Winning over Fans: How Sports Teams Use Live-Tweeting to Maximize Engagement

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Abstract

Professional sports franchises rely heavily on social media to interact with fans – often in real time through live-tweeting their athletic contests. Using a quantitative content analysis of 540 live-tweets, this study examined the content message strategies (i.e. hashtags, GIFs, still images) teams employ and the impact those strategies have on user engagement (i.e., retweets, likes, and replies). Findings suggest multimedia has little positive impact on fan engagement. Additionally, links and mentions decrease engagement. This study carries practical implications for teams trying to effectively engage their Twitter followers.

I. Introduction

Founded in 2006, Twitter is a popular microblogging service that allows individuals to share information within and beyond one's network by composing tweets with 140 characters or fewer. It currently has more than 300 million monthly active users (Twitter, 2016). There is widespread recognition by both sports teams and sports media that Twitter is a powerful and revolutionary tool for publishing, promotion, and relationship management (Hambrick, Simmons, Greenhalgh, & Greenwell, 2010; Sheffer & Schultz, 2010; Witkemper, Lim, & Waldburger, 2012). As a result, more and more sports organizations have adopted Twitter accounts to enhance their levels of interaction with fans worldwide. According to Witkemper et al. (2012), almost every team across major professional sports leagues in the U.S. has engaged in some activities with fans on Twitter. Compared to other social media platforms, Twitter allows sports teams to offer more frequent and "disposable" updates in a short period of time (Price, Farrington, & Hall, 2013). Because tweets are constantly refreshed in real time, people may often see the most recent information and disregard those that appear lower in their feed. Having lots of information about their own Twitter data, sports organizations are employing various strategies to compete for users' attention.

More recently, live-tweeting has gained more popularity among teams in major sporting events. Unlike regular tweeting, live-tweeting facilitates dialogues about events as they unfold. Users are likely to engage with live-tweets while watching live events (Corney, Martin, & Göker, 2014). Therefore, these tweets are more time sensitive and focused than regular tweets, which also makes it more challenging for sports teams to identify effective strategies to engage fans and followers. Despite this growing popularity of live-tweeting in

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major sporting events, few research studies have examined how sports teams live-tweet and whether these live-tweets are effective in encouraging user involvement. Therefore, this study utilized a content analysis to examine the different content strategies adopted by sports teams in live-tweeting and how these strategies contribute to user engagement on Twitter.

II. Literature Review

Prior to this study, information was gathered to examine Twitter's role in live sporting events, different definitions of engagement in a social media context, the impact of multimedia on user engagement, and the role of content message strategies. The review of scholarly literature is broken down, accordingly.

Live-Tweeting and Its Use in Sporting Events

Hawathorne, Houston, and McKinney (2013) define live-tweeting as posting on Twitter in an ongoing manner during an event. Its growing popularity can be explained by users' increasing demands for real-time information. Live-tweeting also adds value to content curators because it is able to track ordinary users' participation in the information gathering process (Marwick & boyd, 2011). Live-tweeting has been used in a variety of contexts, such as the presidential primary debates to engage users in public conversation and to influence the framing of debates (Hawthorne et al, 2013) and during the airing of television shows to build and maintain a network of viewers with common interests (Schirra, Sun, &, Bentley, 2014).

Like television shows and important debates, major sporting events take place during pre-specified times, attract large audiences, and are fast-paced (Corney et al., 2014). These characteristics of live events contribute to users' participation and foster their online discussion. They are able to not only connect with sports organizations as they read tweets from their favorite teams and athletes, but also create personalized spaces to discuss games and express support for their favorite teams. Due to the highly concentrated topics, live-tweeting also provides a focused context for conversation that strengthens the social bonds among followers of a particular Twitter account (Schirra et al., 2014). It will be interesting to explore how differently fans and followers engage in live-tweeting as a result of the different content strategies employed by teams in sporting events.

User Engagement and Social Media

At the broadest level, O'Brien (2011) defines engagement as the quality of user experience with technology. Following this experience-focused approach, Mersey, Malthouse and Calder (2010) refer to engagement as the collective experiences an audience has with a media brand. This experience can be further broken down into the engagement at a particular time point or the engagement during a period (O'Brien & Toms, 2008; Peters, Castellano, & de Freitas, 2009). Earlier conceptualizations of engagement have emphasized the psychological aspect in which users become cognitively involved in processing content, leading to absorption (Busselle & Bilandzic, 2008; Jacques, Preece, & Carey, 1995; Wang, 2006). With the introduction and growth of newer communication technologies of interactive media and social media, the concept of engagement has evolved and been defined differently. Oh, Bellur, and Sundar (2015) have called for attention to defining engagement through a behavioral approach. Following this approach, engagement is defined by the tangible ways users perform actual interaction with an interface, such as clicking interactive features and sharing social media posts (Oh et al., 2015). The current study adopts this definition of engagement to examine live-tweeting in sporting events.

Following the behavioral approach, social media engagement can be conceptualized as the different active outcomes of users' interactions with social media content. In these active outcomes, users carry influence by responding to social media content, discussing social media content, and spreading social media content to make it viral (McCay-Peet & Quan-Hasse, 2016). This conceptualization is also consistent with how engagement is defined by the online strategic communication industry (Zarrella, 2009), which goes beyond exposure-based measures, such as time spent and attention paid to content (Napoli, 2011). On Twitter, the concept of engagement can, therefore, be operationalized as number of retweets, number of likes, and number of replies.

