

# The Effectiveness of Advertising Embedded in Televised Sport Programming: How Team Performance Influences de Formation

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## Abstract

The present study investigated the effect of emotions derived from the unique nature of spectator sport (e.g., uncertainty about outcomes) on sport fans' responses to advertisements presented in a sport broadcasting context. In order to test the study's hypotheses, a repeated measures design (i.e., program-induced valence [2] × program-induced arousal [2] × ad valence [2]) was employed. As hypothesized, the affective reactions to game outcomes (i.e., a win or a loss) had significant carry-over effects on the evaluative judgments to commercials. The findings enrich our understanding of how sport fans process information relating to televised commercials during sporting events. Furthermore, the results relate to the possible ways in which sport advertising influences consumers' attitudes and thus the findings are of benefit to practitioners (e.g., sport team sponsors, sporting event advertisers) as well as scholars (e.g., sport marketing researchers).

**Keywords:** emotions, uncertainty of outcome, program-induced affect, advertising strategy

## Introduction

One of the distinctive parts of sport broadcasting is that with televised sports the emotional reactions of fans pertaining to the unique aspect of sport (e.g., uncertainty of the game outcome) are intensified (Knobloch-Westerwick, David, Eastin, Tamborini, & Greenwood, 2009; Peterson & Raney, 2008). In sport broadcasting contexts, where marketing stimuli are often packed, it is common for sport viewers to process the commercials while they are emotionally engaged in the contests. For example, the 2017 Super Bowl had a viewership of over 111 million with the game ending in the first overtime in Super Bowl history, an emotionally charged come-from-behind victory by the New England Patriots that no doubt elicited strong

emotional feelings from their fans (as well as the fans of the opposing team, the Atlanta Falcons). After the final moments of the game, a lot of commercials (of which the post-game media spots alone brought in \$20 million for Fox, the network broadcasting the game) were played and consumed by millions of viewers (Schuster, 2017). Additionally, during this exciting sporting event, advertisements took up 22% of the entire broadcast and the 40 corporate brands each spent around \$5 million for each 30-second televised spot, which generated an estimated \$500 million of live stream advertising revenue for Fox (Nielsen, 2017). Likewise, a significant amount of marketing initiatives is presented to sports viewers whose emotions are

already stimulated through their consumption of a televised sporting event.

It is noteworthy to point out that the hedonic nature of sport consumption may boost or undermine the effectiveness of commercials (Pyun & James, 2011). The emotions induced by the program may spill over to influence the processing of advertisements in commercial breaks (Potter, LaTour, Braun-LaTour, & Reichert, 2006). For example, recent studies in the field of sport management have found that different emotional states induced from a sport-related stimulus triggered different information processing of subsequent marketing stimuli (Kwak, Kim, & Hirt, 2011; Wang & Kaplanidou, 2013). Thus, it is crucial for scholars and practitioners to fully understand the unique opportunities or challenges offered by way of televised sporting events. However, this specific topic of the emotion carry-over effect has been scarcely considered and empirically tested in the sport broadcasting context (Bee & Madrigal, 2012; Pavelchak, Antil, & Munch, 1988). Further, when it comes to the literature pertaining to program-induced affect (Goldberg & Gorn, 1987; Kamins, Marks, & Skinner, 1991), there is an overall limited understanding of the affective priming effects. Bellman, Wooley, and Varan (2016) noted that previous work in this specific area has often revealed conflicting results, and thus replication-extension studies should be conducted within different programming contexts using different measurements to provide more confident and robust evidence for the effect. Stronger emotional responses evoked by televised sports content—compared to other media entertainment genres (Gantz, Wang, Paul, & Potter, 2006)—may give researchers in this area a special chance to better understand how emotions work in consumers' reactions to marketing stimuli (Kwak et al., 2011).

Therefore, the primary purpose of the present study was to extend scholars' understanding of how the context of a televised sport program influences the persuasive information processing of those who consume the commercials. To be specific, the investigation examined the effect of emotions derived from the unique nature of spectator sport (e.g., intensive emotional responses, uncertainty of outcomes) on sport fans' attitude formation regarding TV commercials presented in a sport broadcasting context. The study was conducted in a laboratory experimental setting to test how the intensity (i.e., calm to exciting) of emotional experiences (i.e., happy or unhappy) created by mediated sports moderates the effect of the emotional valence of commercials (i.e., pleasant or unpleasant) on attitudinal responses via a self-administered survey

as well as affective responses via real-time measures (facial electromyography [EMG]). The investigation, sought to provide a clearer and more comprehensive understanding of the underlying mechanism regarding how commercial in conjunction with sporting event have an impact on attitude formation. It employed a mixed design that included several methodological approaches (e.g., real-time psychophysiological measures, randomized-block factorial designs, pre-tests for stimuli selections, unfamiliar commercials and brands), which were adopted from previous research (Bellman et al., 2016; Kim, Magnusen, & Lee, 2017; Norris & Colman, 1993; Shapiro, MacInnis, & Park, 2002; Wang & Lang, 2012). Also, an objective of the study was to develop, based on the findings, advertising suggestions and strategies for sport marketing and advertising practitioners to consider.

### ***Effect of Program-Induced Emotions***

Emotions are generally regarded as internal, typically intensive and short-lived, mental states that allow one to express appraisal reactions to events or objects (e.g., Holbrook & O'Shaughnessy, 1984; Ortony, Clore, & Collins, 1988). They are theoretically divided into the two independent dimensions of pleasure and arousal (Russell & Mehrabian, 1977). Over the past few decades a substantial amount of research (Bellman et al., 2016; Goldberg & Gorn, 1987; Potter et al., 2006; Wang & Lang, 2012) has examined how emotional pleasure and/or arousal induced by surrounding program contexts influence the effectiveness of commercials embedded in the programs as it pertains to memory, emotional reactions, attitudes toward ads/brands, and purchase intentions based on several emotion theories (e.g., emotion priming theory, excitation transfer theory).

This is in line with the affective priming paradigm, which asserts that the valence dimension (i.e., pleasant to unpleasant) regarding a consumer's emotional state, influences the emotion-congruent directions of consumer's memory, judgment, decision-making, and behavior (e.g., Bower, 1981; Schwarz, 1990), scholars have investigated how the valence dimension of emotions derived from a television program context carries over to the audiences' response to subsequent commercials. For example, Goldberg and Gorn (1987) found that light-hearted (e.g., happy) programming elicited greater evaluations toward a following ad than sad programming. More recent work by Bellman et al. (2016) reexamined the effect of the program-induced valence on the effectiveness of advertising by using facial-tracking technology. They found that pleasant emotions induced from humorous (e.g., funny)

programs amplified smiling activities during the presentation of ads.

While numerous other program-induced emotion studies (Mathur & Chattopadhyay, 1991; Owolabi, 2009; Srull, 1983) have provided empirical evidence that supports the emotion congruent effect on emotional, attitudinal, and behavioral responses, they are limited in that only the valence dimension was manipulated when testing the program-induced effect. In fact, televised events not only evoke pleasant or unpleasant feelings but also induce different levels of arousal (i.e., very calm to highly arousing). Both dimensions of emotions (i.e., valence and arousal) induced from a television program may cohesively interact to influence the information processing of the subsequent commercials (Wang & Lang, 2012).

