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The Loud Crowd

Using Vocal Responses to Understand the Emotional Experiences of Spectators

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Abstract

Much research has been conducted on the relationship between emotions and the sport experience, but most research in this field has used survey data, which has proven to have many limiting factors when attempting to measure emotions. Rather than relying on surveys, the present study uses a more direct measure of consumer emotion: sound. By measuring the variations in sound levels among sport attendees, the present study provides an exploratory study of sport fan emotions through behavioral indicators of emotional experiences rather than cognitive recall. Our results indicate that the strongest vocal responses were consistently in response to surprising plays, not necessarily plays most beneficial to the home team. These results from increase our understanding of the emotional experience of sport attendees and provide insight into how to expand and maximize the emotional responses of sport spectators to create a stronger connection between team and consumer.

Keywords: *Sound, sport, experience, emotion*

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During the 2014 National Football League season, the Seattle Seahawks and Kansas City Chiefs engaged in a public competition over the loudest stadium in the NFL. As stadium attendance continues to face pressure from the ever-increasing quality of the television product particularly in the United States (Ozanian, 2017), understanding the emotional experience in the stadium may be a key competitive advantage over cheaper and more convenient television options. The sounds produced by a large crowd of thousands are one of those differentiating factors, as it is impossible to simulate such sounds at home (Lee, Heere, & Chung, 2013). Thus, marketing managers could benefit from understanding what events during the game experience elicit the strongest emotional response, not only because these vocal expressions serve as an indicator of what is important to the consumer, but also because it might be these responses that bring people back to the stadium.

Despite public attention on overall noise levels in sport stadiums, there is surprisingly little research on what kind of emotional experiences elicit a vocal response from individual spectators, despite its importance to the overall game-day experience (Jones, Lane, Bray, Uphill, & Catlin, 2005; Uhrich & Benkenstein, 2010). Emotional contagion literature has noted how public displays of emotion can improve surrounding individuals' experiences with a live product (Cote, 2005), suggesting the importance of shared vocal expression of emotion on both behaviors and affect (Van Kleef, 2009). Meaningful experiences and feelings can assist in promoting behavioral and psychological responses (Uhrich & Benkenstein, 2012), which can lead to long-term attachment to a team (Gross, 2002). In other words, if teams and venues can create greater emotional responses from their attendees, they can create more attachment to their team, further suggesting the need to understand and promote those in-game experiences that lead to emotional reactions by attendees.

Previous researchers who examined the emotional experience of sport spectators typically relied on either Sloan's (1979) emotional scale or Svebak's (1993) Tension and Effort Stress Inventory (TESI). Sloan (1979) created his scale after identifying 16 emotions affected by a team's performance. Both these authors aimed to differentiate the positive emotions after winning from the negative emotions associated with one's team losing. Wann and colleagues continued to examine the effects of performance on emotions (Wann, Dolan, McGeorge, & Allison, 1994; Wann, Royalty, & Rochelle, 2004), and brought in concepts such as team identification and motivation to better understand what might mediate these emotions. Most recently, Lee, Kim, and Heere (in press) proposed a new scale to measure emotions that are experienced during a game. However, these studies rely on the cognitive recall of emotions experienced previously, and as the purpose of the current research is to track changes in emotion levels caused by many different in-game experiences *as they occur*, simply differentiating between winning and losing might offer an incomplete picture of a fan's emotional experience.

In one of the few studies to explicitly examine emotional responses during a game, Kerr, Wilson, Nakamura, and Sudo (2005) found evidence of a dynamic emotional experience by fans of both the winning and losing teams. What they found was that the recall of emotions of the fans changed for fans throughout the game based on their experiences to that point. Though their study was a step forward, it still relied on recall of emotions, and still connected emotions to the score, rather than particular events. This reliance has prevented an understanding of how people respond emotionally to game day promotions, as the emphasis on performance has prevented an examination of in-game promotions so far.

Uhrich and Benkenstein (2010) took the subject of in-game emotional expression one step further by pointing out the importance of the sport stadium atmosphere, the homogeneity of spectator reactions, and the importance of acoustics within the stadium to enhance these reactions. However, they did not look to see exactly what aspects of the game were eliciting these emotional responses, nor were they focused on the varying levels of emotional response for differing events during the game. While research has shown that the number of fans and the emotional responses of others affect the overall emotional response and atmosphere at a sporting event (see Chen, Lin, & Chiu, 2013; Uhrich & Benkenstein, 2012), there is no research that has found an innovative or effective way to measure these emotional responses as they occur.

