleasure when watching low-violence televised sports compared to female participants.

H1g: Participants will report significantly higher levels of pleasure when watching high-violence televised sports compared to watching low-violence televised sports.

H2: Participants' self-reported levels of arousal differ as a function of their level of the sensation-seeking trait, biological sex, and level of violence in televised sports.

H2a: HSS will report significantly higher levels of arousal when watching high-violence televised sports compared to watching low-violence televised sports.

H2b: HSS will report significantly higher levels of arousal when watching high-violence televised sports compared to LSS.

H2c: HSS will report significantly lower levels of arousal when watching low-violence televised sports compared to LSS.

H2d: Male participants will report significantly higher levels of arousal when watching high-violence televised sports compared to watching low-violence televised sports.

H2e: Male participants will report significantly higher levels of arousal when watching high-violence televised sports compared to female participants.

H2f: Male participants will report significantly lower levels of arousal when watching low-violence televised sports compared to female participants.

H2g: Participants will report significantly higher levels of arousal when watching high-violence televised sports compared to watching low-violence televised sports.

H3: Participants' mean heart rates differ as a function of their level of the sensation-seeking trait, biological sex, and level of violence in televised sports.

H3a: HSS will exhibit a significantly higher mean heart rates when watching high-violence televised sports compared to watching low-violence televised sports.

H3b: HSS will exhibit a significantly higher mean heart rates when watching high-violence televised sports compared to LSS.

H3c: HSS will exhibit a significantly lower mean heart rates when watching low-violence televised sports compared to LSS.

H3d: Male participants will exhibit a significantly higher mean heart rates when watching high-violence televised sports compared to watching low-violence televised sports.

H3e: Male participants will exhibit a significantly higher mean heart rates when watching high-violence televised sports compared to female participants.

H3f: Male participants will exhibit a significantly lower mean heart rates when watching low-violence televised sports compared to female participants.

H3g: Participants will exhibit a significantly higher mean heart rates when watching high-violence televised sports compared to watching low-violence televised sports.

H4: Participants' mean skin conductance differ as a function of their level of the sensation-seeking trait, biological sex, and level of violence in televised sports.

H4a: HSS will exhibit a significantly higher mean skin conductance when watching high-violence televised sports compared to watching low-violence televised sports.

H4b: HSS will exhibit a significantly higher mean skin conductance when watching high-violence televised sports compared to LSS.

H4c: HSS will exhibit a significantly lower mean skin conductance when watching low-violence televised sports compared to LSS.

H4d: Male participants will exhibit a significantly higher mean skin conductance when watching high-violence televised sports compared to watching low-violence televised sports.

H4e: Male participants will exhibit a significantly higher mean skin conductance when watching high-violence televised sports compared to female participants.

H4f: Male participants will exhibit a significantly lower mean skin conductance when watching low-violence televised sports compared to female participants.

H4g: Participants will exhibit a significantly higher mean skin conductance when watching high-violence televised sports compared to watching low-violence televised sports.

H5: Participants' mean respiration differ as a function of their level of the sensation-seeking trait, biological sex, and level of violence in televised sports.

H5a: HSS will exhibit a significantly higher mean respiration when watching high-violence televised sports compared to watching low-violence televised sports.

H5b: HSS will exhibit a significantly higher mean respiration when watching high-violence televised sports compared to LSS.

H5c: HSS will exhibit a significantly lower mean respiration when watching low-violence televised sports compared to LSS.

H5d: Male participants will exhibit a significantly higher mean respiration when watching high-violence televised sports compared to watching low-violence televised sports.

H5e: Male participants will exhibit a significantly higher mean respiration when watching high-violence televised sports compared to female participants.

H5f: Male participants will exhibit a significantly lower mean respiration when watching low-violence televised sports compared to female participants.

H5g: Participants will exhibit a significantly higher mean respiration when watching high-violence televised sports compared to watching low-violence televised sports.

### Exploratory Questions

The focus of this investigation was to study how sensation-seeking theory helps explain the effects of televised sports violence on viewers' emotional and physiological responses and how viewers' biological sex differences affect those responses. In addition to testing those main hypotheses, the study also attempts to explore some additional research questions, such as the following: Do highly identified football fans report significantly higher levels of sensation seeking than low-identified football fans or non-fans? Are these differences equal across sex groups? The relationships among sensation

seeking, biological sex, and participants' level of football fanship have not previously been thoroughly examined.

The relationship between participants' football fanship and their response to different levels of violence in televised football was also explored. Previous studies have found that sensation seeking was significantly positively correlated with self-reported interests in viewing violent-combative sports for males (McDaniel, 2003). What, though, is the relationship between sensation seeking and the frequency of attending football games and the frequency of watching football on television? Further, even though the dimensions of pleasure and arousal are conceptualized to be orthogonal emotional constructs (Mebrabian & Russell, 1974; Russell, Weiss, & Mendelson, 1989), studies have found a positive relationship between those two dimensions (e.g., Pavelchak, Antil, & Munch, 1988; Tuan Pham, 1992; Vitz, 1966). Therefore, the relationship between participants' level of pleasure and arousal when exposed to different levels of televised sport violence within each sensation-seeking group was also explored.

Zuckerman (1994) suggested that HSS might have low levels of tonic arousal in an unstimulated condition; however, the evidence for that hypothesis is inconclusive. Many studies that have attempted to test the differences in tonic levels of heart rate (HR) between sensation seekers have produced inconsistent results. For example, some researchers have reported a lower baseline HR in HSS than in LSS (Ridgeway & Hare, 1981; Robinson & Zahn, 1983), while one study reported a higher baseline HR in HSS (Stern, Cox, & Shahan, 1971). Other investigators found no difference in baseline HR between HSS and LSS (Cox, 1977; Zuckerman, Simons, & Como, 1988). Mixed results have also been reported in several studies that have examined the relationship between

sensation seeking and viewers' skin conductance level during rest (e.g., Cox, 1977, Feij, Orlebeke, Gazendam, & van Zuilen, 1985; Neary & Zuckerman, 1976; Plouffe & Stelmack, 1986; Ridgeway & Hare, 1981; Smith, Davidson, Smith, Goldstein, & Perlstein, 1989; Zahn, Schooler, & Murphy, 1986; Zuckerman, 1990; Zuckerman, Simons, & Como, 1988). Therefore, the relationship between sensation seeking and the participants' baseline physiological measures was explored. In addition, the strength of the association between physiological measures and subjective reports has been assessed in a number of studies using pictorial and sound stimuli (Greenwald, Cook, & Lang 1989; Lang, Greenwald, Bradley, & Hamm, 1993). Previous studies on emotion have produced inconsistent findings for the relationship between subjective self-reported and objective physiological measures (e.g., LaFrance & Banaji, 1992). Little research in the mediated sport literature has examined the relationship between physiological arousal and subjective arousal. Therefore, the relationship between participants' physiological arousal during televised sports viewing and their self-reported arousal was also explored. Thus, additional research questions for this study were as follows:

- Q1. What is the relationship among the personality trait of sensation seeking, biological sex, and participants' levels of football fanship?
- Q2. What is the relationship between participants' football fanship and their emotional and physiological responses when exposed to different levels of televised sport violence?

- Q3. What is the relationship between the personality trait of sensation seeking and participants' self-reported frequency of attendance at football games and frequency of watching football on television?
- Q4. What is the relationship between participants' self-reported levels of pleasure and arousal and the level of televised sport violence?
- Q5. What is the relationship between the personality trait of sensation seeking and participants' baseline physiological measures?
- Q6. What is the relationship between participants' self-reported subjective arousal and their objective physiological arousal?

#### Definitions of Major Terms

**Sensation Seeking:** a biologically determined personality trait initially grounded on optimal levels of stimulation (OLS) and arousal (OLA) (Zuckerman, 1969; 1994); “the seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experience” (Zuckerman, 1994, p. 27).

**Sports Violence:** violent physical contact between performers that is accepted and inherent in a given sport and within the rules of the game. In this study, the operational measure of violence is the intensity of the direct physical contact between players, similar to Sargent’s studies (1998; 2003).

**Emotions**: “mental states of readiness that arise from appraisals of events or one’s own thoughts” (Bagozzi, Gopinath, & Nyer, 1999, p. 184). Several theorists (e.g., Russell, 1980; Watson & Tellegen, 1985) have suggested that there are two fundamental underlying dimensions of emotion: pleasure (valence) and arousal. In this project, emotional responses are defined by two factors: pleasure and arousal (Mehrabian & Russell, 1974; Russell, 1980; Smith & Ellsworth, 1985; Watson & Tellegen, 1985).

**Pleasure**: is conceptualized as a positive affective state that ranges from unpleasant to pleasant and “is distinguished from preference, liking, positive reinforcement, and approach avoidance” (Mehrabian & Russell, 1974, p. 18).

**Arousal**: refers to the intensity of an affective experience that “varies along a single dimension ranging from sleep to frantic excitement” (Mehrabian & Russell, 1974, p. 18).

**Physiological Responses**: refers to autonomic changes or bodily changes in response to the treatment stimuli. In this study, physiological reactions were assessed by measuring participants’ heart rate, skin conductance, and respiration.

**Football Fanship**: is defined as spectators’ varying levels of interest in football.

## CHAPTER II

### REVIEW OF LITERATURE

The purpose of this study was to test the ability of sensation-seeking theory to explain individual differences in emotional and physiological responses to televised sports violence, as well as to test that theory's ability to account for sex differences in those responses. As a foundation for this research, this chapter is a comprehensive review of the theoretical and empirical research related to viewers' responses to media violence and televised sports. First, this study's definition of sports violence is briefly presented. Next, the main theories of sports spectatorship are reviewed. Then, the dominant approaches guiding past research on televised sports audiences are reviewed. Finally, the theoretical foundation of sensation seeking is introduced, the development of the sensation-seeking scale is addressed, and past research on the mass media domain and on the televised sports area associated with sensation-seeking theory is discussed in detail.

#### Definition of Sports Violence

In order to investigate the research questions and to test the hypotheses in this study, the term violence must be clearly defined. Although the definitions of "violence" are diverse in different academic disciplines (Smith, 1983b), the focus in this study is on sports violence.

Smith (1983a, 1983b), reviewing sports violence, classified sports violence into four categories based on legitimacy levels:

- 1) *Brutal body contact.* This type of sports violence involves physical contact between players, within the official rules of the game. This type of violence is not only accepted, but seen as inherent in contact sports, such as boxing, football, and ice hockey. Examples include “collisions, hits, tackles, blocks, body checks, and other forms of forceful physical contact that can produce injuries” (Coakley, 2001, p. 176).
- 2) *Borderline violence.* This type of violence consists of player violence that violates the rules of the game, but it is usually justified as being “part of the game.” Examples include “the brush back pitch in baseball, the forcefully placed elbow in soccer and basketball, the strategic bump used by runners to put another off stride, the fist-fight in ice hockey, and the forearm to the ribs of a quarterback in football” (Coakley, 2001, p. 176).
- 3) *Quasi-criminal violence.* This type of violence violates the official rules of the game and breaks the players’ informal code of conduct. Violence of this type frequently results in serious injuries and is generally regarded as unacceptable. Examples include “cheap shots, late hits, sucker punches, and flagrant fouls that endanger the players’ bodies and reject the norm of respecting the game” (Coakley, 2001, p. 176).
- 4) *Criminal violence.* This type of sports violence seriously violates both the official rules of the game and players’ conduct codes and could result in player death. Violence of this type is strongly unacceptable. Examples include “assaults that occur after a game is over and assaults during a game

that appear to be premeditated and violent enough to kill or seriously disable a player” (Coakley, 2001, p. 176).

The violent plays selected for the current study fit into the first of Smith’s (1983a; 1983b) four types: violent physical contact between players that is accepted and inherent in a given sport and within the rules of the game. The plays were similar to the violent treatments employed in study by Bryant et al. (1981). Therefore, the operational definition of sports violence in this study was based on the intensity of physical contact between players that is accepted and within the rules of the game.

### Theories of Sports Spectatorship

This section reviews four important theories of sports spectatorship: basking in reflected glory (BIRGing), cutting off reflected failure (CORFing), disposition theory, and catharsis effect.

#### Basking in Reflected Glory (BIRGing)

The benefits of participating in sporting activities, such as physical and mental fitness and health, are seldom questioned (Bryant & Raney, 2000; Zillmann, Bryant, & Sapolsky, 1989). Researchers have also provided evidence that sport spectatorship can serve useful functions, such as image management (Zillmann & Paulus, 1993).

Cialdini and his colleagues (Cialdini, Borden, Thorne, Walker, Freeman, & Sloan, 1976), in a pioneering attempt, conducted a series of field experiments to explain spectators’ desire to increase their association with successful others, such as a sports team, to enhance their self-esteem or public image, which Cialdini termed “basking in

reflected glory” (BIRGing). One study monitored students’ apparel in specific classes at seven major universities. On Mondays during the football season, the number of student wearing apparel identifying the school was recorded. The results showed that the wearing of school-identifying apparel was much more common after a home-team victory on the preceding Saturday. In another study, Cialdini et al. (1976) conducted phone surveys to test the BIRGing phenomenon through linguistic expression. Students were contacted by phone and asked to participate in a survey of college students’ knowledge of campus issues. After the campus-life test was administered, half of the students were told that they had done well on this test (personal success feedback), and the other half were told that they had done poorly (personal failure feedback). Then, the students were asked to recall the outcome of a particular football game. One-half were asked to describe a game their team had won; the other half, a loss. The results supported BIRGing theory: students had a tendency to describe their school team’s victory using “we” (e.g., “we won”) and their team’s defeat using “they” (e.g., “they lost”). In addition, the results revealed that the tendency was even more pronounced among students who were told that they had done poorly on the campus-life test. That is, when students’ public image was in jeopardy, there is a reliable tendency for them to enhance their self-esteem by associating themselves with successful others or groups (e.g., school football team), even though the students had made no contribution to the victory. Similar findings supporting the BIRGing phenomena were reported in subsequent research by Cialdini and Richardson (1980) and Cialdini and De Nicholas (1989).

### Cutting off Reflected Failure (CORFing)

A corollary to BIRGing is CORFing (cutting off reflected failure), which refers to the tendency of individuals to cut off reflected failure as a means of distancing themselves from unsuccessful persons or groups in order to maintain or protect their self-esteem (Snyder, Higgins, & Stucky, 1983). Empirical evidence supporting the CORFing phenomenon was demonstrated by the work of Snyder, Lassegard, and Ford (1986).

Both BIRGing and CORFing were based on Heider's (1958) *balance theory*; however, researchers argued that BIRGing serves as an image-enhancement function, while CORFing is an image-protection function (Snyder, Lassegard, & Ford, 1986).

### Disposition Theory of Sport Spectatorship

According to the sports cliché, “winning isn’t everything; it’s the only thing;” however, Zillmann et al. (1989) suggested that the enjoyment of sports contests depends upon not only winning, but upon one’s affective disposition towards allied teams/players as well as their affective disposition towards the competing teams/players. That line of research is called the *disposition theory of sport spectatorship* (Bryant & Raney, 2000; Raney, 2003a; Zillmann, Bryant, & Sapolsky, 1989; Zillmann & Paulus, 1993).

According to Zillmann et al. (1989), the disposition theory of sports spectatorship can be simplified to two main propositions:

- 1) “Enjoyment derived from witnessing the success and victory of a competing party increases with positive sentiments and decreases with negative sentiments toward that party”.

- 2) “Enjoyment derived from witnessing the failure and defeat of a competing party increases with negative sentiments and decreases with positive sentiments toward that party” (p. 257).

According to disposition theory, the degree of enjoyment of sports contests relies upon spectators’ preexisting affective dispositions toward the participating players and teams. Spectators’ maximum enjoyment of a victory results when a loved player or team defeats a disliked player or team. Conversely, the enjoyment of a sports contest is least (or a maximum disappointment) when a favored player or team loses to a disliked opposition (Zillmann & Paulus, 1993).

Several empirical studies have supported dispositional effects in a range of entertainment genres (a full review of dispositional theory, see Raney, 2003b), including drama (Zillmann & Bryant, 1975), humor (Zillmann & Cantor, 1976; Zillmann & Bryant, 1991), sports (Zillmann, Bryant, & Sapolsky, 1979; 1989; Zillmann & Paulus, 1993), and suspense (Zillmann, 1980; 1991). However, researchers have suggested, “the dispositional mechanics of enjoyment are most obvious in sports spectatorship” (Bryant & Miron, 2002, p. 570).

For example, Sapolsky (1980) showed to both black and white audiences a videotape of a high school basketball game between an all-black team and an all-white team. The video was edited to produce several versions and to have two outcomes; on one the White team was victorious; on the other, the Black team. After watching one version, viewers rated their enjoyment of the final 18 plays and the final outcome of the game. The results supported disposition theory, in that 89.6 % of the Black viewers

rooted for the Black team; the Black viewers also reported more enjoyment than White viewers when Black players scored. In addition, Black viewers reported a significantly more enjoyment of the overall game than the White viewers when the Black team won. Although the results showed that only 45.7% of White viewers identified themselves as rooting for the White team, and their enjoyment of a White team victory was not as strong, the results were generally in accord with disposition theory predictions.

Zillmann et al. (1989) had participants watch a live telecast of a professional football game and rated their enjoyment of every play and the game after their preexisting dispositions had been measured and classified as negative, neutral, or positive). The results showed that the viewers' satisfaction with the game outcome was a function of their affective dispositions toward the teams. The greatest enjoyment was observed in those with a positive disposition toward the winning team and a negative disposition toward the defeated team. The least enjoyment (maximal disappointment) was observed in those with a negative disposition toward the winning team and a positive disposition toward the defeated team. In addition, dispositional effects were found for both male and female viewers in their enjoyment of sports contests.

Another investigation of dispositional effects in sports spectatorship employed spectators' "national identification" to assess their enjoyment of sports contests (Zillmann et al., 1989). Male and female students at Indiana University watched a portion of the 1976 Olympic Championship men's basketball game between the United States and Yugoslavia and then rated their enjoyment, basket by basket. Consistent with the tenets of disposition theory, the American students reported considerable enjoyment when the U.S. players scored. The results revealed an even stronger disposition effect whenever

baskets were scored by one of the two players from Indiana University, the 1976 NCAA Basketball Champions. Watching American players score was very enjoyable to the Indiana University students, but watching their fellow students score was even more so.

Branscombe and Wann (1992) had participants view a videotaped boxing match between an American boxer and a Russian boxer to study the relationships among game outcome, spectator disposition (assessed as levels of identification), and their emotional and physiological reactions. Predictably, results showed that those who highly identified themselves as Americans reported greater enjoyment when the American boxer won than when he lost. In addition, a significant increase in both diastolic and systolic blood pressure was observed during exposure to the film but only among those who described themselves as highly identified fans. Low-identified spectators showed significant change in neither viewing enjoyment nor physiological reactions to the match. Similar results were reported in a study conducted by Wann, Dolan, McGeorge, and Allison (1994), in that highly identified sport fans tended to possess an increased positive emotion when their team won and experienced strong negative reactions when their team lost. However, the change from pre-game emotions to post-game emotions was negligible for viewers with low team identification.

Disposition theory has been supported in studies of not only mediated sports but also of sports-event attendance. For example, Madrigal (1995) found that the level of fan identification with a team has a significant impact on fan enjoyment of the game and substantially affects one's satisfaction with having decided to attend. Zillmann et al. (1989) recorded crowd noise as the measure of enjoyment during two college football games to investigate the disposition effect on the spectators (Zillmann et al., 1989).

Similar to the findings on the enjoyment of televised sports, the data for live viewing yielded strong support for the disposition theory. The fans applauded not only the home teams' successful plays but also the opponents' failing plays. Similarly, they expressed disapproval of after the home teams' failed moves as well as the rivals' successful plays.

Bernhardt, Dabbs, Fielden, and Lutter (1998) investigated sports fans' psychophysiological reactions (as measured by testosterone levels) as a function of the outcomes of winning and losing. Results showed that testosterone levels increased among fans of winning teams and decreased among fans of losing teams, based on measurements taken on participants watching a basketball game at the event and viewing a televised soccer game at sports taverns.

Hillman, Cuthbert, Cauraugh, Schupp, Bradley, and Lang (2000) examined self-identified sports fans' emotional responses to sports pictures. The results showed that highly identified fans reported more arousal and more pleasure from team-relevant sports pictures than from team-irrelevant sports pictures. In addition, the results of the physiological measurements (i.e., heart rate and electrocortical responses) indicated positive emotional responses to team-relevant pictures as a function of fan identification levels.

Taken together, findings from the above-cited investigations demonstrated strong support for disposition theory, in that spectators' affective disposition toward particular teams and players could influence their emotional and physiological reactions to sports contests, whether mediated (television, film, pictures) or non-mediated (sporting events).

As Whannel (1992) noted “if the pleasures of sport viewing have a structure, then identification is central to it” (p. 200).

### Catharsis Theory

One of the most popular rationales accounting for the appeal of violent sports is catharsis theory (Bryant, Zillmann, & Raney, 1998). The notion of catharsis suggests that a purging of pent-up negative emotion will occur when individuals either engage in or witness aggressive acts (Bryant, Zillmann, & Raney, 1998; Cantor, 2003). Media producers often use the catharsis effect to justify their emphasis on violence because they believe that violent fare has “a therapeutic effect” and can “reduce society violence” (Cantor, 2003, p. 202).

The catharsis concept was introduced by Aristotle, who argued that viewers’ negative emotions (e.g., fear, pity) could be released by watching tragic drama (Cantor, 2003; Russell, 1983). Freud endorsed the concept and suggested that by observing other people performing violent actions could allow the spectators to vent their angry feelings harmlessly (Cantor, 2003). Feshbach (1955; 1956; 1961) applied Aristotelian cathartic theory to media research and hypothesized that engaging vicariously in the violent behavior in media presentations would reduce viewers’ aggressive tendencies (Bryant & Miron, 2003). Lorenz was the first scholar to apply the catharsis proposition to sports spectatorship (Bryant & Raney, 2000). He argued that doing or just watching the performance of aggressive or violent actions could provide a “pleasing outlet function” and reduce “destructive energy” (Zillmann, Bryant, & Sapolsky, 1979, p. 310). That is, spectators would receive a cathartic benefit (a valuable psychological mechanism for

spectators to reduce the aggression/hostility/frustration levels) from watching aggressive/violent sporting events.

Although the catharsis effect has been the most popular and appealing explanation for the popularity of sports violence, empirical evidence has repeatedly failed to support the contention that watching violent media content purges viewers' aggression or violence or relieves their negative feelings (Bryant, Zillmann, & Raney, 1998; Russell, 1983). Instead, a large body of research has found a *stimulation effect* from watching violent media (Wimmer & Dominick, 2000, p. 383). That is, rather than releasing pent-up negative feelings or behavioral tension, viewers actually become more hostile and/or aggressive after watching violent media content (see Appendix A: Research on the Effects of Sports Violence on Spectators' Aggression).

### Predominant Approaches to Studying Televised Sports Audiences

Qualitative research on televised sports audiences has been dominated by two approaches: *media effects research*, which focuses on exploring the effects of exposure to televised sporting events on audiences, and the *Uses and Gratifications* (U & G) paradigm, which attempts to investigate viewers' motivations and experiences with televised sports.

#### Media Effects Research

Media effects research, initially guided by traditional social psychological models, is a mechanistic approach that attempts to determine the impact of the media on the recipients of the message during the communication processes (Kinkema & Harris,

1998; Rubin, 2002). Early media researchers assumed that the media had a “powerful, predictable, and uniform effect” on the audience (Heath & Bryant, 2000, p. 346). The model has been called “bullet theory” or “hypodermic needle theory,” and later “stimuli-response theory” (Heath & Bryant, 2000, p. 346). That model sees audience members as passive and reactive recipients of media messages (Rubin, 2002; Williams, 2003).

Most media effects research on televised sports audiences has focused on the negative effect of sports violence on viewers (e.g., Arms, Russell, & Sandilands, 1979; Goldstein & Arms, 1971; Russell, 1983; 1993). Research on the harmful effects associated with exposure to sports violence, such as increasing aggressiveness and hostility, is reviewed in Appendix A; therefore, the following literature review focuses on the entertainment effects (e.g., enjoyment) of televised sports.

When studying televised sports audiences, the researchers have generally used a controlled experiment design to explore the contextual factors of televised sporting events that influence audience enjoyment of televised sports (e.g., Bryant, 1989; Bryant, Brown, Comisky, & Zillmann, 1982; Bryant, Comisky, & Zillmann, 1981; Bryant, Rockwell, & Owens, 1994; Comisky, Bryant, & Zillmann, 1977; Gan, Tuggle, Mitrook, Coussement, & Zillmann, 1997; Sapolsky, 1980; Sullivan, 1991).

### The Effects of Commentary on the Enjoyment of Televised Sports

One research approach that empirically investigated the enjoyment of viewing televised sports was to assess the effects of sportscaster commentary. For example, Comisky, Bryant, and Zillmann (1977) had male and female participants view one of the two segments (either the normal play or rough play) from professional ice hockey games

that were presented either with commentary (in the normal-action condition, the commentary stressed roughness of play; in the rough-action condition, the commentary de-emphasized roughness of play) or without commentary. Immediately after watching the segments, the viewers rated their perception of violent play and their appreciation of the sporting events. The results showed that sports commentary substantially affected viewers' perceptions of the roughness of play. For instance, the normal-action segments accompanied by commentaries stressing rough action were perceived as rougher and more violent than the rough-action plays coupled with bland commentary that ignored violence or the rough plays without commentary. Regarding the appreciation of televised sports contests, the spectators reported greater entertainment and enjoyment when viewing the normal plays with the commentary emphasizing violent action rather than either the rough plays with commentary that ignored roughness of play or the rough plays without commentary. Apparently, broadcast commentary can affect viewers' perceptions of the intensity of the action and ultimately increase their enjoyment of the contests.

Sullivan (1991) further investigated the effect of broadcast commentary on viewers' perceptions of play and their enjoyment of overt player hostility and violence in a televised basketball game. According to Sullivan, *rough play* "occurs within the normal scope of the game and its rules" (p. 493), and *hostile play* was a player's "apparent intention of hurting or intimidating" an apposing player. The investigator had participants watch a 15-minute portion of a videotaped college basketball game between Georgetown and Syracuse, accompanied by three commentary treatments: dramatic commentary (emphasizing hostility and violence among opponents), neutral commentary (play-by-play description only), and no commentary. Participants' perceptions of play

(aggressiveness, competitiveness, hostility, and desire to win), and of opposing players' hostility were assessed, as well as their appreciation of the overall game. Additionally, participants' sex and their degree of sports fandom were employed.

Consistent with previous research on the effect of sports commentary on viewers' perception of violent play in heavy contact sports, such as professional hockey (i.e., Comisky et al., 1977), the findings showed that commentary affected viewers' perceptions of player hostility, even in a less combative sporting event. Participants in the dramatic-commentary condition perceived more player hostility than did the participants in the neutral-commentary or no-commentary conditions. However, the participants' overall appreciation of the game and enjoyment of fighting did not differ significantly in the three treatment conditions. Bryant, Zillmann, and Raney (1998) suggested that the insignificant findings might have been because "the commentary merely shifted the locus of the aggression from the less aggressive to the more aggressive team, rather than systematically enhancing or suppressing viewers' perceptions of the overall level of aggressiveness of play" (p. 264).

Moreover, the study detected that males and females differed strongly in perception of player hostility, enjoyment of fighting, and overall appreciation of the game. Male participants reported significantly higher scores in the perception of player hostility, the enjoyment of player fighting, and overall appreciation of the game than did female participants. Although sports fans and non-fans did not differ significantly either in the ratings of the enjoyment of fighting or the perception of player hostility, the overall appreciation of the game varied significantly by fandom, in that avid sports fans rated their overall appreciation of the game significantly higher than did nonfans.

An investigation by Bryant, Brown, Comisky, and Zillmann (1982) further supported that commentary affected viewers' enjoyment of televised sports. Instead of using commentary to manipulate the perceived violence of play, the investigators varied the perceived affective relationship between contestants to examine the impact of dramatic conflict on the viewer's enjoyment of a televised tennis match. Participants watched one of three identical visual presentations of a videotaped tennis match, each accompanied by a sportscasters' commentary that described a different affective relationship between the two players. In one version, the contestants were described as hated foes (enmity). In a second version, the contestants were described as devoted friends (amity). A third version, depicting a neutral relationship between the contestants, served as a control condition. The participants rated their perceptions of the players and their overall appreciation after viewing the match. The findings revealed that participants who viewed the enmity version perceived more hostility, tension, and competitiveness between the players and reported a significantly greater degree of enjoyment, excitement, involvement, and interest from watching the match than did participants who watched the amity or neutral versions.

Taken together—based on the findings of the studies of Comisky et al. (1977) and Sullivan (1991), in which the commentary was manipulated to emphasize or de-emphasize the violence of the plays, and the study of Bryant et al. (1982) that manipulated the commentator's description of the affective relationship between players—sportscasters' color commentary appears to affect spectators' perceptions of plays or players, which in turn changed spectators' overall enjoyment of sports contests.

### Enjoyment of Violent Plays in Televised Sports

Using a different approach, Bryant, Comisky, and Zillmann (1981) manipulated the degree of violent plays in televised sports to investigate spectators' viewing enjoyment. In the initial phase of this study, a large pool of football plays was collected from numerous teams and from several televised professional football games (in order to rule out team or player preferences) during the regular season of the National Football League (NFL). The 150 selected plays were edited to present the visual action in a random sequence and included the original broadcast commentary. In the pretest phase of the investigation, the degree of roughness and violence was differentiated at three levels, based on rating scores (10 undergraduate students served as raters) on the two scales (a roughness scale and a violence scale). In the main experiment, a wide variety of 45 plays chosen from the pretest—which were comparable in other stimulus criteria but varied only in the degree of roughness and violence (3 conditions: low, medium, high)—were shown to male (n=38) and female (n=38) college students who considered themselves typical sports fans. Immediately after watching each play, the participants rated their viewing enjoyment on a single bipolar scale (labeled “disliked extremely” at –100, “neither disliked nor liked” at 0, and “liked extremely” at 100). The results showed that the viewers' enjoyment of the plays was enhanced by roughness and violence. Participants reported significantly more enjoyment from rougher plays than from tamer ones. However, the relationship was statistically significant for male viewers only, even though the viewing enjoyment patterns for both sexes were parallel. The investigators suggested that the tendency to enjoy violent plays was not as pronounced for female viewers.

Their study also found sex differences in the enjoyment of watching televised sports violence. Men reported more enjoyment from watching highly violent plays than women. Although males' viewing enjoyment was greater than females' at all three levels of roughness and violence, there were no significant sex differences in the enjoyment of plays in the low and medium conditions. It should be noted that all of the study participants were self-rated football fans, not sports spectators in general.

DeNeui and Sachau (1996) used statistics from hockey games as measures of players' aggressive (e.g., penalty minutes, home team power plays, and visiting team power plays) and non-aggressive (e.g., game outcome, score difference, shots on goal, and saves) indices to investigate the relationship between aggressive aspects of the game and spectators' enjoyment of intercollegiate hockey games in field settings. The researchers found that both sexes' enjoyment of hockey games was related to the aggressiveness of the games. However, the difference between the men's enjoyment and the women's enjoyment of the aggressive plays was not statistically significant.

To summarize, both sportscast commentary and violent plays can critically influence spectators' perceptions of violence, which eventually contribute to the intensity of their enjoyment of televised sporting events. That is, both the visual aspect (e.g., physical violent play) and the audio aspect (e.g., commentary) of televised sports violence enhance the entertainment value and increase viewers' overall enjoyment.

### Enjoyment of Suspenseful Outcomes in Televised Sports

The effects of suspense on viewing enjoyment have already been established in other genres of the media entertainment, such as drama, horror, and humor (e.g., Zillmann, 1980; 1991; 1996; Zillmann, Hay, & Bryant, 1975). The enjoyment of suspenseful outcome has also been investigated in the domain of athletic performance.