To address the gap, another line of inquiry has been conducted to investigate the interacting roles of program-induced valence and arousal based on excitation transfer theory (Zillmann, 1971). This posits that a consumer's (or an audience's) affective response, appraisal, or other judgments may be affected by residual arousal emotions derived from a prior stimulus. However, the research in this area has yielded contradictory findings and thus provides an unclear understanding of the topic. Several studies (Gorn, Pham, & Sin, 2001; Bee & Madrigal, 2012) have found independent and separate effects of program-induced excitement. Whereas other investigations (Broach, Page, & Wilson, 1995; Wang & Lang, 2012) have reported the combined effects of program-induced arousal and valence on the attitude toward the advertisement, its brand, and product purchasing.

Some scholars (Bee & Madrigal, 2012; Mattes & Cantor, 1982) have asserted that arousal experienced at a given time has a positive impact on the evaluative judgment of subsequent commercials. For example, Gorn et al. (2001) found that program-induced arousal has more robust effects on the viewer's evaluation as the findings of their study indicated that highly aroused subjects tend to have polarized thoughts and feelings toward advertisements. However, valence did not influence the evaluation of the advertisement. Consistent with the finding by Gorn et al. (2001), some subsequent investigations suggested that when combining program-induced valence with arousal, the arousal dimension, but not the pleasure dimension, has a positive impact on advertisement evaluation (Bee & Madrigal, 2012; Shapiro et al., 2002).

Further, some previous research (Broach et al., 1995) has revealed the significant interplaying roles of program-induced valence and arousal in information processing of advertisements. For instance, Wang and

Lang (2012)—by employing real-time psychophysiological measures—examined how emotional arousal and valence derived from program context influences subsequent commercial information processing. Their research revealed that there were significant interaction effects of program-induced valence and arousal on the viewer's responses to the ad. Participants reported the greatest evaluations of the advertisements when they were exposed to them right after the exciting pleasant program. Also, participants elicited more favorable responses to commercials that appeared after a calm negative program than those that appeared after a calm positive program.

To summarize, the research regarding program-induced emotion effects is limited. While there have been studies on the independent role of valence (Goldberg & Gorn, 1987; Kamins et al., 1991), only a relatively small amount of research—with inconsistent findings—has manipulated levels of emotional valence and arousal together (Bee & Madrigal, 2012; Broach et al., 1995; Shapiro et al., 2002; Wang & Lang, 2012). Accordingly, still not much is known about whether either program-induced valence or arousal alone (and/or the interaction between two) influences attitudinal responses to subsequent advertisements. Therefore, three hypotheses were developed to test the suppositions noted above:

H1a: There will be significant main effects of sport program-induced valence on affective responses to advertisements, attitude toward advertisements, and advertised brands such that the effectiveness of commercials will be significantly greater for pleasant than unpleasant conditions.

H1b: There will be significant main effects of sport program-induced arousal on affective responses to advertisements, attitude toward advertisements, and advertised brand such that the effectiveness of commercial will be significantly greater for arousing than calm conditions.

H1c: There will be significant interaction effects between sport program-induced valence and arousal on affective responses to advertisements, attitude toward advertisements, and advertised brand such that at the arousing condition, the effectiveness of commercials will be significantly greater for pleasant than unpleasant conditions. At the calm conditions, no such effect will be expected.

### ***Matching Effect between Program and Advertisement***

Another interesting topic the current study addressed is a program-ad matching effect (Bellman et al., 2016; Kamins et al., 1991; Mathur & Chattopadhyay, 1991; Potter et al., 2006). This assumed that when the emotional tone of programs and commercials are

matched, the more positive effect would be exhibited. Such effects have been empirically supported by all the studies noted above. For example, Kamins et al. (1991) investigated how commercial effectiveness is influenced by the interplay between the program-induced emotion and the emotional tone of the advertisements. They developed an experimental design and manipulated two between-subject factors (i.e., program and commercial) at two levels (positive or negative). Although there were no main effects of program-induced valence, significant interaction effects between types of programs and commercials were found on perceived commercial effectiveness, attitudes toward the advertisement, liking for the commercial, and behavioral intentions. In that, the effectiveness of commercial was greater for a pleasant advertisement, when subjects were exposed to the commercial following a positive program. While a negative commercial was more effective when subjects watched the commercial play after a negative program.

### ***Effect of Sport Program Context***

Investigations have also taken place with regard to how televised sports-induced emotions have an impact on the information processing of subsequent advertisements (Bee & Madrigal, 2012; Pavelchak et al., 1988). Limited research has examined the effect of suspenseful televised sports on advertisement recall by employing field experiments (Pavelchak et al., 1988) and advertisement evaluation by a laboratory experiment (Bee & Madrigal, 2012). For example, Bee and Madrigal investigated the effect of emotions induced via sporting event context on advertisement effectiveness (e.g., evaluation, attitude). To be specific, in their experiment three factors were manipulated in a 2 (program-induced valence: pleasant, unpleasant)  $\times$  2 (program-induced arousal: arousing, calm)  $\times$  2 (ad arousal: arousing, calm) mixed experiment design. Final game outcomes (i.e., a victory or a defeat) were manipulated to induce pleasant or unpleasant emotional states, while the levels of uncertainty of the game outcome (i.e., a close or a lopsided victory or defeat) were manipulated to evoke arousal. Bee and Madrigal's findings indicated that arousing sporting matches enhanced the effectiveness of the advertisement presented right after the game. Further, arousing advertisements were better evaluated when they appeared in a highly suspenseful program context. Although Bee and Madrigal expected that program-induced arousal would polarize the effect of game outcome on advertisement attitudes, program-induced arousal was found to be a significant factor only with regard to its ability to elicit favorable advertisement responses. They concluded that the viewers' responses

to the advertisement were impacted by the excitement of the game rather than by their team's victory or defeat.

While this study extends our understanding of how the emotional nature of sport consumption influence the way sport fans process the subsequent commercials, there is still an unknown regarding how sport fans react to commercials that possess either positive or negative valence. As suggested by the findings of previous literature (Bellman et al., 2016; Kamins et al., 1991; Mathur & Chattopadhyay, 1991), the congruency between emotional valences induced from final game outcome and that of the commercial would moderate the effectiveness of commercial. It should be noted that this specific topic is also very important for sport practitioners (e.g., event organizers, marketers, advertisers) in order to develop effective advertising strategies because they often target sport viewers whose emotions are already stimulated through their consumption of a televised sporting event (Wang & Kaplanidou, 2013). Moreover, commercial often utilize negative emotional appeals (e.g., fear, anger) because of their usefulness (e.g., attention, persuasion, attitude change; Nabi, 2002). For these reasons, the current study involved a manipulation of the emotional tones of the commercials at two levels (i.e., positive and negative) and hypothesized as follows:

H2: There will be significant interaction effects between program-induced valence and ad valence on affective responses, attitude toward the advertisement, and advertised brand such that in the pleasant conditions, the effectiveness of the commercial will be significantly greater for positive commercials than negative commercials. In unpleasant conditions, the effectiveness of the commercial will be significantly greater for negative commercials than positive commercials.