Research on emotional contagion suggests people naturally adapt to the emotions of others (Cote, 2005), and sport spectators exhibit this contagion through activities involving verbal group expressions such as songs, anthems, and other displays of team pride during a sporting event (Decrop & Derbaix, 2010). Therefore, the focus of this study is to observe the emotions of spectators during a live event through a measurement of their vocal responses as the event occurs. The study's contribution is mainly in its conceptualization and its methodology used to measure this emotional contagion. While the results might prove noteworthy, their contribution is limited and should only serve as indicators for future research. Our goal is to propose a new method that moves beyond traditional post-hoc survey designs and offers better insight into the emotional experience of sport spectating.

Method

This exploratory study utilizes a non-experimental research design, which is a methodology that lacks the manipulation of a specific independent variable and/or random assignment of participants to conditions, to better understand how sport spectators emotionally contribute to the game day experience and vocally respond to various aspects of that experience. Therefore, the researchers recorded the collective vocal responses of the spectators to the game and the promotional activities. Because our approach was intentionally designed to overcome the previous limitations, we designed a data collection process that, to the best of our

knowledge, has not been conducted previously within a sport setting. As a result, this study should be interpreted as an exploratory study, in which the authors relied upon open coding to detect new themes (Strauss & Corbin, 1998), in the hopes of generating new avenues for theory development.

Site Selection

The specific research setting used in this study was the home stadium of a second-year college football team located in the southwestern United States. The stadium is a publicly owned, domed, multipurpose facility used for a variety of sports throughout the year, with a football capacity of approximately 60,000 fans. This particular setting was selected for several reasons. First, the domed nature of the stadium made measuring sound more even across the stadium, since noise reflects off the roof rather than escaping in an open stadium setting. Additionally, the domed setting eliminates the effect of any outside noise (i.e., weather, airplanes) ensuring that all measured noise was a result of the game and the crowd.

The researchers chose to attend two different home games in the 2012 season. Four researchers attended both games, with one researcher sitting in each quadrant of the stadium. All the researchers sat in the upper-deck of the stadium, which is mostly empty in the east and west quadrants and entirely empty in the north and south. The researchers intentionally sat away from the crowd so as to avoid casual conversations or individual noises from greatly influencing the sound measurements.

Measurement and Instrumentation

The researchers arrived roughly one hour before the game to establish a baseline noise level not impacted by the crowd, band, or loudspeaker, using handheld digital sound level meters designed to measure general sound levels ranging between 40 and 150 dBs. As an exploratory study, the researchers needed to establish some consistent baseline on which to collect data, and 90 dBs seemed an appropriate figure based on the pregame measurements collected without the participation of the crowd but including the general noise of the stadium. This reading is comparable to the sound level of a running garbage disposal, and the researchers recorded all events louder than this baseline throughout the game as well as following all in-game promotions. For each in-game promotion that happened throughout the event, the researchers measured the sound levels of these promotions regardless of any decibel increases. Finally, the researchers recorded all scoring plays by both teams and included these moments in the dataset as well.

In addition to noting the decibel levels of each qualifying event, the researchers also noted the time of the game and gave a brief description of the event that preceded the elevated sound level. For the in-game promotions, the researchers noted the activity associated with the promotion. After each of the two games, the lead researcher collected each of the four data sheets and combined them into

a comprehensive data set. Only readings recorded by at least three of the four researchers were included in the overall dataset, a step designed to include only stadium-wide events and responses. Data for both games were entered into the same data set, though each point was identifiable by game.