According to Bense (1954, 1956, 1958, as cited in Bryant & Raney, 2000), the uncertain (suspenseful) outcome of sporting events plays an important role in spectators' excitement and, in turn, influences their enjoyment of sports contests. The aforementioned Sapolksky (1980) study was the first empirical work to investigate whether the degree of suspense contributes to an audience's enjoyment of watching sports contests. The study design varied by (a) race of the winning team (black, white), (b) race of the spectator (black, white), and (c) suspense of the contest (high, low). Black males and white males watched portions of a men's basketball game that was won by either an all-black team or an all-white team and then rated their enjoyment of the game. Although the results supported the disposition theory, contrary to predictions, the study failed to detect the effects of suspense on viewers' enjoyment of sports telecasts. The investigator argued that the negligible effect of suspense in the investigation might be explained by the fact that viewers were aware that the games were not live and the fact that the victorious team had already been determined.

The findings of two recent studies, which investigated the effects of suspense on viewers' enjoyment of sportscasts, have received more substantial support. Bryant, Rockwell, and Owens (1994) videotaped a high school football game and then edited it

to create two different versions: one suspenseful (a close, intense game whose outcome was decided by a field goal on the last play of the game); the other, nonsuspenseful (the outcome was decided early in the contest). Other variables employed were the participants' sex (male, female) and the outcome of the game (favorable, unfavorable). The viewers of the suspenseful version reported feeling more excitement, less boredom, less dullness, and more enjoyment than the viewers of the nonsuspenseful version. In addition, participants who watched the suspenseful version reported being more anxious about the outcome, wanted their favored team to win, and liked the winning team more than viewers of the nonsuspenseful version. A sex difference was found only during the beginning of the telecasts, in that males reported significantly greater enjoyment than did females. The findings regarding the outcome variable showed that participants reported enjoying a favorable outcome for their favored team to a greater extent than the unfavorable outcome, which was consistent with previous studies examining the disposition theory of sports spectatorship.

In order to increase ecological validity and to avoid the limitation in the study by Sapolsky (1980), in which the game outcomes had already been decided, Gan, Tuggle, Mitrook, Coussement, and Zillmann (1997) had students watch one of eight "live" broadcasts of the 1995 National Collegiate Athletic Association (NCAA) men's basketball games and report their viewing enjoyment of the game, based on the point separation of the final scores: extreme suspense (differential of 1-4 points), substantial suspense (5-9 points), moderate suspense (10-14 points), or minimal suspense (15 or more points). Along with the game outcome, respondents' sex and rooting interest (disposition toward the winning or losing team) were also assessed. The results indicated

that suspense heightened the enjoyment of game, which was consistent with the aforementioned study by Bryant et al. (1994). However, the investigation showed a significant interaction between the degree of suspense and the sex of the viewer. For male viewers, the enjoyment of the game increased with the degree of suspense. Female viewers' enjoyment, on the other hand, increased with the level of suspense only to a point (the substantial suspense game), after which it declined considerably to the same level when watching extremely suspenseful games as for minimally suspenseful games. In other words, men enjoyed the highly suspenseful game while moderate suspense may meet the arousal needs of women. Moreover, the results yielded significant sex differences in the viewing enjoyment of the extremely suspenseful outcome condition. Consistent with the assumption of the disposition theory, the results showed that respondents who rooted for the team that won reported enjoying the game more than those who rooted for the team that lost.

### Enjoyment of Uncertainty and Effective Plays

Zillmann et al. (1989) stated that not only the unpredictable outcome (suspense) in sporting events but also “uncertainty-laden” plays influence spectator enjoyment. According to Zillmann et al., (1989), the uncertain nature of play can be applied to two different features: novelty and riskiness. They explained that a play could be uncertainty-laden when 1) it is rarely used and thus comes as a great surprise when it is used; or 2) it carries a very high risk of failure (p. 272).

In an initial study to validate the effects of uncertainty on spectators' enjoyment of sports contests, Zillmann et al. (1989) examined the relationship between novelty

(uncommonness), riskiness, and enjoyment reactions to professional football plays. In line with the prediction, viewers' enjoyment was found to be positively related to the degree of risky plays (percentage of unsuccessful execution) ( $r = .90$ ). Results also revealed a strong positive relationship between effectiveness of play (the average gain of yardage) and viewing enjoyment reactions ( $r = .81$ ). However, commonness or uncommonness of the play, defined as "the average frequency of a play's successful or unsuccessful use by a team in a game, respectively" (p. 273), was not related to spectators' enjoyment ( $r = -.11$ ).

Similar findings regarding the riskiness of play contributing to a spectator's enjoyment of sporting events also have been established in a study conducted by Sargent, Zillmann, & Weaver (1998).

### Sex Differences in the Enjoyment of Televised Sports

The notion of sex differences in the enjoyment of televised sports has received considerable academic attention. The aforementioned investigations have shown strong support for sex differences in the enjoyment of violent plays (e.g., Bryant et al., 1981), perception of violence (e.g., Comisky et al., 1977; Sullivan, 1991), suspenseful outcome (e.g. Bryant et al., 1994; Gan et al., 1997), and the overall enjoyment of the sports competition (e.g., Sullivan, 1991). In addition, research has found that such sex differences may differ as a function of the type of sport. For example, Sargent, Zillmann, and Weaver (1998) investigated sex differences in the viewing enjoyment of various types of athletic competition and performance, based on the significant features entailed in the sporting events. Male and female college students assessed 25 televised sports,

based on seven criteria: enjoyment, excitement, boredom, violence, activity, elegance, and danger. The cluster analysis resulted in nine groups of sport types that were significantly differentiated on all seven evaluation criteria. After evaluating the similarities and differences in the salient characteristics of the nine clusters of sports, three fundamental sports typologies were suggested: 1). combative sports, which stress power, dominance, physical strength, and involve direct physical contact between competitors, e.g., football, ice hockey, basketball, and boxing, 2). stylistic sports, which feature beauty and elegance of body movement, e.g., figure skating and gymnastics, and 3). mechanized sports, which entail the use of tools, e.g., auto racing and golf. The results showed that male respondents reported enjoying combative sports most, and mechanized sports least. Female respondents, to the contrary, reported enjoying stylistic sports most and, like male respondents, mechanized sports the least. Results also suggested substantial sex differences in the enjoyment of various sports typologies. Male respondents reported significantly greater enjoyment of combative sports and mechanized sports. Female respondents, by contrast, reported significantly greater enjoyment of stylistic sports.

In addition, they found that the perceived unique characteristic of violence in sports plays a significant role in spectators' affective reaction, especially for males. For example, the relationships between the violence rating and enjoyment ( $r= .71$ ,  $p= .03$ ), excitement ( $r= .78$ ,  $p= .01$ ), and boredom ( $r= -.75$ ,  $p= .02$ ) were statistically significant for men, while those relationships were not statistically significant for women. In other words, for male respondents, the more violence they perceived, the higher their enjoyment and excitement and the lower their boredom. For female respondents, the

characteristic of violence was not related to their rating of viewing enjoyment, excitement, or boredom. The authors suggested, “the involvement of violent action appears to be what appeals to men” (p. 59). The findings appeared consistent with earlier experimental work by Bryant et al. (1981) in which male spectators enjoyed violent plays while the relationship between enjoyment and violence was not reliable for females.

In addition, the relationship between excitement and enjoyment was highly correlated for both male and female respondents ( $r = .99$  for men,  $r = .98$  for women,  $p < .001$  for both sexes). For both sexes, greater excitement produced greater enjoyment.

#### Individual Differences in the Enjoyment of Televised Sports Violence

A substantial number of researchers who have examined the harmful effects of violent entertainment have applied an individual differences approach to determine the influence of viewers' personality characteristics on media violence consumption, such as aggressive predisposition (e.g., Atkin, Greenberg, Korzenny, & McDermott, 1979; Bushman, 1995; Celozzi et al., 1981), psychotism (e.g., Aluja, 2000; Aluja & Torrubia, 1998; Gunter, 1983; Weaver, 1991; 2000; 2003), hypermasculinity (e.g., Russell, 1992; Scharrer, 2001), Machiavellianism (Tamborini, Stiff, & Zillmann, 1987), and sensation seeking (e.g., Aluja, 2000; Aluja & Torrubia, 1998; Tamborini & Stiff, 1987; Tamborini, Stiff, & Zillmann, 1987). However, examinations of individual differences on entertainment effects have received much less attention than studies of negative effects in televised sports contexts. Only two previous studies examined viewing enjoyment and emotional responses to televised sports violence have focused on the individual differences in viewers' characteristics. One study examined the relationships among trait

anger, sex, and the viewer's enjoyment of televised sports violence; the other focused on the viewer's aggressive predisposition.

Building on the work of Bryant et al., (1981), Rayburn (1998) attempted to determine whether spectators' sex and levels of trait anger influence their enjoyment of watching televised violent football plays. Male (n=69) and female (n=73) college students rated their enjoyment of plays, based on different degrees of roughness (low, medium, and high). The results supported those of Bryant et al. (1981) that the viewing enjoyment of football plays was positively related to the degree of rough play—the rougher the plays, the greater the enjoyment. Consistent with the findings of Bryant et al. (1981), the enjoyment of violent plays was particularly strong among male participants. Compared to females, males reported greater enjoyment of the rougher plays. Self-reported football fanship was positively correlated with enjoyment of the rough plays. However, no connection was found between the enjoyment of rough plays and trait anger. Also, there was no significant relationship between trait anger and football fanship, and sex was found to be unrelated to football fanship as well.

Another study, using individual differences approach to examine the influence of spectators' predisposed aggression on the enjoyment of televised sports violence, has been more successful. Bryant and Brown (1988, as cited in Bryant, 1989) examined the effects of viewers' individual propensity to aggression and their sensibility to sports violence on their enjoyment of sports violence. Participants' predisposed aggression levels were assessed, using the Buss-Durkee Hostility Inventory. Male participants rated extremely high or extremely low on the aggression scale participated in a sports viewing experiment. Before watching the sports telecasts, participants' sensibility to sports

violence was manipulated by watching one of three videotapes in a sports journalism format. One version represented sports violence as justified, another version condemned sports violence, and a third version served as a control. Participants' propensity toward aggression (low, high) and manipulated sensibility toward sports violence (violence justified, violence condemned, and control treatments), as well as repeated measures of viewing violent football plays (low, intermediate, and high) were employed as independent variables, and viewers' reported enjoyment after viewing each play served as a dependent variable. The results showed that viewers with high aggression propensity who received the "violence justified" treatment reported significantly greater enjoyment when watching the highly rough play than any other groups. Viewers with high aggression propensity enjoyed the low-violence plays the least, whether the violence was justified or condemned. Although the results showed that there were individual differences in viewing enjoyment of sports violence, the sample was limited to the male adults; therefore, it could not detect sex differences or any possible interaction effects between individual differences and sex.

### Criticism of Media Effects Research

Early theoretical perspectives on media effects have been criticized for their presumption of the recipient as a "blank slate" (Blackman & Walkerdine, 2001, p. 44). Studies in media effects research assumed that media contents or messages are capable of influencing all audiences in the same way, regardless of individual differences among audiences (Williams, 2003). The process was "a one-way hypodermic injection into the veins of the body politic. Whoever they were, wherever they were, the media of mass communication affected all its uncritical consumers equally" (Tudor, 1979, p. 176). The

message recipients were seen to be “passive and reactive” (Rubin, 1994, p. 417). That line of research focused on media content as the determinant for media effects, while audience characteristics in the processes of media consumption were largely ignored (Williams, 2003). However, decades of research have suggested that mass media do not always affect all audiences the same way. Audiences do not read and perceive media messages and images in “a more or less uniform way” (De Fleur & Ball-Rokeach, 1989, p. 165). Research has suggested that viewer characteristics influence the effects of media exposure. Viewer characteristics include sex (Atkin et al., 1979; Cantor & Nathanson, 1997; Haridakis, 2002), age (Huesmann, Eron, Lefkowitz, & Walder, 1984), social class (Dominick & Greenberg, 1972; Frost & Stauffer, 1987), motivation (Greenberg, 1974-1975; Haridakis, 2002; Haridakis & Rubin, 2003), and personality traits (Atkin et al., 1979; Gunter, 1985; Johnston, 1995; Haridakis, 2002; Krcmar & Greene, 1999; Tamborini, Stiff, & Heidel, 1990; Tamborini, Stiff, & Zillmann, 1987).

One limitation of the literature on the enjoyment of televised sports is that most studies have focused on characteristics of the contents. Two studies (Bryant & Brown, 1988; Rayburn, 1998) have explored viewer characteristics to understand the effects of exposure to sports violence. Focusing individual differences (i.e. personality characteristics) has been recognized as a useful approach to understanding the consumption of media violence (e.g., Weaver, 1991; 2000; 2003). Therefore, the current study expands the existing literature by applying sensation-seeking theory, a personality characteristic, to explain audience need for stimulation and arousal in the mediated sports context.

## Uses and Gratifications Perspective

The *uses and gratifications* (U & G) perspective, one of the dominant approaches in audience research, has been applied to a wide range of mediated communications to study audience motivations and behaviors, including televised sports audiences. (e.g., Gantz, 1981; Gantz & Wenner, 1991; Gantz & Wenner, 1995; Wenner & Gantz, 1989; Wenner & Gantz, 1998).

## The Development of the “U & G” Approach

Early media research assumed direct and powerful effects on message recipients (Rubin, 1994; 2002). However, decades of research have indicated that media actually reinforce people's pre-existing attitudes and opinions, rather than changing them (Klapper, 1960). Klapper (1963) argued that media research "too frequently and too long focused on determining whether some particular effect does or does not occur" (p. 517). Researchers have suggested that one must first understand the motivations and consumption of audience members in order to explain media effects (Rubin, 1993; 1994; 2002). Media research then shifted the focus from the mechanistic perspective of media effects research (what the media do to people) to the functional and psychological view of the "U & G" perspective (what people do with the media) (Katz, Blumler, & Gurevitch, 1974; Klapper, 1963; Rubin, 1994; 2002).

The audience-centered approach of "U & G" in mass communication research has been described as developing "from psychological and sociological models of indirect media effects" (Rubin & Rubin, 1985, p. 36). The primary objects of the "U & G"

framework are “(a) to explain how people use media to gratify their needs; (b) to understand motives for media behaviors; (c) to identify functions or consequences that follow from needs, motives, and behaviors” (Rubin, 2002, p. 527). The basic assumption of the “U & G” perspective is that media audiences are “active communicators” who use media and content to gratify felt needs and wants that come from social and psychological origins (Rubin, 2002, p. 528).

The value of the “U & G” approach is its emphasis on audience members during the media message process, as the role of the audience had been largely ignored in media effects research (Williams, 2003). Although its focus is on the audience, the goal of the “U & G” approach is “ultimately, an effort to understand ‘effects’” (Katz, Gurevitch, & Haas, 1973, p. 164).

### Audience Motivation for Media Consumption

Over the years, researchers in the “U & G” domain have investigated people’s motivation for medium-specific consumption, such as television (e.g., Rubin, 1981a), newspapers (e.g., Berelson, 1949), radio (e.g., Mendelson, 1964; Towers, 1987), magazines (e.g., Towers, 1986), VCR (e.g., Levy, 1987; Lin, 1990; 1993; Rubin & Rubin, 1989), computers (e.g., Perse & Dunn, 1998), and the Internet (e.g., Eighmey & McCord, 1998; Ferguson & Perse, 2000; Korgaonkar & Wolin, 1999; Papacharissi & Rubin, 2000). Researchers also have studied genre-specific consumption, including the investigation of motivation and consumption associated with listening to quiz programs on the radio (e.g., Herzog, 1940), radio soap operas (e.g., Herzog, 1944), reading comic books (e.g., Wolfe & Fiske, 1949), television news (e.g., Levy, 1978; Rubin & Perse,

1987a; Wenner, 1985), television soap operas (e.g., Alexander, 1985; Kim & Rubin, 1997; Perse & Rubin, 1988; Rubin & Perse, 1987b), public television (e.g., Palmgreen & Rayburn, 1979), religious television (e.g., Abelman, 1987), and televised sports (e.g., Gantz, 1981; Wenner & Gantz, 1998). In addition, researchers have also focused on program-specific consumption. For example, Rubin (1981b) investigated the motivation for watching a specific program of “60 Minutes,” and Hur and Robinson (1981) examined the motivation for watching the television program, “Roots”.

The present study attempts to determine the effects of the personality trait of sensation seeking and the viewer’s sex on spectators’ emotional and physiological reactions to media violence in televised sports. The following section focuses on the audience’s viewing motivation for and experiences with televised sports.

#### Audience Motivation for Viewing Televised Sports

Gantz’s (1981) examination of televised sports audiences was the earliest study using the “U & G” perspective to empirically explore audiences’ viewing motivations and consumption experiences with televised sports. Using survey methodology, the study had college students evaluate a list of 17 motivations for each of four televised sports (baseball, hockey, football, and tennis). The results showed that the strongest appeal for watching televised sports was “to thrill in victory” and “to let loose,” which appeared to be peculiar to sports programs. Also, the investigator found that many motivations for watching televised sporting events were similar for a broad range of sports.

Wenner and Gantz (1989) conducted telephone interviews with 707 adults drawn from two random samples in Los Angeles (N=400) and Indianapolis (N=307). The largest number of respondents reported that the sport they spent the most time viewing was professional football, followed, in order, by professional basketball, baseball, college basketball, college football, and tennis. While the motivations for watching each of the six sports were similar, “following a favorite team” was the strongest motive for all six sports. “Interest in the drama and tension” was the second strongest motive for watching professional and college football and basketball. For tennis and baseball spectators, learning about players and sports was the second strongest motive. Audiences’ disposition toward with a team or player was the strongest motivation for them to watch televised sports. “Excitement” (liking the drama and tension) was the reason audiences watched contact sports (e.g., football, basketball), while the reason spectators watched low-contact sports (e.g., tennis, baseball) was for “information” (learning about players and the sport).

Wenner and Gantz (1998) aggregated the data from the two aforementioned studies (i.e., Gantz, 1981; Wenner & Gantz, 1989) and factor analyzed viewing motivations, resulting in five dimensions of motivation along a continuum from more to less involvement levels. The first factor, which centered on the desire to “thrill in victory” and “identify with a winner,” was characterized as the “fanship dimension.” The second factor was the “learning dimension,” characterized as “the willingness to learn more about the teams and players.” The next factor included “let off steam,” “get psyched up,” “let loose,” and “an opportunity to have beer or drink,” was characterized as the “release dimension.” In the fourth, “companionship dimension”, watching sports on

television was a way to “spend some time with friends or family”. The last factor was defined as the “filler dimension” in which people watched televised sports because “there is nothing else to do”, to “kill time”, or to “pass time”.

Lee (1993) conducted a survey in Taiwan to investigate audiences’ motivations for viewing televised sports in different cultural settings. The factor analysis resulted in five motivational dimensions. The strongest was a recreational function, followed by four other functions: entertainment, companionship, fanship, and excitement.

#### Audience Behaviors and Affective Reactions for Televised Sports Viewing

In order to understand the behaviors and attitudes of televised sports viewers, researchers with the “U & G” perspective also examined audience activity before, during, and after sports viewings (i.e., Gantz, 1981; Wenner & Gantz, 1989; 1998). The studies found that audiences tended to engage in certain pre-program preparations for televised sports viewing. For instance, audiences often talked to others, read newspaper reports, drank, and tuned in before the game began. Results also indicated that sports spectators were not just passive viewers; they became emotionally aroused (e.g. excited, angry, happy, or sad) and caught up in the game they were watching. They tended to be more vocal (e.g., yelling) and interactive with others (e.g., talking about the action) during viewing. After viewing, they tended to talk about the game, watch game highlights on television newscasts, and read newspaper articles about the game. In addition, they were more likely to stay in a good mood after a victory or stay in a bad mood after a defeat (Gantz, 1981; Wenner & Gantz, 1989; 1998).

### Sex Differences in Televised Sports Consumption

Using the data gathered in the aforementioned studies of Wenner and Gantz (1989), and Gantz and Wenner (1991) examined sex differences in the consumption of televised sports. They found that, compared to women, men reported more interest in televised sports, spent more time watching sport and sports news on television, and spent more time reading sports sections in newspapers. The findings also indicated that men and women differed in the amount of time they spent watching specific televised sports. Compared to women, men appeared to spend more time watching football and basketball. Women, on the other hand, watched more tennis and baseball (Gantz & Wenner, 1991).

Regarding sex differences in viewing motivation, Gantz and Wenner (1991) found that men were more likely to watch sports on television in order to “get psyched up,” relax, let off steam, have a drink, or enjoy the tension and drama of the game. Women, on the other hand, tended to watch sports for “companionship motivation,” such as watching sports because friends and family were watching, or to give them something to do with friends or family. However, when women were avid fans, their viewing motivation was more like men’s. Sex differences in the motivation of viewers of televised sports have also been found in a different cultural setting by the aforementioned research of Lee (1993).

Gantz and Wenner (1991) also found that men and women differ in certain behavior before, during, and after viewing sports telecasts. For example, before viewing sports on television, men were more likely to engage in preparatory behaviors, such as tuning in early, talking and reading about the upcoming game, and drinking before the game began. During the viewing, men, compared to women, tended to act like those

attending the event, by talking, yelling, and commenting. Men also tended to be more emotionally involved, for instance, being happy when their teams performed well and being angry when their teams performed badly. Women, compared to men, were more likely to engage in household chores during the broadcast. After the game, men were more likely to follow up on the game; for example, continuing to talk about the game, watching highlights on television newscasts, reading about the contest in the newspaper, and continuing to drink in celebration of victory. In contrast, women's post-game activities were more likely to involve unplanned television viewing. Also, men were more likely to stay in a good mood after watching their team win and stay in a bad mood when their team lost.

### Criticism of the “U & G” Approach

As mentioned in the previous chapter, criticism about the research conducted in the “U & G” tradition have been limited by the validity of self-reported motivations and the failing of “traced empirical connections between [media] gratifications and their psychological roots” (Palmgreen, Wenner, & Rosengren, 1985, p. 21).

In addition, earlier media studies using the “U & G” approach have been criticized as not having “theoretical coherence” (Wimmer & Dominick, 2000, p. 385). As McQuail (1991) noted, “no common model, set of procedures or purposes informs the tradition … it is essentially lacking in theory and such theory it has is inadequate and confused” (p. 14). Critics also argued that studies using the “U & G” approach become a data collection for “identifying motives” rather than “explaining the processes or effects

of media use” (Rubin, 2002, p. 529). “U & G” studies have been criticized as mainly “descriptive” and “unsystematic” (Rubin, 2002, p. 529).

The assumption of an “active audience” in the “U & G” tradition has been questionable, especially when studying the television audience (Severin & Tankard, 2001). For example, research on television audiences found that some people reported their experiences with television as being a ritualized orientation (use of the media being more habitual and more passive, less-goal-directed) rather than an instrumental orientation (active and intent for seeking certain media content) (Rubin, 1994; 2002; Severin & Tankard, 2001). In addition, studies examined viewing motivations showed that audiences watched televised sports as a “filler dimension,” such as watching to “kill time,” or to “pass time,” or because “there is nothing else to do” (Wenner & Gantz, 1998).

### Summary of Key Findings

In summary, both the “media effects” and the “U & G” approach provide useful perspectives for investigating audiences’ experiences in the consumption of televised sports; however, they are from very different points of view. For example, effects research examines media content from the perspective of the communicator, while the “U & G” approach is from the viewpoint of audience members (Windahl, 1981; Severin & Tankard, 2001). The traditional effects approach is geared to investigate the influence of media exposure, while the “U & G” approach strives to understand how audiences use the media. Effects research assumes that audiences are passive and can be directly influenced, manipulated, or controlled by media content, while the primary assumption of

the “U & G” approach is that audiences actively select and use media to satisfy felt needs and wants (Rubin, 2002).

From the above literature review on televised sports audience research, studies using the media effects approach have identified several factors that appeared to be critical to spectators’ enjoyment of televised sports. For example, research showed that contextual features in sports telecasts, both the audio (commentary as verbal aggression) and video portion (physically rough play) of televised sports, can influence spectators’ subjective perception of unique characteristics of the sporting event and subsequently affect their overall viewing enjoyment. Those characteristics include the level of physical violence (e.g., Bryant, Comisky, & Zillmann, 1981; Rayburn, 1998), the perceived violence in sports contests (commentary emphasizing violent actions) (e.g., Comisky, Bryant, & Zillmann, 1977; Sullivan, 1991), the perceived conflict between players (e.g., Bryant, Brown, Comisky, & Zillmann, 1982), the suspense outcome (e.g., Bryant, Rockwell, & Owens, 1994; Gan, Tuggle, Mitrook, Coussement, & Zillmann, 1997; Sapolsky, 1980), and the degree of uncertainty and effective plays (e.g., Zillmann, Bryant, & Sapolsky, 1989).

Sports spectators’ degrees of identification (dispositional affect toward a team or player) have been found to be a consistently strong predictor of viewers’ psychological and physiological responses to televised sports (e.g., Branscombe & Wann, 1992; Madrigal, 1995; Sapolsky, 1980, Zillmann et al., 1989). That is consistent with the study of Wenner and Gantz’s (1989) using the “U & G” approach to explore viewing motivation, in that “following a favorite team” was the strongest motivation for watching televised sports contests.

Researchers examining genre-specific consumption of televised sports also identified some of audiences' viewing motivations, such as "to thrill in victory," "to let loose," "to get psyched up," and "to let off steam", which have not appeared in studies of other types of entertainment programming (Gantz, 1981). Those investigations also showed that, while watching mediated sports, audience involvement, such as pre-program preparations, tended to be more vocal and interactive with others during viewing and differed from those of audiences watching other types of programming. This significant finding was not previously documented in the "U & G" literature examining other entertainment genres (Gantz, 1981; Wenner & Gantz, 1998). In addition, the high emotional levels of involved sports fans after watching a game supported the notion of "bask in the reflected glory" (Wenner & Gantz, 1998).

Strong sex differences in viewing motivation and enjoyment for watching sports on television have been reported in audience research in both the media effects model and the "U & G" approach. For example, effects research found that males enjoy aggressive and rough play more than females (e.g., Bryant et al., 1981; Sullivan, 1991), and that males prefer combative violent sports and that females enjoy watching stylistic sports (e.g., Sargent et al., 1998). The findings were consistent with Wenner and Gantz's (1989) research using the "U & G" approach, in which men reported spending more time watching fast-paced contact sports (e.g., football and basketball); women watched more tennis, a non-contact sport, and baseball, a slower-paced sport.

Some effects research has applied an "individual differences" approach to examine audiences' enjoyment of televised sports. Findings showed that spectators with a high level of aggression were more likely to enjoy sports violence, while those who

with a low level of aggression tended to enjoy less violence (Bryant & Brown, 1988). However, viewers' trait anger was found unrelated to their enjoyment of watching violent play (Rayburn, 1998).

### Sensation-Seeking Theory

The personality trait of sensation seeking is regarded as Zuckerman's important contribution to theory construction. Grounded originally on the theoretical rationale of optimal levels of stimulation (OLS) and of arousal (OLA), Zuckerman developed a valuable, cogent model from the psychophysiology, biochemistry, and biosocial disciplines (Zuckerman, 1979a; 1994).

The sensation-seeking theory was originally derived from Zuckerman's work in sensory deprivation research (Zuckerman, 1994). The sensation-seeking trait has been shown to be related to various biological correlates, including neurotransmitter systems (norepinephrine, dopamine), monoamine oxidase (MAO: an enzyme in the brain), and gonadal hormones (testosterone and estrogens) (Zuckerman, 1983a; 1988; 1990; 1991a; 1992; 1994; Zuckerman, Buchsbaum, & Murphy, 1980).

Over the years, sensation seeking has been demonstrated to be a heuristic personality theory for explaining people's preferences for stimulation (McDaniel, 2003). Measures of this trait have been applied in a wide variety of contexts, including vocational choices, recreational activities, sports participation (Appendix B: Sensation Seeking and Sports Participation), entertainment and media preferences, and risk-taking behaviors (Roberti, 2004; Zuckerman, 1994). The findings indicated that sensation

seeking is a salient trait to explain and predict human behavioral expressions (Zuckerman, 1994).

The following section begins by providing a brief review of the development of sensation-seeking scales. Next it describes research examining the relationship between sensation seeking and individuals preferences in design, art, pictures, music, entertainment and media, horror and erotic films, and television programs. Finally, it discusses research on sensation seeking and televised sports.

### The Development of Sensation-Seeking Scales

Zuckerman, Kolin, Price, and Zoob (1964) developed the original sensation-seeking scale as an operational measure of individual differences in psychological needs for novel stimulation and arousal. The scale has been revised a number of times (Zuckerman, 1979a; 1994). The latest version, Sensation Seeking Scale (SSS) Form V, was developed using a large sample of English and American subjects (Zuckerman, Eysenck, & Eysenck, 1978).

According to Zuckerman (1994), the SSS Form V consists of 40 dichotomous forced-choice items divided into four subscales: (1) thrill and adventure seeking (TAS), with items expressing a desire to engage in certain kinds of sports or other activities that involve unusual sensations of speed, risk, and exploration experiences. An attitude item that describes the factor is “I sometimes like to do things that are a little frightening” (versus the forced-choice statement: “A sensible person avoids activities that are dangerous”); (2) experience seeking (ES), with items indicating the seeking of novel sensations and experiences through the mind and senses, as in art, music, and travel, and

through a nonconforming lifestyle. An item that represents that attitude is “I like to explore a strange city or section of town by myself, even if it means getting lost” (versus the forced-choice statement: “I prefer a guide when I am in a place I don’t know well”); (3) disinhibition (DIS), with items that assess the desire to seek out stimulation through social activities, such as parties, social drinking, and variety in sexual experiences and partners. An attitude item expressing that factor is “I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal” (versus the forced-choice statement: “I am not interested in experience for its own sake”); (4) boredom susceptibility (BS), with items referring to an acute aversion to boredom produced by repetitive experience of any kind, such as routine work or dull people. An attitude item that describes the factor is “The worst social sin is to be a bore” (versus the forced-choice statement: “The worst social sin is to be rude”). Each of the four subscales contains ten items. A total sensation-seeking score is the sum of the four subscales.

Although the 40-item SSS Form V has been the most widely used measure of sensation seeking (Zuckerman, 1994), some criticism has been noted regarding the potential limitations of the scale. For instance, the colloquial terminology in some items has been criticized as anachronistic (Gilchrist, Povey, Dickinson, & Povey, 1995; Zuckerman, 1996b). In addition, because SSS Form V includes 40 pairs of statements, it is time-consuming to administer (McDaniel, 2003). Moreover, the scale requires forced-choice responses between two statements: Arnett (1994) argued that participants might find the forced-choice response format unsatisfying, as they may feel that either, both, or neither statement applies. For example, the study of Jack and Ronan (1998) utilized SSS

Form V scale to measure individual sensation-seeking tendencies. Several respondents expressed concern with the scale format:

“...in many of the questions, the two alternatives are not opposites for which I agree with both points. In others, I disagree with both points...(and) many questions express extreme opinions. In most of these questions my opinions are somewhat in the middle” (p. 1080).

The four subscales of SSS Form V have been criticized for being only moderately correlated with each other (Ridgeway & Russell, 1980). Also, the subscales, especially the BS subscale, have been noted to have low internal reliability (Eysenck & Haapasalo, 1989; Deditius-Island, Heide, & Caruso, 2002; Zuckerman, 1979a; 1994). Krcmar and Greene (1999) argued that the four subscales should not be summed as a total SSS score because they “do not similarly predict a given dependent measure” (p. 41).

Moreover, certain items on SSS Form V have social desirability concerns, are culturally biased, or have basic psychometric shortcomings (Arnett, 1994; Haynes, Miles & Clements, 2000; Jackson & Maraun, 1996; Ridgeway & Russell, 1980; Steenkamp & Baumgartner, 1992; Zuckerman, 1994). For example, since the scale contains some items related to illegal behavior such as recreational drug use. Respondents might have concerns about answering questions related to norm-breaking behavior (Haynes et al., 2000). In addition, some items refer to certain sporting activities (e.g., parachute jumping, skiing, or surfboard riding) that might have culture-specific limitations (Zuckerman, 1994; 2002). Those items also have an age-related bias, due to physical strength and endurance requirements of the activities (Arnett, 1994), which could be

problematic, especially when the sensation-seeking trait has been found to correlate negatively with age (Zuckerman, 1994).