## **Method**

### ***Experimental Design***

In order to test the hypotheses, a 2 (program-induced valence: pleasant, unpleasant)  $\times$  2 (program-induced arousal: arousal, calm)  $\times$  2 (ad valence: positive, negative)  $\times$  2 (video replication) mixed subjects design was developed. Except for the video replication, all factors were within-subject factors. The program-induced valence had two levels: pleasant and unpleasant. The program-induced arousal had two levels: arousing and calm. Two factors were fully crossed, producing four emotional trajectories of sporting stimuli (i.e., pleasant/arousing content, pleasant/calm content, unpleasant/arousing content, and unpleasant/calm content). Thus, there were two clips in each of the four



different types, resulting in a total of eight segments of sport game stimuli. Furthermore, the valence of the advertisements were divided across two levels: positive and negative. In accordance with the suggestion of previous studies by Lord et al. (2001) and Wang and Lang (2012), an assessment of the commercial stimuli generalizability was performed by examining in the experimental setting another set of commercials that were similar to the eight advertisement stimuli in terms of their structural features, stories, and product categories. According to Jackson and Jacobs (1983), generating multiple messages helps to control any observed impacts caused by confounding factors of a

Table 1. Descriptive Statistics of Selected Sporting Stimuli

Condition	Pleasant <i>M (SD)</i>	Unpleasant <i>M (SD)</i>	Arousal <i>M (SD)</i>
Pleasant & Arousing 1 (Victory & Tight)	6.03 (1.20)	1.75 (1.27)	5.81 (1.13)
Pleasant & Arousing 2 (Victory & Tight)	4.97 (1.53)	1.52 (0.75)	4.82 (1.57)
Pleasant & Calm 1 (Victory & Lopsided)	4.42 (1.73)	1.61 (1.20)	3.24 (1.58)
Pleasant & Calm 2 (Victory & Lopsided)	4.15 (1.78)	1.82 (1.21)	2.73 (1.87)
Unpleasant & Arousing 1 (Defeat & Tight)	2.12 (1.40)	4.69 (1.86)	4.72 (1.69)
Unpleasant & Arousing 2 (Defeat & Tight)	2.16 (1.37)	5.13 (1.90)	4.75 (1.87)
Unpleasant & Calm 1 (Defeat & Lopsided)	2.39 (1.25)	4.52 (1.56)	3.06 (1.41)
Unpleasant & Calm 2 (Defeat & Lopsided)	2.47 (1.41)	4.53 (1.60)	2.92 (1.39)

certain message while also helping to make a casual relation between a particular interesting variable and construct confident. Thus, a total of 16 commercials (i.e., positive [ $n = 8$ ] and negative [ $n = 8$ ]) were assigned to two blocked conditions (i.e., the replication factor). One of the two experimental sets was randomly assigned to the subjects. No replication effects were found on dependent variables. Thus, it was dropped in the final data analysis.

Also, the emotional valence (i.e., pleasant and unpleasant) and product categories (e.g., beer, food, service) of the commercials were counterbalanced across the replicated condition. Each commercial stimulus was paired with one of four categories of sporting stimuli using a Latin square design—which enables minimizing the confounding effects (e.g., product category, discrete emotion, time duration, content of advertisement) on attitudinal responses—so that every single commercial stimulus was played exactly once after four different emotional trajectories

of sporting stimuli (i.e., win/close, win/lopsided, lose/close, and lose/lopsided). In order to control the order effect, eight commercials embedded within sporting stimuli were randomly presented and administrated by MediaLab software (Jarvis, 2012). The final experiment design can be seen in Appendix 1.

### Experimental Stimuli & Pretests

Stimuli selections (e.g., selecting the appropriate sports programs and commercials) are critical parts of the current experiment because previous studies suggested that inconsistent results about the roles of two primary dimensions of emotions (i.e., valence and arousal) may be due to the fact that previous research had not systematically controlled the emotional tones of emotion induction stimuli (i.e., program and commercial). One other dimension (either valence or arousal), which was not a primary interest of the previous studies, was not carefully considered in the research stimuli development stage (Shapiro et al., 2002). For example, Bee and Madrigal (2012) manipulated the arousal level of advertising stimuli, but they did not control for the valence dimension in the advertising stimuli. Such an action may have tainted the results of their study because different emotional valence dimensions during the presentation of the advertising stimuli may play vital roles in the viewer's advertisement processing (Wang & Lang, 2012; Yeghyan, 2015). Thus, the current study conducted pretests for stimuli sections in order to systemically manipulate the levels of valence and arousal via the experimental stimuli as intended.

**Sporting stimuli.** The sporting stimuli of the current experimental study were developed via the disposition theory of sport fandom (Zillmann, Bryant, & Sapolsky, 1989), which suggest that sport fans elicit positive emotional reactions to their preferred team winning and negative emotional responses to their favorite team losing. Also, the arousal responses to game outcomes can be moderated by the level of uncertainty about game outcome. The more competitive a sporting game is, the stronger fans' emotional responses are with regard to the final outcome (Peterson & Raney, 2008). Thus, the game outcomes (i.e., a victory or a defeat) were manipulated to induce pleasant or unpleasant emotional states while the levels of uncertainty of the game outcome (i.e., a close or a lopsided victory or defeat) were manipulated to evoke the different levels of arousal, which is the parallel way of emotion inducements employed by Bee and Madrigal (2012).

In order to select appropriate emotion induction video clips, based on the criteria for the final score differentials (close: 0–4 points, lopsided: 10–20 points)

Table 2. Descriptive Statistics of Selected Commercial Stimuli

Emotional Tone of Ad	Condition	Product Category	Discrete Emotion	Pleasant <i>M (SD)</i>	Unpleasant <i>M (SD)</i>	Arousal <i>M (SD)</i>	Familiarity		Duration (Seconds)
							Brand <i>M (SD)</i>	Ads <i>M (SD)</i>	
Positive Ad	P1-1	Beer	Humor	4.88 (1.11)	1.59 (1.06)	3.94 (1.14)	1.53 (1.57)	1.35 (0.86)	47
	P1-2	Daily	Joy	4.63 (1.82)	1.19 (0.54)	3.31 (1.54)	1.38 (1.50)	1.00 (0.00)	30
	P1-3	Retailer	Humor	3.29 (1.49)	1.71 (1.16)	2.88 (1.65)	1.41 (1.46)	1.24 (0.56)	30
	P1-4	Daily	Joy	4.41 (1.62)	2.0 (1.32)	3.71 (1.45)	1.94 (1.89)	1.35 (1.05)	30
	P2-1	Beer	Pride	4.33 (2.09)	1.40 (0.50)	3.60 (1.92)	1.93 (1.71)	1.53 (1.40)	70
	P2-2	Daily	Joy	4.45 (1.80)	2.31 (1.43)	3.88 (1.76)	1.18 (0.73)	1.12 (0.48)	30
	P2-3	Insurance	Humor	4.40 (1.63)	1.94 (1.30)	3.67 (1.71)	1.53 (1.20)	1.93 (1.49)	30
	P2-4	Restaurant	Joy	4.44 (1.15)	1.75 (1.44)	3.75 (0.85)	1.62 (1.15)	1.56 (1.20)	30
Negative Ad	N1-1	Beer	Sadness	2.25 (1.65)	4.50 (2.00)	3.19 (1.51)	1.88 (1.78)	1.38 (1.25)	59
	N1-2	Daily	Disgust	1.75 (1.52)	5.31 (1.89)	2.75 (2.17)	1.00 (0.00)	1.13 (0.50)	76
	N1-3	Retailer	Fear	2.19 (1.17)	3.69 (2.24)	3.88 (2.49)	2.37 (2.09)	1.94 (1.84)	30
	N1-4	Gum	Disgust	2.88 (2.36)	3.38 (2.30)	3.75 (2.10)	1.31 (1.01)	1.06 (0.25)	30
	N2-1	Beer	Fear	2.47 (1.80)	3.88 (2.00)	2.88 (1.53)	1.65 (1.54)	1.29 (0.85)	50
	N2-2	Restaurant	Disgust	2.29 (1.76)	4.41 (2.60)	3.06 (1.85)	1.12 (0.33)	1.18 (0.39)	30
	N2-3	Bank	Sadness	2.56 (1.41)	3.50 (1.90)	3.25 (1.73)	1.0 (0.00)	1.06 (0.25)	60
	N2-4	Theme Park	Fear	2.56 (1.41)	3.69 (1.53)	3.87 (1.54)	1.56 (1.54)	1.69 (4.58)	30