At the time of the study, Twitter limited the length of tweets to 140 characters, which is almost the size of a news article headline in traditional media (Bruni, Francalanci, & Giacomazzi, 2012). This limitation in length requires message senders to be strategic about creating effective content that is easy for users to consume. Researchers have argued that the actual content and messages on Twitter matter more in influencing users than any non-message features in social media, such as icons and multimedia elements (Agichtein, Castillo, Donato, Gionis, & Mishne, 2008). When discussing the social influence of Twitter, Bruni et al. (2012) further propose that the tweets themselves could have a critical role regardless of the message sender's network characteristics. Therefore, this study focused on examining how four particular content strategies commonly adopted in live-tweeting influence user engagement in sporting events: use of multimedia, use of conversation starter/facilitator, variation of message visibility, and valence of tweets. Together, these four aspects address both the informational and the emotional aspects of content strategies (van den Putte, 2009).

Multimedia and User Engagement

The concept of multimedia has been defined in various ways in different contexts. The commonality among these definitions is that multimedia usually involves the use or the integration of more than one form of communication (Jonassen, 2000). Marmolin (1991) and Sundar (2000) argue that multimedia also implies the use of multiple senses in processing information transmitted via more than one modality. The presence of multiple modalities will lead to the co-existence of multiple ways of information presentation. Therefore, multimedia can also be considered as multiple perceptional representation media (Hoogeveen, 1997).

As indicated by the Cue Summation Theory (Severin, 1967), information learning could increase as the number of available modality stimuli increases. The adoption of multimedia elements has been discovered to enhance better cognitive activities as long as these elements complement each other (Brashears, Akers, & Smith, 2005). In online communication, Sundar (2007) considers multimedia or multi-modality as one variable in user engagement. The underlying explanation for multimedia's effects on user engagement can be found via the lens of perception bandwidth. Due to the presence of multiple perceptual presentations, multimedia serves to expand perceptual bandwidth and allow users to adopt multiple sensory channels to process information (Reeves & Nass, 2000), which results in more cognitive involvement and subsequently more behavioral participation. In a sentiment analysis of social media messages, You and Luo (2013) discovered that multimedia components on social media could convey more subtle feelings than pure texts, which drew more attention from users. Bruni et al. (2012) have also found that links to multimedia information increased the virality of social media posts in terms of number of sharing. Following this line of literature, use of multimedia elements will positively influence users' cognitive responses to live-tweets and subsequently influence their behavioral engagement with these tweets.

H1. Use of multimedia will lead to higher user engagement in live-tweeting of sporting events.

It is important to note that there are different multimedia components that can be adopted in a tweet aside from text, such as video, still image, GIF, emoji, and link. These components vary in their respective psychological mechanisms to influence user engagement. For example, links influence user engagement through offering interaction possibilities and additional sources of information, which is different from the other multimedia components. Although videos, still images, GIFs, and emojis could all elicit visual arousal, they differ from each other in terms of the needed attention. Still images and emojis are less cognitively demanding than lengthy videos (Bakhshi et al., 2016; Bruni et al., 2012). Users do not need to keep a sustained attention to understand them. Research shows that non-moving visual elements are effective in assisting memory of the surrounding text (Collyer, Jonides, & Bevan, 1972). Because videos and GIFs involve more visual changes than stills images and emojis, they may demand more cognitive resources to process. Users need to be more motivated to finish them and allocate relatively more attention to understand them. In live games, users may have a shorter attention span with limited time to fully consume the tweets due to the fast pace of the event. Multimedia components that are more cognitively demanding may, therefore, lead to less engagement. On the other hand, videos and GIFs have better storytelling capacity (Bakhshi et al., 2016), which could lead to more emotional stimulation. Existing research has also shown that individuals would experience more physiological arousal when responding to moving images (Detenber, Simons, & Bennett Jr., 1998). These emotional and physiological arousals may also lead to more behavioral engagement with sports teams' live-tweets. Given the mentioned differences above, it will be interesting to explore how different multimedia components contribute to user engagement in live-tweeting of sporting events.

RQ1: How do different multimedia components vary in their respective influences on user engagement in live-tweeting of sporting events?

In addition to psychological mechanism, the above-mentioned multimedia elements afforded by Twitter vary in technological requirements. For example, still images and emojis do not consume much Internet bandwidth and are more accessible for mobile devices, whereas videos and GIFs require a better Internet connection to be displayed and are less friendly to mobile devices. In sporting events, most users are likely to follow live-tweeting on the their mobile devices. Videos and GIFs, therefore, may be harder to access than still images and emojis because they take longer to load than plain text. Because of these constraints, tweets with different multimedia components may vary in their possibilities to be viewed in their entirety (Bruni et al., 2012).

Although videos and GIFs may elicit more favorable attitudes (i.e., likes), they may not necessarily lead to more retweets in social media. Similarly, although links may elicit more favorable attitudes by offering interaction possibilities and additional information, it directs users to leave the current screen or browser window to another one, which complicates behavioral engagement with the tweets. Therefore, different multimedia components may influence different aspects of user engagement. It will be interesting to see how multimedia components affect different aspects of user engagement, including retweets, likes, and replies.