Perhaps, the most serious problem regarding the SSS Form V scale, as pointed out by Arnett (1994), might be that several items relate to alcohol use, drug use, and sexual behavior. Those items might result in a potentially confounding effect in studies investigating the association between the sensation-seeking trait and those types of behavior.

More recently, a new “Impulsive Sensation Seeking” (ImpSS) scale was introduced as a reliable and valid instrument of the sensation-seeking trait (McDaniel, 2003; McDaniel & Zuckerman, 2003; Zuckerman, 1994; 1996b). The ImpSS scale is part of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) and was designed to measure biologically based personality dimensions (Zuckerman, 1994; 2002; Zuckerman, Kuhlman & Camac, 1988; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993; Zuckerman, Kuhlman, Thornquist, & Kiers, 1991). Based on factor analyses of multiple scales and items in personality instruments, including SSS Form V, the ZKPQ consists of five factors of personality traits: Impulsive Sensation Seeking (ImpSS), Neuroticism-Anxiety (N-Anx), Aggression-Hostility (Agg-Host), Activity (Act), and Sociability (Sy). For the current investigation, the ImpSS scale is of primary interest.

Zuckerman (1994) suggests that the 19-item Impulsive Sensation Seeking (ImpSS) scale “is the most promising short, true-false form for the general sensation seeking trait” (p. 47). Unlike the items on the SSS Form V, the ImpSS scale uses general content, avoids items using colloquialisms, and eliminates items describing specific

activities (such as drug use, drinking, sex, or risky sports) to avoid any potential confounding effects on criterion variables (Zuckerman, 1994; 1996b; 2002; 2005; Zuckerman et al., 1993). Therefore, the current research uses the ImpSS scale as the operational measure of the sensation-seeking trait.

### Sensation Seeking and Preferences for Design, Art, Pictures, and Music

Researchers have examined the relationships between the personality trait of sensation seeking and design preferences. The findings of empirical studies have shown that sensation seeking is associated with individuals' preferences for complexity in polygons (Loof & Baranowski, 1971; Rawlings, Twomey, Burns, & Morris, 1998) and for the more complex, asymmetrical figures or designs (Zuckerman, Bone, Neary, Mangelsdorff, & Brustman, 1972; Zuckerman, Neary, & Brustman, 1970).

Tobacyk, Myers, and Bailey (1981) examined the relationship between sensation seeking and preferences in painting. Results indicated that sensation seeking was positively related to preferences for abstract paintings and for depictions of violence themes. The empirical evidence supporting the link between sensation seeking and abstract art preferences has also been demonstrated by the study of Furnham and Bunyan (1988). Likewise, Rawlings, Barrantes, and Furnham (2000) found that the sensation-seeking trait was related to liking "violent-abstract" paintings. In addition, Furnham and Avison (1997) found that a preference for surreal paintings was positively related to the sensation-seeking trait.

Zuckerman, Ulrich, and McLaughlin (1993) investigated the relationship between sensation seeking and a preference for nature paintings. The results showed that,

compared to LSS, HSS preferred the pictures that were rated as high in tension; however, HSS and LSS did not differ in their preferences for the low-tension paintings.

Zaleski (1984a) examined the relationship between the sensation-seeking trait and a preference for emotionally salient visual stimuli by showing a set of pictures to the participants and asking them to select the one picture they liked most and the other four preferred pictures in order. The pictures had been rated as emotionally positive, neutral, and negative, based on their contents rather than their artistic characteristics. The emotionally positive pictures included pleasant themes, such as celebrations, while the negative ones contained morbid themes, such as torture, executions, and corpses. Results showed that the HSS preferred more emotionally negative pictures, while the LSS had a stronger preference for the positive pictures. There was no significant difference between the groups in preference for the emotionally neutral pictures. In addition, there was a significant sex difference, in that males preferred emotionally negative pictures and the females favored positive ones. Results also indicated an interaction effect between sensation seeking and participants' sex. HSS males preferred emotionally negative pictures; LSS females liked the positive ones. Those two groups (HSS males and LSS females) showed the largest difference in visual-stimuli preferences.

The pattern of sensation seekers' taste for arousing content has also been found in studies about music preferences. For example, Little and Zuckerman (1986) found that individuals who scored higher on the sensation-seeking scale preferred all types of rock music; those who enjoyed bland, soundtrack music tended to score lower on the sensation-seeking scale.

Taken together, high sensation-seekers' preferences in design, art, pictures, and music showed a liking for stimuli that were highly arousing and that exhibited strong and intense emotions, regardless of positive or negative content.

### Sensation Seeking and Preferences in Entertainment and Media

Researchers have also examined entertainment and media preferences in relation to the personality trait of sensation seeking. For example, Schierman and Rowland (1985) investigated the relationship between sensation seeking and entertainment preferences among Canadian college students. The results showed that male HSS tended to read X-rated magazines, news magazines, and non-fiction books and to watch news reports; male LSS reported preferences for watching musical movies and reading romantic fiction books. Female HSS reported preferences for watching movies and reading magazines containing explicit sexual activity (X-rated), attending pubs with or without entertainment and lounges with entertainment, attending "Rock" concerts, going to nightclubs, and listening to "Pop" music; female LSS reported preferences for watching comic and dramatic theater productions. The investigators also observed the actual viewing preferences by giving participants the choice of watching 30-minute segments from five movies, including a violent action movie (*48 Hours*), a horror movie (*Halloween*), a comedy (*Caddyshack*), a romance (*Endless Love*), and a drama (*Ordinary People*). The results showed that both males and females HSS spent a relatively greater amount of their viewing time on the violent action movie; LSS spent more time watching comedy. There were sex differences in the proportion of time spent watching each of the five movies. Males preferred the violent action movie, while females favored the drama movie.

Hirschman (1987) examined the relationship between sensation seeking and consumers' preferences for different types of media content, including television programs, motion pictures, and books. The findings indicated that the sensation-seeking motive was significantly related to media content that depicted violence, action, and eroticism. For example, for television program genre preferences, the results showed that the sensation-seeking motive was negatively related to preferences for news, variety specials, game/quiz, docudramas, police/detective, and talk shows for males. For females, the sensation-seeking motive was positively related to preferences for soap operas and docudramas. For literature preferences, the results showed that the sensation-seeking motive was positively related to horror, humor, science fiction, adventure, and erotic-pornographic literature for males. For females, the sensation-seeking motive was positively related to love-romance, erotic-pornographic, and science fiction. For motion picture content preferences, the results showed that horror movies, science fiction, and adventure motion pictures were positively linked to the sensation-seeking motive for both sexes; preferences for love-romance movies, and erotic-pornographic movies were positively related to sensation-seeking motives for women. Preferences for televised sports programming were found to be related to a mastery/control motive for men, but not related to a sensation-seeking motive for either sex.

#### Sensation Seeking and Preferences for Horror- and Erotic-Films

Although high sensation seekers generally prefer the thrills of arousing physical real-life experiences more than vicarious experiences, such as watching movies, there is some evidence of a preference among HSS for horror films (Zuckerman, 1996a). For example, Edwards (1984) conducted a mail survey to investigate the relationship between

sensation seeking and horror movie interest and attendance. The results showed that reported interests in watching horror films correlated positively with the sensation-seeking scale, both in total score and all four subscales (SSS Form IV). Likewise, Sparks (1984) utilized a 20-item *Frightening Films Enjoyment Scale* that he developed to assess its relation to the sensation-seeking trait. Results showed a significantly positive correlation between sensation seeking and the enjoyment of frightening films for males ( $r = .22, p < .003$ ) and females ( $r = .28, p < .002$ ).

In an attempt to test a model for predicting the frequency of horror film attendance, Tamborini and Stiff (1987) conducted a field survey right after the viewers had seen the film *Halloween II* and were just leaving the movie theater. The path model showed that respondents' age and sex influenced their sensation-seeking motive, preference for destruction, and a just ending in horror films. The latter variables then subsequently affected their "like for fright" (liking horror movies because they are exciting and scary), and in turn, influenced the frequency of their attending horror movies. In other words, the path model indicated that the sensation-seeking motive indirectly predicted the frequency of horror movie attendance through a taste for being frightened and excited, which in turn influenced the frequency of horror movie attendance. Results also revealed that males preferred horror movies because of the violent destruction and power typically depicted in them; females liked them because of their satisfying endings (e.g., the good guy usually wins in the end).

Zuckerman and Little (1986) examined the relationships between personality traits and interest in horror and sex films among college students. Zuckerman's sensation-seeking trait and Eysenck's three major dimensions of personality traits (extraversion,

neuroticism, and psychoticism) were measured, along with self-reports of the frequency of attending horror movies and X-rated films. They also developed two scales: Curiosity about Morbid Events (CAME) and Curiosity about Sexual Events (CASE). The CAME scale reflects enjoyment of and interest in violent themes in the media (e.g., newspapers, films, television), in sports, and in the real world. The CASE scale assesses individuals' attitudes and preferences for portrayals of explicit sex in movies, novels, photographs, and in real life. The results showed that the CAME and CASE scales were significantly positively correlated for both males and females. SSS Form V total scores correlated significantly with both CAME and CASE scales, as well as subjects' self-reported frequency of horror and X-rated movie attendance for both sexes. The psychotism (P) dimension from the Eysenck Personality Questionnaire (EPQ) demonstrated significantly positive correlations with both CAME and CASE scales in both males and females, and sex film attendance for males. In addition, male subjects reported significantly higher scores than females in SSS total scores, P scale of the EPQ, CAME, CASE, and self-reported frequencies of attendance at both horror and sex movies. The authors concluded "sensation seekers like scenarios that are relatively novel and arousing, regardless of their specific content" (Zuckerman & Little, 1986, p. 55).

Aluja (2000) used the junior personality scales of Zuckerman's SSS Form V (SSS/J) scale and Eysenck's Personality Questionnaire (EPQ/J), and Zuckerman and Little's (1986) Curiosity about Morbid Events (CAME-M/J) scale to investigate the relationship between those personality variables in a Catalan-speaking adolescent sample. The results were in accord with those obtained by Zuckerman and Little (1986). Sensation seeking was related to CAME-M/J for both male and female adolescents. A

sensation-seeking personality was also a significant predictor for the consumption of violent films for both sexes.

Little (1986; as cited in Zuckerman, 1991b, 1994, 1996a) examined the effects of horror films on physiological arousal in relation to sensation seeking. Participants' skin conductance levels (SCLs) and skin conductance responses (SCRs) were recorded as they watched a 20-minute portion of the horror movie, *Friday the Thirteenth*. Results showed that the initial levels and later reactions of high and low sensation seekers were similar until the last minute of the movie, when a "climactic decapitation" occurred (Zuckerman, 1996a, p. 157). Compared to HSS, the LSS showed a strong increase in physiological arousal. Zuckerman (1996a) suggested it was probably because the HSS had been habituated to the violence by then. However, the greater increase in physiological reaction was expected to be exceptionally unpleasant to LSS, as their levels of arousal were extremely higher than their optimal levels (Zuckerman, 1996a).

Based on the above research, the positive correlation between sensation seeking and interest in horror film and erotic themes suggests that interest in viewing highly stimulating visual images is a function of the sensation-seeking trait.

### Sensation Seeking and Television Preferences

Rowland, Fouts, and Heatherton (1989) explored the links between the personality trait of sensation seeking and television content preferences, and attitudes toward television among Canadian college students. Results showed that sensation seeking was negatively related to political/moral attitudes toward television (e.g., low sensation seekers expressed more conservative political and moral attitudes towards

television programs). Regarding sex differences in television viewing frequency and television content preferences, the results revealed that males reported watching more television than females. Males reported watching sports and situation comedies more frequently and reported more enjoyment than females; females watched soap operas more frequently and reported more enjoyment than males. Males, with a liking for sports and situation comedies, also reported more enjoyment of news and police/crime programs than did females. However, the results failed to produce any significant relationship between sensation seeking and program preferences. The authors suggested, “it may be the specific content of a particular program which is related to sensation seeking rather than generic categories of television programming” (p. 1006).

Potts, Dedmon, and Halford (1996) examined the relationships between sensation seeking and television viewing motives and programming preferences in a college student sample. Sensation seeking was found to predict several program viewing preferences. HSS were more likely to watch music videos, daytime talk shows, stand-up comedy programs (females only), documentaries, and animated cartoons and watched fewer newscasts and drama programs than LSS.

Perse (1996) examined the relationship between the personality trait of sensation seeking and television viewing selections and behaviors. The results revealed that HSS were more likely to watch music and action-adventure programs. The LSS, on the other hand, were more likely to watch news and magazine programs. The author suggested the appeal of action-adventure programs for HSS might have been because of the fast-paced and violent nature of those types of programs, and the preference for music programs might have been partially because of the easy access to music programs on cable

channels because of the use of cable subscribers in the study. However, contrary to the previous research of Potts et al. (1996), in which preferences for news were positively related to sensation seeking, the findings showed that sensation seeking is negatively related to preferences for news and magazine genres.

### Sensation Seeking and Television Viewing Behavior

The aforementioned studies also investigated the relationship between the amount of television viewed and sensation seeking; however, the results were inconsistent. For example, Rowland, Fouts, and Heatherton (1989) found the regular viewing of television was negatively related to sensation seeking for males, but an inverted U-function of television viewing by females: HSS males watched less television than medium or low sensation seekers, and HSS and LSS females watched less television than the medium groups. The investigators concluded that watching television is apparently not a high priority for sensation seekers, particularly on Friday evenings, when engaging in social events and parties are common for college students. Schierman and Rowland (1985), Potts et al. (1996), and Perse (1996) also examined sensation seeking and television viewing. Contrary to the findings of Rowland, Fouts, and Heatherton (1989), there was no significant difference between the amount of television watched by the HSS and LSS group in those studies. Perhaps it is because television might provide different needs for different levels of sensation seeking (Rowland et al., 1989). HSS might not watch less television than LSS, as HSS might use certain arousing television content as a way to increase their environmental stimuli; LSS might watch some relaxing television programs to maintain their optimal arousal levels. Even though watching television may not be a

priority activity for HSS, as compared to engaging in more exciting physical or social activities (Perse, 1996; Zuckerman, 1994), the availability of television, which can easily provide sources of sensation rewards, might provide accessibility for sensation seekers to use in this form of entertainment. As Zuckerman (1988) suggested, the environmental accessibility of sources is a significant factor in sensation seekers' selection of stimuli.

Studies also supported the positive association of sensation-seeking needs with channel switching: HSS change channels more often than LSS (Schierman & Rowland, 1985; Rowland, Fouts, & Heatherton, 1989; Perse, 1996). Additionally, HSS tend to engage in more concurrent activities while watching television, such as reading, eating, talking to others, or talking on the telephone (Rowland, Fouts, & Heatherton, 1989). Those results indicated that HSS might use television for more arousal seeking purposes to increase novel experiences and add complexity to their environment by frequently changing programs and engaging in other activities. Frequently channel changing might reflect an aversion to boredom and a need for change for sensation seekers and serve as a means of increasing novelty and complexity into their viewing activities (Zuckerman, 1996a).

### Sensation Seeking and Televised Sports Viewing

A review of the above literature suggests that HSS should enjoy highly stimulating and arousing television programs more than LSS. However, the literature that examined the relationship between sensation seeking and television programming showed that a preference for televised sports—which contain some of television's most arousing content—was not related to sensation seeking. McDaniel (2003) argued that the

insignificant findings in existing research might be explained by a lack of classification of television content in most studies. For example, the study of Potts et al. (1996) showed that sensation seeking is negatively related to news viewing, while the study of Schierman and Rowland (1985) revealed a positive relationship between sensation seeking and television news viewing. There is a wide variety in news content. The different aspects of the news might explain the inconsistent results found in studies examining the relationship between sensation seeking and preferences for news viewing. As Schierman and Rowland (1985) argued, some people might enjoy some soft aspects of news for relaxation, while some might favor the arousing content of violent events in television news. Potts et al. (1996) suggested that future studies might examine “what aspects of television newscasts are considered appealing or unappealing to sensation seekers” (p. 1083).

That might explain why most studies failed to support a link between sensation seeking and preference for televised sports. This might be in part because those studies treated televised sports as a broad genre, failing to account for the differences in the stimulus intensity and arousal potential of the various types of televised sports. Those differences have been found to influence viewers’ enjoyment (e.g., Bryant, 1989; Bryant, Brown, Comisky, & Zillmann, 1982; Bryant, Comisky, & Zillmann, 1981; Bryant, Rockwell, & Owens, 1994; Comisky, Bryant, & Zillmann, 1977; Gan, Tuggle, Mitrook, Coussement, & Zillmann, 1997; Sapolsky, 1980; Sullivan, 1991). A few recent studies that have recognized the heterogeneity of televised sport programs have found that audience preferences for certain sports (e.g. football, hockey) were related to sensation

seeking trait (i.e., Krcmar & Greene, 1999; Lee, McDaniel, & Newhagen, 2001; McDaniel, 2003).

Krcmar and Greene (1999) examined the relationship among sensation seeking, exposure to television violence, and subsequent risk behavior for adolescents. They had respondents report how frequently they watched each of five program genres, including violent drama (e.g., *JAG*), realistic crime shows (e.g., *COPS*), contact sports (e.g. football, and hockey), non-contact sports (e.g. golf, and tennis), and sitcoms. Rather than using the total scores of the 40-item Sensation Seeking Scale (SSS Form V), they used the four sensation-seeking subscales. The results showed that the experience seeking (ES) subscale was negatively related to exposure to all violent drama, realistic crime shows, and both contact and non-contact sports for male adolescents, and that it was negatively related to exposure to all violent drama and realistic crime shows for female adolescents. The thrill and adventure (TAS) subscale was positively related to viewing non-contact sports for male adolescents only. The disinhibition (DIS) subscale was positively related to exposure to contact sports and crime shows for males, and it was negatively related to all violent drama for both sexes. The boredom susceptibility (BS) subscale was negatively related to the viewing of all violent drama for males, and it was negatively related to exposure to contact sports for females. However, the study revealed that viewing television violence seldom appears to serve as a substitute for indulging in actual risk-taking behaviors (e.g. drug use, risky driving).

Lee, McDaniel, and Newhagen (2001) used a strategy of asking respondents to concentrate on past experiences of viewing their favorite televised sports to investigate the relationship between sensation seeking and audiences' viewing responses to their

favorite sports on television. The results indicated that sensation seeking was positively associated with male respondents' levels of arousal and with female respondents' levels of pleasure. The findings also suggested that sports fandom was the strongest predictor of arousal levels for both male and female respondents, and that it was a significant predictor of pleasure for female respondents. In addition, the results showed the respondents' levels of perceived violence was a positive predictor of male respondents' arousal but a negative predictor of female respondents' levels of pleasure.

In another study that recognized the variation in the content of sports telecasts, McDaniel (2003) investigated whether sensation seeking was a function of viewers' interest in different types of sports telecasts. Televised sports programs were classified into three categories, based on the sports typologies of Sargent et al. (1998). The violent-combative category included NHL hockey, NFL football, NCAA Division I college football, and professional wrestling. NBA men's basketball, WNBA women's basketball, and NCAA men and women's basketball were placed in the category of aggressive-combative sports. The stylistic-sports category consisted of figure skating, gymnastics, and both men's and women's professional tennis. Results showed that sensation seeking was positively related to the respondents' self-reported levels of interest in viewing violent-combative sports telecasts for both males and females, and the trait was negatively related to female respondents' interest in viewing stylistic sports. In addition, the results supported Sargent et al. (1998), showing that respondents' sex affected their reported interest in viewing different types of televised sports. Male respondents reported significantly greater interest than females in viewing both violent-combative and aggressive-combative sports, while female respondents reported

significantly greater interests than males in viewing stylistic sports. Results also indicated that respondents who engaged in more “parasocial interaction” (yelling at players, coaches, and officials) during telecasts tended to have significantly higher sensation seeking scores and also reported higher levels of arousal than other respondents (McDaniel, 2004).

As mentioned in Chapter One, the Krcmar and Greene (1999) research was limited by the fact that they used self-reported viewing frequency as the measure of exposure to television violence. The study of Lee et al. (2001) was limited by the fact that the investigators assessed respondents’ emotional reactions by asking them to recall their experiences watching their favorite televised sports. The study by McDaniel (2003) was also limited by the use of self-reported preferences for specific types of sports telecasts, rather than directly exposing participants to televised sports viewing and assessing their reactions. An additional limitation of those three investigations was the assumption that “the only difference between the two films is the amount of violence” (Freedman, 2002, p. 195) even though the films featured two different “types” of sports. This study advances the literature on the relationship between sensation seeking and televised sports viewing by using an experiment designed to systematically manipulate the levels of violence in televised sports, to directly expose participants to different levels of violence, and to actually measure their emotional and physiological responses.

Despite those limitations, the studies of Krcmar and Greens (1999), Lee et al. (2001), and McDaniel (2003) laid the groundwork for further investigation of the relationship between sensation seeking and preference for televised sports. The results of those studies departed from those of previous research and supported the assumption that

the sensation-seeking trait is related to viewing certain televised sports, suggesting that interest in viewing certain sports content might be a function for sensation seekers to achieve or maintain their OLS or OLA (Lee et al., 2001; McDaniel, 2003; 2004). Their findings also suggested that future studies that examine the relationship between sensation seeking and audiences' viewing preferences for televised sports should differentiate sports in terms of their arousal potential and stimulus intensity (McDaniel, 2003).

## CHAPTER III

### METHODOLOGY

Building on sensation-seeking theory and the review of literature in the preceding chapter, this study was designed to test the ability of sensation-seeking theory to explain individual differences in emotional and physiological responses to violence in televised sports, as well as to test that theory's ability to account for sex differences in those responses.

This chapter begins with an overview of the research design, followed by sample - selection rationale, the treatment stimulus constructs, the measurement instruments, and the data collection procedures for the main experiment. Finally, the statistical analysis strategies for this research are discussed.

#### Overview of the Research Design

Experiment methodology in a laboratory setting was employed by this research to collect data. Participants' reports of emotional responses (levels of pleasure and arousal) were subjected to two separate 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (order of video treatment) repeated-measures ANOVAs, while participants' physiological reactions (HR, SC, And RSP) were subjected to three separate 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (viewing period) x 2 (order of video treatment) repeated-measures ANOVAs to test the study's main hypotheses.

Participants' self-reported emotional responses and physiological responses were the dependent variables that were separately analyzed in each ANOVA model. In all analyses, participants' sensation-seeking trait (HSS or LSS), biological sex (males or females), and the viewing order of video treatment (order 1: low-violence, neutral, high-violence) or order 2: high-violence, neutral, low-violence) served as the between-subjects factors; while the level of violence (neutral, low-violence, and high-violence) constituted the within-subjects factor. For the physiological responses, an additional *viewing period factor* with two levels (before viewing and during viewing) as the repeated-measures variable was included in the model. Overall, the basic model was designed to determine whether emotional and physiological responses to televised sports violence differ among individuals, differ in the personality trait of sensation seeking, and differ according to biological sex. All the variables employed in this research were grounded in sensation-seeking theory or existing literature on responses to media violence, including sports.

### Rationale for Using Experimental Methodology

Although laboratory studies have limited external validity, the use of a designed experiment in this investigation was appropriate for several reasons. Controlled experiments have generally demonstrated high internal validity for media research because that method allows researchers to control the procedure and the extraneous variables (Frost & Stauffer, 1987; Wimmer & Dominick, 2000). More importantly, the use of a designed experiment allowed investigators to overcome the limitations of past research, using survey methodology to examine the influence of sensation seeking on preferences for specific media content, such as violent presentations (Hoffner & Levine, 2005; McDaniel, 2003). In addition, the experimental method allowed researchers in the

present investigation to systematically control the levels of violence presented in the game clips, as well as to directly assess viewers' actual physiological and emotional reactions to televised sports violence.

### Participants

A convenience sample of both male and female undergraduate students from a variety of disciplines and enrolled in sports-psychology courses in Fall 2005 at the University of Maryland volunteered to participate in this study in exchange for extra credit. To avoid the interference with physiological measures, especially heart rate, only non-smokers were selected to participate in the main experiment.

### Rationale for the Use of College Students

Using a sample of the college-student population was appropriate for this study for several reasons. First, college students at the same university represent a relatively homogeneous sample in terms of certain socio-demographics (i.e., age and level of education). Therefore, the college student sample reduced any effect differences that age and education level might have had on viewers' responses and, consequently, increased the power of the statistical test to detect the influences of sensation seeking and biological sex on viewers' reactions to televised sports violence (Calder, Phillips, & Tybout, 1981). More specifically, the purpose of this study was to test the ability of sensation-seeking theory to explain individual differences in responses to televised sports violence. Researchers have suggested that, when testing a theory (theoretical propositions), "homogenous samples are preferred because they typically provide a strong test of the theory" (Calder et al., 1981, p. 200).

In addition, college students have been used in previous research examining audiences' enjoyment of televised sports (e.g., Bryant et al., 1981; Rayburn, 1998; Sullivan, 1991) and in studies investigating the relationship between sensation seeking and media preferences (e.g., Potts et al., 1996; Schierman & Rowland, 1985). Thus, the results derived from the current research will be comparable to previous investigations. Moreover, the inventories used in this study (e.g., ImpSS scale, PAD scale, and PII scale) have demonstrated reliability with college-student samples (e.g., Mehrabian & Russell, 1974; Zaichkowsky, 1985; 1994; Zuckerman et al., 1993).

#### Rationale for Determining Sample Size

In order to employ an acceptable number of participants for statistical-analysis requirements, the desired sample size for the main experiment in this investigation was determined through power analysis and consideration of the cost-benefit tradeoffs (e.g., length of time required to complete the experiment, available laboratory time, use of the physiological equipment, numbers of students willing to participate, etc.). Based on the noncentral F distribution, which describes the power of ANOVA tests (Scheffé, 1959), an estimated sample size of 110 was chosen. For the proposed 2 (Sensation Seeking: high vs. low) x 2 (Biological Sex: males vs. females) x 3 (Levels of Violence: neutral, low, high) ANOVA, a sample of 110 subjects guaranteed power of at least 0.80 for detecting an effect size of 0.75 at the .05 level of significance. The estimated necessary sample size was calculated using the SYSTAT computer program.

### Stimulus Construction

The initial phase of data collection was to construct the treatment stimulus—televised sports. The television segments consisted of two versions of five-minute sequences of video clips from professional football games; one was composed of extremely violent action; the other, little or no violence.

### Initial Stimulus Construction

The stimulus treatments for the main experiment were constructed similarly to a procedure outlined in the studies of Bryant et al., (1981) and Rayburn (1998). First, 52 professional football games were recorded from preseason and regular-season National Football League (NFL) contests telecast during the summer and fall of 2005. The experimenter previewed the games to select a large pool of plays to fit the categories of low violence and high violence. Plays from various teams were selected to reduce the possible influence of a participant's disposition toward a particular franchise (Zillmann et al., 1989). Similar to the research design in Bryant et al. (1981), all the violent action clips selected were “within the rules of the game”. Rare plays (e.g., “Statue of Liberty,” “flea-flicker,” fake punt) were eliminated to control for a potential novelty effect. Plays that ended in injuries were not selected to avoid “the potential enjoyment-impairing properties of pity or grief” (p.258). A total of 300 plays, including passing plays, running plays, kickoff returns, punt returns, and quarterback sacks, were selected and edited and copied in random order onto a DVD-ROM for a pilot study, with a four-second pause between plays to allow time for participant evaluation.

### Pilot Study

To determine the appropriate experiment stimuli, a pilot study was conducted before the main experiment. The procedures were similar to those conducted in studies of Bryant et al. (1981) and Rayburn (1998).

A convenience sample of 15 male and 15 female undergraduate students from several Kinesiology classes at the University of Maryland independently rated the 300 plays on a devised level-of-violence scale. The participants were instructed not to speak to one another during viewing and were given written instructions (Appendix C) on how to rate the plays, based on the intensity of physical contact among the players. The scale (Appendix D) used a Likert scale, ranging from 0 (no physical contact) to 7 (extremely high physical contact). The mean rating score for each action clip was computed. Plays that were selected for the next phase of stimulus construction had to meet two requirements: 1) the mean scores on the violence scale were either 1 through 3 (low violence) or 5 through 7 (high violence); and 2) 28 or more of the mean scores fell into the same range. To maximize variance between treatment levels (the high- and low-violence categories), plays rated in the medium range were dropped from further analysis (Reeves & Geiger, 1994). The Cronbach alpha coefficients for intercoder reliability of the violence ratings were computed (Appendix E). The resulting 30 reliability values ranged from .459 to .862 ( $p < .01$ ).

For the final experiment, 18 high-violence plays and 18 low-violence plays were selected. Each treatment condition (i.e., violence level) included the same number of each type of play. In the final sample of 18 plays per condition, the plays selected were

of the following types: five kicking plays, five successful passing plays, four incomplete passing plays, and four running plays. No quarterback sacks were included because all of them were perceived as violent by the raters. Also, because existing research showed that viewers enjoyment is positively related to the levels of risk and the effectiveness of the play (Zillmann et al., 1989), the total number of yards gained per condition was, to the extent possible, the same within each treatment, to control for the possible impact of success on viewers' responses, similar to the criterion used in the studies of Bryant et al. (1981) and Rayburn (1998). In the final selection of plays for each violence condition, the number of yards gained totaled 124. The viewing time of each video was five minutes.

#### Final Edition of Stimulus Constructs

Based on the results of the pilot study, 36 plays were then copied onto two videos in a random sequence, becoming the manipulation stimulus for the main experiment. The two video stimuli—one version featuring extremely violent action and the other showing action with little or no violence—were copied onto a DVD-ROM. The plays were shown with their original broadcast commentary, similar to the treatment construction employed in the study of Bryant et al. (1981).

To validate the violent treatment in the two football segments, a paired-samples t-test on the violence scale were conducted as a manipulation check to examine the overall differentiation of high-violence and low-violence conditions. The two stimulus treatments were comparable in number of each type of play and total-number-of-yards-gained, but differed in degree of violence. A significant difference in the mean score on

the violence scale was expected between the two conditions ( $p < .05$ ). As expected, a paired-t-test comparison revealed that the mean score for high-violence plays ( $M=5.41$ ,  $SD=.51$ ) was significantly higher than the mean score for low-violence football plays ( $M=1.67$ ,  $SD=.39$ ). The results indicated that the video treatment was significantly different in degree-of-violence,  $t(29)= 28.11$ ,  $p < .001$ , and that treatment manipulation was deemed successful.

#### Rationale for Selecting Football as the Treatment Stimulus

Football was chosen as the treatment in this study for several reasons. Football is an intensive, fast-paced, and exciting sport, involving direct physical contact among players and a relatively high degree of violence/aggressiveness (Sloan, 1989). Violence is seen as an inherent feature in football (Smith, 1983a). One of the game's most renowned coaches, Vince Lombardi, once observed that football "is a violent sport. That is why the crowds love it" (cited in Michener, 1976, p.520). In addition, in the sports typologies by Sargent et al. (1998), football was categorized as a violent contact sport. Thus, football was considered a promising treatment material for a study such as this.

Moreover, football is the most popular men's sport on television in America (Coakley, 2001; Wenner & Gantz, 1989). The championship game (Super Bowl) is one of the most widely viewed sporting events on American television. According to Coakley (2001), 15 of the 20 largest American television audiences were telecasts of Super Bowl games. Bellamy (1998) noted that, "the NFL has long been regarded as the preeminent television sport" (p.81).

Football allows ready comparison of the effects of violence and nonviolence on viewers. Previous studies examining the effects of violent plays on viewers enjoyment have used football plays as the stimulus treatment (e.g., Bryant et al., 1981; Rayburn, 1998). Thus, the use of football as the stimulus treatment in this investigation is appropriate to provide further empirical support for the findings in previous research (i.e., Bryant et al., 1981; Bryant, 1998).

More importantly, previous studies have found that sensation seeking is positively related to spectators' preferences for viewing violent contact sports, such as football and ice hockey (i.e., Krcmar & Greene, 1999; McDaniel, 2003). The use of violent football plays as the treatment stimulus in this investigation may help determine whether sensation seekers' preference for viewing violent sports (e.g., football) is primarily because of its violent characteristics.