Data Analysis

We did not approach the data analysis with any preexisting hypotheses or data categories; rather, via the inductive approach, we allowed the data to dictate the generation of codes and themes. The inductive approach was used due to its usefulness when conducting exploratory research with limited theory involved in the guidance of our results (Hinkin, 1995; Strauss & Corbin, 1998). Following a thorough examination of the dataset by multiple researchers, Saldaña's (2009) two-cycle approach to qualitative coding served as our coding guide. The first-cycle coding called for open coding, which consisted of writing words and phrases that identify or name specific dimensions and categories. Some of the first-cycle codes used by the researchers include "score," "anticipation," and "penalty." The second-cycle coding calls for a more focused coding process that transforms the dozens of open codes into more coherent themes and patterns. For example, the open codes "long run," "interception," and "drop" were all grouped into the more focused code of Surprising. Typical of most coding procedures, the same measurement or play could have been placed within multiple second-cycle codes.

To ensure accuracy and trustworthiness of the coding process, the second-level codes were validated through a discussion by the two coders. Such a discussion allowed the researcher to develop counterarguments, a method of data analysis used in Schouten and McAlexander (1995), as a way of ensuring analytical correctness. Only second-level codes that passed the scrutiny of both researchers are discussed in the results section, as these second-level codes are presented as the themes supported by the data.

Results

The comprehensive dataset resulted in a sample size of 225 individual recordings. Rather than listing all of the individual measurements and their corresponding events, we created several tables based on a thematic grouping of noteworthy events. The first presented data, found in Table 1, display the ten data points with the largest positive variations in sound.

The Top 10 Loudest Plays: The Role of Surprising Events

The results presented in Table 1 indicate that most of the loudest moments during the data collection were immediate responses to positive plays for the home team. While this finding is not necessarily surprising and supports the relationship between performance and emotions, it is noteworthy that among the many positive plays for the hometown, the loudest responses occurred

Table 1*The Top 10 Loudest Plays*

Measure	Game	Quarter	Score	Description
104	1	3 rd	7-10	4-yard touchdown where runner flipped over the goal line
103	2	1 st	3-0	79-yard punt return for a touchdown; louder during run than score
100	2	1 st	10-0	57-yard touchdown pass by opponent
100	2	2 nd	17-7	Dropped long touchdown pass
99	2	3 rd	31-14	Diving catch by away team
99	2	4 th	31-24	34-yard touchdown pass
98	2	4 th	31-24	Pass Interference call against home team
98	1	2 nd	14-10	Holding call against away team
98	1	4 th	28-10	31-yard touchdown pass
98	2	4 th	38-24	4 th down sack by home team

after “unusual” or “unexpected” plays, which reflects the emotion of “surprise.” For example, the loudest play recorded in this study followed a play where the quarterback scrambled out of the pocket and flipped over a defender into the end zone. The second loudest play was similarly an “surprising” positive event for the home team: a long punt return for a touchdown. What was interesting about this data point was that the loudest moment of the play was not when the referee signaled touchdown, but rather when the player made his “move” that indicated to the crowd a touchdown was a possibility. By the time the player reached the end zone, the volume in the stadium had actually decreased from the moment of the initial move. The crowd was empirically louder when the first hint that a touchdown might be scored presented itself rather than when the touchdown was actually achieved.

The results presented in Table 1 are not all indicative of plays beneficial to the home team. Two data points in Table 1 were the result of penalties; one “for” the home team and another “against” the home team. These two plays, despite opposite effects on the home team, resulted in identical levels of emotional response by the crowd. A final point from Table 1 is the presence of a dropped pass by the home team, the fourth loudest data point. While the two loudest points were moments easily identifiable as positive for the home team, the dropped touchdown pass was a key play that negatively impacted the home team, yet still registered an emotionally charged experience by the spectators, as it was an unexpected event that surprised the spectators.

Unsurprising Plays: Highest and Lowest Anticipated Events

Based on our first findings, we decided to classify the surprising and unsurprising events separately. The results presented in Table 2 show the five highest and lowest events that were coded as “unsurprising” during the data analysis process. The highest scoring unsurprising play, a pre-3rd down cheering moment with the home team on defense, was several decibels lower than the 10th loudest surprising moment. One of the notable findings from Table 2 is the low noise level that the “game-clinching” first down play registered. It was a close game, and the play essentially guaranteed the home team would maintain possession of the ball until the end of the game, thus eliminating any realistic chance for a comeback by the opponent. Another theme from the data analysis was the loud volume associated with pre-3rd down plays when the home team was on defense. These plays were actually louder than key plays where the home team was on defense near the end zone; there was something inherently exciting about third down plays when the home team was on defense.