In relation to RQ1, H1 was set up: The use of multimedia components like still images, links, videos, gifs, and emojis, will positively influence user engagement in live-tweeting of sporting events.

RQ2: How do multimedia elements in a tweet affect user engagement, as measured by retweets, likes, and replies, in live-tweeting of sporting events?

Use of Discussion Starter and Facilitator

In live-tweeting of sporting events, two common content strategies that many sports teams have adopted to start and to facilitate the discussions with users are the call-to-actions and the giveaways. Both of these two content features are classic persuasive techniques that have been widely used in sales, marketing, and advertising (Goldstein, Martin, & Cialdini, 2009).

The purpose of a call to action is to elicit desired actions by encouraging readers of the message (Safko, 2012). Most of the calls to action on Twitter are in the form of text. More recently, Twitter has also launched call-to-action buttons that allow users to interact with the sponsored tweets (Lafferty, 2016). The call to action on Twitter can, therefore, be defined as a content element that invites users to engage in conversation(s) with both the message sender and other users. Given the prevalent use of calls to action on websites and social media (Zarrella, 2009), users are mentally prepared for the experience of being called to act (Smith, 2014). This mental preparedness can be explained by the perceptual set theory in psychology: Individuals may develop predisposition to notice a particular aspect of a stimulus if their past experience helps them establish this expectation (Allport, 1955). Based on this assumption, social media practitioners have strongly recommended integrating call to action into social media content strategies (Safko, 2012). Research has shown that the adoption of call to action could lead to higher conversion on social media (Zarrella, 2010).

In addition to call to action, giveaways have also been adopted as a way to facilitate discussion on Twitter. It has proven to be effective in boosting sales and customer engagement in traditional merchandise campaigns (Goldstein et al., 2009). In live-tweets about sporting events, giveaways are usually in the form of merchandise or promotional items. For instance, the Chicago Blackhawks tweeted to fans at home in the middle of a game to reply with a photo of their gameday setup inside their house. That tweet received 134 replies and one fan received a set of coasters as a prize. The psychological explanation for the effect of giveaways lies in the emotional responses about getting something for free (Ariely, 2010). Anderson (2009) considers this free concept as a radical price that could lower the mental barrier to engagement.

H2. The use of 1) call to action and 2) giveaway will positively influence user engagement in live-tweeting of sporting events.

Variation of Messages Visibility

Aside from using conversation starters and facilitators, another commonly adopted Twitter strategy is to vary the visibility of content. There are two specific ways to vary the visibility of a tweet: mention (i.e., @ username) and hashtag (#) (boyd, Golder, & Lotan, 2010; Suh, Hong, Pirolli, & Chi, 2010). They influence tweet visibility through different mechanisms.

On Twitter, a mention is a tweet that includes a user's username preceded by the "@" symbol anywhere in the tweet (Twitter Help Center, 2016). Once a user is mentioned in a tweet, he/she will receive a notification from Twitter. By clicking the link included in the notification tab, a user will be able to access the tweet in which he/she is mentioned. If multiple usernames are included in a tweet, each of the mentioned users will be able to see the tweet in their notification tab. Therefore, Suh et al (2010) describe mention as a referencing feature by specifying a user or several users. Through the manipulation of addressivity (Honeycutt & Herring, 2009), this particular message feature gains the attention from the tagged user(s) by increasing the visibility of the tweet. Boyd et al. (2010) have also conceptualized the mention as an attention seeking feature that alerts the tagged person that he/she has been talked about. Given that Twitter sends a clickable link for each mention to the tagged person, this message feature also allows the discovery of other interesting account to follow if the tagged person has not already followed the account. The use of mention can, therefore, be considered as an attempt to start a conversation with another user (Bruns & Moe, 2013).

Given that a particular username or usernames are tagged in the tweet, the use of mention usually implies an underlying intention to address specific individual(s) rather than the entire population of followers. Because of this focused addressivity, other followers may consider the tweet as less relevant and become less interested in it, which negatively impacts user engagement. For example, Suh et al. (2010) have discovered a marginally significant negative association between the use of mention and retweeting behavior. In addition, when a user replies to another user's tweet, the tweet usually begins with the @username of the person replied to. Reply is, therefore, considered as a special case of mentions (Twitter, 2016). When a tweet starts with the @username (without a period before it), only the sender, the receiver, and those who follow both the sender and the receiver will see the tweet. It thus limits the visibility of the tweet to the greater population of the followers and their engagement with the tweet.

H3. The use of mentions, including replies, will negatively influence user engagement in live-tweeting of sporting events.

The other feature that influences tweet visibility is hashtag. By adding the hashtag symbol (#) before a keyword or a phrase, users group the tweets into categories, which allows the tweets to be discovered more easily via the Twitter search function (Bruns & Moe, 2013). When a user searches for a particular hashtag, he/she will discover tweets from accounts that he/she has not followed. Therefore, hashtags could increase the visibility of tweets by enabling them to reach beyond the existing followers and rapidly assemble the ad hoc public (Bruns & Moe, 2013). Existing literature on Twitter has established a positive relationship between use of hashtags and user engagement. For example, Stefanone, Saxton, Egnoto, Wei, and Fu (2015) have discovered that hashtag use is positively related to tweet diffusion. The use of hashtags has also been found to be a strong predictor for retweetability (Suh et al., 2010). Based this discussion, this study proposes the following hypothesis:

H4. The use of hashtag will positively influence user engagement in live-tweeting of sporting events.