Note: *P* = Positive; *N* = Negative

and how many lead changes occur (close: 1–2 times, lopsided: 0 times), the final segment of 16 NCAA basketball games (i.e., last four minutes) out of a total of 96 games played by a college team located in the Midwestern United States during three complete seasons were selected as possible target stimuli. In order to select eight video stimuli, 65 undergraduate students, who did not participate in the main experiment and were psychologically associated with the team as indicated by an average team identification rating of 5.03, participated in the pretest. A total of eight videos out of the 16 possible targets—two of four in each of four emotional trajectories of sport programming—were counterbalanced and randomly shown to participants. After watching each segment, participants were asked to report on how positive (i.e., positive, happy, and pleasant), negative (i.e., negative, sad, and unpleasant), and aroused (i.e., aroused, excited, and awake) each stimulus made them feel; this was done by anchoring a 7-point semantic differential scale (Wang & Lang, 2012). Finally, the eight programs that best exemplified two in each of the four emotional trajectories of sporting programs (i.e., pleasant/arousing contents, pleasant/calm contents, unpleasant/arousing contents, and unpleasant/calm contents) were selected based on the results of repeated measures of ANOVA. As predicted in the underlying assumption of the current study, the victory conditions significantly elicited

more pleasant responses than the defeat conditions,  $F(1, 248) = 202.39, p < .001$ , and the defeat conditions were significantly more negative than the victory conditions,  $F(1, 245) = 289.34, p < .001$ . Further, the tight games were more arousing than lopsided games,  $F(1, 250) = 112.37, p < .001$ . The detailed information is described in Table 1.

**Commercials.** Another pretest was designed to select target commercials that possessed either negative or positive valence and were moderately arousing. For the advertising stimuli, arousal was controlled at a medium level in order to test how program-induced arousal spills over to influence the processing of commercial (Wang & Lang, 2012; Yegiyen, 2015). As suggested by previous research (Srull, 1983), brand and advertisement familiarity might serve as confounding factors. Because the study took place in the United States, 48 possible target advertisements that aired on the broadcasting channels of other countries (e.g., Australia, Canada, United Kingdom) were selected as possible target stimuli based on the suggestion by Norris and Colman (1993). According to Bellman et al. (2016), unfamiliar advertisements and brands from other countries can increase viewer's attention. Also, it is very fascinating to see how consumers develop attitudes toward a brand via an advertisement.

A similar research protocol from pretest for program selections was utilized in this pretest. Sixty-five

participants were randomly distributed to one of four counterbalanced advertisement blocks, which included twelve advertisements out of a total of 48 advertisements. After watching each commercial, the participants were asked to report via a survey involving emotional responses (i.e., positivity, negativity, and excitement) and familiarity toward the brand and commercial. Considering the average ratings for constructs (i.e., pleasantness, unpleasantness, arousal, and familiarity) and product categories of commercials, a total of 16 commercials—consisting of eight positive and eight negative commercials—were purposely selected and tested by employing a 2 (emotional tone of commercial)  $\times$  4 (product categories)  $\times$  2 (repetition). A repeated analysis of variance (ANOVA). Results revealed that positive commercials elicited more positive feelings than negative commercials,  $F(1, 227) = 92.78$ ,  $p < .001$ , while negative commercials elicited more negative feeling than positive commercials,  $F(1, 208) = 122.33$ ,  $p < .001$ . Except for the effect of the emotional tone, none of the factors (i.e., product categories and repetition) had any impact on pleasantness and unpleasantness ratings. The 16 selected commercials were emotionally positive ( $n = 8$ ) or negative ( $n = 8$ ) with a medium level of arousal and a low level of brand and commercial familiarity. A summary of descriptive statistics of the selected commercials is presented in Table 2.

### Measures

The current investigation was conducted under two different experimental paradigms to measure key determinants in the effectiveness of a commercial. The participants' responses were first measured via self-administered instruments covering attitudes. In addition, psychophysiological approaches utilized in prior works (Potter et al., 2006; Wang & Lang, 2012) were adopted in order to capture emotional responses. According to Potter and Bolls (2011), psychophysiological measures (e.g., facial EMG, skin conductance) are useful in measuring emotional reactions to stimuli without social and cognitive biases. Also, these autonomic measures allow us to capture dynamic changes in emotional responses to stimuli in real time (Potter & Bolls, 2011; Potter et al., 2006; Wang & Lang, 2012). Furthermore, sport marketing scholars such as Kim et al. (2017) have called for a more accurate and dynamic approach in measuring sport consumers' emotions and information processing. Research in relation to sport media consumption has, as noted by Potter and Keene (2012), often disregarded the real-time quickness and dynamic nature of the processing (cognitive and emotional) involved.

**Affective responses.** Electrical signals associated with orbicularis oculi (smile) and corrugator (frown) muscle activities were recorded to physiologically operationalize the emotional valence dimension using facial electromyography (EMG; Potter & Bolls, 2011). Orbicularis oculi (smile) muscle activation indicates pleasantness, whereas an increase in corrugator (frown) muscle activity implies unpleasantness (Potter & Bolls, 2011; Wang & Lang, 2012). The facial EMG data—which was sampled at 20 times per second, amplified 5000 times, band pass filtered with a range of 10Hz and 1000Hz, and then, integrated online—was recorded during the presentation of sporting events (last 30 seconds) and commercials (30 seconds). Change scores for sporting events were computed by subtracting the facial EMG data from each second before the onset of game play (Potter & Keene, 2012). Further, the facial EMG data collected during the viewing of commercials were standardized to z-scores for each subject (Wang & Lang, 2012) and utilized as outcome variables, as previous studies suggested that the hedonic valence response could be considered as an indicator of commercial effectiveness (Bee & Madrigal, 2012; Wang & Lang, 2012).

**Sympathetic arousal.** Skin conductance levels (SCL) as measures of electrodermal activity were recorded in order to physiologically operationalize autonomic arousal. It was measured to check whether a manipulated factor (i.e., uncertainty of outcomes [tight, lopsided]) affected the level of arousal as intended. It has been a well-established measure as an index of autonomic arousal level (Wang & Lang, 2012; Potter & Bolls, 2011; Potter et al., 2006). The SCL data—recorded at a sampling rate of 20Hz, and digitized and averaged over a second—were collected during the last 30 seconds of game play and changed by subtracting original data from the baseline (i.e., one second before the sport stimuli onset; Potter & Keene, 2012).