Table 2

Highest and Lowest Anticipated Events

Measure	Game	Quarter	Score	Description
96	2	4 th	31-24	Pre-3 rd down cheering (home team defense)
96	1	2 nd	14-10	Home team school cheer (after penalty on away team)
95	2	1 st	0-0	Kickoff
95	2	1 st	3-0	Short field goal is good
95	2	3 rd	24-17	Pre-3 rd down cheering (home team defense)
78	2	3 rd	24-17	Team-themed memory challenge
78	1	4 th	31-24	Home team gets “game-clinching” first down on short run
76	1	3 rd	17-10	Memory challenge promotion
75	1	4 th	31-24	Pre-3 rd down (home team on defense)
73	1	4 th	31-17	Opponent touchdown on short run

Promotional/On-Field Activities: Highest and Lowest Events

The results presented in Table 3 show the five highest and lowest volumes for events coded as Promotional or On-Field Activities. There were 39 events in our dataset for this code, which included events promoting other school sports, corporate sponsors, or sponsored activities via the loudspeaker or on-field activities. Some promotions did elicit a noticeable increase in sound for the spectators, notably the on-field promotional events. For instance, the second

Table 3*Highest and Lowest Promotions/On-Field Activities*

Measure	Game	Quarter	Score	Description
97	1			Announcer says home state team beats football powerhouse
95	1			Fan field try
95	2			Announcer recognizes veterans in crowd
94	1			Smoke machine starts before team enters field
93	2			Announcer asks crowd to make some noise
83	2			T-shirt cannon
81	1			Little kid dress-up promotion
78	1			State Farm agent award
78	2			Memory challenge
76	1			Memory challenge

loudest promotional activity involved a spectator kicking field goals of several distances to win a prize; as each introductory kick was successfully completed, the noise level and excitement in the crowd increased. However, not all of the on-field promotional events elicited equally elevated decibel readings. For example, a promotion with two younger children putting on oversized cleats, jerseys, and helmets did not cause a vocal reaction from the crowds.

A final comment from the promotional volume levels in Table 3 includes the loudest promotional response, which was when the announcer revealed that another college team from the same state beat a national football powerhouse. This event had nothing to do with the actual game, yet it led to a strong emotional reaction; a similar reaction occurred when the announcer asked veterans to stand and be recognized. The research setting is located near an air force base and has a strong military presence in the region. Both of these events appealed to the spectators' sense of state and national pride more than their allegiance to the team playing on the field, yet still registered high decibel readings equal to many of the events from the game itself.

Game Differences: Impact of Context and Rivalry

The number of promotions and expected events was equal for both of the attended games, indicating a similar makeup of events in the dataset. The attendance was slightly larger for the second game, but the baseline measures taken before the second game were similar to the baseline measures from game one. A significant difference between the two games was that the second game was played against a school that fans considered a "natural" or geographic rival.

Among the top 10 loudest deviations in sound measures found in Table 1, seven are from the second game of the data collection. It was only the surprising quarterback flip into the end zone in Game 1 that was among the top seven loudest plays. Four of the five loudest unsurprising events also occurred in Game 2, and four of the five lowest recorded unsurprising events occurred in Game 1. Interestingly, the same trend was not evident in the promotional decibel readings found in Table 3. Three of the top five loudest promotional activities occurred in Game 1.

Emotional Momentum

Another salient theme found in the data was coded as Fan Momentum. The decibel levels were lower during periods with a high number of promotions, especially times with several promotions in a row. During these event sequences, the emotional momentum of the spectators appears to have been disrupted. Even when important or impactful events followed a period of low emotional volume, the noise levels of the event tended to be relatively low. Rather, when an impactful event followed another impactful event, the noise levels were increased. Even a surprising play that followed a dull period struggled to produce a decibel reading high enough to merit noting from the spectators.

The strongest support for emotional momentum is the second event listed in Table 2: the 96 dBs registered during a home team school cheer. The home team's main cheer was played countless times throughout the game, yet following a high decibel reading for a penalty on the away team was the only time the school cheer registered a response above 94 dBs. There were several of these sequences of events, where an event with a high decibel reading was immediately followed by a higher than normal decibel reading for a relatively common event. Moreover, the impact of "interrupting events"—events with poor decibel readings that came between high decibel readings, such as a delay in action or a poorly received promotional activity—was noted in the data analysis as well as the decibel levels before and after the interrupting event. On average, the "interrupting events" seemed to lower the decibel readings of the events following them.