#### Rationale for Using Repeated-Measures Design

In this study, video viewing was a *repeated measure*—with all participants watching all video clips. The use of a repeated-measures design for the televised sports segments was appropriate for several reasons. For example, the repeated-measures design is more powerful than a completely randomized design (Stevens, 1996). The use of a within-subjects design allows each participant to serve as his or her own control group (Ravaja, 2004) and consequently diminish error variance to one-half to one-fifth that of between-subjects measures (Calfee, 1985; Reeves & Geiger, 1994). That is particularly important in media research employing psychophysiological measures, because “there are large individual differences in psychophysiological response and the

typical effects sizes are not very large” (Ravaja, 2004, p. 220). Therefore, repeated-measures design “is quite sensitive to detecting treatment differences” (Wimmer & Dominick, 2000, p. 221). As Calfee (1985) pointed out, “Other things being equal, a within-subjects design gives a clear picture of the treatment effects because the unsystematic variability within treatment conditions will be less than for a comparable between-subjects design (p.223).

Moreover, there was a practical benefit from using a repeated-measures design: the economy of participants employed for the investigation. Fewer subjects are required for studies using repeated-measures design because the same subjects are tested repeatedly (Stevens, 1996). Also, that methodology has been used for previous research on spectators’ viewing enjoyment of televised football violence (i.e., Bryant et al., 1981; Rayburn, 1998).

However, a major concern in the repeated-measures approach is the contamination or carry-over effect between treatments (Calfee, 1985; Stevens, 1996). Therefore, participants in this study were shown a neutral film segment (e.g., a nature scene) as a distraction between the two football segments (Cantor, Zillmann, & Day, 1978; Reeves & Geiger, 1994) in order to minimize the possibility of carry-over effects, to maximize the time between the two treatment stimuli and allow the physiological measures to return to their baselines, and also to minimize participants’ suspicions about the true purpose of this investigation. Viewing the neutral film clip required five minutes. It showed natural scenery from Ireland (selected from the video, *The Magnificent Scenery of Ireland*). The scenes were accompanied by soothing music without lyrics. The video served as the control video in the data analysis.

So, the final set of treatment stimuli was comprised of three videos representing different levels of violence: high, low, and neutral. Additionally, the order in which the videos were shown was counterbalanced among the participants to guard against the possible influence of stimulus order (e.g. the primacy and recency effects) and fatigue (or boredom) on participants' psychological and physiological responses to the experiment treatment (Davis & Rose, 2000; Reeves & Geiger, 1994; Stevens, 1996).

### Measures

This study was designed to test the ability of sensation-seeking theory to explain individual differences in emotional and physiological responses to violence in televised sports, as well as to test that theory's ability to account for sex differences in those responses. Participants' self-report levels of pleasure and levels of arousal as well as their physiological response (measured by heart rate, skin conductance, respiration) were the dependent variables. Participants' sensation-seeking trait (low, high), biological sex (male, female), video treatments (high-violence, low-violence, and neutral content), order of video treatment (order 1 or order 2), and viewing period (before viewing and during viewing) were the independent variables. All the scales used in this study have demonstrated a satisfactory level of reliability and validity in previous research.

### Independent Measures

There were five independent variables in this study. The first independent variable was the personality trait of sensation seeking (high sensation seeker vs. low sensation seeker); the second independent variable was the participants' biological sex (male vs. female); and the third independent variable was the level of violence in

treatment stimuli (high-violence, low-violence, and neutral content). The level of violence was a repeated measure, with all participants watching all treatment stimuli. The fourth independent variable was the order of video treatment. The fifth independent variable was the viewing period factor (before viewing and after viewing) only for physiological measures.

#### The Personality Trait of Sensation Seeking

The 19-item Impulsive Sensation Seeking (ImpSS) Scale (Appendix F) was employed to measure each participant's level of the personality trait, sensation seeking, similar to the scale used in McDaniel's (2003) study investigating the relationship between audiences' sensation seeking and their viewing preferences for televised sports.

The ImpSS scale was incorporated into the "alternative five-factorial model" from the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) (Zuckerman, 1994; 2002; Zuckerman, Kuhlman, & Camac, 1988; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993; Zuckerman, Kuhlman, Thornquist, & Kiers, 1991). Researchers have indicated that the ImpSS scale may be an appropriate alternative to measure the sensation seeking tendency rather than the most widely used Sensation Seeking Scale (SSS) form V (Haynes, Miles, & Clements, 2000; McDaniel, 2003; McDaniel & Zuckerman, 2003; Zuckerman, 1994; 1996b). For example, the ImpSS scale has been found to possess high internal consistency and test-retest reliability and to exhibit good convergent and discriminant validity (Zuckerman et al., 1988; Zuckerman et al., 1991; Zuckerman et al., 1993). It correlates fairly well ( $r = .66$ ) with the SSS Form V Total score (Zuckerman, 1994; 1996b). Most notably, it correlates evenly with the four subscales of the SSS Form

V, suggesting that “it is not biased toward one subtype of sensation seeking” (Zuckerman, 1994, p.47). Also, researchers have suggested that the 19-item true-false format of ImpSS scale is easier to administer than the more elaborate 40 paired forced-choice format of SSS form V, due to the brevity of the scale and ease of response (McDaniel, 2003; McDaniel & Zuckerman, 2003). Additionally, unlike the SSS form V, the ImpSS scale contains no item using anachronistic phrasings or colloquial terms and excludes items referring to particular objectionable activities (e.g., drinking, drug use, or sex) or cultural and age-biased sporting activities (e.g., parachute jumping, skiing, or surfing) (Zuckerman, 1994; 1996b; 2002).

The psychometric properties of the ImpSS scale have been supported among college students (Zuckerman et al., 1993), the target sample of this study. Additionally, the ImpSS scale has demonstrated the utility of being an operational measure of sensation seeking in the areas of sports participation (e.g., Jack & Ronan, 1998) and sports spectatorship (e.g., McDaniel, 2003).

The ImpSS scale utilizes a true/false (true = 1, false = 0) response set made up of eleven items for assessing sensation seeking and eight items measuring impulsivity. According to Zuckerman (1994), the personality dimensions of impulsiveness and sensation seeking show behavioral and biological correlates. Therefore, the 19 items from the above two sub-scales were later summed to make a composite ImpSS score (possible range, 0 to 19). Then, using the equal tripartite division, participants were classified into categories of high- ( $\geq 67$  percentile), medium- ( $67 < > 33$ ), and low- ( $\leq 33$  percentile) sensation seekers, based on their mean scores on ImpSS scale. Since men have been shown to exhibit higher levels of sensation seeking than women, group

membership was modified by biological sex (Zuckerman, 1994). That classification procedure is consistent with published sensation-seeking research (e.g., Jack & Ronan, 1998; McDaniel, Lee, & Lim, 2000-2001; McDaniel & Zuckerman, 2003; Rowland, Fouts, & Heatherton, 1989; Zuckerman, 1994). For the purpose of maximizing the differences (variance) in participants' sensation-seeking variable, only those who were found to be high or low sensation seekers were selected for the main experiment (Bryant & Brown, 1988).

### Dependent Measures

Dependent variables included participants' emotional reactions (pleasure and arousal) and physiological responses (heart rate, skin conductance, and respiration) to televised sports violence.

#### Self-Reports of Emotional Responses

Several theorists (e.g., Russell, 1980; Watson & Tellegen, 1985) have suggested that the basic dimensions in emotion can be defined by two factors: pleasure (valence) and arousal. Therefore, participants' self-reported levels of pleasure and arousal from the televised sports violence were measured as the dependent variables. According to Mehrabian and Russell (1974), the pleasure dimension is conceptualized as a positive affective state that "is distinguished from preference, liking, positive reinforcement, and approach avoidance" (p.18), while the arousal dimension is "a feeling state that varies along a single dimension ranging from sleep to frantic excitement" (p.18).

Levels of pleasure and arousal were measured by the Pleasure-Arousal-Dominance (PAD) Scale (Appendix G) developed by Mehrabian and Russell (1974). Research has suggested that the PAD scale was designed “to measure emotional responses to environmental stimuli” and “is best used when a researcher is interested in measuring the dimensions underlying emotional states” (Richins, 1997, p.128). The scale has been used to measure emotional aspects of consumer behavior (e.g., Havlena & Holbrook, 1986; Holbrook, Chestnut, Oliva, & Greenleaf, 1984; Tuan Pham, 1992), including studies of televised sports audiences (Lee, McDaniel, & Newhagen, 2001; McDaniel, 2003; Pavelchak, Antil, & Munch, 1988) and sports fans (Hillman, Cuthert, Cauraugh, Schupp, Bradley, & Lang, 2000; 2004)

Havlena and Holbrook (1986) compared Mehrabian and Russell’s semantic differential PAD scale (a reduced set of PAD was used, providing four items in each dimension) to Plutchik’s (1980) eight emotional categories scale in a variety of consumption experiences, such as leisure, esthetics, athletics, and entertainment. The authors suggested that the PAD scale was a superior measure for evaluating emotional response of experiential consumption as compared to the other index. For example, the scale has shown a satisfactory reliability, in that the internal consistency for each PAD dimension showed the coefficient alpha level above .90. In addition, the PAD scale is a more parsimonious measure of consumers’ emotional experiences than Plutchik’s scale. The relationships between the PAD scale and the other emotional measure (i.e., Plutchik, 1980) demonstrated convergent validity.

The two dimensions (pleasure level and arousal level) of the reduced set of the PAD scale were adapted to measure participants’ emotional response (Havlena &

Holbrook, 1986). The set consists of four semantic differential items each for measuring participants' emotional pleasure and arousal reactions from watching sports telecasts. After viewing each video treatment, the participants were asked to report how they felt during the viewing on a questionnaire that used four-item adjective-pairs measuring pleasure levels and four items measuring arousal levels on a five-point bipolar scale format. The item scores were averaged to create pleasure and arousal indexes, with higher scores indicating higher levels of pleasure and arousal.

### Physiological Responses

Physiological measures have been found to be valuable indicators of emotional reactions (Lang, 1994). Previous studies have also shown the utility of physiological measures in sports spectators (Hillman, Cuthert, Cauraugh, Schupp, Bradley, & Lang, 2000; 2004). However, little research has focused on physiological reactions to stimuli and concomitant personality differences in a mediated sports context.

It has been suggested that the use of multiple physiological measures, rather than a single measure, can better identify the response patterns in media research (Ravaja, 2004). Therefore, physiological responses in the current study were assessed by measuring participants' heart rate (HR), skin conductance (SC), and respiration (RSP) during viewing. Each of the physiological measures employed has demonstrated utility as an arousal measure (Cacioppo, Tassinary, & Berntson, 2000).

Participants' HR was measured using three electrodes placed on the chest area near the heart. Heart rate was recorded in beats per minute. HR acceleration indicates increasing arousal (Brownley, Hurwiz, & Schneiderman, 2000). SC was measured using

two small electrodes attached to the index finger and ring finger of participants' non-dominant hand. SC was recorded in microsiemens. The higher the microsiemen number, the greater the electrodermal reactivity across the surface of skin (Dawson, Schell, & Filion, 2000). RSP was measured using an elastic strap placed around participants' chest. RSP was recorded in breaths per minute. The higher the mean on RSP, the greater the arousal state (Harver & Lorig, 2000).

All the physiological data were collected using devices (Procomp Infinite: Model # SA7500) and software (bioGraph Infinite) developed by Thought Technology (TT).

### Potential Control Variable

#### Football Fanship

Previous studies have shown that the level of fanship influenced viewers' enjoyment of sports telecasts (e.g., Rayburn, 1998; Sullivan, 1991). In other words, the enjoyment derived from exposure to sporting events may vary, based on the spectators' degree of felt involvement toward a player, team, or sport. Therefore, in order to account for participants' varying levels of involvement (fanship) in football, Zaichkowsky's (1994) modified 10-item Personal Involvement Inventory (PII) might be employed as a covariate (Appendix H). That scale has been found to be a reliable and valid measure in sporting-event attendance, such as golf spectators (Lascu, Giese, Toolan, Guehring, & Mercer, 1995) and baseball fans (Wakefield, 1995), as well as in the study of televised sports spectators (McDaniel, 2003; Tuna Pham, 1992).

Zaichkowsky (1985) defines involvement as “a person’s perceived relevance of the object based on inherent needs, values, and interests”(p. 342). Mittal (1995) suggests that the underlying theme of involvement is the perceived importance of a product. Therefore, the PII scale is applicable to measure a person’s varying degrees of interest in a sports product.

Participants were asked to rate their perceptions of football followed by 10 bipolar adjective items on a 5-point semantic differential scale. The item scores were later summed and averaged to form an index of football fanship, with higher scores indicating higher levels of football fanship.

### Demographic Information

Some demographic questions (Appendix I) were employed in the questionnaire for the purpose of sample description, including sex, age, ethnicity, and class standing. Participants’ sex was also treated as a between-subjects factor. Although studies usually employ participants’ age as a control variable, as the sensation-seeking trait tends to decline with age (Zuckerman, 1994), the recruited participants here were all undergraduate students. Therefore, the age effect was expected to be minimal. In addition, the survey instrument included questions about alcohol consumption and smoking in order to help gauge the predictive validity of the ImpSS scale. The question about participants’ tobacco or cigarette use was also used as a prescreen question to select subjects (Appendix I).

### Procedures for the Main Experiment

Data collection for the main experiment in this study consisted of four phases. The campus Human Subjects Institutional Review Board approved the study before any data was collected.

The first phase of data collection was conducted in class sessions in a large classroom on campus, approximately four weeks before the main experiment. Students enrolled in sports psychology courses were recruited to participate. Participants in the pilot study were ineligible for the main experiment. Participants were given a self-administered questionnaire with clearly described instructions to assess: (1) the personality trait of sensation seeking (ImpSS scale); (2) the degree of football fanship (PII scale and football-enthusiasm scale); and (3) basic demographics and screening questions regarding smoking and drinking behavior. Participants were encouraged to work at their own pace and not interact with each other. After all participants have completed the questionnaires, the questionnaires were collected and the participants were thanked for their participation (Appendix J: Instruction for Administering the Pre-Experiment Questionnaire).

In addition, participants were provided opportunities to complete the questionnaire during the following two weeks if they were unable to participate in the in-class pre-experiment questionnaire administration. The pre-experiment survey took about 15 minutes.

The second phase of data collection was the classification and selection of the sample. After the pre-experiment questionnaires were processed, each participant was

assigned to one of three groups (i.e., high, medium, or low sensation seeker), based on the tripartite division in scores on the ImpSS scale (adjusted by sex). Potential subjects were excluded if they were smokers. Non-smoker participants who were found to be high or low sensation seekers were selected for participation in a subsequent sports-viewing study.

The third phase of data collection was to contact the selected participants. They were contacted by e-mail (Appendix K) and invited to serve as participants in an experiment in exchange for extra class credit. They were told about the project in general terms (exploring people's responses to television programs), the electrocardiograph electrode placement procedure, and their right to withdraw from the experiment at any time. Additionally, in order to assure the validity of the physiological measurements, participants were instructed to refrain from drinking alcohol and caffeine for at least 6 hours before their appointments and to avoid exercising for at least one hour before the scheduled laboratory session (Rowland, Kaariainen, & Houtsmuller, 2000).

In the final phase of the data collection, approximately four weeks after the in-class session, those agreeing to participate were scheduled individually to attend a one-hour laboratory session held outside of class at various times over a two-month period. Participants were tested individually at a laboratory in order to avoid distraction, as well as to prevent any interfering physiological signal.

At the beginning of the main experiment, the participants were given an overview of the experiment. Also, each was given a consent form describing the purpose of the investigation and the procedures involved, particularly the electrocardiograph electrode

placement procedure; explaining that their physiological reactions were to be recorded before and during the television viewing process; and stating that they could withdraw at any time without any explanation or penalty (Appendix L). However, participants were not informed about the specific hypotheses of the study. They were assured that their data would be kept confidential and used only for research purposes. In addition, they were advised that their participation credit was unrelated to their responses. The subjects were then given the opportunity to ask any questions. Each participant was then asked to read and sign an informed consent form.

After completing consent forms, the participants were instructed to sit quietly in their comfortable chairs facing a 27-inch television monitor placed approximately five feet away. The physiological sensors were then attached to the participants, as the experimenter explained the function of each sensor. First, the heart rate sensors were placed on each participant's chest, after using rubbing alcohol to sanitize the skin surface to improve the conductance. Next, after cleaning with alcohol, two small sensors were placed on the index and ring fingers of each participant's non-dominant hand, to measure skin conductance. Last, an elastic strap was placed around each participant's chest, at the level of the solar plexus, to monitor respiration rate. After the sensors were attached, the participants were instructed to relax, sit quietly, and minimize body movements so as not to disturb the physiological measures. A five-minute baseline measurement was then taken.

After the completion of the baseline recordings, participants were informed that the post-viewing questionnaire contained three identical sets of pages (one set for each video segment), and that the video would be stopped after each segment so that they

could complete the questionnaire. Subjects were instructed to sit quietly, move as little as possible, and be attentive to the television content for duration of the entire video presentation. The participants then watched the television materials on a television monitor with their physiological reaction being recorded.

After each viewing, participants' physiological readings were stopped, and they were asked to complete a set of the post-viewing self-administered questionnaires, which included scales designed to assess their (1) level of pleasure and (2) level of arousal. The same steps were repeated three times—once for the high-violence football plays, once for the low-violence football plays, and once for the nature-scenery clip. A five-minute baseline physiological measurement was taken prior to each video-stimulus presentation. So, the two football stimuli were shown 20 minutes apart to allow sufficient time for participants' emotional and physiological effects to subside. Participants were invited to provide their e-mails to receive the results of the study when they became available. Also, participants were asked not to discuss any of the details of the experiment with other potential participants. Then, each participant was given a certificate of participation as documentation to receive the promised extra credit, thanked for their participation, and dismissed.

The length of the entire procedure, for participants in the main experiment was approximately one hour: five minutes for reading the information sheet, reviewing the procedures, and completing the informed consent form; ten minutes for the placement of the sensors; five minutes for the physiological baseline measurement before each five-minute video viewing; then the participants watched the video. After each five minutes of videotape viewing, participants were given three minutes to complete the post-viewing

questionnaire. Another five minutes were allowed for removing the equipment and debriefing.

### Validity Checks for Measures

#### Validity Check of the ImpSS Scale

Sex differences in the sensation-seeking personality trait have been found in previous studies using both the SSS form V (Zuckerman, 1994) and the ImpSS scales (Zuckerman et al., 1993). Research has shown that males tend to score higher than females on the sensation-seeking scale. Therefore, in order to assess the validity of the ImpSS scale as a measure of the sensation-seeking trait in this study, an independent-sample t-test was conducted to compare the mean scores of males and females on the ImpSS scale. A significant difference in the mean scores of the men and the women on the ImpSS scale was expected ( $p < .05$ ).

In addition, previous studies have shown that individuals with higher sensation-seeking scores are related to higher levels of risk-taking behavior, such as drinking and smoking (Zuckerman, 1979a; 1979b; 1994). Therefore, a correlation between the ImpSS scores and the self-reported measures of drinking and smoking was examined to assess the predictive validity of the ImpSS scale. A significant positive correlation was expected between the ImpSS scores and alcohol consumption and smoking ( $p < .05$ , one-tailed).

### Validity Check of the PAD Scale

In order to validate the self-reported emotional pleasure and arousal (as utilized by the PAD scale), a pencil-and-paper version of the five-point Self-Assessment Manikin (SAM) (Appendix M) was employed (Bradley & Lang, 1994).

The SAM scale is a non-verbal pictorial instrument that quickly and directly assesses a person's reports of emotional reaction to an object or stimuli (Bradley, Greenwald, Petry, & Lang, 1994; Bradley & Lang, 1994; Greenwald, Cook, & Lang, 1989; Lang, 1980; Lang, Dhillon, & Dong, 1995; Lang, Greenwald, Bradley, & Hamm, 1993; Lang, Newhagen, & Reeves, 1996). Researchers have suggested that the SAM is an easy instrument without language barriers (Bradley & Lang, 1994). In its first implementation, SAM was an interactive computer program. A paper-and-pencil version was subsequently developed.

The SAM scale has been shown to be a reliable and valid inventory for measuring emotional experiences (Bradley & Lang, 1994; Greenwald et al., 1989; Lang et al., 1993). In addition, the SAM scale has previously been used effectively to measure emotional responses to a wide variety of stimuli, including television messages (Lang, Dhillon, & Dong, 1995). In particular, the scale has been shown to correlate quite well with the semantic differential PAD scale (Bradley & Lang, 1994).

The SAM scale for the pleasure dimension consists of five human-face characterizations with expressions ranging from a big smile to an extreme frown. The SAM scale for the arousal dimension consists of five human figures in postures ranging from excited and wide-eyed to relaxed and sleepy (Bradley & Lang, 1994). Participants

rated their degrees of pleasure and arousal after each viewing treatment. A significant positive correlation was expected between the PAD and SAM scales on each condition ( $p < .05$ , one-tailed).

### Validity Check of the PII Scale

In order to validate the football-fanship measure (as utilized by PII scale), a five-item measure of football enthusiasm (Appendix N) was employed (Dickerson & Gentry, 1983; Cornwell, Maignan, & Irwin, 1997). Participants were asked to indicate how often they attended football games in a stadium, watched football on television, read about football in newspapers and magazines, talked about football with friends or family, and used the Internet to obtain football information. The participants rated each item on a 5-point Likert scale ranging from 1 to 5 (1=never, 2=rarely, 3=sometimes, 4=fairly often, and 5=very often). Item scores were averaged to create the index of football enthusiasm. A significant positive correlation was expected between the PII and football-enthusiasm scales ( $p < .05$ , one-tailed). The items regarding frequency of attending football games and frequency of watching football on television were used to answer Exploratory Question Three to determine the relationships between those activities and sensation seeking.

### Statistical Analyses

All analyses were performed using the SPSS (version 12.0) statistical package.

The probability of Type I error was set at .05.

### Procedures for Data Analysis

First, data was screened through the SPSS computer program for accuracy of data entry, missing values, distributions, and possible outliers. Data with standardized residuals greater than three standard deviations in absolute value for each dependent variable were considered outliers and were excluded from subsequent statistical analyses. Descriptive statistics were obtained for each variable, especially the demographical profile of the participants.

Next, Cronbach alpha coefficient analyses were conducted to assess the internal consistency reliability on all the scales utilized in this study.

In addition, Pearson Product Moment correlations were employed to assess the validity check of the ImpSS scale, the PAD scale, the PII scale, and the football enthusiasm scale, and to examine the relationship between the independent variables (sensation seeking and biological sex) and the potential covariate, as well as to answer all the Exploratory Questions. Also, analysis of variance (ANOVA) was used to answer Exploratory Questions One and Five.

Finally, the main analyses of the current study examined the relationships among sensation seeking, biological sex, and viewers' emotional and physiological responses to televised sports violence. Therefore, a separate analysis of variance (ANOVA) repeated-

measures was employed to investigate the research hypotheses for each dependent measure. In all analyses, participants' levels of sensation seeking (HSS vs. LSS), biological sex (males vs. females), and order of video treatment (order 1 vs. order 2) served as the independent-measure factors, while the level of violence (high, low, or neutral) was the repeated-measures factor. Participants' self-reported emotional responses (level of pleasure and level of arousal) and physiological response (HR, SC, and RSP) were the dependent variables analyzed separately in each ANOVA model. However, the changes in the physiological responses, brought about by viewing televised sports were the major interest of this study, and previous studies as well, showed that individuals differ in baseline physiological responsiveness (Cacioppo, Tassinary, & Berntson, 2000). Thus, it is important to control for those individual differences in baseline levels when examining physiological responses to media stimuli. Therefore, participants' physiological baselines and responses during viewing were entered into the model as repeated-measures variables.

In summary, participants' self-reported emotional responses (levels of pleasure and levels of arousal) were subjected to two separate ANOVAs: 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (order of video treatment), with repeated measures on video treatment conditions, while participants' physiological reactions (HR, SC, and RSP) were subjected to three separate ANOVAs: 2 (sensation seeking) x 2 (biological sex) x 3 (video treatment) x 2 (viewing period) x 2 (order of video treatment), with video treatment conditions (high-violence, low-violence, and neutral content) and viewing periods (before viewing and during viewing) as repeated-measures factors to test the study's main hypotheses.

### Guideline for Analyzing Effects in an ANOVA Repeated-Measures Design

In the ANOVA examinations, the interaction effects between variables were analyzed first. If the interaction effect were significant, then an examination of the simple effects would be conducted. If no significant interactions were found between variables, then the main effects for each independent variable would be examined to determine if statistically significant main effects existed. If the main effects were statistically significant, then the marginal means for each main effect would be compared by conducting post-hoc comparisons.

Tukey's Honestly Significant Difference (HSD) test was used to test the marginal mean and cell mean differences when the main and interaction effects were significant, respectively. In addition, estimates of effect sizes are reported using Eta squared ( $\eta^2$ ).

Mauchley's test of sphericity was used to determine violations of the sphericity assumption. The Huynh-Feldt correction (Huynh & Feldt, 1970), which provides an adjustment of the critical F test, was applied when the assumption of sphericity appeared to have been violated (Tabachnick & Fidell, 2001). When an adjustment was made, p values and effect sizes reported were based on the adjusted degrees of freedom.

## CHAPTER IV

### RESULTS

The purpose of this study was to test the ability of sensation seeking theory as an explanation for individual differences in emotional and physiological responses to sports violence as well as to test that theory's ability to account for sex differences in those responses. More specifically, this study sought to determine whether viewers' emotional and physiological responses to violent action in televised American football differ among individuals having different levels of the personality trait of sensation seeking and between males and females.

This chapter presents the results of the study. First, the characteristics of the participants are addressed, followed by the assessment of scale reliability, correlation analysis of potential covariate, and manipulation checks. Then, the results of hypotheses tests and exploratory questions are presented and summarized.

#### Characteristics of the Participants

Participants in this study were recruited from the undergraduate population at the University of Maryland during Fall 2005. Prescreening was conducted on 409 students—182 female (44.5%) and 227 male (55.5)—in several group-screening sessions. The screening was done using the ImpSS scale and cigarette/tobacco usage. Participants were classified into three groups based on the tripartite division in mean scores on the ImpSS scale (adjusted by sex). Participants whose ImpSS scores fell within the top one-third (males, 13-19; females, 11-19) were classified as high sensation seekers (HSS).

Participants whose ImpSS scores fell in the bottom one-third (males, 0-5; females, 0-6) were classified as low sensation seekers (LSS). The mean score of the ImpSS scale for the current initial screening sample ( $n=409$ ) was 9.22 and the standard deviation was 4.13 (males:  $M = 9.65$ ,  $SD = 4.19$ ; females:  $M = 8.68$ ,  $SD = 4.00$ ). The means are less than the normative sample mean of 10.18 and standard deviation of 4.10 (Zuckerman & Kuhlman, 1993) (males:  $M = 10.99$ ,  $SD = 3.87$ ; females:  $M = 9.68$ ,  $SD = 4.16$ ). In addition, because the use of cigarette or tobacco might suggest possible confounding of physiological responses, participants who answered positively to the cigarette or tobacco usage were then excluded from the recruiting. Subjects who met the eligibility criteria were contacted by email and invited to participate in the experiment and thereby to receive extra credit. Ultimately, 110 individuals participated in the main experiment.

The sample in the main experiment consisted of 56 females (50.9%) and 54 males (49.1%). The participants ranged in age from 18 to 28 years ( $M=20.68$ ,  $SD=1.67$ ). The mean scores for participants classified as HSS and LSS were 14.42 ( $SD=2.15$ ) and 3.33 ( $SD=1.66$ ), respectively. The ethnicity composition of the sample was 60.0 % Caucasian, 11.8 % African-American, 7.3 %, Latino, 13.6 % Asian, and 5.5 % multi-racial. Approximately 28.2 % of the participants were senior; 41.8 % were juniors; 27.3 %, sophomores; and 1.8 %, freshman. Table 1 summarizes the characteristics of the sample population.

Table 1. Summary of the Characteristics of the Sample Population

Sample Description	N	Percentage
<b>Sensation Seeker</b>		
LSS ( $M= 3.33$ , $SD=1.66$ )	57	51.8
HSS ( $M=14.42$ , $SD=2.15$ )	53	48.2
Total	110	100.0
<b>Sex</b>		
Female	56	50.9
Male	54	49.1
Total	110	100.0
<b>Age</b> ( $M=20.68$ , $SD=1.67$ )		
18	1	.9
19	24	21.8
20	39	35.5
21	21	19.1
22	9	8.2
23	9	8.2
24	4	3.6
25	1	.9
26	1	.9
28	1	.9
Total	110	100.0
<b>Ethnicity</b>		
Caucasian	66	60.0
African-American	13	11.8
Latino-Hispanic	8	7.3
Asian	15	13.6
Multi-Racial	6	5.5
Other	2	1.8
Total	110	100.0
<b>Class Standing</b>		
Freshman	2	1.8
Sophomore	30	27.3
Junior	46	41.8
Senior	31	28.2
Other	1	.9
Total	110	100.0

As stated in the previous chapter, data whose standardized residuals were beyond three standard deviations in absolute value for each dependent variable were considered as outliers and deleted. Also, physiological data from two participants were not used in the final data analyses because of a recording error and an equipment error. Therefore, final N's for the analysis were as follows: for self-reported levels of pleasure, n = 110; for self-reported levels of arousal, n = 108; for heart rate data, n = 107; for skin conductance data, n = 104; and for RSP data, n= 106.

### Scale Reliabilities

Cronbach's coefficient  $\alpha$  was computed to assess scale reliability. The internal consistency-reliability coefficients were .80 for the ImpSS scale, .95 for the PII scale (football fanship), and .93 for the football-enthusiasm scale (used for the validity check of the PII scale). For self-reported emotional measures, reliability was computed within each response for each separate video condition. The self-reported levels of pleasure consisted of four items, with an alpha of .88 for the high-violence content, .88 for the low-violence content, and .89 for the neutral content. The self-reported levels of arousal also consisted of four items, with an alpha of .88 for the high-violence content, .86 for the low-violence content, and .73 for the neutral content. Therefore, based on the results of scale reliability, all measures, with the exception of the arousal levels for the neutral content, had adequate internal consistency coefficients. Table 2 depicts the Cronbach's alpha results for each scale.

Table 2. Cronbach Alpha Results for Measures

Variable	Items	N	$\alpha$
<b>Personality Variable</b>			
ImpSS	19	n=409	.80
<b>Potential Covariate</b>			
Football fanship	10	n=409	.95
Football-enthusiasm	5	n=409	.93
<b>Dependent Variables</b>			
Pleasure (high-violence)	4	n=110	.88
Pleasure (low-violence)	4	n=110	.88
Pleasure (neutral)	4	n=110	.89
Arousal (high-violence)	4	n=110	.88
Arousal (low-violence)	4	n=110	.86
Arousal (neutral)	4	n=110	.73

#### Initial Correlation Analyses of Potential Covariate

Before the main analyses were conducted—examining interrelationships among sensation seeking, biological sex, and participants' emotional and physiological responses to violence in televised sports—patterns of relationships between the possible control variable (football fanship) and the independent variables (sensation seeking and biological sex) were explored.

Pearson product-moment correlation analysis was conducted to assess the potential relationships between participants' level of the sensation-seeking trait and football fanship and point-biserial correlation to examine the relationship between participants' biological sex and football fanship. The analysis revealed statistically significant positive correlations between sensation seeking and football fanship ( $r = .259$ ,  $p < .01$ , two-tailed), and between biological sex and football fanship ( $r = .359$ ,  $p < .01$ , two-tailed). Earlier researchers have suggested that when there is an interaction between a covariate and an independent variable and when subjects are not randomly assigned to treatment groups, it would be inappropriate to use Analysis of Covariance (ANCOVA) and the variable should not be used as a covariate (Lord, 1969; Hinkle, Wiersma, & Jurs, 1998; Tabachnick & Fidell, 2001). Therefore, football fanship was not included as a covariate in this study's analyses. Table 3 illustrates the relationship between sensation seeking and football fanship, and between biological sex and football fanship.

Table 3. Correlation Between Football Fanship and ImpSS Scale and Biological Sex

	ImpSS	Biological Sex (Female=0; Male=1)
Football Fanship	.259**	.359**

\*\* Correlation is significant at the .01 level (two-tailed).