**Attitude toward advertisement.** Attitudes toward the advertisements were assessed via a six-item semantic differential scale (i.e., unpersuasive-persuasive, uninformative-informative, unbelievable-believable, not likable-likeable, unattractive-attractive, and unappealing-appealing), modified and adopted from previous works (Miniard, Bhatla, & Rose, 1990; Wang & Lang, 2012). Acceptable internal reliability ( $\alpha \geq .96$ ) of the scale has been shown in all of the previous studies.

**Attitude toward brand.** In order to measure attitudes toward the advertised brands, four seven-point semantic differential scales were adapted and modified from Krosnick, Boninger, Chuang, Berent, and Carnot (1993). This scale has been widely used by previous

studies (Funk & Pritchard, 2006) with a strong reliability ( $\alpha = .96$ ). Items included bad/good, unpleasant/pleasant, and unfavorable/favorable.

**Demographic & individual characteristics.** In order to identify the subjects' demographic information, questions regarding age, gender, and major appeared on the screen. Furthermore, team identification scales, based on the work of Robinson and Trail (2005), were adopted. Also, subjects were asked to write down a team name(s) if they were avid fans of a basketball team(s) shown in the sporting stimuli. The psychological associations were measured in order to check whether participants are psychologically involved with the basketball team of the university.

### Sample and Procedure

In order to ensure statistical power (level of significance [ $\alpha = .05$ ], power level [ $1-\beta = .80$ ], and effect size [ $f = .25$ ]) and estimate sample size (Cohen, 1988), a priori power analyses were conducted using G\*Power 3.1 software (Faul, Erdfelder, Buchner, & Lang, 2007); it was determined that the study design required 62 subjects. Ensuring that the study had a sufficient power of sample, 76 participants (of which 53 identified as male) were recruited and completed the experiment. The average age of the participants was 19.73, with an age range of 18 to 25 years. Invitation letters describing the voluntary and confidential nature of the study were distributed to undergraduate students attending a large university located in the Midwestern region

of the United States. Prospective students were asked to arrange time slots (only one student per slot) for the experiment. Compensation in the form of a \$20 payment was provided to each participant. Also, none of the participants knew or were familiar with any advertised brands or commercials used in the experiments.

Once a subject arrived at the lab where the technology for the physiological experiment was set up, the experimenter greeted the subject and briefly explained the study. Then, the subject read the informed consent form, which was approved by the university's Institutional Review Board (IRB) through an expedited review procedure alone. If the subject agreed to participate in the study, then he or she was seated in front of a 42-inch LCD monitor within an experimental laboratory. Physiological sensors (i.e., Ag/AgCl electrodes) were attached to the palm of each subject's non dominant hand for skin conductance measurements and to the face above the eyebrow (corrugator supercili) and below the eye (orbicularis oculi). Next, the subject completed a short questionnaire involving a team identification scale as it pertains to the college basketball team. After completing the team identification scale, the study participants were exposed to eight sport game stimuli. Once they viewed each sport game, a counterbalanced commercial (i.e., positive or negative) was immediately presented. Then, the subjects were asked to complete a questionnaire