Implications

Previous research has noted the importance of winning, losing, and game-score specific outcomes on emotional experiences (e.g., Wann et al., 2004), but the distinction between Surprising and Unsurprising more directly impacted levels of emotion as measured via sound levels. For the participants in this study, their emotional experiences measured via variations in sound levels were more impacted by surprising plays than by positive plays for their team, which showed that their emotional experience was tied to the specific event and its uniqueness within the game and not to the outcome of the game itself. The importance of arousal and surprise was further confirmed through the fact that fans responded with equal vigor to the positive and negative events for their team throughout the

two games. The fans in the stadium responded strongly when a surprising play occurred for or against their team, and it appeared that the vocal expressions of the fans were more influenced by the unexpected nature of an event as opposed to its outcome. Previous literature has emphasized the importance of outcome on emotions of spectators (Madrigal, 2003), but this study shows the element of surprise experienced during unexpected events, regardless of the outcome of the surprising event, significantly affects emotion levels and should therefore be examined more directly in future studies on spectator emotions.

Regarding responses to in-game promotions, several findings are worth discussing. Our findings dictate that direct involvement by the spectators in the promotional activities is essential to emotional arousal. For marketers, this is especially important because teams should develop future promotions that maximize fan involvement. Additionally, the promotional activity that somehow related either to the team, university, or surrounding city received greater emotional responses than those promotions that did not. Even without a long history, the football program was successful in using important or memorable plays from earlier in the season to create an emotional response from the spectators. It was very evident that fans remember the emotional arousal of a significant play from earlier in the season, and the responses of fans to these replays suggests that past aroused experiences are an efficient mechanism for producing future transcendent experience as well.

As of now, we know very little about how marketers should use sound during game day (Ballouli & Heere, 2015), and in particular, we know very little about how promotions and advertisements during game day affect the emotions of spectators. This study also shows how different in-game events and promotions and the timing of these events in relation to each other can affect the emotional momentum of sports consumers. Emotions were considerably higher when exciting events followed other exciting events. A poorly planned or timed promotion retards the emotional experience of spectators and decreases the return on investment for the sponsor. Marketers should therefore not only consider what promotions they use, but also when certain promotions are most appropriate. Future studies should explore the role of game promotions on fan momentum, which would allow for a stronger understanding of how marketers can manipulate the emotions of their spectators.

It is worth discussing again the methodological differences between the current study and previous research on sport fan emotions. Individuals' forecasts and recollections are often overblown, indicating that the individual will typically remember emotions being bigger and longer lasting than the actual emotional experience really was (Baumeister, Vohs, DeWall, & Zhang, 2007). Given these realities of recalling emotion, it is no surprise that previous research overemphasized the importance of winning and losing on emotional experience (Wann et al., 2004). However, the results from this study indicate that the actual

emotional experience, not the cognitive recall of the emotions, is less dependent on winning than previous research has suggested and more dependent on the surprising, entertaining, aspects of the sport spectating experience.

The methodology used in this study contributes to the literature by exposing the limitations of focusing on game outcomes and instead looks at the emotions of spectators throughout the game and how those emotions are affected and changed by various game experiences. More research is necessary to fully understand the relationship between a fuller range of emotions (including those that do not require a vocal response) and individual events within a game and how this compares to the overall outcome for a team with which one is identified.

A limitation of this study was in the selection of the football team used, which was in its first year of existence. This may have limited the role of the marketers in soliciting a vocal response from their spectators through resources such as team and fan traditions. In sport stadiums of teams with rich histories and deep traditions, it may very well be sonic celebrations that lead to arousal by the crowd (Ballouli & Heere, 2015). When “Jump Around” is played at Camp Randall for the University of Wisconsin football games or when “Sweet Caroline” plays in the middle of the eighth inning at Fenway Park for the Boston Red Sox, spectators have been socialized to celebrate these songs accordingly. Had the current study taken place in one of these settings such moments of tradition may very well have recorded the loudest response. Future research should focus on established teams and the effects of established traditions on vocal expressions and emotional contagion of the crowd.

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