Effect of Tweet Valence

The valence of a tweet indicates the predominant sentiment of the message, such as positive, negative, or neutral (Jenders, Kasneci, & Naumann, 2013). In online persuasion literature, message valence has been found as influential on triggering biased source evaluation and on the development of attitude and behaviors toward message (Lee, Park, & Han, 2008; Clemons, Gao, and Hitt, 2006). With regard to the effects of message valence on Twitter, the existing research findings have not been entirely consistent. For example, Jenders et al. (2013) have discovered that tweets with negative sentiment are more likely to go viral than those with either positive or neutral sentiment. This finding is consistent with the negativity bias discovered in e-commerce literature, such that negative messages have a stronger influence on individuals than positive messages (Lee et al., 2008). This negativity bias can be explained by the prospect theory (Kahneman & Tversky, 1979): Individuals place more weight on negative information than positive information because the experience of loss is usually considered greater than the pleasure of gain. Therefore, negative messages are more likely to attract attention and enhance tweet engagement.

In contrast, positively valenced tweets have been found to be retweeted more often than negatively valenced tweets by Stefanone, et al. (2015). In a study about brand fan page on social media, de Vries, Gensler, and Leeflang (2012) have discovered that positive brand posts increase the number of likes. Pfitzner, Garas, & Schweitzer (2012) have also found a general bias toward positive tweets. Given the inclusive findings on the effect of message valence, the current author proposes the following research question instead of a hypothesis.

RQ3: How do tweet valence influence user engagement in live-tweeting of sporting events?

III. Methods

A quantitative content analysis was conducted to examine how different content strategies influence user engagement in live-tweets. The analysis included the live-tweets published by 12 sports teams in 12 games (refer to Appendix I for more details). In order to ensure the representativeness, the live-tweets analyzed in this study were collected from three different sports: baseball, basketball and hockey. These three sports were chosen based on the following three criteria. First, it is important for the sport to have a large audience. Second, there is a significant number of professional teams across the United States for the sport. Third, the sport has been active on Twitter for live-tweeting. The live-tweets were collected for the premium games of these three sports between March 28 and May 17, 2016. During this time period, basketball and hockey teams were competing in their respective postseasons. For baseball, Opening Day was about to begin. Therefore, home openers were analyzed for baseball teams.

After determining the different sports for research, a total of 12 teams were selected based on the team's Twitter follower count, the ability to host a premium sporting event, and its geographic proximity to teams of other sports. The size of a team's Twitter follower count was important to ensure a large enough number of who would have been able to see any posted tweet. By the time of data analysis, the numbers of followers of these 12 teams ranged from 265,000 to 2,450,000. Based on preliminary research, teams usually generated more tweets if they were hosting games. Therefore, live-tweets for home games were selected. Finally, geographic proximity of teams was taken into consideration to ensure that these teams shared similar fanbases so they could be compared for analysis. Four teams were chosen per sport across four different regions: West, Midwest, South, and East.

The four baseball teams selected were the Oakland Athletics (West), Chicago Cubs (Midwest), Atlanta Braves (South), and New York Yankees (East). The four basketball teams selected were the Golden State Warriors (West), Cleveland Cavaliers (Midwest), Charlotte Hornets (South), and Boston Celtics (East). The four hockey teams selected were the San Jose Sharks (West), Chicago Blackhawks (Midwest), Carolina Hurricanes (South) and New York Islanders (East). These 12 teams represented large sports markets with sizable fanbases on Twitter. The majority of these games were broadcasted nationally with a large audience. The eight basketball and hockey teams either made it to the playoffs or were fighting for a spot in the playoffs toward the end of the regular season.

One game was selected for each of the 12 teams. Game selection was determined based on whether it was nationally or widely televised and whether the game itself carried significance for the team's respective fanbases. Most nationally televised games during this data collection involved rivalries, such as the New York Yankees vs. Boston Red Sox, and San Jose Sharks vs. Los Angeles Kings. Other nationally televised games were held for home openers, such as the Atlanta Braves. In addition, other types of games were included because of the time of year, including playoff games for the Golden State Warriors and Cleveland Cavaliers.

A sample of 540 live-tweets were collected in this study. This research defined the live-tweeting period as one hour before the scheduled start time of a game to one hour after the conclusion of the game. All of the tweets posted during this time period for each game were included for analysis. The numbers of retweets, likes, and replies were counted one hour after the composition of a pregame or postgame tweet. For example, if a team tweeted a starting lineup at 6:30 p.m. before a game started, the numbers of retweets, likes, and replies were counted at 7:30 p.m. The numbers of retweets, likes and replies were counted two hours after the publication of a tweet during the game. Longer response time was chosen for in-game tweets to allow followers enough time to respond. This decision was made based on the findings from the pilot study on some existing live-tweets. The pilot study found that user engagement in live-tweeting, as measured by retweets, likes, and replies, tended to die out after an hour for pregame and postgame. In contrast, in-game tweets tended to have high levels of engagement within a two-hour timespan. In-game tweets were defined as those taking place from the time the team recognized the game began to the time the team tweeted out the final score. For example, if a team tweeted out a score in the middle of a game at 8:05 p.m., the number of retweets, likes, and replies were counted at 10:05 p.m. The majority of tweets were posted in-game rather than during pregame or postgame. As shown in Appendix 1, the number of live-tweets varied by region and by team.