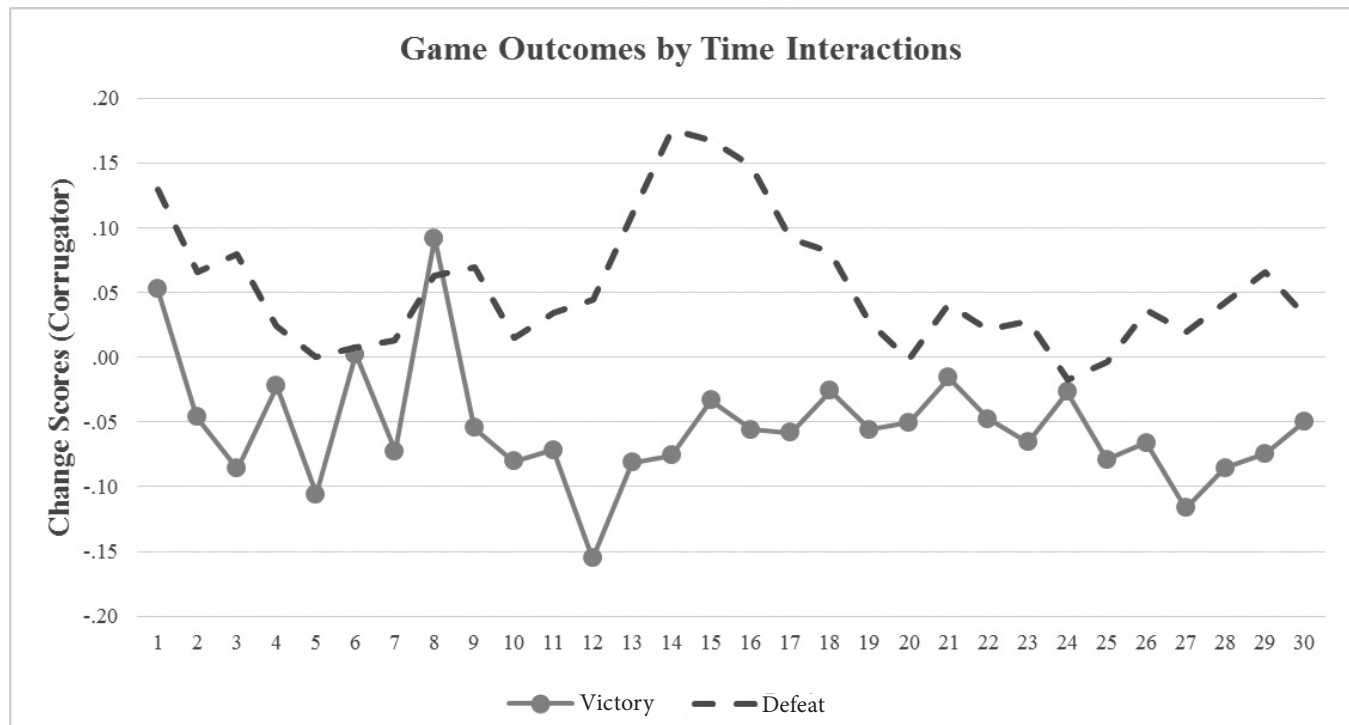


Figure 1. Interaction of game outcomes and time on corrugator muscle activities



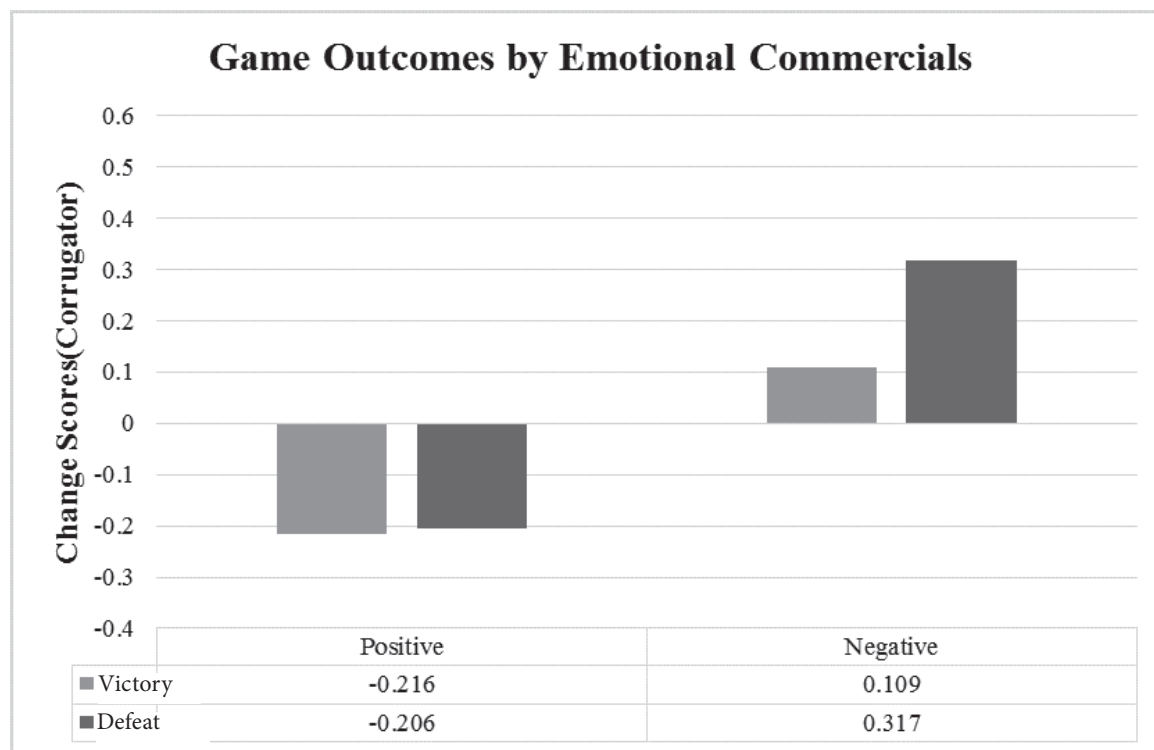


Figure 2. Interaction of game outcomes and emotional commercials on corrugator muscle activities

involving attitudes toward the advertisements and advertised brands. All experimental procedures were administered by MediaLab and the experiment took approximately 90 minutes for each subject.

### Data Screening and Data Analysis

Before testing the research hypotheses, the data were screened. Of the 76 subjects, seven participants who did not support their college basketball team ( $M_{\text{team identification}} < 4.00$ ) and/or were committed fans of other college basketball teams in the experimental stimuli were dropped from the main analyses. Thus, a total of 69 participants, who considered themselves fans of their college basketball team as indicated by an average team identification rating of 6.10, were included in the final analysis. Moreover, because of unexpected technological or experimenter-based errors, some data—such as OO ( $n = 2$ ), corrugator ( $n = 2$ ), and self-administered questionnaire ( $n = 1$ )—were excluded from the main analyses. None of the multivariate outliers on the self-administered ratings were detected, but two univariate outliers ( $Z > +3.0$ ,  $Z < -3.0$ ) for the self-reported data were deleted to reduce both type I and type II errors by testing  $z$ -scores and Mahalanobis distance (Tabachnick & Fidell, 2013).

In order to statistically compare mean differences affected by the within-subjects factors, series of repeated measures of ANOVAs were performed.

The Greenhouse-Geisser adjustment was used for significance tests when the sphericity assumption was violated (Geisser & Greenhouse, 1958). For all significant results, partial eta squared ( $\eta_p^2$ ) was reported as an index of estimated effect size (small = .01; medium = .06; large = .14).

### Results

#### Manipulation Check

In order to test the validity of the emotion induction stimuli, a Game Outcome (2)  $\times$  Uncertainty about Outcomes (2) repeated-measure ANOVA was performed on the change scores of orbicularis oculi (OO), corrugator, and skin conductance level (SCL) during the last 30 seconds of the sporting events. As predicted, the game outcomes had significant main effects on OO,  $F(1, 66) = 4.10$ ,  $p < .05$ ,  $\eta_p^2 = .06$  and corrugator,  $F(1, 66) = 5.39$ ,  $p < .01$ ,  $\eta_p^2 = .12$ . Victory conditions ( $M_{\text{OO}} = -.02$ ,  $SE = .00$ ;  $M_{\text{Corrugator}} = -.00$ ,  $SE = .00$ ) elicited greater activities of OO and lesser activities of corrugator than defeat conditions ( $M_{\text{OO}} = -.06$ ,  $SE = .016$ ;  $M_{\text{Corrugator}} = .01$ ,  $SE = .004$ ). Furthermore, the main effect of uncertainty about outcomes on SCL data was significant,  $F(1, 68) = 8.99$ ,  $p < .001$ ,  $\eta_p^2 = .14$ . Tight games ( $M = 1.15$ ,  $SE = .28$ ) induced greater arousal than lopsided games ( $M = -.16$ ,  $SE = .27$ ). No effects on dependent variables were observed.

Table 3. Descriptive Statistics of Dependent Measures

	Treatment Condition							
	Pleasant (Victory)				Unpleasant (Defeat)			
	Arousing (Tight)		Calm (Lopsided)		Arousing (Tight)		Calm (Lopsided)	
Variables	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Orbicularis oculi	.07 (.06)	-.03 (.06)	-.02 (.08)	.04 (.08)	-.05 (.06)	.03 (.07)	-.06 (.05)	.02 (.08)
Corrugator	-.24 (.09)	.15 (.09)	-.20 (.08)	.07 (.09)	-.17 (.07)	.29 (.10)	-.24 (.08)	.34 (.10)
Aad scales	4.97 (1.09)	3.70 (1.74)	4.84 (1.22)	3.53 (1.88)	4.73 (1.37)	3.19 (1.51)	4.68 (1.29)	3.28 (1.66)
Ab scales	5.05 (1.10)	3.72 (1.60)	4.97 (1.16)	3.92 (1.93)	4.78 (1.34)	3.49 (1.52)	5.03 (1.14)	3.61 (1.63)

Table 4. Results of Repeated Measures of ANOVA

Independent Variables	F-Values for the Dependent Variables			
	Orbicularis oculi	Corrugator	A <sub>ad</sub> scales	A <sub>b</sub> scales
<i>Main Effects</i>				
Program-induced valence (A)	.371	2.88+	5.30*	3.03+
Program-induced arousal (B)	.019	.054	.513	.399
Ad valence (C)	275	41.7***	102.3***	119.2***
<i>Interaction Effects</i>				
A×B	.001	.00	.333	.248
A×C	.702	3.09+	.925	.888
B×C	.536	.00	.121	.057
A×B×C	.663	.825	.164	.461

+  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

### Affective Responses

Repeated-measure ANOVAs, featured in program-induced valence (2) × program-induced arousal (2) × ad valence (2), were performed on OO and corrugator data gathered during the presentation of commercials (30 seconds). No significant differences were found for main or interaction effects on OO data. The main effect of program-induced valence (H1a) and the interaction effect of program-induced valence by ad valence (H2) on corrugator activation during the presentation of commercials approached significance,  $F(1, 66) = 2.874$ ,  $p = .095$ ,  $\eta_p^2 = .04$  and  $F(1, 66) = 3.092$ ,  $p = .083$ ,  $\eta_p^2 = .05$ , respectively. As shown in Figure 1, the corrugator muscle during the presentation of the commercials was more activated following the unpleasant (defeat) conditions ( $M = .05$ ,  $SE = .03$ ) than pleasant (victory) conditions ( $M = -.05$ ,  $SE = .03$ ), which is in accord with H1a.