## Validity Checks for Measures

### Validity Check of the ImpSS Scale

Previous research has shown that males exhibit higher levels of the sensation-seeking trait than females (Zuckerman, 1994). In order to evaluate the ImpSS scale as a valid measure of sensation seeking, an independent-samples t-test was conducted to examine the relationship between sensation seeking and biological sex. As expected, there was a statistically significant sex difference,  $t(398) = 2.344$ ,  $p = .02$ . Males ( $M=9.65$ ,  $SD= 4.19$ ) scored significantly higher on ImpSS scale than females ( $(M=8.68$ ,  $SD=4.00)$ . The results were consistent with existing sensation-seeking research (e.g., Zuckerman, 1979a; 1994), suggesting that ImpSS scale is a valid operational measure of sensation seeking. In addition, past research has found that sensation seeking was related to alcohol drinking and cigarette smoking; therefore, a test of correlation was conducted to examine the relationship between the ImpSS scores and participants' self-reported frequency of drinking and smoking. Results showed that ImpSS scores were positive related to self-reported measures of drinking ( $r = .370$ ,  $p = .000$ , one-tailed) and smoking ( $r = .121$ ,  $p = .008$ , one-tailed). The result of the correlations helped support the predictive validity of the ImpSS scale. In addition, consistent with the literature (Zuckerman, 1994), Pearson product-moment correlations showed that the sensation seeking subscale was significantly positive correlated with the impulsivity subscale ( $r = .488$ ,  $p < .01$ , two-tailed).

### Validity Check of the PAD Scale

As part of the procedure for evaluating the validity of the self-reported emotional pleasure and arousal (as utilized by the PAD scale), the correlations between the Pleasure-Arousal-Dominance (PAD) scale and the pencil-and-paper version of the Self-Assessment Manikin (SAM) scale were computed separately for each video condition. As expected, results of Pearson product-moment correlations revealed that the PAD scale and the SAM scale were significantly positive correlated with each other on both pleasure and arousal dimensions for all three video treatment conditions ( $p < .01$ , one-tailed). Table 4 lists the correlation matrix for the pleasure dimension and Table 5 for the arousal dimension. The correlations are consistent with published research (e.g., Bradley & Lang, 1994). The relationships found in the above analyses helped support the validity of the PAD scale.

Table 4. Correlation Between the PAD Scale and the SAM Scale by Video Condition (Pleasure Dimension)

	Neutral	Low-Violence	High-Violence
	PAD Pleasure	PAD Pleasure	PAD Pleasure
SAM Pleasure	.765**	.716**	.687**

\*\* Correlation is significant at the .01 level (one-tailed).

Table 5. Correlation Between the PAD Scale and the SAM Scale by Video Condition  
 (Arousal Dimension)

	Neutral	Low-Violence	High-Violence
	PAD Arousal	PAD Arousal	PAD Arousal
SAM Arousal	.592**	.740**	.668**

\*\* Correlation is significant at the .01 level (one-tailed).

### Validity Check of the PII Scale

In order to evaluate the PII scale as a valid operational measure of football fanship, Pearson correlation was computed to examine the relationship between the PII scale and the football-enthusiasm scale. As expected, there was a significant positive correlation between the PII scale and the football-enthusiasm scale ( $r = .797$ ,  $p < .01$ ). The results support the validity of the PII scale as a measure of football fanship in the current study.

## Testing of Hypotheses

### Hypothesis One

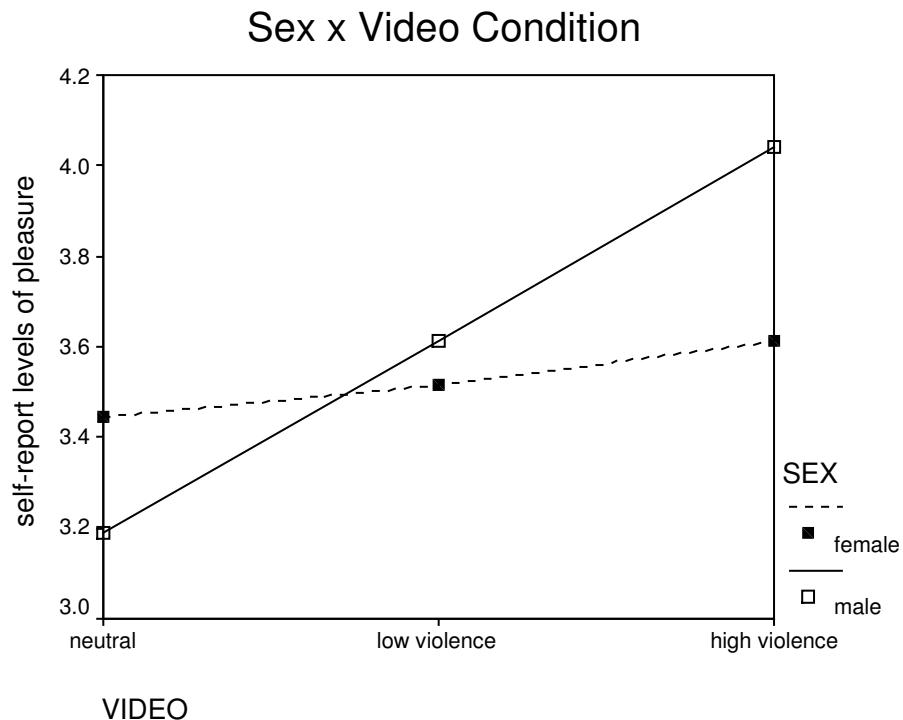
The first hypothesis predicted that participants' self-reported levels of pleasure differed as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. In order to investigate the hypothesis, a 2 (sensation seeking) x 2 (biological sex) x 3 (video condition) x 2 (order of video treatment) ANOVA repeated-measures test was conducted, with sensation seeking (HSS vs. LSS), biological sex (males vs. females), and order of video treatment (1 vs. 2) as the between-subjects factors, and the video condition (neutral, low-violence, and high-violence) as the within-subjects factor. The dependent variable was the participants' self-reported levels of pleasure. The ANOVA results revealed a significant interaction effect between sensation seeking and video treatments,  $F(2, 181) = 3.497, p = .038, \eta^2 = .033$ . Post hoc analyses using Tukey HSD tests indicated that HSS reported significantly higher levels of pleasure when exposed to both high-violence ( $M = 3.947, SD = .098$ ) and low-violence televised sports ( $M = 3.610, SD = .104$ ) than when exposed to neutral content ( $M = 3.188, SD = .119$ ). Although HSS reported higher levels of pleasure when watching high-violence televised sports ( $M = 3.947, SD = .098$ ) than low-violence televised sports ( $M = 3.610, SD = .104$ ), the difference was not statistically significant. For LSS, the levels of pleasure were undifferentiated for the three levels of violence. Contrary to the prediction, there was no significant difference between HSS and LSS in self-reported levels of pleasure for all three video conditions. This sensation seeking x video conditions interaction for self-reported levels of pleasure is shown in Figure 1.

Figure 1. Significant Interaction Effect of Sensation Seeking x Video Condition on Levels of Pleasure



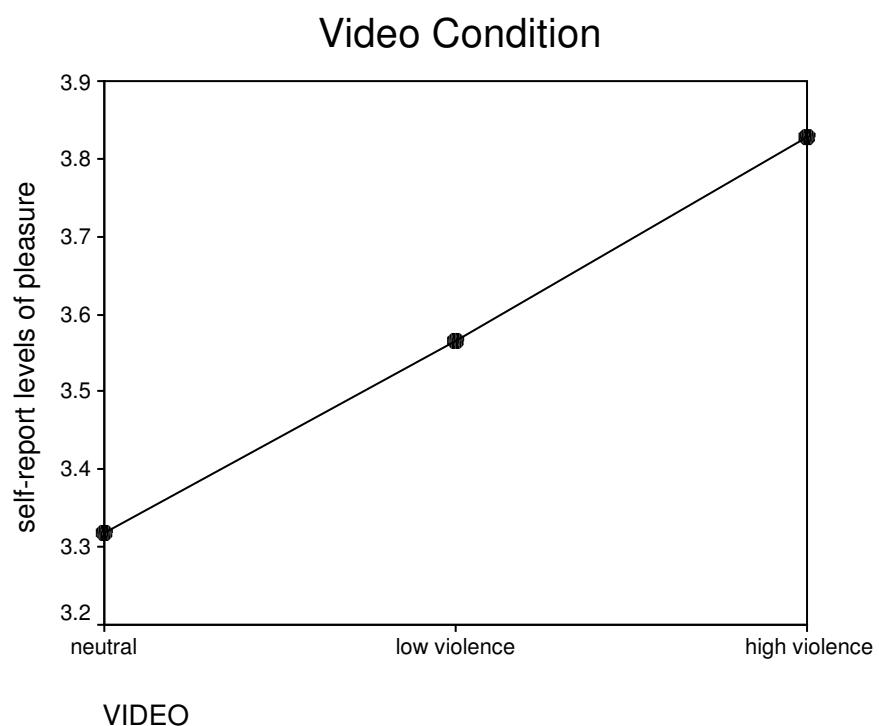
The ANOVA result also revealed a significant interaction effect between biological sex and video treatments,  $F(2,181) = 6.197$ ,  $p = .004$ ,  $\eta^2 = .057$ . Post hoc analysis showed that male participants' levels of pleasure when they watched the three levels of violence differed significantly from one another. Specifically, males' self-reported levels of pleasure were highest for watching high-violence televised sports ( $M = 4.041$ ,  $SD = .097$ ), followed by low-violence televised sports ( $M = 3.613$ ,  $SD = .103$ ), and finally the neutral content ( $M = 1.437$ ,  $SD = .041$ ). Females' levels of pleasure were in the same direction as males; however, the levels of pleasure were undifferentiated among the three video conditions for female participants. As expected, male participants ( $M = 4.041$ ,  $SD = .097$ ) reported significantly higher levels of pleasure when exposed to high-violence televised sports compared to female participants ( $M=3.612$ ,  $SD= .095$ ). However, there was no statistical difference in levels of pleasure between males and females when watching low-violence televised sports and neutral content. The biological sex x video conditions interaction for levels of pleasure is shown in Figure 2.

Figure 2. Significant Interaction Effect of Biological Sex x Video Condition on Levels of Pleasure



In addition, the ANOVA result also demonstrated a significant video main effect,  $F(2, 181) = 13.767$ ,  $p = .000$ ,  $\eta^2 = .119$ . Participants' self-reported levels of pleasure increased as the levels of violence increased. Specifically, the levels of pleasure were highest when viewing the high-violence televised sports ( $M = 3.827$ ,  $SD = .068$ ), lower for low-violence televised sports ( $M = 3.564$ ,  $SD = .072$ ), and lowest for the neutral content ( $M = 3.318$ ,  $SD = .083$ ). Post hoc analysis for the video main effect revealed that each of those paired comparisons was significantly different from one another ( $p < .05$ ), indicating that participants' levels of pleasure were significantly different for each of the three video conditions. Participants reported significantly higher levels of pleasure when watching high-violence than the low-violence televised sports. The differences in the levels of pleasure were also statistically significant for the low-violence televised sports and neutral content. The video main effect is shown in Figure 3.

Figure 3. Significant Main Effect of Video Condition on Levels of Pleasure

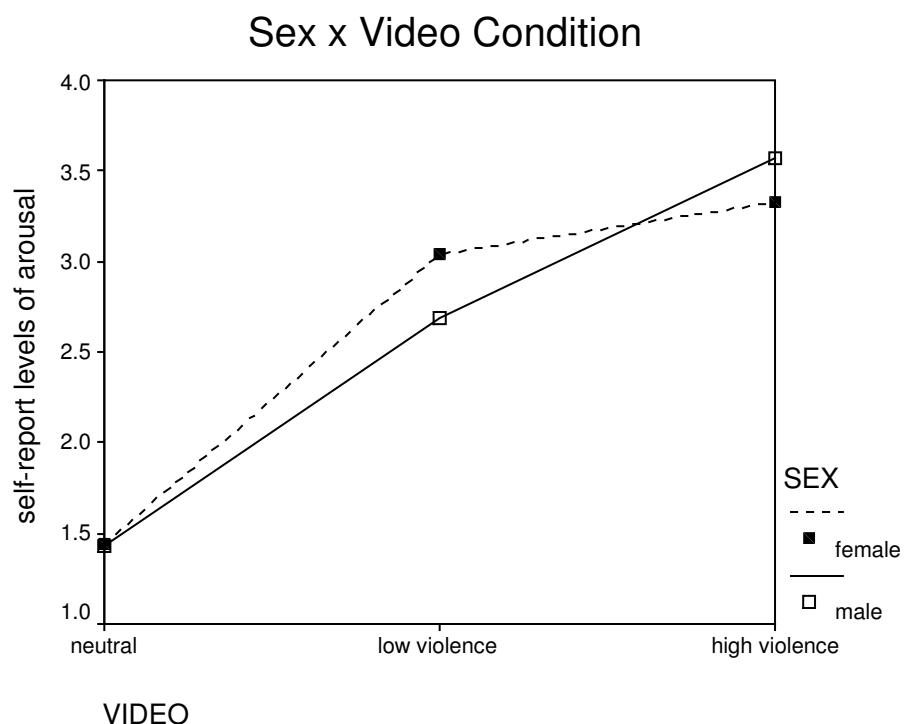


## Hypothesis Two

The second hypothesis predicted that participants' self-reported levels of arousal differed as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. In order to investigate the hypothesis, the same analytic structure was used for the levels of arousal analysis as for the levels of pleasure. The  $2 \times 2 \times 3 \times 2$  (sensation seeking x biological sex x video condition x order of video treatment) repeated-measures ANOVA results showed that there was no significant interaction effect between sensation seeking and video treatments,  $F(2,200) = .445$ ,  $p = .642$ ,  $\eta^2 = .004$ . However, a significant interaction effect was found between biological sex and video treatments,  $F(2,200) = 7.766$ ,  $p = .001$ ,  $\eta^2 = .072$ . Tukey HSD Post hoc analysis revealed that, for male participants, the levels of arousal for the three video-viewing conditions were significantly different from one another ( $p < .01$ ). Male participants reported significantly higher levels of arousal when exposed to high-violence televised sports ( $M = 3.570$ ,  $SD = .106$ ) than when exposed to low-violence televised sports ( $M = 2.687$ ,  $SD = .099$ ) and the neutral content ( $M = 1.435$ ,  $SD = .059$ ). In addition, the levels of arousal were significantly different between watching low-violence televised sports ( $M = 2.687$ ,  $SD = .099$ ) and the neutral content ( $M = 1.435$ ,  $SD = .059$ ). For female participants, the levels of arousal in both high- ( $M = 3.326$ ,  $SD = .106$ ) and low-violence ( $M = 3.039$ ,  $SD = .099$ ) televised sports were significantly higher than when watching the neutral content ( $M = 1.439$ ,  $SD = .059$ ). However, the levels of arousal were undifferentiated between high- ( $M = 3.326$ ,  $SD = .106$ ) and low-violence ( $M = 3.039$ ,  $SD = .099$ ) televised sports for female participants. Contrary to the prediction, there was no significant difference in self-reported levels of arousal between

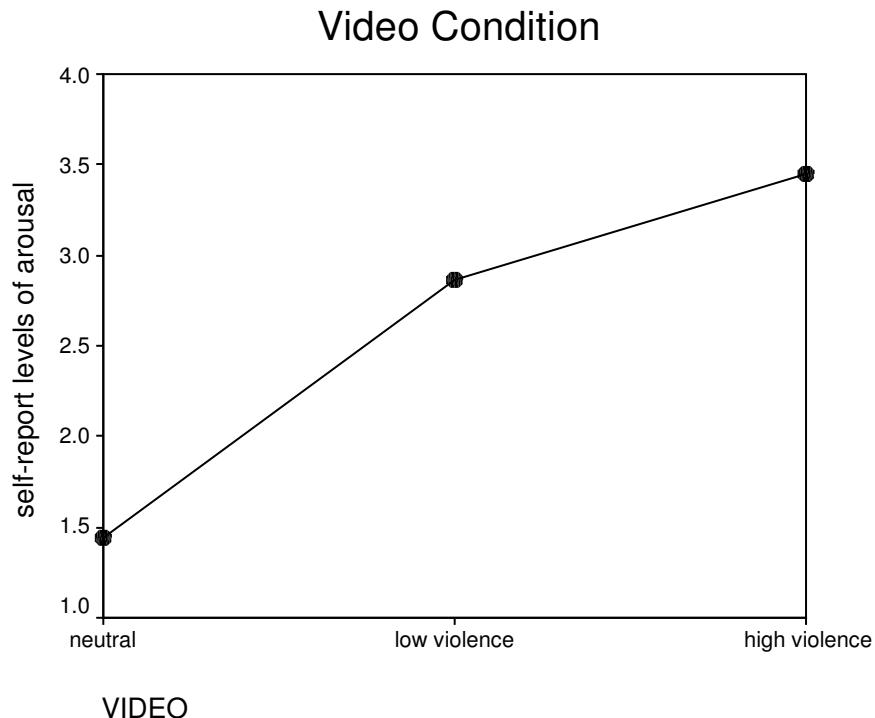
males and females when exposed to high-violence televised sports. However, male participants ( $M = 2.687$ ,  $SD = .099$ ) reported significantly lower levels of arousal when exposed to low-violence televised sports than female participants ( $M = 3.039$ ,  $SD = .099$ ). The biological sex x video interaction for level of arousal is shown in Figure 4.

Figure 4. Significant Interaction Effect of Biological Sex x Video Condition on Levels of Arousal



As expected, the result also revealed a significant video main effect,  $F(2, 200) = 370.234$ ,  $p = .000$ ,  $\eta^2 = .787$ . Participants' self-reported levels of arousal were highest when watching the high-violence televised sports ( $M = 3.448$ ,  $SD = .075$ ), followed by the low-violence televised sports ( $M = 2.863$ ,  $SD = .070$ ), and finally the neutral content ( $M = 1.437$ ,  $SD = .042$ ). Post hoc analysis for the video main effect indicated that each of the paired comparisons was significantly different from one another ( $p < .01$ ). Participants reported significantly higher levels of arousal when watching high-violence televised sports, compared to low-violence televised sports and the neutral content; the differences in the levels of arousal were also statistically significant for low-violence televised sports and the neutral content. The result is consistent with the findings in participants' self-reports levels of pleasure. The video main effect is shown in Figure 5.

Figure 5. Significant Main Effect of Video Condition on Levels of Arousal



### Hypothesis Three

The third hypothesis predicted that participants' mean heart rate (HR) differed as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. In order to investigate this hypothesis, a 2 (sensation seeking) x 2 (biological sex) x 3 (video condition) x 2 (viewing period) x 2 (order of video treatment) ANOVA repeated-measures was conducted, with sensation seeking (HSS vs. LSS), biological sex (males vs. females), and order of video treatment (1 vs. 2) as the between-subjects factors, the video condition (neutral, low-violence, and high-violence) and viewing period (before viewing and during viewing) as the within-subjects factors. The dependent variable was the participants' mean HR. The ANOVA results revealed a significant sensation seeking x biological sex x video condition x order of video treatment interaction effects,  $F(2, 198) = 3.630, p = .028, \eta^2 = .035$ .

In order to further explore the complex nature of this 4-way interaction, the HR data for each of the three video conditions were averaged across the levels of the viewing period, because the viewing period factor does not come into the 4-way interaction. The collapsed HR data were then subjected to a 2 (sensation seeking) x 2 (biological sex) x 3 (video condition) ANOVA repeated-measures for participants for each order. The results revealed a significant 3-way interaction (sensation seeking x biological sex x video condition) only for order 2,  $F(2, 98) = 3.978, p = .022, \eta^2 = .075$ .

Post hoc analysis using Tukey HSD tests for the 3-way interaction indicated that female HSS ( $M = 75.856, SD = 3.105$ ) and LSS ( $M = 77.488, SD = 2.890$ ) both had higher mean HR when exposed to high-violence televised sports than both male HSS ( $M$

= 72.546, SD = 3.105) and LSS ( $M = 74.505$ , SD = 3.231), respectively. The follow-up tests also showed that female LSS ( $M = 77.941$ , SD = 2.657) had higher mean HR when exposed to low-violence televised sports compared to male LSS ( $M = 73.151$ , SD = 2.971). In addition, the mean HR was significantly greater for female HSS ( $M = 76.262$ , SD = 2.956) when exposed to the neutral content than male HSS ( $M = 71.473$ , SD = 2.956). However, for both male and female participants, there was no statistically significant difference in mean HR between HSS and LSS for all three video-treatment conditions. In addition, participants' mean HR were undifferentiated among the three video-viewing conditions for both sensation-seeking groups for both sexes. The sensation seeking x biological sex x video interaction for mean HR is shown in Figure 6 for HSS and figure 7 for LSS.

Figure 6. Significant Interaction Effect of Sensation Seeking x Biological Sex x Video Condition on Mean HR for HSS

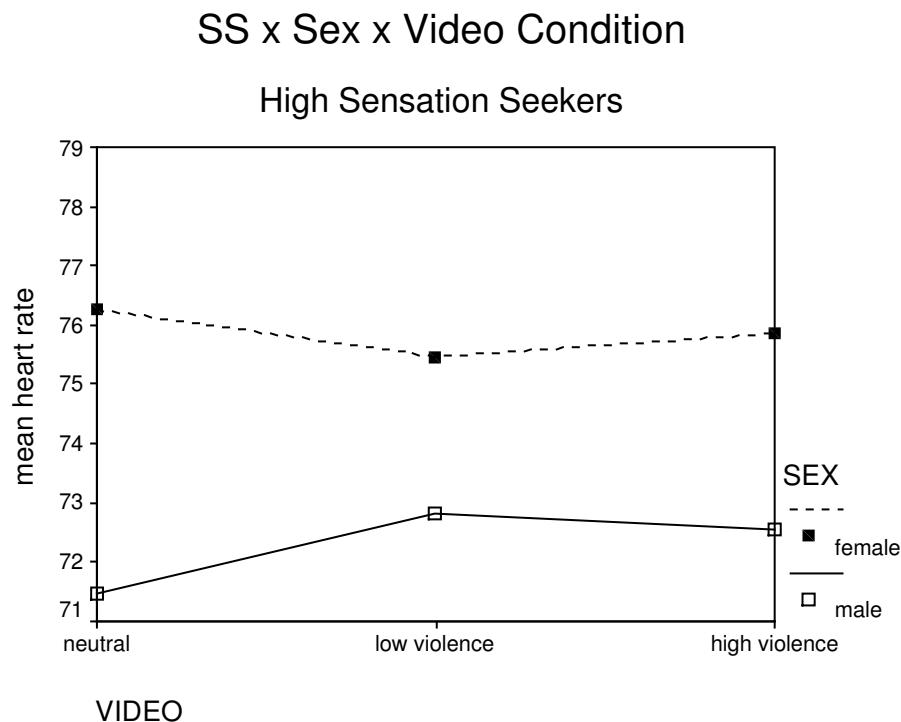
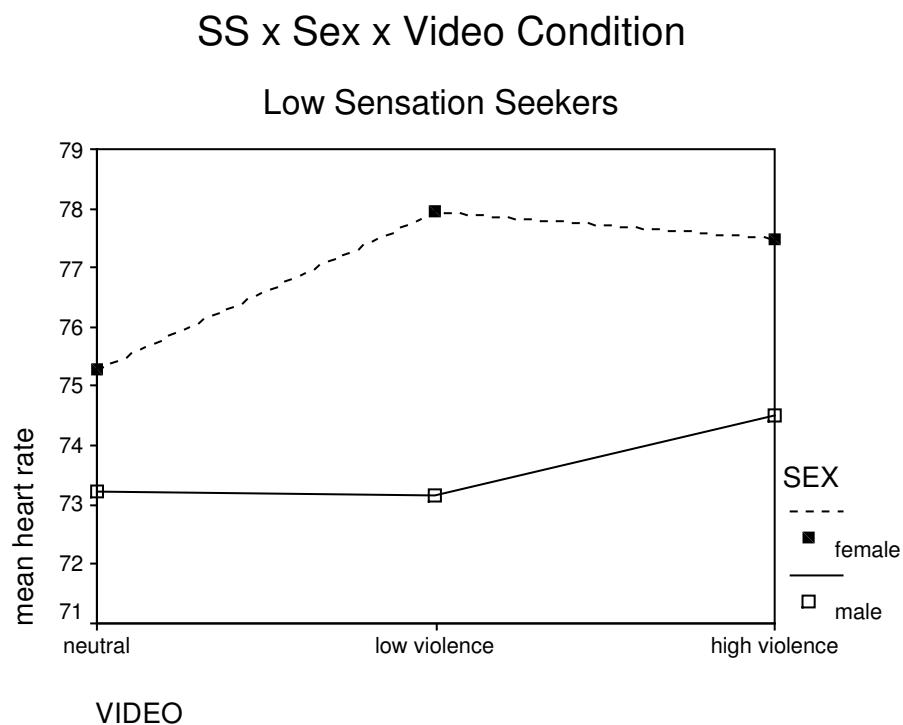
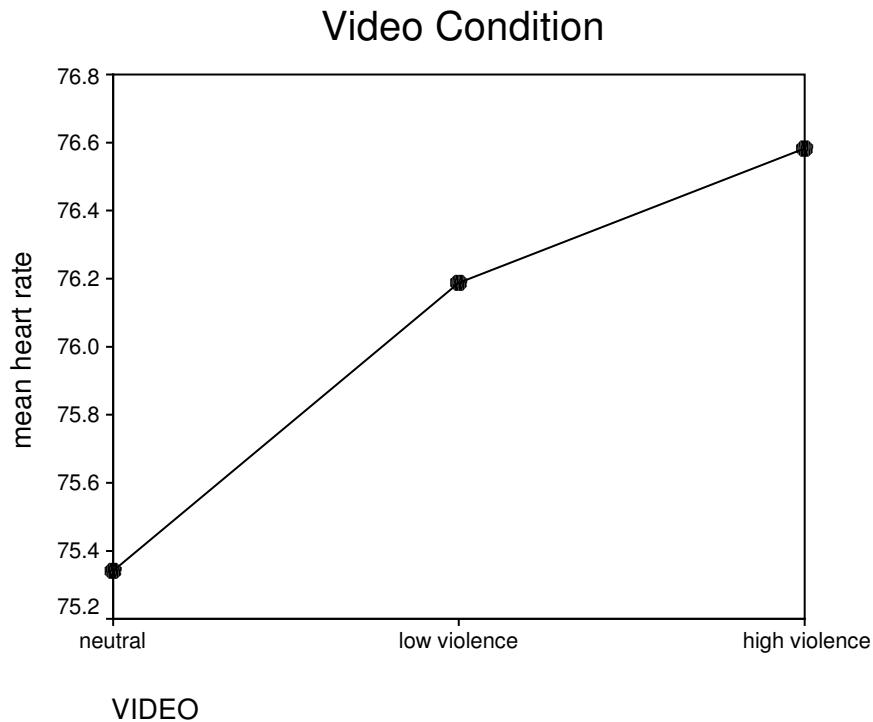


Figure 7. Significant Interaction Effect of Sensation Seeking x Biological Sex x Video Condition on Mean HR for LSS.



The ANOVA results for the mean HR data also revealed a significant video main effect,  $F(2, 198) = 7.940$ ,  $p = .000$ ,  $\eta^2 = .074$ . Although participants' mean HR increased as the level of violence increased, post hoc comparisons using Tukey HSD revealed that the only significant difference in mean HR for participants appeared between watching high-violence televised sports ( $M = 76.582$ ,  $SD = 1.088$ ) and the neutral content ( $M = 75.342$ ,  $SD = 1.062$ ). There was no statistically significant difference in participants' mean HR between watching high-violence ( $M = 76.582$ ,  $SD = 1.088$ ) and low-violence ( $M = 76.189$ ,  $SD = 1.078$ ) televised sports, or between watching low-violence televised sports ( $M = 76.189$ ,  $SD = 1.078$ ) and the neutral content ( $M = 75.342$ ,  $SD = 1.062$ ). This video main effect is shown in Figure 8.

Figure 8. Significant Video Main Effect on Mean HR



#### Hypothesis Four

The fourth hypothesis predicted that participants' mean skin conductance (SC) differed as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. In order to investigate the hypothesis, the same analytic structure was used for the mean SC analysis as for the mean HR. The  $2 \times 2 \times 3 \times 2 \times 2$  (sensation seeking x biological sex x video condition x viewing period x order of video treatment) repeated-measures ANOVA results revealed a significant biological sex x video condition x order of video treatment interaction effect,  $F(2,137) = 5.611, p = .010, \eta^2 = .055$ . For both orders, participants' mean SC levels were lowest when exposed to the first video (low-violence televised sports for order 1 and high-violence televised sports for order 2), followed by the second video (neutral content for both orders), and finally the third video (high-violence televised sports for order 1 and low-violence televised sports for order 2) for both sexes. Post hoc analysis indicated that male participants' mean SC was significantly greater when watching the third video (high-violence for order 1 and low-violence for order 2) than the first video (low-violence for order 1 and high-violence for order 2) for both orders. In addition, the difference in mean SC was significantly higher when exposed to the second video treatment (neutral video) than the first video (low-violence televised sports) for males for order 1 only. However, there was no statistically significant difference in mean SC for female participants among the three video conditions for both orders. For order 1, male participants' mean SC (low-violence:  $M = 1.786, SD = .261$ ; neutral:  $M = 2.447, SD = .254$ ; high-violence:  $M = 2.998, SD = .251$ ) was significantly greater than female participants (low-violence:  $M = 1.015, SD = .256$ ; neutral:  $M = 1.327, SD = .249$ ; high-violence:  $M = 1.633, SD = .245$ ) in all

three video-treatment conditions. The biological sex x video condition x order of video treatment interaction effect is shown in Figure 9 for order 1 and Figure 10 for order 2.

Figure 9. Significant Interaction Effect of Biological Sex x Video Condition x Order of Video Treatment on Mean SC for Order 1

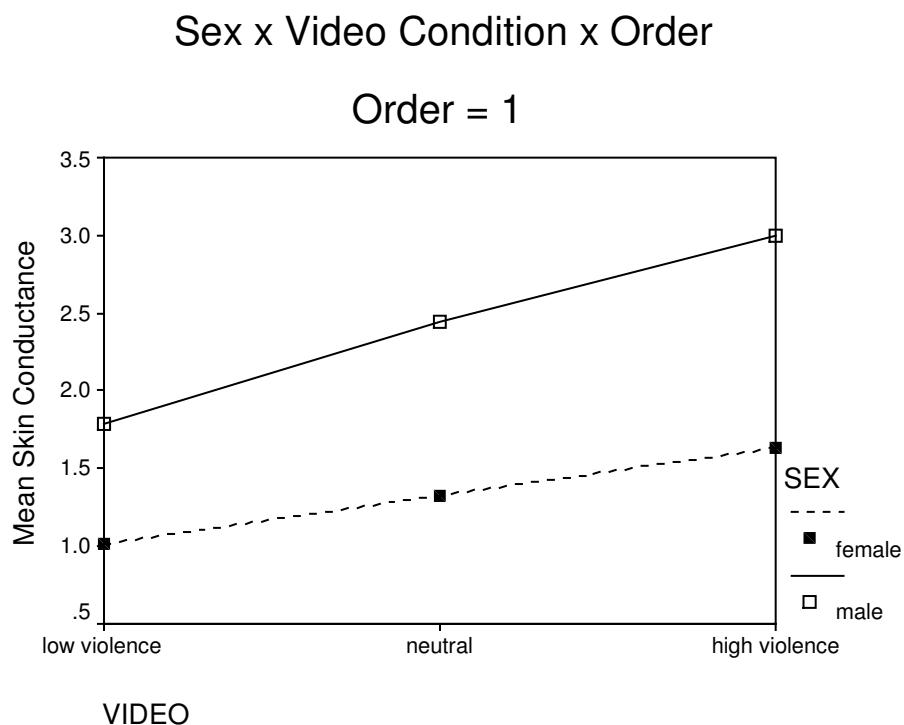
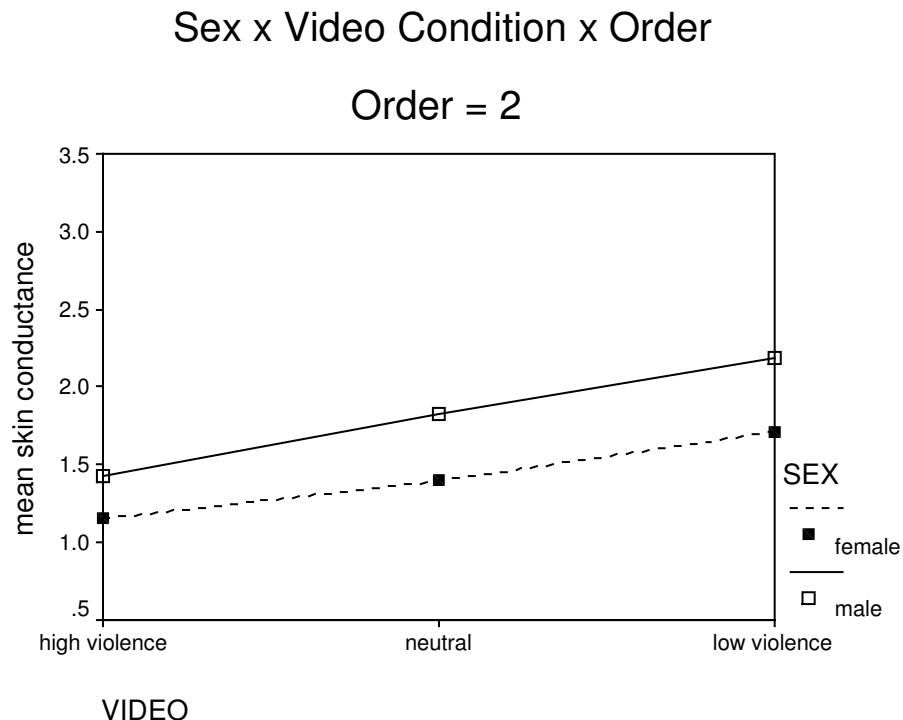


Figure 10. Significant Interaction Effect of Biological Sex x Video Condition x Order of Video Treatment on Mean SC for Order 2



However, the ANOVA results revealed no video main effect for SC data,  $F(2, 137) = 2.428$ ,  $p = .109$ ,  $\eta^2 = .025$ .