Coding Scheme

The unit of observation in this study was live-tweet on Twitter. The following categories were developed to code the live-tweets posted for the selected sporting events.

User engagement. Following Stokes and the Minds of Quirk (2013), this study operationalized user engagement as a composite measure with three sub-dimensions: retweets, likes, and replies. For each collected tweet, the researcher coded the number of retweets (Mean (M) = 364.07, Standard Deviation (SD)= 995.60), the number of likes (M = 564.86, SD = 1113.58) and the number of replies (M = 10.24, SD = 20.40). Overall engagement was calculated by adding up the numbers for the three sub-dimensions (M = 939.16, SD = 2,091.81).

Multimedia components. Multimedia was measured by five components in this study: videos, still images, GIFs, emojis, and links. The number of each multimedia component was counted for each tweet. Among all of the collected tweets (N = 540), 16.7% of the tweets had at least one video, with 25.2% having at least one image, 11.3% having at least one GIF, 16.9% having at least one emoji, and 10.4% having at least one link.

Call to action. Call to action was operationalized as a message in which Twitter followers were explicitly told to do something or were asked to answer a question. For example, during the San Jose Sharks game, the team's Twitter account asked fans to tweet out their seat locations. The presence of a call to action in a tweet was coded as 1 with the absence of it coded as 0.

Giveaway. Giveaway was operationalized as a promotional item given to reward fans or Twitter followers. In live-tweeting, it often entails a material prize given to a fan by the team directly. For example, in a #SharksSocial campaign, the San Jose Sharks gave one fan a red scarf. The presence of a giveaway in a tweet was coded as 1 with the absence of it coded as 0.

Mention. Mention was operationalized as the use of @username in the tweet. The author coded the number of mentions included in each tweet (M =.51, SD = .76).

Hashtag. Hashtag was operationalized as the use of # followed by a keyword or a topic in the tweet. The author coded the number of hashtag included in each tweet (M =.93, SD = .88).

Valence of tweet. This study coded tweet valence into three categories by identifying the dominant sentiment of a tweet. These categories were positive (56.3%), negative (3.5%), and neutral (40.2%). This variable was then dummy-coded into three variables of positive, negative, and neutral valence.

Time of tweeting and use of scores and stats were included as two control variables. Time of tweeting was coded into two categories of during game (1) or not (0). Use of scores and stats was coded into two categories of with scores and stats (1) and without scores and stats (0).

Coding Procedure and Inter-Coder Reliability

The current author and another coder first categorized the tweets after several training sessions and developed the filtering criteria to sort out the irrelevant tweets. The researchers then established the definition for each category with sufficient examples to guide the coding. After establishing the coding scheme, the two researchers randomly selected and coded a subsample (i.e., 12%) of all collected live-tweets. The inter-coder reliability test using Krippendorff's alpha was conducted for this subsample of tweets and accordingly set at 80%. For the coding categories with lower inter-coder reliability, the two researchers further discussed the coding strategies and trained each other to reach higher agreement and conducted another round of coding. The inter-coder reliability test results indicated that all of the coding categories reached a high level of reliability: time of tweeting = 1; scores and stats = 1; number of videos = 1; number of still images = 1; number of GIFs = 1; number of emojis = 1; number of links = 1; call-to-action = .8; giveaways = .8; number of mentions = .97; number of hashtags = .97; valence of tweet = .83. After establishing the inter-coder reliability, the two researchers independently coded the respective portions of the entire sample of tweets.

Data Analysis

This study adopted hierarchical multiple regressions to examine the research questions and test the hypotheses. The control variables and the independent variables were entered into the models in blocks. Regression analysis was first run for user engagement as a composite measure and then for each dimension of it.

IV. Results

This section described how different components of tweets have effects on user engagement as measured by the composite number of retweets, likes, and replies, followed by their effects on the three composite elements individually.

Still images. As shown in Appendix II, specifically in Block 1, the use of still images among different types of multimedia components significantly predicted user engagement as measured by the composite number of retweets and the number of likes, replies (ß = .09, $p < .05$). Therefore, H1 was partially supported by one multimedia component. The more still images used in a tweet, the more likely users engaged in the tweet. Regarding still images' effect on each dimension of user engagement, still images resulted in more retweets and likes at a statistically significant level. However, the use of still images did not have any significant effect on the number replies received by a tweet.

Links. In addition to still images, the use of links also had some effect on user engagement. Although the number of links used in a tweet did not have any significant effect on user engagement as a composite measure, it significantly predicted number of replies received by a tweet ($p < .05$). Unlike the positive influence of still images, the use of links had negative impacts on the number of replies.

For the other multimedia components, such as the uses of videos, GIFs, and emojis, this study discovered any significant influence on neither user engagement as a composite measure, nor their individual components, which partially rejected H1.

Effects of Discussion Starter and Facilitator

This study did not find any significant effect of call to action or giveaway ($p >.05$). on user engagement as a composite measure or any dimensions of it. Therefore, H2 was not supported (refer to Block 2 in Appendix II).