Planned post-hoc comparison tests showed that the corrugator muscle activity was greater when the negatively-valenced commercials were played right after the unpleasant (defeat) conditions ( $M = .32$ ,  $SE = .05$ ) than after the pleasant (victory) conditions ( $M = .11$ ,  $SE =$

.05),  $t(66) = -6.04$ ,  $p < .001$  (two-tailed) whereas the corrugator muscle activity did not differ when positive commercials were presented after pleasant (victory) conditions and unpleasant (defeat) conditions (See Figure 2). Such findings contradict Hypothesis 2. None of the other hypothesized effects (H1b and H1c) was detected in facial EMG data.

### Attitude Toward Ad and Advertised Brand

The statistical analyses of the self-reported data (i.e., attitude toward advertisement, attitude toward brand) were conducted with program-induced valence (2) × program-induced arousal (2) × ad valence (2) repeated-measure ANOVAs. The program-induced valence (H1a) had a significant main impact on attitude toward advertisement,  $F(1, 65) = 5.46$ ,  $p = .023$ ,  $\eta_p^2 = .08$  while the main effect of program-induced valence (H1a) on attitude toward brand approached significance,  $F(1, 65) = 3.40$ ,  $p = .070$ ,  $\eta_p^2 = .05$ . The average score of attitude toward advertisements and brands were higher for the pleasant (victory) conditions ( $M_{Ad} = 4.26$ ,  $SE = .01$ ;  $M_{Brand} = 4.42$ ,  $SE = .10$ ) than for the unpleasant (defeat) conditions ( $M_{Ad} = 3.97$ ,  $SE = .09$ ;

$M_{\text{Brand}} = 4.23$ ,  $SE = .09$ ), which is support for Hypothesis 1. However, no evidence to support the other hypothesized effects (H1b, H1c, and H2) was found. The summaries of descriptive statistics and ANOVA results for dependent variables are presented in Table 3 and Table 4.

## Discussion

The primary goal of this study was to extend the understanding of how the context of televised sport programming influences the persuasive information processing of the viewers who see commercials during their consumption of sport broadcasts. The excitement, uncertainty, and competitiveness displayed in unscripted televised sport often produce strong emotional experiences for the viewers (e.g., fans). However, not much is known about whether the emotions have an impact on the persuasive processing of commercials often packed before, during, and after the broadcast of the sporting event. Further, mixed conclusions in program-induced affect literature made it difficult to predict the potential emotion spillover effects. Therefore, this investigation experimentally tested the moderating effects of sporting program-induced valence and arousal on the relationship between the emotional commercials and viewers' affective and attitudinal responses by employing a mixed-subjects design that included several methodological adjustments which were adopted from previous research (Bellman et al., 2016; Norris & Colman, 1993; Shapiro et al., 2002; Wang & Lang, 2012). The findings from the psychophysiological and self-reported data revealed that the final game outcome (i.e., win and lose) in a sport competition creates different emotional experiences (i.e., unpleasantness to pleasantness), which in turn lead to different patterns of persuasive information processing of a commercial. The study offers several theoretical, methodological, and managerial contributions to the sport marketing field. From a theoretical standpoint, the study creates a better understanding of advertising through sports. In addition to other theoretical (e.g., schema, attribution) explanations (Gwinner & Swanson, 2003; Madrigal, 2000; McDaniel, 1999), the hedonic reactions to sport programming and their spillover effect could be another explanation regarding how advertising through sport works. Moreover, the study extends the body of knowledge in program-induced emotion effects by reexamining this perspective within sport programming, an attractive context for advertising that has witnessed the adoption of several methodological adjustments proposed in the literature. Also, from a measurement standpoint, the study utilized real-time psychophysiological measures

in order to respond to calls (e.g., Kim et al., 2017) for a more accurate and dynamic approach in the assessment of sport fans' emotions and cognitive processing. Finally, the findings of the study allow for the offering of several advertising strategies within the context of sport broadcasting.

## Theoretical Implications

The current study enriches the field's understanding of how sport fans process information and form attitudes relating to commercials as a function of sport program-induced emotion. In this investigation, the sport program-induced valence had a carry-over effect on the evaluation of commercials and brands (H1a). As supported in other sport management studies (Kwak et al., 2011; Wang & Kaplanidou, 2013), sport fans' affective reactions to the team performance resulted in different patterns of evaluative processing of the subsequent marketing stimuli. In the present study, the moderating functions of the performance-induced valence (game outcome) were salient with regard to the relationship between the commercial and the evaluation of the advertisement. Also, the performance-induced valence had some effects on affective responses to the advertisements and evaluations of the advertised brand. Specifically, regardless of whether commercials possessed either positive or negative valence, the commercials were more favorably evaluated when subjects watched them immediately after the team's victory than after a loss. Similarly, less frowning muscle activity (negative responses) during the commercial delivery following a win than was found following a defeat. Such a finding suggests that the pleasant reactions to sport programming enhance the effectiveness of commercials as they relate to attitude formation in sport broadcasting settings. The findings provide additional evidence and explanation regarding how and why advertising through sport is an effective medium for marketing. Exploring the hedonic nature of sport consumption in conjunction with its subsequent psychological impact would be fruitful to better understand and predict sport consumer behavior.

In addition, the current replication study within sport broadcasting contexts extends the body of knowledge related to the program-induced emotion effect literature. The results did not reveal a significant difference of the subjects' judgments or their evaluations based on the different program induced-arousal (H1b). Regardless of whether the sporting event is arousing or calming, neither situation affected the subjects' judgment or their evaluation. Furthermore, in this study, the program-induced arousal (i.e., level of closeness) did not interact with the program-induced valence (i.e., game outcome) to influence the

effectiveness of commercials (H1c). Based on the findings mentioned above, it can be argued that at least in the sport broadcasting setting of this study, the program-induced valence alone, rather than the program-induced arousal, plays a significant role in evaluations of commercials.

Such findings serve as a contradiction to some previous postulations regarding the positive roles of arousal in attitude formation (Bee & Madrigal, 2012; Mattes & Cantor, 1982; Gorn et al., 2001) and arousal transfer theory (Zillmann, 1971). Specifically, the results are not similar to the findings of Bee and Madrigal (2012) in that they found that program induced-arousal (uncertainty of game outcomes), not program-induced valence (game outcome), was a significant predictor for the effectiveness of a commercial. The mixed results when comparing Bee and Madrigal to the current study might be involved with the current experimental design (i.e., repeated measures). The current study's experimental session of 90 minutes might have been too long to sustain levels of arousal. Thus, a fatigue effect could be considered as one of the possibilities for the mixed results. Nonetheless, it should be noted that the current study's results, which yielded significant effects of program-induced valence on advertising effectiveness (H1a), support the hedonic emotion priming theory (Bower, 1981; Forgas, 1992) and provide additional evidence for the program-induced valence effect (Bellman et al., 2016; Goldberg & Gorn, 1987; Owolabi, 2009), which hold that a preceding pleasant stimuli elicit more favorable attitudinal judgement as it pertains to a subsequent stimuli.