## Hypothesis Five

The fifth hypothesis predicted that participants' mean respiration (RSP) differed as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. In order to investigate the hypothesis, the same analytic structure was used for the mean RSP analysis as for the above two physiological measures (mean HR and SC). The  $2 \times 2 \times 3 \times 2 \times 2$  (sensation seeking x biological sex x video condition x viewing period x order of video treatment) repeated-measures ANOVA results showed that there was a significant 4-way interaction effects (sensation seeking x biological sex x video condition x order of video treatment),  $F(2,196) = 4.111$ ,  $p = .018$ ,  $\eta^2 = .040$ .

In order to further examine the complex nature of the 4-way interaction, the RSP data for each of the three video conditions were averaged across the levels of the viewing period, because the viewing period factor does not come into the 4-way interaction. This collapsed RSP data were then subjected to a  $2$  (sensation seeking)  $\times$   $2$  (biological sex)  $\times$   $3$  (video condition) ANOVA repeated-measures for participants for each order. The results revealed a significant 3-way interaction (sensation seeking x biological sex x video condition) only for order 1,  $F(2, 98) = 4.829$ ,  $p = .010$ ,  $\eta^2 = .090$ . Post hoc analysis using Tukey HSD tests for the 3-way interaction indicated that male LSS had higher mean RSP than female LSS when exposed to both low-violence televised sports (males:  $M = 16.271$ ,  $SD = .476$ ; females:  $M = 14.987$ ,  $SD = .458$ ) and neutral content (males:  $M = 15.995$ ,  $SD = .533$ ; females:  $M = 14.478$ ,  $SD = .514$ ). In addition, female HSS ( $M = 15.444$ ,  $SD = .533$ ) had higher mean RSP when exposed to neutral content compared to

female LSS ( $M = 14.478$ ,  $SD = .514$ ). However, there was no significant difference in mean RSP between male HSS and female HSS, or between male HSS and male LSS for all three video conditions. The mean RSP was statistically significant higher when watching high-violence televised sports ( $M = 16.088$ ,  $SD = .480$ ) than the neutral content ( $M = 15.155$ ,  $SD = .533$ ) for HSS males only. Participants' RSP was undifferentiated between watching the high-violence and low-violence televised sports for both HSS and LSS for both sexes. This sensation seeking x biological sex x video condition interaction for mean RSP is shown in Figure 11 for HSS and figure 12 for LSS.

Figure 11. Significant Interaction Effects of Sensation Seeking x Biological Sex x Video Condition on Mean RSP for HSS.

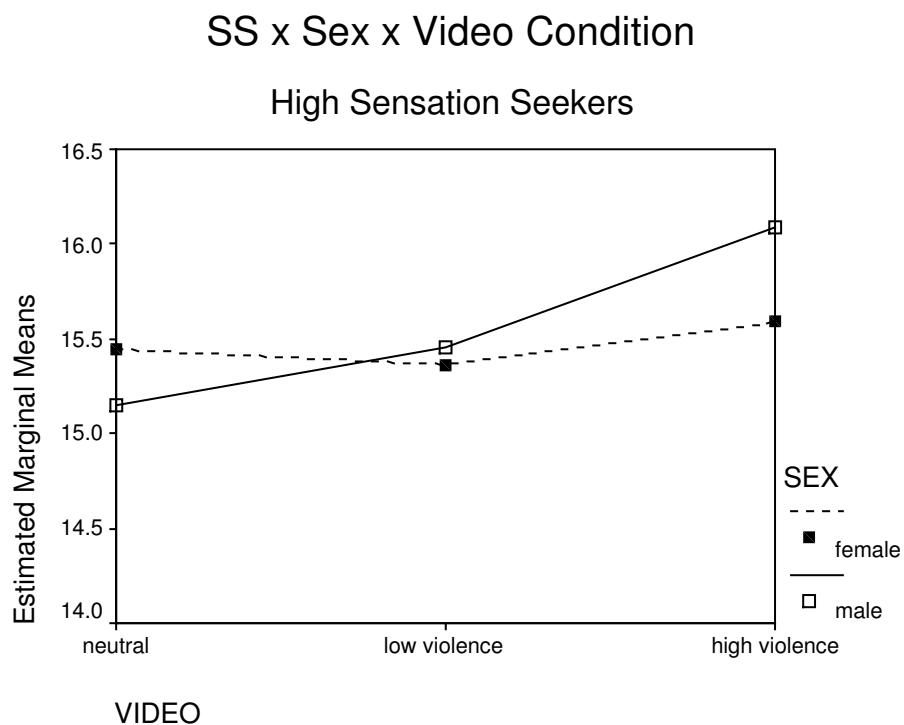
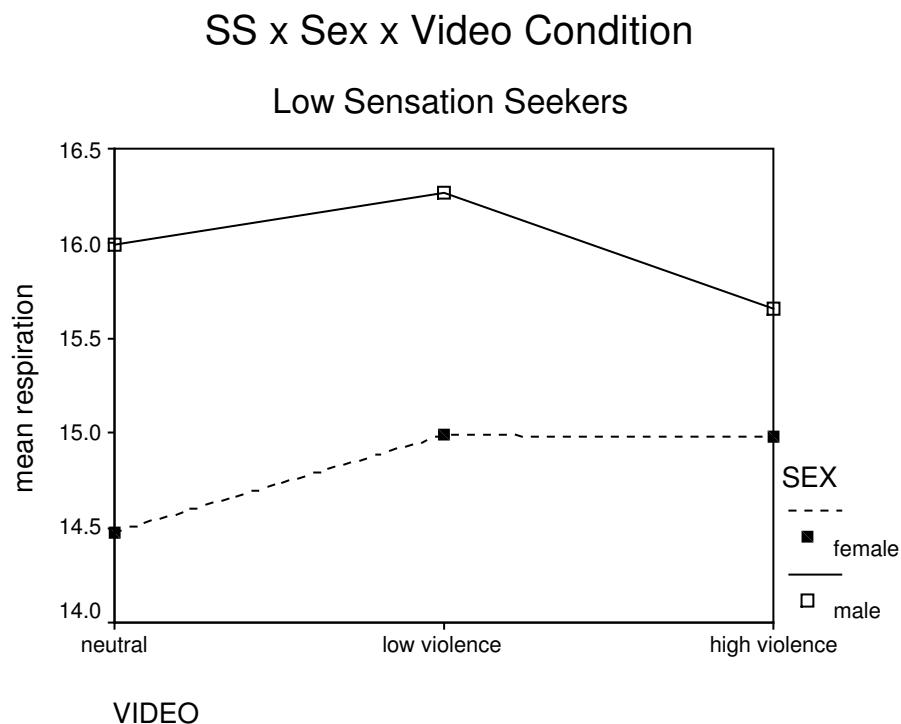


Figure 12. Significant Interaction Effects of Sensation Seeking x Biological Sex x Video Condition on Mean RSP for LSS.



Although the ANOVA results yielded a significant video main effect,  $F(2, 196) = 4.816$ ,  $p = .009$ ,  $\eta^2 = .047$ , post hoc analysis revealed no statistically significant differences in participants' mean RSP among the three video viewing conditions.

### Summary of Hypothesis Testing

Hypothesis One predicted that participants' self-reported levels of pleasure differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. This hypothesis was partially supported. Table 6 summarizes Hypothesis One.

Table 6: Summary of the Hypothesis One

H1: Participants' self-reported levels of pleasure differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.	Finding	Supported
H1a: High sensation seekers will report significantly higher levels of pleasure when watching high-violence televised sports as compared to watching low-violence televised sports.	H > N L > N	NO
H1b: High sensation seekers will report significantly higher levels of pleasure when watching high-violence televised sports as compared with low sensation seekers.	n.s.	NO
H1c: High sensation seekers will report significantly lower levels of pleasure when watching low-violence televised sports as compared with low sensation seekers.	n.s.	NO
H1d: Male participants will report significantly higher levels of pleasure when watching high-violence televised sports as compared to watching low-violence televised sports.	H > L > N	YES
H1e: Male participants will report significantly higher levels of pleasure when watching high-violence televised sports as compared with female participants.	M > F	YES
H1f: Male participants will report significantly lower levels of pleasure when watching low-violence televised sports as compared with female participants.	n.s.	NO
H1g: Participants will report significantly higher levels of pleasure when watching high-violence televised sports as compared to watching low-violence televised sports.	H > L > N	YES

*Note. H=high-violence; L=low-violence; N=neutral content; n.s.=not significant;  
HSS= high sensation seekers; LSS=low sensation seekers; M=males; F=females*

Hypothesis Two predicted that participants' self-reported levels of arousal differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. This hypothesis was partially supported. Table 7 summarizes Hypothesis Two.

Table 7: Summary of the Hypothesis Two

H2: Participants' self-reported levels of arousal differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.	Finding	Supported
H2a: High sensation seekers will report significantly higher levels of arousal when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO
H2b: High sensation seekers will report significantly higher levels of arousal when watching high-violence televised sports as compared with low sensation seekers.	n.s.	NO
H2c: High sensation seekers will report significantly lower levels of arousal when watching low-violence televised sports as compared with low sensation seekers.	n.s.	NO
H2d: Male participants will report significantly higher levels of arousal when watching high-violence televised sports as compared to watching low-violence televised sports.	$H > L > N$	YES
H2e: Male participants will report significantly higher levels of arousal when watching high-violence televised sports as compared with female participants.	n.s.	NO
H2f: Male participants will report significantly lower levels of arousal when watching low-violence televised sports as compared with female participants.	$F > M$	YES
H2g: Participants will report significantly higher levels of arousal when watching high-violence televised sports as compared to watching low-violence televised sports.	$H > L > N$	YES

*Note. H=high-violence; L=low-violence; N=neutral content; n.s.=not significant;  
HSS= high sensation seekers; LSS=low sensation seekers; M=males; F=females*

Hypothesis Three predicted that participants' mean HR differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. This hypothesis was partially supported. Table 8 summarizes Hypothesis Three.

Table 8: Summary of the Hypothesis Three

H3: Participants' mean HR differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.	Finding	Supported
H3a: High sensation seekers will exhibit a significantly higher mean HR when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO
H3b: High sensation seekers will exhibit a significantly higher mean HR when watching high-violence televised sports as compared with low sensation seekers.	n.s.	NO
H3c: High sensation seekers will exhibit a significantly lower mean HR when watching low-violence televised sports as compared with low sensation seekers.	n.s.	NO
H3d: Male participants will exhibit a significantly higher mean HR when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO
H3e: Male participants will exhibit a significantly higher mean HR when watching high-violence televised sports as compared with female participants.	F > M for both HSS & LSS	NO
H3f: Male participants will exhibit a significantly lower mean HR when watching low-violence televised sports as compared with female participants.	F > M LSS only	Partially
H3g: Participants will exhibit a significantly higher mean HR when watching high-violence televised sports as compared to watching low-violence televised sports.	H > N	NO

*Note. H=high-violence; L=low-violence; N=neutral content; n.s.=not significant;  
HSS= high sensation seekers; LSS=low sensation seekers; M=males; F=females;*

Hypothesis Four predicted that participants' mean SC differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. This hypothesis was partially supported. Table 9 summarizes Hypothesis Four.

Table 9: Summary of the Hypothesis Four

H4: Participants' mean SC differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.	Finding	Supported
H4a: High sensation seekers will exhibit a significantly higher mean SC when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO
H4b: High sensation seekers will exhibit a significantly higher mean SC when watching high-violence televised sports as compared with low sensation seekers.	n.s.	NO
H4c: High sensation seekers will exhibit a significantly lower mean SC when watching low-violence televised sports as compared with low sensation seekers.	n.s.	NO
H4d: Male participants will exhibit a significantly higher mean SC when watching high-violence televised sports as compared to watching low-violence televised sports.	Order 1: H>L; N>L Order 2: L > H	Partially
H4e: Male participants will exhibit a significantly higher mean SC when watching high-violence televised sports as compared with female participants.	M > F.	YES
H4f: Male participants will exhibit a significantly lower mean SC when watching low-violence televised sports as compared with female participants.	M > F	NO
H4g: Participants will exhibit a significantly higher mean SC when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO

*Note. H=high-violence; L=low-violence; N=neutral content; n.s.=not significant;  
HSS= high sensation seekers; LSS=low sensation seekers; M=males; F=females;*

Hypothesis Five predicted that participants' mean RSP differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports. This hypothesis was not supported. Table 10 summarizes Hypothesis Five.

Table 10: Summary of the Hypothesis Five

H5: Participants' mean RSP differ as a function of their level of the sensation-seeking trait, biological sex, and the level of violence in televised sports.	Finding	Supported
H5a: High sensation seekers will exhibit a significantly higher mean RSP when watching high-violence televised sports as compared to watching low-violence televised sports.	H > N HSS males only	NO
H5b: High sensation seekers will exhibit a significantly higher mean RSP when watching high-violence televised sports as compared with low sensation seekers.	n.s.	NO
H5c: High sensation seekers will exhibit a significantly lower mean RSP when watching low-violence televised sports as compared with low sensation seekers.	n.s.	NO
H5d: Male participants will exhibit a significantly higher mean RSP when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO
H5e: Male participants will exhibit a significantly higher mean RSP when watching high-violence televised sports as compared with female participants.	n.s.	NO
H5f: Male participants will exhibit a significantly lower mean RSP when watching low-violence televised sports as compared with female participants.	M > F LSS only	NO
H5g: Participants will exhibit a significantly higher mean RSP when watching high-violence televised sports as compared to watching low-violence televised sports.	n.s.	NO

*Note. H=high-violence; L=low-violence; N=neutral content; n.s.=not significant;  
HSS= high sensation seekers; LSS=low sensation seekers; M=males; F=females;*

## Testing of Exploratory Questions

### Exploratory Question One

The first exploratory question analyzed the interrelationships of the personality trait of sensation-seeking, biological sex, and participants' levels of football fanship. As mentioned above, participants' levels of football fanship was significantly positively correlated with the personality trait of sensation seeking and biological sex (See Table 3). In order to determine whether the football fanship differs between the HSS and LSS and between males and females, a two-way ANOVA (sensation seeking x biological sex) was conducted with participants' self-reported football fanship as the dependent variable. The results indicated significant main effects for both sensation seeking,  $F(1, 106) = 7.635, p = .007, \eta^2 = .067$ , and biological sex,  $F(1, 106) = 6.226, p = .014, \eta^2 = .055$ . The means presented in Table 11 illustrate the significant differences in football fanship as a function of sensation seeking and biological sex. HSS ( $M=3.936, SD=.138$ ) reported a significantly higher mean score for football fanship than did LSS ( $M=3.407, SD=.133$ ). In addition, males ( $M=3.910, SD=.137$ ) reported a significantly higher mean score for football fanship than did females ( $M=3.432, SD=.134$ ).

Table 11. ANOVA Results: Football Fanship by Sensation Seeking and Biological Sex.

	LSS	HSS	All
Female	M=3.128 SD = .186 n = 29	M=3.737 SD = .193 n = 27	M=3.432 <sup>c</sup> SD = .134 n = 56
Male	M=3.686 SD= .190 n = 28	M=4.135 SD= .197 n = 26	M=3.910 <sup>d</sup> SD= .137 n = 54
All	M= 3.407 <sup>a</sup> SD= .133 n = 57	M=3.936 <sup>b</sup> SD= .138 n = 53	M=3.671 SD= .096 n = 110

Note: Means with dissimilar lettered superscripts (a, b) differ significantly from one another at  $p < .01$ . Means with dissimilar superscript symbols (c, d) differ significantly from one another at  $p < .05$ .

### Exploratory Question Two

The second exploratory question examined the relationship between participants' football fanship and their emotional and physiological responses when exposed to different levels of violence. Pearson correlation analysis revealed that participants' football fanship was significantly positive correlated with their self-reported pleasure, arousal, and SC for both high- and low-violence televised football. These correlations are reported in Table 12.

Table 12. Correlation Between Football Fanship and Participants' Self-Reported Pleasure, Arousal, and Physiological Measures

	Neutral	Low-Violence	High-Violence
Football Fanship			
Pleasure	-.156	.430**	.565**
Arousal	-.200*	.162*	.435**
HR	.000	-.026	-.033
SC	.166*	.204*	.214*
RSP	.092	.103	.107

\* Correlation is significant at the .05 level (one-tailed).

\*\* Correlation is significant at the .01 level (one-tailed).

### Exploratory Question Three

The third exploratory question asked about the relationship between the personality trait of sensation seeking and participants' self-reported frequency of attendance at football games and the frequency of watching televised football. Pearson correlation analysis revealed that ImpSS scores were significantly correlated with participants' self-reported frequency of attendance at football games and frequency of watching football on television for both males and female. These correlations are reported in Table 13.

Table 13. Correlation Between Sensation Seeking and Participants' Self-Reported Frequency of Attendance at Football Games and Frequency of Viewing Televised Football

	Sensation seeking	Attendance	TV viewing
(Males)			
Sensation seeking	1	.192**	.125*
Attendance		1	.560**
TV viewing			1
(Females)			
Sensation seeking	1	.154*	.263**
Attendance		1	.557**
TV viewing			1

\* Correlation is significant at the .05 level (one-tailed).

\*\* Correlation is significant at the .01 level (one-tailed).

#### Exploratory Question Four

The fourth exploratory question inquired into the relationship between participants' self-reported levels of arousal and pleasure when exposed to different levels of televised football violence. A test of correlation was performed to identify the relationship between the two self-reported emotional responses for each video condition. Results indicated that arousal and pleasure were significantly correlated for all three video-viewing conditions. The positive correlation indicated that increases in arousal

were associated with greater pleasure—as the intensity of arousal increased, levels of pleasure also increased. In addition, correlations were also performed between self-reported levels of arousal and pleasure for HSS and LSS separately. Results indicated that positive correlations between arousal and pleasure tend to be more pronounced for HSS for all three video conditions. For LSS, there was no significant correlation between arousal and pleasure during neutral and low-violence televised sports viewing, with an exception of positive correlations in high-violence televised sports viewing. Those correlations are reported in Table 14.

Table 14. Correlation Between the Self-Reported Level of Arousal and Pleasure by Video Condition

	Neutral			Low-Violence			High-Violence		
	Self-Reported Arousal								
	LSS	HSS	Total	LSS	HSS	Total	LSS	HSS	Total
<b>Self-Reported Pleasure</b>									
Neutral		.213		.282*	.372**				
Low-Violence					.207		.538**	.307**	
High-Violence							.490**	.399**	.456**

\* Correlation is significant at the .05 level (one-tailed).

\*\* Correlation is significant at the .01 level (one-tailed).

### Exploratory Question Five

The fifth exploratory question examined the relationship between the personality trait of sensation seeking and participants' physiological baseline measures before testing. Correlations between participants' levels of sensation seeking and physiological baseline measures (HR, SC, and RSP) before experimental treatment were calculated. Results showed that there was no significant correlation between participants' sensation seeking and their baseline on all three physiological measures. These correlations are shown in Table 15.

Table 15. Correlation Between Sensation Seeking (ImpSS Scale) and Participants' Physiological Baseline Measures

	Heart Rate	Skin Conductance	Respiration
Sensation Seeking	.000	.046	- .040

\* Correlation is significant at the .05 level (two-tailed).

\*\* Correlation is significant at the .01 level (two-tailed).

Furthermore, ANOVAs were conducted to determine whether the physiological baseline measures taken before testing differed between the HSS and LSS groups. The results indicated that there was no significant difference between HSS and LSS for the baseline measure on mean HR,  $F(1, 100) = .189$ ,  $p = .665$ , or mean SC,  $F(1, 96) = 2.527$ ,

$p = .115$ , or mean RSP,  $F(1, 100) = .787$ ,  $p = .377$ . Means and standardized deviations are shown in Table 16.

Table 16. Mean and Standardized Deviations for Physiological Baseline Measures, by Sensation Seeking Groups

	LSS	HSS
HR baseline	M=76.1612 SD=1.6444 n=51	M=77.1835 SD=1.6855 n=51
SC baseline	M=.9176 SD=.6706 n=49	M=1.1878 SD=.9827 n=49
RSP baseline	M=14.7614 SD=2.2731 n=51	M=14.3120 SD=2.8133 n=51

### Exploratory Question Six

The last exploratory question investigated the relationship between participants' subjective self-reported arousal and their objective physiological arousal. Pearson correlation analysis revealed a nonsignificant correlation between self-reported arousal and any of the three physiological measures (HR, SC, and RSP) for all three video viewing conditions for participants as a whole, indicating that there was no association between participants' subjective self-reported arousal and their objective physiological arousal. For HSS, self-reported arousal showed a positive correlation with SC and RSP when exposed to high-violence televised football. For LSS, self-reported arousal was positively related to SC when exposed to high-violence televised football. Tests of correlation are reported in Table 17.

Table 17. Correlation Between the Physiological Measures and Self-Reported Arousal,  
by Video Conditions

	Neutral			Low-Violence			High-Violence		
	Self-Reported Arousal								
	LSS	HSS	Total	LSS	HSS	Total	LSS	HSS	Total
<b>Neutral</b>									
HR	.124	-.141	.009						
SC	-.048	.173	.057						
RSP	-.049	-.126	-.119						
<b>Low-Violence</b>									
HR				.110	.116	.073			
SC				.213	-.018	.110			
RSP				-.032	.170	.061			
<b>High-Violence</b>									
HR							-.138	-.066	-.151
SC							.338**	.275*	.150
RSP							.051	.275*	.134

\* Correlation is significant at the .05 level (one-tailed).

\*\* Correlation is significant at the .01 level (one-tailed).

### Summary of Exploratory Questions

Table 18. Summary of Exploratory Questions

Exploratory Questions	Finding
Q1: What is the relationship among the personality trait of sensation seeking, biological sex, and participants' levels of football fanship?	Positive Correlation
Q2: What is the relationship between participants' football fanship and their emotional and physiological responses when exposed to different levels of violence in televised sports.	Positive Correlation (pleasure, arousal, and SC for both high- and low-violence televised sports).
Q3: What is the relationship, for both sexes, between the personality trait of sensation seeking and participants' self-reported frequency of attendance at football games and frequency of viewing football on television?	Positive Correlation
Q4: What is the relationship between participants' self-reported levels of pleasure and arousal and the level of televised sports violence?	Positive Correlation
Q5: What is the relationship between the personality trait of sensation seeking and participants' baseline physiological measures?	No Correlations
Q6: What is the relationship between participants' subjective self-reported arousal and their objective physiological arousal?	No Correlations

## CHAPTER V

### DISCUSSION

The attraction of violent sports is not new. It can be traced back to gladiators and chariot racers in ancient times (Guttmann, 1983; 1986; Zillmann & Paulus, 1993). However, no theory-based explanation for the attraction has been fully developed.

One personality variable, which has been used in the context of media violence consumption and preferences for televised sports, and which seems to hold promise for understanding the attraction of violent spectacles is Zuckerman's *sensation-seeking theory*. Based on a biologically determined personality trait, the theory of sensation seeking asserts that an individual's need for stimulation and arousal may account for his/her preferences for, enjoyment of, and responses to media violence (Zuckerman, 1994). Some researchers suggest that this trait might also account for sex differences in media tastes (e.g., McDaniel, 2003; Zuckerman, 1988). Although previous studies, using survey methodology, have found that the preference for violent-combative televised sports is associated with sensation seeking (i.e., Krcmar & Greene, 1999; McDaniel, 2003), it is not certain that the violent content is what sensation seekers are attracted to. Therefore, using an experiment designed to systematically manipulate the levels of violence in televised sports, this study sought to test the ability of the sensation-seeking theory to explain individual differences in emotional and physiological responses to violence in televised sports, as well as to test that theory's ability to account for sex differences in those responses. Five main hypotheses were proposed to determine whether viewers' emotional and physiological responses to violent action in televised

American football differ among individuals having different levels of the personality trait of sensation seeking and between males and females.

This chapter discusses and summaries the results of the study, followed by a discussion of the study's limitations and suggestions for future research. The chapter concludes with a summary of the significance of this study.

### Discussion of the Results

#### The Influence of Sensation Seeking

According to Zuckerman (1988), "...sensation seekers' preferences should be related to the arousal potential of sensations or experiences" (p.175). Given the highly arousing nature of sports violence, the experience of watching such content should be a rewarding, pleasurable experience for sensation seekers. Exposure to sport violence might serve as a source of external stimulation that sensation seekers use to attain their desired levels of arousal. Sensation seeking might be the "fundamental biological mechanisms" (Zuckerman, 1988, p.174) that underlie people's innate attraction to the consumption of televised sports violence.

Therefore, this study hypothesized that, when watching high levels of sports violence, high sensation seekers (HSS) would report higher levels of pleasure and arousal, as well as elicit stronger physiological responses—heart rate (HR), skin conductance (SC), and respiration (RSP)—than both low sensation seeker (LSS) watching high levels of sports violence, as well as HSS watching low levels of sports violence. On the other hand, when watching low levels of sports violence, HSS would

report lower levels of pleasure and arousal, as well as elicit lesser physiological responses than LSS. The magnitude of difference in pleasure level, arousal level, and physiological responses between viewing high-violence and low-violence televised sports was expected to be greater in HSS than in LSS.

Contrary to prediction, the hypotheses that emotional and physiological response would differ between HSS and LSS were not supported. The data in the current research indicated no significant differences in emotional (self-reported levels of pleasure or arousal) and physiological responses (HR, SC, and RSP) between HSS and LSS in any of the three levels of violence. However, HSS reported higher levels of pleasure (for both sexes) and exhibited fast mean RSP (males only) when watching high-violence televised sports than neutral content, and the pleasure level was significantly higher for HSS (for both sexes) when watching low-violence televised sports than neutral content. Overall, when exposed to either high- or low-violence televised sports, the emotional and physiological responses of the HSS were not different from those of the LSS. The LSS, just as the HSS, reported high levels of pleasure when watching high-violence televised sports, and both groups had similar arousal levels, based on both their self-reports and physiological measurements, in response to high- or low-violence televised sports. Apparently, HSS and LSS responded similarly and equally enjoyed high- and low-violence plays.

The results, then, fail to support the sensation-seeking theory as an explanation for individual differences in emotional and physiological responses to televised sports violence. Several possible explanations can be suggested for that result, including (1) the use of ImpSS scale; (2) the influences of football fanship; (3) the differences in cognitive

appraisal system; (4) certain characteristics of the treatment stimuli; (5) the influences of race/ethnicity; (6) the influences of psychological states.

ImpSS scale. It is possible that the lack of significant difference in emotional and physiological responses to televised sports violence between HSS and LSS was caused by the use of the ImpSS scale rather than the SSS form V. Zuckerman (1994) suggested that sensation seeking is incorporated within a broad trait—*impulsive sensation seeking*, and the dimensions of sensation seeking and impulsiveness show behavioral and biological correlates (Zuckerman, 1994). It is possible that the attraction to media violence is associated with the sensation-seeking trait but not the impulsive personality. That possibility can be supported by research examining the relationship between sensation seeking and sports participation (Jack & Ronan, 1998), which found that sensation-seeking tendencies were positively related to participation in risk sports, but that the impulsive personality did not differentiate between high- and low-risk sport participants. Therefore, it is possible that the combination of sensation seeking and impulsivity failed to account for differences in the reactions to sports violence. Perhaps a different measurement tool for sensation seeking would produce a different result. Future sensation-seeking research on the effects of media exposure might compare the two versions of the scale to account for any differences, given that it is uncertain to what degree the ImpSS scale can be regarded as comparable to the SSS scale form V.

Fanship. A partial explanation, at least, for finding no difference between the sensation-seeking groups might be function of fanship. Previous research has shown that the enjoyment of sport contests varies by fanship in that avid sports fans reported

significantly greater enjoyment than did nonfans (e.g., Branscombe & Wann, 1992; Rayburn, 1998; Sullivan, 1991; Zillmann et al., 1989). Data from the current study also support that observation, in that football fandom is correlated positively with viewers' self-reports of pleasure, arousal, and SC for both high- and low-violence televised football (Exploratory Question Two). Perhaps the relationship between sensation seeking and responses to the video was confounded by the trait's influence on participants' own interests or past exposure to sports (particularly football). For example, data from the current study showed that football fandom differs between HSS and LSS and between males and females (Exploratory Question One), and that sensation seeking correlated positively with attendance of football games in stadium and watching football on television for both sexes (Exploratory Question Three). It could be that HSS become habituated more and respond less to violent plays because they experience it frequently from the media and in person. Or it could be that HSS become insensitive to violent plays because they have become desensitized by repeated exposure to football in stadiums and on television. According to desensitization theory, repeated exposure to media violence decrease the sensitivity to violence on the screen. Perhaps watching more football games makes HSS less sensitive to violent plays and thus leads to less arousal and less pleasure.

In addition, it is possible that avid football fans rated the plays according to how they felt about the sport; that is, reflecting their preference for the game as a whole, rather than their emotional reaction to the different levels of violence employed in the experiment. Support for that possibility came from the data in the present study, which

found that HSS enjoyed both high- and low-violent televised football videos more than the neutral-content video.

Moreover, it could be that fans are more knowledgeable about football and would appreciate the non-violent aspects of the game. Previous studies have found that spectators are attracted to stylistic sports, such as gymnastics, diving, and figure skating, because of the inherent aesthetic nature of a performance (Sargent, Zillmann, & Weaver, 1998; Sloan, 1989; Wann, Melnick, Russell, & Pease, 2001; Zillmann & Paulus, 1993). However, the appreciation of the aesthetic component of a sporting contest is not limited to fans of stylistic sports. Fans of other types of sports may also enjoy the aesthetic beauty and grace of athletic body movements. Football fans, for instance, may enjoy the artistry of difficult catches by wide receivers (Wann, Melnick, Russell, & Pease, 2001). Wann and Wilson (1999) conducted two studies to investigate the relationship between spectators' aesthetic motivation and watching aggressive sports. For the first investigation, researchers had college students complete a questionnaire assessing their level of aesthetic motivation and enjoyment of watching seven aggressive sports (football, hockey, professional and amateur wrestling, martial arts, boxing, and rugby). Researchers hypothesized a negative relationship between spectators' aesthetic motivation and the enjoyment of aggressive sports. However, the study showed that the correlation between the two variables was not significant. For the second investigation, the college students first completed an inventory gauging their level of aesthetic motivation and then rated their enjoyment while watching five violent football plays. Consistent with the first study, the result did not support a significant negative relationship between aesthetic motivation and enjoyment of violent plays. The

investigators suggested that fans of aggressive sports might also enjoy the aesthetic features of those sports. Therefore, since sensation seeking is positively related to football fanship, sensation seekers might enjoy both low-violence plays and highly violent plays.