Effects of Messages Visibility

Among the different message strategies sports teams used to vary the visibility of tweets, only the use of mentions (i.e., @username) was found to have significant effect on engagement (refer to Block 3 in Appendix II). The number of mentions had a negative effect (ß = -.15, $p < .01$) on user engagement as a composite measure. The more mentions used in a tweet, the less engaged a user was. Therefore, H3 was supported. This negative effect was also discovered for all three dimensions of user engagement. If a tweet mentioned Twitter accounts (i.e., usernames), it was less likely for it to be retweeted (ß = -.13, $p < .01$), liked (ß = -.15, $p < .01$), and replied (ß = -.14, $p < .01$).

Hashtags had no significant effect on user engagement as either a composite measure or any dimension of it. H4 was thus not supported.

Effects of Tweet Valence

RQ3 asked, how do tweet valence influence user engagement in live-tweeting of sporting events? The valence of tweet was found to have some significant influences on user engagement (refer to Block 4 in Appendix II). Compared to neutral tweets, positive tweets led to significantly more user engagement as a composite measure (ß = .21, $p < .001$). Positive tweets also led to significantly more retweets (ß = .20, $p < .001$), more likes (ß = .22, $p < .001$), and more replies (ß = .16, $p < .01$) than neutral tweets. Negative tweets did not significantly differ from neutral tweets for user engagement as a composite measure, or number of retweets, or number of likes. But negative tweets did lead to a greater number of replies than neutral tweets (ß = .10, $p < .05$).

Effects of Control Variables

Aside from the independent variables, control variables were found to exert some significant influences on user engagement and different dimensions of it. In order to run the multiple regressions, the researchers dummy-coded the three-level variable of sports type into baseball and basketball with hockey as the reference category. Different sports received different levels of engagement.

Type of sport. The analysis results showed that there was no significant difference between baseball live-tweets and hockey live-tweets with regard to user engagement as a composite measure, or number of retweets, or number of likes (refer to Block 5 in Appendix II). However, baseball tweets led to significantly more replies received by a tweet than hockey tweets (ß = .09, $p < .05$). When comparing basketball tweets to hockey tweets, the author found that basketball tweets led to significantly higher user engagement as a composite measure than hockey tweets (ß = .23, $p < .001$). For each of the three dimensions of user engagement, basketball led to better outcomes than hockey. Basketball live-tweets got retweeted significantly more often than hockey live-tweets (ß = .20, $p < .001$). Basketball live-tweets obtained more likes than hockey live-tweets (ß = .24, $p < .001$). They also received more replies than hockey live-tweets (ß = .16, $p < .01$).

Time of tweeting. Whether a tweet was posted pregame and postgame or during game did not predict either user engagement as a composite measure or any dimension of it.

Scores and stats. Including scores and states in live-tweets significantly predicted all aspects of user engagement. Having scores and stats in live-tweets positively influenced user engagement as a composite measure (ß = .17, $p < .001$), number retweets (ß = .18, $p < .001$), number of likes (ß = .15, $p < .01$) and number of replies (ß = .10, $p < .05$) received by live-tweets.

V. Discussion

This study examines the influence of live-tweet strategies adopted by sports teams on fans' engagement. It contributes to the existing literature on sports communication by focusing on an underexplored social media practice: live-tweeting. Compared to other social media activities, live-tweeting of sporting events is more fast-paced and provides a more concentrated context for discussion (Schirra et al., 2014). Given these unique characteristics of live-tweeting, the researchers have discovered some interesting findings that are different from the existing studies (Bruni, et al., 2012; Corney, et al., 2014).

First, despite the general positive assumptions about multimedia (Bruni et al., 2012; Sundar, 2007; You & Luo, 2013), this study did not discover significant positive effects of many multimedia components, except for still images, on fan engagement in live-tweeting of sporting events. The positive influence of still images can be explained by the elicited visual arousal and emotional stimulation with relative low cognitive demand for processing (Bruni et al., 2012; Collyer et al., 1972).

Unlike previous research (Bakhshi et al., 2016; Detenber, et al., 1998), videos, GIFs, and emojis had no significant impact on any aspect of engagement. This might be attributed to both the nature of live-tweeting and the expectation of Twitter users. In general, Twitter users expect short bursts of information and disposable updates in live-tweeting, especially when it moves along with the event. Compared to still images that require no action except for a glance, videos and GIFs demand sustained attention and more cognitive resources to process. During a live sports game, fans and followers are more likely to focus on the game itself and less willing to spare effort on viewing the moving images on Twitter. Additionally, videos and GIFs may take a while to load on mobile devices with slow Internet or a poor connection, which would likely cause disengagement from the tweet. One possible explanation for the lack of engagement with emojis might be that they are harder to interpret than text itself. For example, during a San Jose Sharks game, the team tweeted the entire second period of the game exclusively through emojis. As the period progressed, fans found this to be an annoying tactic because the meaning of the messages was unclear. At one point in the game, the Sharks scored, but the goal was disallowed upon further review by the referees. This complicated situation and the team's reaction could not be easily expressed by just emojis. One fan even described the use of emojis in this circumstance as "irritating as hell." Another fan said that he was "still not sure what happened." Although emojis may be a creative way to capture an emotion that text could not otherwise provide, they can reduce engagement when used in excess.