Furthermore, it was expected that the emotion-consistent combination between commercials (i.e., positive and negative) and the final results (i.e., a win and loss) of the sporting event would be more effective than the inconsistent combination. However, in the present study no empirical evidence was found for this effect (H2). Also, although the interaction effect between program-induced valence and ad valence was not statistically significant ( $p = .08$ ), planned-post hoc comparisons suggested that subjects elicited greater negative responses when they watched negatively-valenced commercials right after their team lost rather than after a win, whereas subjects elicited similar affective responses to positively-valenced commercials presented right after their team won or lost. Such a finding contradicts the program-ad matching effect (Kamins et al., 1991). One possible explanation for this unexpected result is that the matching effect was mostly supported by the study that utilized the public service announcements (e.g., health, safety) as advertising stimuli (Kamins et al., 1991; Potter et al.,

2006). Positive commercials performed well in the contexts (e.g., products, services) of the current study and also in unaffiliated prior research (Bellman et al., 2016). Also, the unexpected results may be associated with the uniqueness of sport. Televised sports are popular entertainment options and consumed for hedonic purposes (Raney, 2006). Sport fans don't watch televised sports to feel sad or angry, unlike other entertaining genres (e.g., movies, documentaries; Gantz et al., 2006), but rather the sport viewers consume their televised events in anticipation of seeing their favorite team's successes and victorious moments. Sport fans might get angry watching an emotionally negative commercial after their team lost. Instead, watching an emotionally pleasant commercial (e.g., funny) might lighten their mood. Thus, it can be argued that the program-ad matching theory proposed by Kamins et al. (1991) might not be applicable in the sport broadcasting context when negative emotions are induced from a loss. It is not whether the emotional tones of the commercial and of the preceding program are matched, but rather which emotions the commercial or preceding program induce are salient factors regarding persuasive information processing of a product commercial.

### ***Practical Implications***

This empirical investigation further reveals how the competitive nature of sports leads to sport consumption, which makes the sport industry more attractive for marketing practitioners (e.g., advertising effectiveness). For example, the findings suggest that a company or brand may want to work into its television contract that only certain commercials are used if the preferred team (e.g., the home team for a local broadcast) wins and a different commercial (or no commercial at all if that is an option) if the team loses in order for a better return on objectives for the company in terms of persuasive advertising strategies (e.g., attitude formation, likeness of ad). Such an approach, based on the findings of this study, could be applied to various spectator segments (e.g., stadium video boards, live-streaming internet coverage, video-sharing websites). From a television network standpoint, if a broadcasting company is able to switch commercial playing as soon as the game ends, it is suggested—based on the results of this study—that a price discrimination strategy based on the game results should be considered or implemented.

Furthermore, while the main effect of ad valence alone is not the primary interest of the current study, given the fact that ad valence had more salient effects on advertising effectiveness than program-induced valence and arousal (See Table 4), advertising



practitioners should understand the important role of ad valence. As revealed in previous literature (Bailey, 2015), in the current experimental setting, the findings revealed that advertising messages that contained pleasant cues (e.g., humorous, joy, pride) led to more positive evaluations than negative cues (e.g., fear, disgust, sadness). Scholars (Furnham & Goh, 2014; Nabi, 2002; Potter et al., 2006) have noted that negative emotional appeals (e.g., fear, anger, sadness) have been consistently adopted when creating commercials because of their usefulness (e.g., drawing attention). Commercials that utilize such tactics are often aired during and after televised sporting events. Examples can be found in recent Super Bowl commercials, ranging from Snickers' "Do Something Manly" to TurboTax's "Nothing to be Afraid Of" television ad spots. However, it should be noted that emotionally positive commercials usually perform better in terms of persuasive advertising strategies (i.e., attitude change) than do negative commercials. Thus, placing commercials (e.g., public service announcements, direct-to-consumer pharmaceutical advertisements) that might present negative emotional appeals (e.g., fear, disgust) during a televised sport competition might not be an optimal strategy.

### Limitations and Suggestions for Future Study

The current research design has a few limitations that might be able to be addressed in future studies. While many limitations of previous work were addressed in the current study by making methodological adjustments regarding pre test stimuli selections, unfamiliarity with commercials, randomized-block factorial designs, and real-time measures, the setting (laboratory experiment) still presents ecological validity challenges (e.g., subjects might have perceived the experimental video recordings as less arousing than live video broadcasts in a non experimental setting; subjects may have encountered some fatigue during their participation with the experiment). Further, the research design and measurements used in the present study involving three manipulated factors and 30-second repeated measures of psychophysiological responses limited the options available in terms of data analysis techniques. Thus, while the current investigation did not examine the direct and indirect relationship among the treatments, emotions, and commercial evaluations, future studies should conduct a mediation analysis in order to detect any mediating effects of emotions between treatments and attitude formation.

Another limitation in the current study involves some of the constructs (e.g., fan identification,

purchase behaviors) themselves. For example, seven of the initial participants did not identify themselves as avid fans and thus were excluded in the final data analysis. The rationale for this exclusion is that non-fans did not fit the study's purpose (i.e., emotion induction and its effect). However, it would be interesting to examine whether the different levels of fanship might moderate the relationship between program-induced emotions and evaluative judgment. Also, the current study did not measure variables associated with other advertising goals such as building awareness and sales (e.g., brand recognition, recall, purchase intention). Attitudinal judgement has been identified as one of the driving factors of advertising effectiveness, but does not necessarily lead to brand awareness/actual consumption of a product of the brand. Thus, future studies should address how sports program-induced emotions are associated with sport fans' memory and purchasing behaviors as they pertain to the advertised brand.

Moreover, future studies should reexamine the sport program-induced emotion effects by employing different marketing stimuli. The current study found the carryover effect of game outcome-induced valence only when the emotional tones of advertisement were either emotionally pleasant or unpleasant. Future research investigations in this area should manipulate various factors of advertisements related to areas such as the intensity of emotional tones (e.g., positive/arousing, negative/arousing), product categories (e.g., sport product vs. non sport product), and themes (e.g., sport relevant vs. irrelevant) in order to elicit a deeper understanding of what kinds of advertisements perform better in the context of the unscripted and emotionally inducing broadcasts of live sporting events.

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#### Appendix 1. Final Experimental Design

	Sporting game repetition 1				Sporting game repetition 2			
	PA1	PC1	UA1	UC1	PA2	PC2	UA2	UC2
Replication 1	Positive commercial block 1				Negative commercial block 1			
	P1-1	P1-2	P1-3	P1-4	N1-1	N1-2	N1-3	N1-4
	P1-2	P1-1	P1-4	P1-3	N1-2	N1-1	N1-4	N1-3
	P1-3	P1-4	P1-1	P1-2	N1-3	N1-4	N1-1	N1-2
	P1-4	P1-3	P1-2	P1-1	N1-4	N1-3	N1-2	N1-1
Replication 2	Sporting game repetition 1				Sporting game repetition 2			
	PA1	PC1	UA1	UC1	PA2	PC2	UA2	UC2
	Negative commercial block 2				Positive commercial block 2			
	N2-1	N2-2	N2-3	N2-4	P2-1	P2-2	P2-3	P2-4
	N2-2	N2-1	N2-4	N2-3	P2-2	P2-1	P2-4	P2-3
	N2-3	N2-4	N2-1	N2-2	P2-3	P2-4	P2-1	P2-2
	N2-4	N2-3	N2-2	N2-1	P2-4	P2-3	P2-2	P2-1

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