The main purpose of this study was to test the arousal model of sensation-seeking theory as an explanation for viewers' emotional and physiological responses to televised sports violence. Arousal was measured in two ways: self-reports of emotion and measurements of physiological arousal (HR, SC, and RSP). The non-significant differences between HSS and LSS in both objective and subjective arousal might have been partly caused by the interaction of emotion and attention to the stimuli treatment. Previous research suggested the decelerations of HR and/or electrodermal activity indicate the attentional engagement to external stimuli and the accelerations show affective arousal (Lacey & Lacey, 1970; Lang, 1990; 1994). It is possible that, while viewing the plays some participants, particularly highly committed fans, might have engaged in cognitive processes, such as trying to identify the teams or the players, which could have reduced their physiological and emotional involvement.

Given that the level of psychological involvement with a sport is known to play a significant role in viewers' responses, it is not surprising that fans who identified with football would enjoy both the high- and low-violence plays (Exploratory Question Two). However, this study did not use viewers' fanship as a covariate because of the significant positive correlation between the football fanship and the independent variables (participants' sensation- seeking trait and biological sex). As mentioned previously, it

would be inappropriate to use a variable as a covariate if there were an interaction effect between it and the independent variable (Hinkle, Wiersma, & Jurs, 1998; Tabachnick & Fidell, 2001). Future research could consider the use of fanship as a between-subjects factor to better understand the relationship between spectators' personality characteristics and their responses to sports violence.

Cognitive Appraisal System. Another possibility might reflect the different cognitive appraisal system between HSS and LSS. For example, Zuckerman (1988; 1994) suggested that HSS tend to underestimate risk; the LSS, to overestimate it. It is possible that HSS perceived the violent football plays as less violent than they were, analogous to their tendency to underestimate risk. Perhaps differences in the appraisal systems of the HSS and the LSS contributed to the results of this study. Perhaps the highly violent football plays were perceived as less violent to the HSS but more so by the LSS. That speculation needs to be further examined, since the perception of violence was not measured in this research.

Treatment Stimuli. Another explanation for the absence of differences in responses to televised sports violence between sensation-seeking groups might stem from the nature of the television medium. Television viewing is a passive activity, especially for sensation seekers. Possibly HSS might find that vicarious thrills lack the level of stimulation and arousal that they get from real life experiences.

A further explanation might pertain to the nature of televised sports. Sports programs are a unique blend of characteristics distinguishing them from other entertainment programs. They are unscripted, with unpredictable outcomes, and real and

exciting (Bellamy, 1998; Gantz, 1981; Wenner & Gantz, 1989; 1998). Possibly, then, sensation seekers are attracted to the drama and intensity that are usually coupled with violent action and not just watching violence for its own sake. Perhaps sports violence alone is not sufficient to arouse and attract sensation seekers. Also, it is likely that the regimen of watching unrelated, recorded football plays in an experimental setting is less exciting to sensation seekers than viewing a live broadcast of a football game on television.

It is also possible that participants who watch football games have the expectation of extremely violent action. Bryant, Comisky, and Zillmann (1981) suggested that, “in so-called contact sports, violent behavior is expected. Even excessive violence is expected” (p. 261). Moreover, the media’s heavy focus on player violence may also contribute to that expectation. For instance, Trujillo (1995) analyzed the media portrayals of Monday Night Football and revealed that broadcasts highlighted violent acts, repeatedly showing close-ups and slow-motion replays. Furthermore, television coverage of violent versus non-violent plays is quite unequal. Non-violent plays are seldom reshown, except in the case of controversial or dispute calls by the referees; violent plays, by contrast, are reshown repeatedly, from various angles, given the advantage of multiple cameras and ever-improving photographic technology. The football plays employed in the current study were the live action from televised football games, and each play was shown only once—without slow-motion replays. It is possible that the segments were not substantively salient for sensation seekers, compared to what they usually saw on television, and therefore were unable to provide adequate stimulation.

The pilot work for this study showed that high-violence football stimuli were judged to have significantly higher levels of physical contact among the players than the low-violence football stimuli. The results of the main experiment showed that the manipulation of each stimulus treatment had been successful in creating different levels of arousal as a function of video conditions; and increased arousal was associated with greater pleasure, especially for HSS (Exploratory Question Four). However, the failure to find differences in emotional and physiological responses between HSS and LSS after exposure to sports violence may suggest that the difference in the level of violence between the two football treatment conditions was not great enough to produce an observable effect on the responses. It should be noted that all the plays selected for this study were within the rules of the game, and that no player was injured in the action. Perhaps those kinds of plays do not provide adequately intense stimulation to arouse HSS unless the plays portray violent activity resulting in injury or fighting. Frost and Stauffer (1987) investigated filmed violence and found that less-serious types of violence, such as assaults and destruction of property, caused less arousal, and that the most arousing forms of violence were depictions of homicide. Results from the current study showed that HSS reported more enjoyment from watching highly violent football plays than from watching neutral-content video, and that they even enjoyed watching low-violence plays more than neutral-content video. However, there was no significant difference in HSS's enjoyment between high- and low-violence football plays. It is possible that variance of violence between the plays was too small for the data analysis. That might indicate the need for future research to increase the violent stimuli to the highest intensity, in order to maximize the differences between high- and low-violence conditions.

In the current study, the degree of violence varied, but the other aspects—number and types of play and total number of yards gained—stayed the same. However, given the complexity of television stimuli, the lack of significantly different responses between sensation-seeking groups might reflect the difficulty in differentiating the potentially confounding effects of visual stimuli (e.g., physical violent play) and auditory (e.g., commentary, crowd noise) stimuli. For example, previous studies have shown that commentary influences viewers' perceptions of violence and ultimately affects their viewing enjoyment of televised sports (e.g., Comisky, Bryant, & Zillmann, 1977; Sullivan, 1991). Also, research has shown a link between sensation seeking and auditory stimuli (e.g., Smith, Davidson, Perlstein, & Gonzalez, 1990). It is possible that, when exposed to the video treatments, viewers might have engaged in multiple sensory channels and their responses to the football plays may not be simply attributable to a single source. Given the fact that the auditory portion of both low- and high-violence televised sports is fast, loud, and exciting—having the potential to attract sensation seekers—perhaps the results were caused by the presence of external visual and auditory stimulation. Although the accompanying audio portion has an undetermined influence on the impact of the video treatment, because of the nature of televised sporting events it is unfeasible to separate the audio stimuli and visual stimuli. Therefore, all the plays used in this study included the original soundtrack, similar to the Bryant et al.'s study (1981).

Race / Ethnicity. According to Zuckerman (1994), there are significant demographic influences on sensation seeking, including race and ethnicity. The results of the current study may have been confounded by the relationship between sensation seeking and race/ethnicity. Football is part of American culture; watching football games

is a popular leisure activity. However, the sport may be unfamiliar to many people from other cultures or countries. For instance, after the experiment in this study, a few participants from minority ethnic groups did say that they had never or seldom watched football games, and that they were not familiar with the rules. Therefore, it is possible that viewers' reactions would differ as a function of culture or ethnicity since the video treatments were football plays selected from various American professional football games, which might be culturally specific to American participants. That possibility can be supported by a previous study (McDaniel, 2003), which found that viewer interest in watching different types of sports telecasts is a function of their ethnicity, in that Caucasian males reported a higher level of interest in viewing violent-combative sports (e.g., hockey, football, and pro wrestling) than did other ethnic minority males. Minority males and females reported higher levels of interest in viewing aggressive-combative sports telecasts, such as basketball, than did Caucasian counterparts. As for viewing telecasts of stylistic sports (e.g., figure skating, gymnastics, and tennis), a higher level of interest was reported by the Caucasians than the ethnic minorities. Future personality studies should control participants' race and ethnicity to account for differences in viewing reactions to televised sports.

Psychological State. The purpose of this study was to determine whether individuals' reactions to sports violence were influenced by sensation seeking; however, research has found that a viewer's psychological state might influence his or her reaction to media content. For example, Bryant and Zillmann (1984) had participants' *excitational state* manipulated into states of boredom and stress and later allowed them to watch 15 minutes of television from a selection of three exciting television programs (i.e.,

an action-adventure drama, a segment of rough plays from a professional football game, and a play-off quiz show) and three relaxing programs (underwater nature scenes, classical lullabies from an orchestra concert, and a travelogue about a restful vacation). Results showed that relaxing television programs were watched more by stressed participants (7 minutes, 7 seconds) than by bored participants (1 minute, 14 seconds). Exciting television programs were watched more by bored participants (13 minutes, 13 seconds) than by stressed participants (7 minutes, 21 seconds). Based on the data, stressed participants spent nearly the same amount of time watching exciting and relaxing television fare, while bored participants spent most of the time watching exciting programs. Participants' heart rates were monitored to determine their arousal state while watching the programs they selected. Results showed that bored subjects who watched exciting programs showed the fastest heart rate—an increase of seven beats per minute (bpm)—whereas bored participants, who chose relaxing fare, showed no change in heart rate. However, stressed participants, whether watching exciting or relaxing fare, showed a decline of 6.5 bpm and 6.9 bpm, respectively. Possibly, then, responses to the stimuli were determined not only by participants' personality traits, but also by their psychological states. However, it should be noted that the data in the current study showed no significant differences between sensation-seeking groups in their baseline physiological arousal states (HR, SC, and RSP) (Exploratory Question Five). This result is consistent with Zuckerman's (1994) conclusion that "no findings of underarousal in high sensation seekers or overarousal of low sensation seekers" (p. 22).

## Conclusion

Although this study provides very limited support for sensation seeking as a predictor of sports violence viewing, the results are consistent with previous literature examining the relationship between personality and television violence that suggested “largely inconsistent or weak relationships” (Gunter, 1985, p.261). Such findings do not mean that the personality factor is unimportant. Personality research has been criticized for maintaining that personality variables are able to account for only a small portion of the explanation for consumer behavior. Kassarjian and Sheffet (1991) argued that to be able to account for 5 to 10 percent of the variance in consumer behavior in a given study, by knowing only about personality variables, is quite amazing, given the complicated interactions among personality, situations, and the environmental effect on human behavior.

## The Influence of Biological Sex

Research on audience enjoyment of televised sports has shown strong support for sex differences in reactions to televised sports (Bryant et al., 1981; Bryant et al., 1994; Comisky et al., 1977; Gan et al., 1997; Sullivan, 1991). More specifically, in televised sports, males tend to enjoy a higher volume of violent plays than females (i.e., Bryant et al., 1981; Rayburn, 1998). A similar finding—that women reported less enjoyment from graphic violence than men—has also been supported by studies examining the enjoyment of horror films (e.g., Mundorf, Weaver, & Zillmann, 1989; Tamborini & Stiff, 1987; Tamborini, Stiff, & Heidel, 1990; Tamborini, Stiff, & Zillmann, 1987). Therefore, based on previous research on media violence, this study hypothesized that males would report higher levels of pleasure and arousal, and would elicit stronger physiological responses

when watching high levels of sports violence, compared to both females watching high levels of sports violence and males watching low levels of sports violence. On the other hand, when watching low levels of sports violence, males would report lower levels of pleasure and arousal, as well as elicit lesser physiological responses than females. The magnitude of difference in pleasure levels, arousal levels, and physiological responses between high violence and low violence in televised sports viewing would be greater in males than in females.

Consistent with the related literature, the data in the current study showed a significant sex difference in the reactions to high-violence televised sports viewing. As expected, when watching high-violence football plays, males reported a higher level of pleasure and exhibited higher mean SC than females. However, contrary to expectations, participant HR data were in the opposite direction, in that females exhibited a higher mean HR than males, for both HSS and LSS. One possible explanation for the females' high HR could be that the violent football plays evoked a high state of distress and aversion, especially in women, which, in turn, result in an acceleration of HR. For example, Oliver, Sargent, and Weaver (1998) examined the sex differences in the enjoyment of different types of films and found that females reported more disturbance and less enjoyment than males after viewing the violent film. This coupled with other researchers' findings—both positive (e.g., pleasure) and negative (e.g., fear, angry, distress, aversion) emotions have been associated with an HR increase (Ravaja, 2004)—would tend to support this explanation.

The current study also found significant sex differences in reactions to low-violence televised sports viewing. Males, as expected, reported lower levels of arousal

than females, and LSS males exhibited slower mean HR than LSS females. In contrast, males showed higher mean SC than females, and LSS males exhibited higher mean RSP than LSS females when watching low-violence football plays. Such results might reflect the fundamental biological differences between the two sexes; females typically have higher HR than males, and males tend to have higher sweat-gland distribution and respiration rates than females. In addition, although the results of this study shown significant sex differences in physiological reactions to both high- and low-violence televised sports viewing, the magnitude of the differences in physiological data between males and females were slight.

The purpose of this study was not only to test the ability of sensation-seeking theory to explain individual differences in emotional and physiological responses to sports violence, but also to test that theory's ability to account for sex differences in those responses. The findings indicated that individual responses to sports violence may be related more to their biological sex than to their sensation-seeking tendencies. The results also indicated that the significant sex differences in responses to sports violence cannot be explained as a function of sensation seeking. For example, males and females differed significantly in self-reported levels of pleasure from watching high-violence televised sports and in self-reported levels of arousal from viewing low-violence televised sports, but HSS and LSS did not differ significantly; physiological responses to both high- and low-violence football plays differed by sex, but no differences were observed between HSS and LSS. Therefore, the data in the current study did not support the assumption that differences in sensation seeking might account for differences between the sexes in reactions to sports violence.

## Conclusion

Participants' biological sex was found to be a strong predictor of their reports of pleasure and arousal derived from watching sports violence. When watching high-violence football plays, males reported higher levels of pleasure than females. In response to watching low-violence plays, males reported less arousal than females. Sex differences in physiological responses were also observed in the current study; however, the direction of the effect was inconsistent. The relationship between biological sex and physiological measurement is apparently more complex than expected (Brody, 1997).

Prior research has applied the sex-role stereotype and sex-role socialization approaches to explain the sex differences in emotional reactions to media violence (Brody, 1985; 1997; Oliver, 2000; Zillmann & Weaver, 1996); however, more theory-based research is needed to provide additional insight into the explanations for the sex differences in the attraction of media violence.

## The Effects of Sports Violence

This study hypothesized that participants would report higher levels of pleasure and arousal, and would elicit stronger physiological responses when watching high levels of sports violence, compared to watching low levels of sports violence. Consistent with previous research on the enjoyment of sports violence (Bryant et al., 1981; Rayburn, 1998), results of the present study suggested that viewers' enjoyment of sporting events did increase as the level of violence increased. Participants reported significantly higher levels of pleasure from watching high-violence football plays than from watching low-violence football plays and neutral content. In self-reports of arousal, violent plays were

reported as being more arousing than low-violence plays and neutral-content video. Such findings provided evidence on the effectiveness of the employed videos, in that perceived arousal levels did vary by violence level; that is, as the level of violence increased, participants perceived higher levels of arousal. The pattern of the results suggested that the relationship between emotional response and violence is linear. Participants' level of pleasure and arousal were highest when watching high-violence plays, followed by the low violence plays, and lowest for neutral-content video.

Although the results of this study showed that emotional pleasure and arousal is a function of the level of violence in televised sports, the effect was more pronounced in men than in women. Men's self-reported levels of pleasure and arousal rose as the level of violence increased, whereas the females' reports showed no significant differences. Such findings are consistent with the literature (e.g., Bryant et al., 1981; Rayburn, 1998). However, results did not support the expected relationship between the effects of sports violence on physiological responses. No significant difference in any of the three physiological measures was found between high- and low-violence football plays. The only significant difference in physiological measures was the participants' higher mean HR when watching high-violence football plays, compared with the neutral-content video.

One possible explanation for such unexpected findings might be related to the order effect of the video treatment. It was initially assumed that the counter-balanced design of the video treatment would diminish the carry-over effects. However, contrary to the assumption, the interaction of the individual reactions to the treatment stimuli and

physiological emotional responses may have varied according to the order of videos they watched. Evidence of the order effect of treatment videos on viewers' reactions has been found in all three physiological measures used in this study, especially in the SC data. For example, participants' mean SC levels were lowest when exposed to the first video (low-violence televised sports for order 1 and high-violence televised sports for order 2), followed by the second video (neutral content for both orders), and finally the third video (high-violence televised sports for order 1 and low-violence televised sports for order 2). The findings indicated a linear relationship between the order of the videos and participants' SC responses, in that participants' SC was lowest for the first video and highest for the third. In short, participants' SC levels increased consistently with the order of the videos they watched, rather than the levels of violence in the videos. That finding suggests that the individual reactions to the videos and the related physiological responses may have been influenced by the order in which they watched the videos.

### Conclusion

The findings of this study supported the notion that violence sells. Watching high-violence televised sport, rather than low- or no violence, created the greater pleasure and arousal for viewers. However, this effect was significant for male viewers only.

### Summary of the Study's Findings

The findings demonstrated several general features of the enjoyment of sports violence. Emotional (self-reported levels of pleasure and arousal) and physiological responses (HR, SC, and RSP) were not different between high and low sensation seekers for either high- or low-violence televised sports. However, HSS did report higher levels of pleasure (for both sexes) and exhibit fast mean respiration (males only) when watching high-violence televised sports than neutral content, and the pleasure level was significantly higher for high sensation seekers (for both sexes) when watching low-violence televised sports than neutral content. Significant sex differences in self-reported levels of pleasure and arousal were observed; males reported higher levels of pleasure than females when watching high-violence televised sports, and males reported less arousal than females when watching low-violence televised sports. Sex differences in physiological responses were also found in the current study; however, the direction of the effect was inconsistent. While viewers' self-reported pleasure and arousal increases with the degree of violence, this relationship was more pronounced in men than in women.

In conclusion, the data from this study failed to support sensation-seeking theory as an explanation for individual and sex differences in emotional and physiological responses to sport violence. However, the data support the notion that HSS enjoyed arousing and exciting media content (both high- and low-violence football plays) more than milder themes (neutral content), which is consistent with the literature (Zuckerman, 1994). Although previous studies have found that the preference for violent-combative

televised sports, such as football, is associated with sensation seeking (i.e., Krcmar & Greene, 1999; McDaniel, 2003), the results in this study indicated there might be other characteristics besides violent content that account for sensation seekers attraction to football. Consistent with previous research (Bryant et al., 1981; Rayburn, 1998), participants' biological sex was found to be a strong predictor of spectators' responses to sports violence. In addition, this study provides support for previous research (Bryant et al., 1981; Rayburn, 1998) suggesting that violence contributes to viewers' arousal and enjoyment of televised sports, especially for male viewers.

#### Limitations of the Study and Directions for Future Research

There are some research limitations, in addition to those discussed in the previous sections, which need to be acknowledged.

#### External Validity

This study was conducted in a laboratory setting; consequently, the external validity of the results is limited. Future sensation-seeking research might investigate the enjoyment of sports violence in a more natural setting with different environmental stimuli, such as watching sports at home, in a stadium, or in a sports bar (Lee et al., 2001; McDaniel, 2003).

#### Generalizability

The generalizability of this study's findings is limited, as this research used a non-random convenience sample. All the participants in the current research were college students, and college students do differ from other populations in certain respects.

Therefore, the results of this investigation cannot reliably be generalized to other populations. In addition, the participants in this study were volunteers. Those who volunteered might differ in significant ways from those who did not take part in the experiment. Future personality research on media effects should strive to go beyond convenience samples to replicate and extend the current work on randomly selected non-student populations.

The results of this investigation should not be generalized to other types of violent media fare, such as horror movies or dramas, because the responses to graphically violent images from spectator sports might differ from responses evoked by other types of entertainment. In addition, other researchers have suggested that spectators' affective responses might differ, based on the medium (Duncan & Brummett, 1989). This study used a televised sports format; future research might replicate these findings, using other types of media, such as sports pages in newspapers and magazines or by using other television formats, such as newscasts and commercials to investigate the influence of the personality trait of sensation seeking and biological sex on viewers' reactions to sports violence.

Another limitation of this study was its use of only NFL football scenes. Therefore, the study results might not apply to other spectator sports. Future studies might examine other sports to determine whether the enjoyment of violent play in football is similar to that in other team contact sports (e.g., ice hockey), team aggressive sports (e.g., basketball, soccer), individual combative sports (e.g. boxing, karate), or mechanized sports (e.g., auto racing), as categorized in the study of Sargent et al. (1998).

In addition, the increasingly popular, so-called “extreme sports” which have gained a substantial number of fans in recent years may also be worth investigating. Moreover, violence presented in a realistic way (e.g., ice hockey) might be different for spectators than that in stylized sports (e.g., professional wrestling) (Arms, Russell, & Sandilands, 1979). Future studies should seek to extend this line of research in various sports contexts.

Moreover, since violent play by male athletes may be more acceptable than similar play by female athletes because of traditional sex-role stereotypes, the results of this study should not be generalized to violent plays involving female athletes. Future studies might investigate whether spectators’ enjoyment of sports violence differ, based on whether female or male athletes were involved in the violent actions (Rayburn, 1998).

### Treatment Stimuli

This research focused on only the degree of violent action. Future research might examine other aspects of sports violence, such as the consequence of violence (e.g., whether the violence is condemned or condoned) (Bryant & Brown, 1988). In addition, all the plays selected for use in this study’s experiment were within the rules of the game and resulted in no visible injury. Thus, future studies might investigate whether varying degrees of injury (e.g., no injury, minor injury, season-ending injury, career-ending injury, death-causing injury) (Rayburn, 1998) or legal or illegal (in violation of the rules of the sport) plays affect viewers’ enjoyment (Bryant et al., 1981).

## Measurements

Although the results of statistical analysis support the reliability and validity of the scales employed in this study, some of the wording in the arousal rating of the PAD scale might not be familiar to undergraduates. During the experiment, some participants asked the meaning of certain words they encountered, such as *frenzied* and *sluggish*. This is a problem that was not anticipated when the PAD scale was chosen for this experiment and one that should probably be taken into consideration when designing questionnaires for future studies. A possible alternative might be the Self-Assessment Manikins (SAM), which is a non-verbal, pictorial instrument for self-reporting emotion responses without language barriers (Bradley & Lang, 1994; Greenwald et al., 1989; Lang, 1980).

This research used participants' physiological measurements (HR, SC, and RSP) to examine the influences of sensation seeking and biological sex on viewing televised sports violence. The data indicated that there were no significant relationship between self-reported arousal and the three physiological measures during any of the video-viewing conditions for participants as a whole (Exploratory Question Six). Although this is consistent with previous research that found that "a close correspondence between physiological patterning and affective self-report has not always been easy to obtain and covariation is typically modest" (Hubert & de Jong-Meyer, 1990, p. 76), future research might consider using the perceptions of the body-sensation scale as self-reports of physiological responses (Hubert & de Jong-Meyer, 1990, Peck, 1999), given the limitation of the arousal subscale in the PAD scale. That scale measures the degree to which participants experience specific body changes, such as fast breathing, heart-rate

increase, sweating, and feeling hot. The scale has been used in previous research and might be an effective measure of subjective arousal for future research (Huber & de Jong-Meyer, 1990; Peck, 1999).

In addition, future research might incorporate a broader range of physiological measures to delve further into the understanding of affective responses to media consumption. For example, facial electromyogram (EMG) corrugator and zygomatic muscle region has been found to be associated with affective valence (Bradley, 2000; Cacioppo Berntson, Larsen, Poehlmann, & Ito, 2000; Greenwald et al., 1989), and other physiological measures such as blood pressure, finger temperature, eye movement, the startle blink reflex, and brain activity have also been identified as indicators of emotional arousal (Bradley, 2000; Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000). Moreover, future researcher might consider having moment-by-moment self-rating emotional responses to compare with the physiological reactions, as suggested by Zuckerman (1996a), although such a procedure may prove distracting to the participants during the viewing process (Zuckerman, 1996a).

Finally, this research used participants' emotional and physiological responses to examine the influence of sensation seeking and biological sex on the viewing of televised sports violence. Future research might consider investigating viewers' cognitive reactions (such as recognition and memory) to sports violence between sensation-seeking groups and between the sexes. The relationship between sensation seeking and individual differences in cognitive responses has not yet been investigated in the context of televised sports violence.

### Significance of the Study

This study contributes to the literature in several ways. First, the large body of research on the effects of media violence has primarily focused on the unintentional influence of such content on viewers, such as increased aggression, hostility, violence, and antisocial attitudes and behaviors (Bryant & Miron, 2002; Zillmann & Bryant, 1994). However, relatively few studies have been conducted to examine why people are attracted to violence (Bryant & Miron, 2002; Zillmann & Bryant, 1994). Researchers have called for studies to focus on the enjoyment aspect of media consumption (Bryant & Miron, 2002; Zillmann & Bryant, 1994). This study contributes to the literature by responding to the call for research on viewers' enjoyment of media violence.

In addition, the possibly detrimental effects that exposure to graphically violent images in the media might have on viewers causes considerable public apprehension and debate (Haridakis, 2000; Slater, 2003). Many parents, educators, and public-policy makers are concerned about the amount of violence portrayed in the media and the harm it may be inflicting on society, particularly minors (Haridakis, 2000). Therefore, a better understanding of the possible causes of viewers' attraction to violent fare could be beneficial to those concerned parties.

Researchers have argued that most studies on media preferences have focused on the demographic differences without looking at psychological rationales (McDaniel, 2003; Weaver, 2000; 2003). This study responds to the call of Weaver (2000; 2003), McDaniel (2003), and other researchers (e.g., Haugtvedt, Petty, & Cacioppo, 1992; Kassarjian & Sheffet, 1991) to look beyond the simple demographic differences to

examine the influences of personality characteristics in studying media consumption. The theory of sensation seeking could be used to extend the scope of existing research to move beyond group variables (e.g., sex) to look at the influence of individual differences (e.g., personality traits) in the mediated-sports contexts (Lee et al., 2001; McDaniel, 2003).

Although researchers have recognized that the personality predisposition of audiences is an important variable to understand and predict media uses and effects (Atkin, 1985; Weaver, 1991; 2000; 2003), personality research has been criticized for lacking a construct within an integrated theoretical framework (Haugtvedt et al., 1992; Kassarjian, 1971; Kassarjian & Sheffet, 1991; McDaniel, 2003; Weaver, 2000; 2003). As Daly (1987) argued:

Communication research emphasizing personality has had no obvious structure or “master plan” associated with it. Each individual investigator selects his or her favorite trait and proceeds to explore the measurement, manifestations, or consequences of the disposition without much regard for how it fits with some large domain (p. 31).

Researchers have called for studies to examine the personality influence in a broader theoretical framework (Daly, 1987; Weaver, 2000, 2003). Therefore, this study applied sensation-seeking theory, grounded on the OLA and OLS conceptual framework, to provide substantial promise for understanding the relationship between spectators' personality characteristics and certain media consumption.

Most social scientists studying sports have mainly focused on the participants (Bryant & Raney, 2000); relatively little systematic research has been done on sports spectators, and even less on televised sports audiences (Bryant & Raney, 2000; Zillmann, Bryant, & Sapolsky, 1979; 1989). As a result, there is a deficiency in the understanding of televised sports spectators. Therefore, this study—which examines the relationships among the personality traits of sensation seeking, biological sex, and spectators' viewing responses to televised sports violence—expands the understanding of the limited body of scholarship on sports spectators. In addition, spectators of televised sports are potential customers of live sporting events and consumers of the advertised products and services (Shank, 2002). A deeper understanding of televised sports audiences could help sport marketers to better target and segment consumers in the development of targeted advertising and promotional campaigns (McDaniel, 2003). Moreover, the need for greater understanding of televised sports audiences has grown yet more salient in recent years because of the decrease in viewer ratings of major professional sports telecasts in North America (Coakley, 2001; McDaniel, 2003; Shapiro, 2001). An investigation of how personality influences audiences' emotional and physiological responses could help producers to better tailor their products to fit viewers' needs (McDaniel, 2003). Particularly, research has shown the utility of sensation-seeking theory as a guide for designing and targeting televised commercials and public service announcements (e.g., Leone & D'Arienzo, 2000; Lorch, Palmgreen, Donohew, & Helm, 1994; Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001; Palmgreen, Donohew, Lorch, & Rogus, 1991; Palmgreen, Lorch, Donohew, & Harrington, 1995; Stephenson, Palmgreen, Hoyle,

Donohew, Lorch, & Colon, 1999). Therefore, scientific research on televised sports audiences could be important in commercial domains.

A considerable number of studies have investigated the relationship between sensation seeking and a wide variety of sports participation (Appendix B: Sensation Seeking and Sports Participation). The findings strongly suggest that the personality trait of sensation seeking is a relevant and meaningful variable in predicting involvement in different sporting activities. The personality trait differentiates sports participants from risk sports to low-risk sports, from contact sports to non-contact sports, and from participants to non-participants. Nevertheless, to date, relatively little systematic research has applied sensation-seeking theory to study sports spectators, as compared to the research examining sports participation. A study examining the relationship between sensation seeking and viewers' psychological and physiological responses to televised sports violence could contribute to that ignored research area.

Physiological arousal in relation to the personality trait of sensation seeking has been explored in some forms of hedonic consumption, such as gambling (e.g., Anderson & Brown, 1984; Blaszczynski, Wilson, & McConaghy, 1986; Coventry & Constable, 1999; Coventry & Hudson, 2001; Coventry & Norman, 1997, 1998; Dickerson & Adcock, 1987) and sports participation (e.g., Breivik, Roth, & Jørgensen, 1998). Sport spectatorship—both attending sporting events and watching sports on television—can be considered as a form of hedonic consumption (Hirschman, 1982; Hirschman & Holbrook, 1982; Holbrook, Chestnun, Oliva, & Greenleaf, 1984; Holbrook & Hirschman, 1982). However, none of the sensation-seeking research on the televised-sports audience has examined the relationship between that trait and physiological arousal generated during

the consumption experience, despite the fact that studies using the “Uses and Gratifications” approach have found that the arousal motivation was related to viewing sports programs (Rubin, 1981a) and violent television shows (Greenberg, 1974). Therefore, the current study not only examined viewers’ self-reported arousal levels, but also looked at the real time physiological response by monitoring participants’ heart rate, skin conductance, and respiration during the televised sports viewing. This investigation is the first known research in this context (sports spectatorship) to use physiological arousal to explore the effects of sensation seeking on viewers’ responses to sports violence. This is particularly significant given the fact that sensation-seeking theory was initially grounded in arousal theory (Zuckerman, 1994). The use of a physiological measure in testing the sensation-seeking theory should advance the understanding of the underlying mechanism of physiological arousal in the consumption of media violence in sports spectatorship.

Although the results of this study did not support sensation-seeking theory as an explanation for individual differences and biological sex differences in emotional and physiological responses to sports violence, it goes beyond previous studies that found a positive relationship between sensation seeking and preferences for violent sports (i.e., Krcmar & Greene, 1999; McDaniel, 2003) by finally subjecting sensation seeking to an experimental test in a mediated sport context. In addition, the results of the study serve an important function by providing further empirical support for the results found in studies of Bryant et al. (1981) and Rayburn (1998), in which spectators enjoyed higher levels of violent play, especially males; and males reported enjoying higher degrees of violent play in televised football than did females.

## APPENDIX A

### Research on the Effects of Sports Violence on Spectators' Aggression

Scholars have investigated the relationship between exposure to media violence and subsequent aggressive attitudes and behavior. The empirical evidence has generally revealed a positive relationship between these two variables. For example, Goldstein and Arms (1971) conducted a field study to examine the effects of observing aggressive sports contests on spectators' hostility. Male spectators were interviewed before and after a traditional Army-Navy football game and an Army-Temple collegiate gymnastics competition (served as a non-aggressive control event). The results showed that, regardless of whether their preferred team won or lost, both fans of Army (winning team) and Navy (losing team) scored significantly higher on the Buss-Durkee hostility scales after observing the football game than an equivalent sample before the game. The increased hostility score was not found in spectators observing the gymnastics competition. The researchers concluded that there was no empirical support for the catharsis effect.