Links had a negative impact on engagement, most notably with the number of replies and likes. This could be attributed to the fact that links take up several characters and limit the amount of content of a tweet, leading to less user engagement. In addition, clicking on a link forces a user to leave his or her current screen or browser window, which makes it hard to come back to Twitter to like or reply.

Only the use of mentions had negative effects on all aspects of engagement as predicted by existing research (Suh et al., 2010), which indicates that it did reduce engagement by limiting visibility and narrowing the size of the audience. If sports teams would like to engage more users in live-tweeting, they need to consider limiting the use of mentions. The use of hashtags did not have any significant impact on any aspect of engagement. It is possible that sports fans mainly unite with other fans based on the teams they support. Therefore, the use of hashtags is less likely to expand the reach of tweets to the broader public. On the other hand, once fans were already united by the focused topic of a game, using hashtags would not matter to them.

This study also contributes to the understanding of engagement by examining the effect of live-tweeting strategies on different aspects of engagement. The findings suggest that different tweet content strategies vary in their capacity to affect tweet virality (i.e., the number of retweets), emotional support (i.e., the number of likes), and direct conversation with teams (i.e., the number of replies). For example, polarized tweets (i.e., positive or negative) both positively predicted fans' engagement in direct discussion with teams, whereas only positive tweets affected the virality of tweets and the emotional support received by the tweets.

VI. Limitation and Future Directions

This study defines and operationalizes engagement following the behavioral approach by focusing on user activities and actions (Zarrella, 2009). However, engagement can also be conceptualized as a multi-dimensional concept that goes beyond digital outreach on social media (Oh et al., 2015). Future research may consider exploring how content strategies in live-tweeting of sporting events influence other dimensions of engagement. For example, it may be interesting to examine the fans' experiences with live-tweeting by measuring their attention allocation, absorption, and appraisal of live-tweets (O'Brien &Toms, 2008). An extension of the current study may also compare the psychological engagement to the behavioral engagement and evaluate how the two influence each other.

In the current study, engagement was determined by the presence of activities and actions of fans. However, the active contribution on social media mainly comes from a small percentage of the community (McCay-Peet & Quan-Hasse, 2016). Many Twitter followers are the lurkers who listen to conversations without contributing much to the content. Future research may take this particular way of engagement in live-tweeting of sporting events into consideration.

Due to the time constraints, the current study collected and analyzed the live-tweets during games for three types of sports. A follow-up study can expand this sample to include live-tweets from other sports, especially those with large fanbases.

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References

Agichtein, E., Castillo, C., Donato, D., Gionis, A., & Mishne, G. (2008) Finding high-quality content in social media. *Proceedings of the International Conference on Web Search and Web Data Mining*, 183–194. doi:10.1145/1341531.1341557

Allport, G.W. (1955). *Becoming: Basic considerations for a psychology of personality*. New Haven: Yale University Press.

Anderson, C. (2009). *Free: The future of a radical price*. New York, NY: HarperCollins.

Ariely, D. (2010). *Predictably irrational: The hidden forces that shape our decisions*. New York, NY: HarperCollins.

Bakhshi, S., Shamma, D. A., Kennedy, L., Song, Y., de Juan, P. & Kaye, J. (2016). Fast, cheap, and good: Why animated GIFs engage us. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 575-586).

Boyd, d., Golder, S., & Lotan, G. (2010). Tweet, tweet, retweet: Conversational aspects of retweeting on Twitter. *Proceedings of the 43rd Hawaii International Conference on System Sciences*,1-10.

Brashears, T., Akers, C., & Smith, J. (2005). The effects of multimedia cues on student cognition in an electronically delivered high school unit of instruction. *Journal of Southern Agricultural Education Research*, *55*(1), Accessed September 26, 2016 from http://www.jsaer.org/pdf/Vol55/55-01-005.pdf.

Bruni, L., Francalanci, C., & Giacomazzi, P. (2012). The role of multimedia content in determining the virality of social media information. *Information*, *3*, 278-289. doi:10.3390/info3030278

Bruns, A., & Moe, H. (2013). Structural layers of communication on Twitter. In Weller, K., Bruns, A., Burgess, J., Mahrt, M., & Puschmann, C. (Eds.). *Twitter and society* (pp. 15-28). New York: Peter Lang.

Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory*, *18*(2), 255- 280. doi:10.1111/j.1468-2885.2008.00322.x

Clemons, E. K., Gao, G., & Hitt, L. M. (2006). When online reviews meet hyperdifferentiation: A study of the craft beer industry. *Journal of Management Information Systems*, 23(2), 149–171. doi:10.2753/MIS0742-1222230207

Collyer, S. C., Jonides, J., & Bevan, W. (1972). Images as memory aids: Is bizarreness helpful? *American Journal of Psychology*, *85*(1), 31-38.

Corney, D., Martin, C., & Göker, A. (2014). Spot the ball: Detecting sports events on Twitter. In M. de Rijke, T. Kenter, A. P. de Vries, C. X. Zhai, F. de Jong, K. Radinsky, and K. Hofmann (Eds.), *Advances in information retrieval* (pp. 449-454). Switzerland, Springer.

de Vries, L., Gensler, S., & Leeflang, P. S. H. (2012). Popularity of brand posts on brand fan pages: An investigation of the effects of social media marketing. *Journal of Interactive Marketing*, *26*(2), 83-91. doi: 10.1016/j.intmar.2012.01.003

Detenber, B. H., Simons, R. F., & Bennett Jr., G. G. (1998). Roll 'em!: The effects of picture motion on emotional responses. *Journal of Broadcasting & Electronic Media*, *42*(1), 113–127.