In an attempt to extend the generalization of the results of the aforementioned study of Goldstein and Arms (1971) to female participants and non-avid fans, Arms, Russell, and Sandilands (1979) recruited both male and female Canadian college students and randomly assigned them to watch one of three sporting events, either professional wrestling (stylized aggression), ice hockey (realistic aggression), or a swimming event (non-aggressive control). The participants filled out questionnaires measuring their hostility levels before and after observing their assigned sporting event in the field

setting. The results showed that participants' levels of hostility increased after watching professional wrestling or a hockey game, but there was no significant change in spectators' levels of hostility in the control group who watched a non-aggressive swimming event. The results extended the generalization of the earlier research findings in Goldstein and Arms (1971) to female participants and non-avid fans (not possessing a strong sport interest) and yielded consistent findings that observation of aggressive sporting events on the field tended to increase the spectators' hostility state. Once again, the catharsis theory was not supported in this investigation.

Researchers also examined the relationship between the amount of sports violence viewing and viewers' aggressive behavior. For example, Lefkowitz, Eron, Walder, and Huesmann (1973) used both the peer nomination technique and self-ratings as measures of aggressive behavior to investigate the relationship between viewing televised contact sports (i.e., hockey, football, boxing, and wrestling) and the aggressive behavior of children. The results showed that the amount of contact sports watched was positively related to both peer nominations and self-ratings of aggression, but only for girls. The authors suggested that the insignificance of such relationships for boys might be due to the socialization practices difference between sexes, in which boys are expected to be more likely to express aggression than girls.

The above literature review suggested that violence viewing leads to aggressive behavior. However, Klapper (1960) suggested, "media fare is not the crucial or primary determinant of delinquent behavior. We are accordingly led to suspect that the course of influence is in the other direction, i.e., that the existing psychological orientation of audience members determines their reactions to violent media fare" (p. 154).

Researchers have also tested a reverse hypothesis that individuals with aggressive predispositions tend to seek out a greater amount of violence on media. For example, Atkin, Greenberg, Korzenny, and McDermott (1979) conducted an investigation using a two-wave panel survey across a one-year lag to examine the relationship between children's aggressive attitudinal predispositions and their selective exposure to aggressive television entertainment programming. The findings suggested a positive association between prior aggressive attitude and subsequent violent program selections, even while controlling for grade, biological sex, and initial television program exposure patterns. In addition, physical aggressiveness was a significant predictor for viewing violent television programs for boys, whereas verbal aggressiveness was a critical predictor for girls.

Celozzi, Kazelski, and Gutsch (1981) examined the relationship between trait aggressiveness, exposure to violent sporting events, and spectators' subsequent levels of aggression. High school senior students were assigned to one of three experimental conditions. One group of participants watched videotaped professional ice hockey game for 10 minutes, another group of participants discussed ice hockey for 10 minutes, and participants neither watched nor discussed hockey served as a control group. Results indicated a significant interaction effect of trait aggressiveness and experimental treatments. Compare to their counterparts in the control group, high trait aggressiveness participants in the hockey viewing condition or hockey discussion condition demonstrated significantly higher levels of state aggression.

Bushman (1995) conducted a series of investigations to determine the relationship between trait aggressiveness and viewer' aggression after exposed to violent media. In

Study One, the results showed that the high trait aggressiveness was positively associated with the viewers' desire to watch violent films. In Study Two, the findings indicated that, after controlling for habitual exposure to television violence, levels of trait aggressiveness were positively related to the levels of state hostility among participants who had watched a violent film, but was not significantly correlated among those who had viewed a nonviolent film. The results in Study Three showed that individuals who had viewed the violent videotape reacted more aggressively than did individuals who had watched the nonviolent videotape. High trait aggressive individuals reacted more aggressively than did low trait aggressive individuals after exposed to the violent videotape. In addition, high trait aggressive individuals who had watched the violent videotape tended to react more aggressively than did high trait aggressive individuals who had watched the nonviolent videotape.

Russell (1992) examined the relationships between hypermasculinity and audiences' responses to viewing a combatant sports. Male undergraduates were classified into high and low macho groups based on their scores on the Hypermasculinity Inventory. They were further classified as either a beer-drinking or a soda-drinking group according to their choice of beverage before the treatment exposure. Participants were then randomly assigned to watch one of the three films: amateur boxing, professional boxing, or skiing (control group). The results showed that both high macho and beer-drinking participants reported increased aggressive mood states after watching a videotaped amateur or professional boxing match. On the contrary, low macho participants and soda drinkers failed to demonstrate any significant increases in aggressive mood states. Similar results have been found in the study of Scharrer (2001),

which used violent action television programming as the treatment stimulus. Male viewers' aggression and hostility increased after exposure to the violent television program, but only among those who exhibited higher levels of hypermasculinity.

Russell, Di Lullo, and Di Lullo (1988-89) randomly assigned male participants to one of three treatment conditions: watching video segments featuring hockey fights, watching video segments featuring nonaggressive hockey action, or no videos (control) after they were either provoked (angered group) or unprovoked (nonangered group) by an experimental confederate. Results showed that, regardless of whether being provoked earlier or not, both angered and non-angered viewers who watched the hockey fight film tended to exhibit an increase in aggressive mood as measured by the Mood Adjective Check List. However, retaliation against the experimental confederate after watching the fight film only appeared in angered participants.

The effects of media violence on viewers' aggression also have been investigated in other entertainment areas. Black and Bevan (1992) conducted a field investigation by going to the theater to examine the relationship between exposure to movie violence and viewers' aggression. Both male and female adults attending two commercial shows (one was a violent movie: *Missing in Action*; the other a nonviolent movie: *A Passage to India*) were recruited to respond to an aggression inventory before or after watching the movie that they had chosen. Consistent with the findings of sport-specific phenomena, the results showed that both males and females who attended the violent movie reported significantly higher aggression scores than those who had chosen to watch the nonviolent movie, both before and after viewing. Moreover, viewers' levels of aggression were even

higher after watching the violent movie whereas those watching the non-violent movie remained at the same low level.

Taken together, these studies fail to support the catharsis effects. Instead, they showed that exposure to media violence in general, or to sports violence in particular (both mediated and non-mediated), increase spectators' subsequent aggressive affect and behavior. Also, research showed that individual differences (e.g., personality) played an important role in accounting for the effect of spectators' increasing aggression after exposure to media violence.

## **APPENDIX B**

### Sensation Seeking and Sports Participation

A number of studies have applied sensation-seeking theory to study the personality characteristics of participants in a wide variety of sporting activities (e.g., Zuckerman, 1983b; 1994). Results indicated that athletes possessed higher sensation seeking dispositions than nonathletes (Gundersheim, 1987; Hartman & Rawson, 1992; Schroth, 1995). In addition, empirical evidence also revealed that sensation seeking needs was related to participation in high physical risk sports or so-called extreme sports (Schrader & Wann, 1999), as individuals with strong sensation seeking tendencies tend to engage in sporting activities that involve high level of risk, sensations of speed, flying, and novel experience, such as parachuting (Breivik, 1995; Breivik, Roth, & Jørgensen, 1998; Zaleski, 1984b; Zarevski, Marusic, Zolotic, Bunjevac, & Vukosav, 1998), skydiving (Blenner, 1993; Briwn, 1978; Hymbaugh & Garrett, 1974; Jack & Ronan, 1998; Shoham, Rose, & Kahle, 1998; Zarevski et al., 1998), hang gliding (Blenner, 1993; Jack & Ronan, 1998; Rainey, Amunatequi, Agocs, & Larick, 1992; Shoham, Rose, & Kahle, 1998; Straub, 1982; Wagner & Houlihan, 1994; Zaleski, 1984b; Zarevski et al., 1998), mountain or rock climbing (Blenner, 1993; Breivik, 1996; Cronin, 1991; Fowler, von Knorring, & Oreland, 1980; Gomá-i-Freixanet, 1991; Jack & Ronan, 1998; Robinson, 1985; Rossi & Cereatti, 1993; Shoham, Rose, & Kahle, 1998; Zaleski, 1984b), skiing (Bouter, Knipschild, Feij, & Volovics, 1988; Calhoon, 1988; Connolly, 1981), water skiing (Gomá-i-Freixanet, 1991), scuba diving (Biersner & LaRocco, 1983; Blenner, 1993; Gomá-i-Freixanet, 1991; Heyman & Rose, 1979), surfing (Diehm & Armatas, 2004), parasailing (Chirivella & Martinez, 1994), white water canoeing or (ocean)

kayaking (Blenner, 1993; Campbell, Tyrrell, & Zingaro, 1993; Schuett, 1993), and motorcycle or auto racing (Blenner, 1993; Gomá-i-Freixanet, 1991; Jack & Ronan, 1998; Straub, 1982; Zaleski, 1984b). In contrast, studies also showed that individuals who possess lower sensation seeking dispositions tend to participate in low-risk sporting activities, such as long-distance running (Jack & Ronan, 1998; McCutcheon, 1980; Potgieter & Bisschoff, 1990), aerobics (Babbitt, Rowland, & Franken, 1990; Jack & Ronan, 1998), golf (Wagner & Houlihan, 1994; Diehm & Armatas, 2004), and bowling (Straub, 1982; Zarevski et al., 1998). In addition, substantially higher levels of sensation seeking were found in people who reported participating in contact sports (e.g., rugby, lacrosse, wrestling) compared to those participating in non-contact sports (e.g., baseball, marathon running), as contact sports are generally more intense, arousing, and aggressive than non-contact sports (Cellini, 1982; Gundersheim, 1987; Potgieter & Bisschoff, 1990; Schroth, 1995).

## APPENDIX C

### Instructions for Pilot Study

1. The purpose of this study is to understand sports spectators. The project is being conducted by the faculty (Dr. Hatfield) and a doctorate student (Shu-Chen Lee) in the Department of Kinesiology.
2. Your participation in the study is completely voluntary and you are free to withdraw at any time. Your involvement is important to the study and will contribute to the field of sports spectatorship research.
3. You will be watching 300 football plays. After watching each play, you will be asked to rate each play by **CIRCLING** the **NUMBER** that corresponds to how violent you perceive the play to be.
4. Definition of Violence:

Violence in sport is different from violence in other activities, in that it is frequently inflicted with no malice or intent to cause pain or harm. In football, for example, a cornerback will hit the receiver very hard right at the moment he catches the ball. Although this is frequently done with great force, the cornerback's goal is simply to make the receiver drop the pass. This still qualifies as a violent act even though there may be no injury or intent to cause harm. Therefore, violence in this study refers to intense physical contact between players that is accepted and inherent in a given sport and within the rules of the game. Here, we are looking for the degree of intense physical contact among plays.

#### Scale used to rate these football plays:

- 1 = no physical contact
- 2 = low physical contact
- 3 = very low physical contact
- 4 = moderate physical contact
- 5 = high physical contact
- 6 = very high physical contact
- 7 = extremely high physical contact

In other words, a play can be rated for extremely high violence even though the players don't engage in punching, kicking, eye-gouging, the use of weapons, or other similarly violent activities that are prohibited by the rules or otherwise not acceptable in a football game. Your rating of these plays for

violence is relative to football, not other types of entertainment or what you see on the nightly news.

5. You will have 4 seconds after each play to mark down your answer. This should be plenty of time, because we just need your immediate perception, so don't analyze the play, just rate your immediate reaction to these plays.
6. **Make sure to rate each play.**
7. The video lasts a total of about 100 minutes. You will take a 5-minute break after watching every 75 plays.
8. There should be no talking during viewing. Don't react visibly or out loud to the football plays while watching, because it can be very distracting.

*Thank you for your help and cooperation.*

## APPENDIX D

### Violence Scale

Instructions: After watching each play, please rate each play by **CIRCLING** the **NUMBER** that corresponds to how violent you feel about each play.

	No Physical Contact	Very Low Physical Contact	Low Physical Contact	Moderate Physical Contact	High Physical Contact	Very high Physical Contact	Extremely High Physical Contact
<b>Play #1</b>	1	2	3	4	5	6	7
<b>Play #2</b>	1	2	3	4	5	6	7
<b>Play #3</b>	1	2	3	4	5	6	7
<b>Play #4</b>	1	2	3	4	5	6	7
<b>Play #5</b>	1	2	3	4	5	6	7
<b>Play #6</b>	1	2	3	4	5	6	7
<b>Play #7</b>	1	2	3	4	5	6	7
<b>Play #8</b>	1	2	3	4	5	6	7
<b>Play #9</b>	1	2	3	4	5	6	7
<b>Play #10</b>	1	2	3	4	5	6	7
<b>Play #11</b>	1	2	3	4	5	6	7
<b>Play #12</b>	1	2	3	4	5	6	7
<b>Play #13</b>	1	2	3	4	5	6	7
<b>Play #14</b>	1	2	3	4	5	6	7
<b>Play #15</b>	1	2	3	4	5	6	7

## APPENDIX E

### Intercoder Reliability for Violence Scale

RATER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	1.00																													
2	.79**	1.00																												
3	.68**	.75**	1.00																											
4	.83**	.78**	.72**	1.00																										
5	.81**	.79**	.71**	.82**	1.00																									
6	.74**	.77**	.75**	.80**	.80**	1.00																								
7	.81**	.82**	.80**	.86**	.84**	.83**	1.00																							
8	.78**	.76**	.71**	.79**	.82**	.77**	.83**	1.00																						
9	.66**	.66**	.65**	.69**	.71**	.69**	.70**	.72**	1.00																					
10	.78**	.78**	.75**	.84**	.84**	.81**	.85**	.80**	.73**	1.00																				
11	.76**	.74**	.75**	.81**	.80**	.81**	.82**	.77**	.65**	.81**	1.00																			
12	.70**	.65**	.55**	.66**	.66**	.61**	.65**	.65**	.60**	.65**	.57**	1.00																		
13	.67**	.73**	.72**	.70**	.72**	.74**	.76**	.76**	.62**	.75**	.70**	.59**	1.00																	
14	.85**	.77**	.72**	.85**	.84**	.79**	.83**	.81**	.69**	.82**	.81**	.67**	.68**	1.00																
15	.67**	.66**	.66**	.71**	.67**	.69**	.70**	.66**	.57**	.69**	.65**	.61**	.58**	.71**	1.00															
16	.54**	.71**	.76**	.60**	.61**	.68**	.70**	.64**	.55**	.65**	.63**	.46**	.69**	.57**	.54**	1.00														
17	.76**	.80**	.73**	.82**	.78**	.79**	.80**	.76**	.72**	.81**	.78**	.67**	.72**	.80**	.69**	.66**	1.00													
18	.62**	.74**	.78**	.64**	.64**	.69**	.73**	.67**	.61**	.70**	.65**	.56**	.74**	.63**	.60**	.77**	.71**	1.00												
19	.66**	.74**	.74**	.65**	.67**	.69**	.73**	.66**	.60**	.69**	.67**	.53**	.66**	.64**	.58**	.65**	.71**	.68**	1.00											
20	.71**	.76**	.76**	.74**	.71**	.74**	.78**	.70**	.62**	.77**	.70**	.61**	.66**	.73**	.64**	.73**	.75**	.73**	.70**	1.00										
21	.60**	.70**	.77**	.62**	.60**	.64**	.70**	.62**	.55**	.65**	.63**	.49**	.69**	.59**	.60**	.79**	.66**	.78**	.65**	.68**	1.00									
22	.70**	.81**	.80**	.74**	.78**	.77**	.81**	.75**	.65**	.77**	.74**	.58**	.75**	.71**	.61**	.80**	.76**	.77**	.76**	.74**	.74**	1.00								
23	.69**	.68**	.65**	.71**	.68**	.68**	.74**	.70**	.62**	.70**	.70**	.53**	.61**	.68**	.57**	.60**	.71**	.62**	.64**	.66**	.60**	.67**	1.00							
24	.56**	.68**	.70**	.61**	.62**	.67**	.67**	.62**	.57**	.66**	.64**	.49**	.68**	.59**	.56**	.72**	.67**	.73**	.67**	.66**	.69**	.68**	.57**	1.00						
25	.76**	.77**	.73**	.79**	.73**	.73**	.79**	.75**	.69**	.76**	.73**	.62**	.68**	.75**	.64**	.69**	.78**	.72**	.71**	.74**	.73**	.76**	.70**	.68**	1.00					
26	.69**	.77**	.77**	.72**	.69**	.72**	.77**	.72**	.63**	.76**	.71**	.57**	.71**	.70**	.62**	.72**	.71**	.74**	.79**	.70**	.74**	.76**	.66**	.72**	.76**	1.00				
27	.70**	.75**	.68**	.70**	.73**	.75**	.76**	.72**	.64**	.76**	.73**	.59**	.74**	.69**	.60**	.65**	.65**	.74**	.71**	.68**	.67**	.74**	.64**	.67**	.71**	.72**	1.00			
28	.71**	.68**	.63**	.72**	.70**	.69**	.69**	.66**	.56**	.69**	.68**	.56**	.55**	.69**	.56**	.63**	.71**	.50**	.50**	.66**	.62**	.56**	.64**	.60**	.60**	1.00				
29	.56**	.69**	.68**	.59**	.58**	.60**	.64**	.58**	.55**	.63**	.58**	.54**	.63**	.54**	.57**	.70**	.61**	.77**	.63**	.64**	.72**	.70**	.56**	.67**	.68**	.73**	.64**	.48**	1.00	
30	.50**	.64**	.65**	.53**	.54**	.55**	.61**	.59**	.54**	.59**	.56**	.48**	.48**	.67**	.50**	.50**	.69**	.60**	.74**	.60**	.60**	.71**	.65**	.57**	.66**	.64**	.67**	.63**	.47**	1.00

## APPENDIX F

### Impulsive Sensation Seeking (ImpSS) Scale

from Zuckerman-Kuhlman Personality Questionnaire (ZKPQ)

(Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993)

**Instructions:** If you **agree with** any of the following **statements or** decide that **it describes you, circle TRUE.** If you **disagree with** a statement **or feel** that it is **not descriptive of you, circle FALSE.** **Answer every statement by CIRCLING** either **TRUE or FALSE** even if you are not entirely sure of your answer. **Do not leave any items blank.** It is important you respond to all items with only one choice, True or False. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. **There are no right or wrong answers** as in other kinds of tests. **Be frank and give your honest appraisal of yourself.**

1. I tend to change interests frequently.  
1. True      2. False
2. I like to explore a strange city or section of town by myself, even if it means getting lost.  
1. True      2. False
3. Before I begin a complicated job or project, I tend to make careful plans.  
1. True      2. False
4. I prefer friends who are excitingly unpredictable.  
1. True      2. False
5. I sometimes like to do things that are a little frightening.  
1. True      2. False
6. I often get so carried away by new and exciting things and ideas that I never stop to consider possible complications.  
1. True      2. False
7. I will try anything once.  
1. True      2. False
8. I tend to start a new task or project without much advance planning on how I will do it.  
1. True      2. False

- 9.** I tend to enjoy "wild" uninhibited parties.  
1. True      2. False
- 10.** I would like the kind of life where I am on the move and traveling a lot, with lots of change and excitement.  
1. True      2. False
- 11.** I am generally an impulsive person.  
1. True      2. False
- 12.** I like to have new and exciting experiences and sensations even if they might be a little scary to me.  
1. True      2. False
- 13.** I sometimes do "crazy" things just for fun.  
1. True      2. False
- 14.** I very seldom spend much time on the details of planning ahead.  
1. True      2. False
- 15.** I would like to take off on a trip with no preplanned or definite routes or timetable.  
1. True      2. False
- 16.** I enjoy getting into new situations where I can't predict how things will turn out.  
1. True      2. False
- 17.** I usually think about what I am going to do before I do it.  
1. True      2. False
- 18.** I like to do certain things just for the thrill of it.  
1. True      2. False
- 19.** I tend to do things on impulse.  
1. True      2. False

## APPENDIX G

### Dimensions of Emotions: PAD Scale

(Mehrabian & Russell, 1974)

**Instructions:** Using each of the pairs of words below, **CIRCLE** the **NUMBER** closest to **how you feel** while **watching** the above **television material**.

#### Arousal dimension

1.	1 relaxed	2	3	4	5 stimulated
2.	1 excited	2	3	4	5 calm
3.	1 sluggish	2	3	4	5 frenzied
4.	1 aroused	2	3	4	5 unaroused

#### Pleasure dimension

1.	1 unhappy	2	3	4	5 happy
2.	1 pleased	2	3	4	5 annoyed
3.	1 unsatisfied	2	3	4	5 satisfied
4.	1 contented	2	3	4	5 miserable

## APPENDIX H

### Personal Involvement Inventory (PII)

(Zaichkowsky, 1985)

Instructions: Please respond to the following question by **circling one NUMBER** at the point **on each scale**, which is closest to reflect how you feel:

To me, **American football** (is):

- |            |                    |   |   |   |                  |
|------------|--------------------|---|---|---|------------------|
| <b>1.</b>  | 1<br>important     | 2 | 3 | 4 | 5<br>unimportant |
| <b>2.</b>  | 1<br>boring        | 2 | 3 | 4 | 5<br>interesting |
| <b>3.</b>  | 1<br>relevant      | 2 | 3 | 4 | 5<br>irrelevant  |
| <b>4.</b>  | 1<br>exciting      | 2 | 3 | 4 | 5<br>unexciting  |
| <b>5.</b>  | 1<br>means nothing | 2 | 3 | 4 | 5<br>means a lot |
| <b>6.</b>  | 1<br>appealing     | 2 | 3 | 4 | 5<br>unappealing |
| <b>7.</b>  | 1<br>fascinating   | 2 | 3 | 4 | 5<br>mundane     |
| <b>8.</b>  | 1<br>worthless     | 2 | 3 | 4 | 5<br>valuable    |
| <b>9.</b>  | 1<br>involving     | 2 | 3 | 4 | 5<br>uninvolving |
| <b>10.</b> | 1<br>not needed    | 2 | 3 | 4 | 5<br>needed      |

## APPENDIX I

### Demographics and Other Information

Instructions: Please complete the following items, which will be **used for classification purposes only.**

1. Sex: please place an “X” in the appropriate blank:

male  
 female

2. Age: please **FILL IN** the **YEAR** you were born:

19\_\_\_\_\_

3. Racial/ethnic background: please place an “X” in the appropriate blank.

Caucasian  
 African-American  
 Native-American  
 Latino/Hispanic  
 Asian  
 Multi-Racial  
 Other: (please indicate) \_\_\_\_\_

4. Class standing in school: please place an “X” in the appropriate blank.

Freshman  
 Sophomore  
 Junior  
 Senior  
 Graduate  
 Other (please indicate) \_\_\_\_\_

### Smoking and drinking behavior

1. Please estimate how many cigarettes you smoke on an average day: \_\_\_\_\_[if none, write “0”, please use the whole numbers]
2. Please estimate how many times you have been intoxicated in the past 30 days: \_\_\_\_\_[if none, write “0”, please use the whole numbers]

### Prescreen Question

Do you currently smoke cigarettes or use tobacco products?

Yes      No

## APPENDIX J

### Instructions for Administering the Pre-Experiment Questionnaire

1. You will each be given a questionnaire for the purpose of gathering data for a research project being conducted by the faculty (Dr. Hatfield) and a graduate student (Shu-Chen Lee) in the Kinesiology Department.
2. Your participation in the study is completely voluntary and you are free to withdraw at any time. By returning this survey you are indicating your willingness to participate in this study. Your voluntary involvement is important to the study and will contribute to the field of sports spectatorship research.
3. Completion of this survey will take approximately 10-15 minutes. If you choose not to participate, please wait quietly while your classmates complete the questionnaire.
4. Please read all instructions and questions carefully, and try to work at your own pace.
5. Please make sure you carefully mark your answers so we know which response you intended as your final answer.
6. There are no right or wrong answers, just answer questions honestly as they pertain to how you think or feel. **All of your responses will remain confidential and will be used for research purposes only.**
7. There should be no talking. If you have questions, raise your hand and someone will come to answer it for you.
8. Thank you for your help and cooperation.

## **APPENDIX K**

### E-mail Invitation

Hi,

My name is Shu-Chen Lee. I am a doctoral candidate in the Department of Kinesiology at the University of Maryland, currently working to complete the requirements of my degree by conducting a research study on television audiences.

You have completed a questionnaire in Dr. Hatfield's KNES 350 class and signed up to participate in an experiment I am conducting. You have been selected to participate in the second part of this study in exchange for 2 points of extra credit. You will choose a time and date between now and the end of this week for your participation. The experiment will take place in room 0110H, which is across from the vending machines on the ground floor of the HHP building. The entire procedure will take only one hour to complete.

Because your heart rate will be recorded during the experiment, you will have to refrain from smoking and consuming alcohol or anything that contains caffeine (coffee, sodas containing caffeine, such as colas, mountain dew, etc., and energy drinks such as Red Bull) for the 6 hours before your appointment. You also should not exercise for at least 1 hour prior to the scheduled appointment. Please keep this in mind when choosing the time that you want to participate.

Your Username is:

Your Password is:

To schedule the time and date for your participation, click the following link:

[Link to Participation scheduling web page](#)

This will take you to a web page that displays a calendar showing the times that are currently available over the next seven days. Click on the block of time that you want to reserve. A page will then appear showing the date and time that you are about to reserve and asking for your Username and Password. If this is the correct time/date that you want to reserve for your participation, enter your Username and Password and then click the "Update Reservation" button to confirm your reservation. Otherwise, hit the "back" button on your browser to return to the calendar and choose different block of time. The system will only allow you to schedule one appointment to participate.

Appointments are available with starting times from 9:00am to 6:00pm, 7 days a week through the end of the semester. This should make it easy for you to make an appointment that fits into your busy schedule.

I need 110 volunteers to complete their participation between now and the end of the semester, so it would be a great help to me if you would schedule your appointment at the earliest date that is convenient for you.

Your willingness to participate is completely voluntary and you are free to withdraw from participation anytime during the experiment procedure. I assume you that your data will be confidential. Please let me know if there is any question regarding the nature and the goals of the study.

Sincerely,

Shu-Chen Lee  
Doctoral Candidate  
Department of Kinesiology  
University of Maryland, College Park

## APPENDIX L

### Informed Consent Form

<u>Project Title</u>	<i>Spectators' Emotional and Physiological Responses to Televised Sports</i>
<b>Why is this research being done?</b>	<i>This is a research project being conducted by Dr. Bradley Hatfield and Shu-Chen Lee at the University of Maryland, College Park. We are inviting you to participate in this research because you are at least 18 years of age. The purpose of this research is to explore audiences' responses to certain types of televised sports.</i>
<b>What will I be asked to do?</b>	<i>The procedures involve two sessions. You will first complete a questionnaire in class, with questions about your personality characteristics, your personal experiences in sports participation, exercise, televised sports viewing, and some general information about you (such as age, sex, class standing). Examples of items from the questionnaire: How many days have you viewed at least part of sports on television during the last 7 days? How many days do you engage in some form of physical exercise that lasts for at least 20 minutes? True/False: I will try anything once. Completion of this survey should take approximately 10-15 minutes. At a later date, some of you will be contacted by email and given the opportunity to participate in the second part of this research. It is for this reason that we need your name and email address. The experiment will take place at the Cognitive-Motor Neuroscience lab (Room 2303A) in the Health and Human Performance (HHP) building at the University of Maryland, College Park. During the lab session, you will watch three five-minute videotaped of sport programming and complete a questionnaire to give us your reactions to each of the videos. In addition, before and during viewing your heart rate will be measured by a sensor attached to the index finger of your nondominant hand. A cable connects the sensor to a computer that records the data. The procedure in the lab will probably take one hour to complete. The equivalent of two percent of the total points towards your grade will be given for participation in the lab session of this study, all other students in the class will be given the opportunity to acquire the same number of points for an alternative assignment.</i>
<b>What about confidentiality?</b>	<i>We will do our best to keep your personal information confidential. To help protect your confidentiality, data from the study will be stored securely and will be made available only to researchers conducting the study. If we write a report or article about this research project, your identity will be protected to the maximum extent possible.</i>
<b>What are the risks of this research?</b>	<i>There are no foreseeable or expected long term risks to participate in this research study. However, you may experience some discomfort completing the questionnaires or by watching some clips of televised sports.</i>

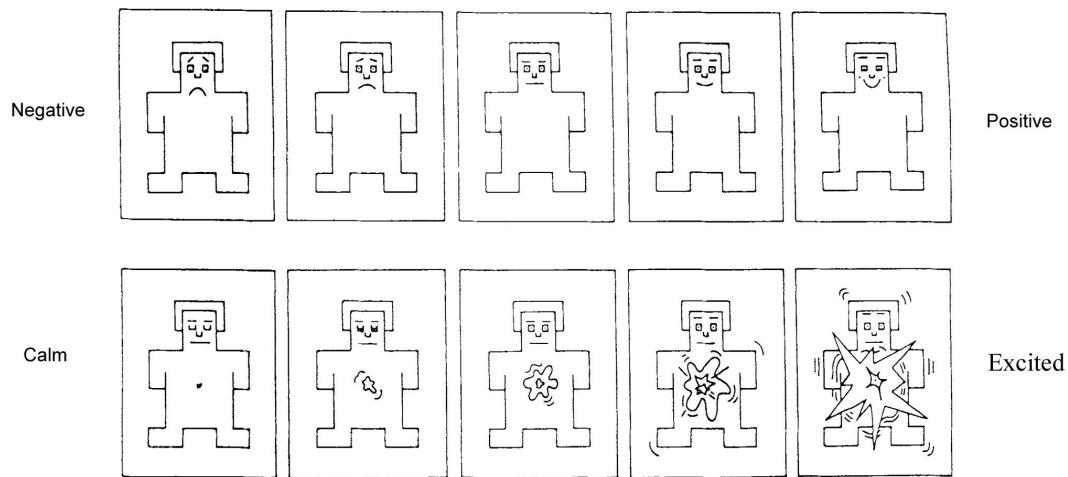
<b>Project Title</b>	<i>Spectators' Emotional and Physiological Responses to Televised Sports</i>
<b>What are the benefits of this research?</b>	<i>This research is not designed to help you personally, but the results may help the investigator learn more about the relationship between audiences' characteristics and their responses. We hope that, in the future, other people might benefit from this study through improved understanding of how audience' characteristics influences their psychological and physiological responses to certain types of televised sports.</i>
<b>Do I have to be in this research? Can I stop participating at any time?</b>	<i>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.</i>
<b>What if I have questions?</b>	<i>This research is being conducted by Dr. Bradley Hatfield and Shu-Chen Lee at the Department of Kinesiology at the University of Maryland, College Park. If you have any questions about the research study itself, please contact Dr. Bradley Hatfield at 301-405-2485 or bhatfiel@umd.edu or Shu-Chen Lee at: The University of Maryland, 2303 HHP Building, 301-405-2474 or jeanlee@umd.edu If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland, 20742; (e-mail) irb@deans.umd.edu; (telephone) 301-405-0678 This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</i>
<b>Statement of Age of Subject and Consent</b>	<i>Your signature indicates that: you are at least 18 years of age;, the research has been explained to you; your questions have been answered; and you freely and voluntarily choose to participate in this research project.</i>
<b>Signature and Date</b>	<b>Printed Name of Participant</b>
	<b>Signature of Participant</b>
	<b>Date of Signature</b>
	<b>Contact Email of Participant</b>

## APPENDIX M

### Self-Assessment Manikin (SAM)

(Bradley & Lang, 1994; Lang, 1980)

**Instruction:** Please check the expression that **best describes your reaction** to the above television clip you just watch. **Check one box** for each of the two rows.



## APPENDIX N

### Football-Enthusiasm Scale (revised)

(Dickerson & Gentry, 1983; Cornwell, Maignan, & Irwin, 1997)

**Instructions:** For each of the following five statements, please **CIRCLE** the **one item** that best describes how often **you** engage in each of the following types of activities.

**1.** I attend football game in a stadium.

1. never      2. rarely      3. sometimes      4. fairly often    5. very often

**2.** I watch telecasts of football games on television.

1. never      2. rarely      3. sometimes      4. fairly often    5. very often

**3.** I read about football information in newspapers and/or magazines.

1. never      2. rarely      3. sometimes      4. fairly often    5. very often

**4.** I talk about football with my friends and family.

1. never      2. rarely      3. sometimes      4. fairly often    5. very often

**5.** I use the Internet to get football information, such as game outcomes, scores, or to learn about football teams or athletes.

1. never      2. rarely      3. sometimes      4. fairly often    5. very often

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