Goldstein, N. J., Martin, S. J., & Cialdini, R. (2009). *Yes!: 50 scientifically proven ways to be persuasive*. New York, NY: Free Press.

Hambrick, M. E., Simmons, J. M., Greenhalgh, G. P., & Greenwell, T. C. (2010). Understanding professional athletes' use of Twitter: A content analysis of athlete tweets. *International Journal of Sport Communication*, *3*(4), 454-471. doi: 10.1123/ijsc.3.4.454

Hawathorne, J., Houston, J. B., & McKinney, M. S. (2013). Live-tweeting a presidential primary debate: Exploring new political conversations. *Social Science Computer Review*, *31*(3), 552-562. doi: 10.1177/0894439313490643

Honeycutt, C., & Herring, S. (2009). Beyond microblogging: Conversation and collaboration in Twitter. *Proceedings of the Forty-Second Hawai'i International Conference on System Sciences.* doi: 10.1109/HICSS.2009.89

Hoogeveen, M. (1997). Towards a theory of the effectiveness of multimedia systems. *International Journal of Human-Computer Interaction*, *9*, 151-168. doi: 10.1207/s15327590ijhc0902_4

Jacques, R., Preece, J., & Carey, T. (1995). Engagement as a design concept for hypermedia. *Canadian Journal of Educational Communications*, *24*(1), 49-59.

Jenders, M., Kasneci, G., & Naumann, F. (2013). *Analyzing and predicting viral tweets*. Processings of the 22nd International Conference on World Wide Web, 657-664. doi: 10.1145/2487788.2488017

Jonasses, D. (2000). *Computers as mindtools for schools*. Upper Saddle River, NJ: Merrill.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263-291. doi:10.2307/1914185

Lafferty, J. (2016, January 5). *Twitter launches conversational ads: Tweets with call-toaction buttons*. Retrieved from http://www.adweek.com/socialtimes/twitter-launches-conversational-ads-tweets-with-call-to-action-buttons/632376

Lee, J., Park, D.-H., & Han, I. (2008). The effect of negative online consumer reviews on product attitude: An information processing view. *Electronic Commerce Research and Applications*, *7*(3), 341-352. doi: 10.1016/j.elerap.2007.05.004

McCay-Peet, L., & Quan-Hasse, A. (2016). A model of social media engagement: User profiles, gratifications, and experiences. In H. O'Brien and P. Cairns (Eds.) *Why engagement matters: Cross-disciplinary perspectives of user engagement in digital media* (pp. 199-218). New York: Springer.

Marmolin, H. (1991). Multimedia from the perspective of psychology. In L. Kjelldahl (ed.). *Multimedia: Systems, interactions and applications*. NY: Springer-Verlag.

Marwick, A., & boyd, d. (2010). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society, 13*(1), 114-133. doi: 10.1177/1461444810365313

Mersey, R., Malthouse, E., & Calder, B. (2010). Engagement with Online Media. *Journal of Media Business Studies, 7*(2), 39-56. doi:10.1080/16522354.2010.11073506

Napoli, P. M. (2011). *Audience evolution: New technologies and the transformation of media audiences*. New York, NY: Columbia University Press.

O'Brien, L. H. (2011). Exploring user engagement in online news interactions. *Proceedings of the Association for Information Science and Technology*, *48*(1), 1-10. doi:10.1002/meet.2011.14504801088

O'Brien, H., & Toms, E. (2008). What is user engagement? A conceptual framework for defining user engagement with technology. *Journal of the American Society for Information and Science and Technology, 59*(6), 938-955. doi:10.1002/asi.20801

Oh, J., Bellur, S., & Sundar, S. S. (2015). Clicking, assessing, immersing, and sharing: An empirical model of user engagement with interactive media. *Communication Research*, *21*, 1-27. doi:10.1177/0093650215600493

Peters, C., Castellano, G., de Freitas, S. (2009). An exploration of user engagement in HCI. *Proceedings of the International Workshop on Affective-Aware Virtual Agents and Social Robots*, *9*. doi: 10.1145/1655260.1655269

Pfitzner, R., Garas, A., & Schweitzer, F. (2012). Emotional divergence influences information spreading in Twitter. *Proceedings of the 6th International Conference on Weblogs and Social Media*, *12*, 2-5.

Price, J., Farrington, N., & Hall, L. (2013). Changing the game? The impact of Twitter on relationships between football clubs, supporters and the sports media. *Soccer and Society*, *14*(4), 446-461. doi: 10.1080/14660970.2013.810431

Reeves, B., & Nass, C. (2000). Perceptual user interfaces: perceptual bandwidth. *Communications of the ACM*, *43*(3), 65-70. doi:10.1145/330534.330542

Safko, L. (2012). *The social media bible: Tactics, tools, and strategies for business success*. New Jersey: John Wiley & Sons.

Schirra, S., Sun, H., & Bentley, F. (2014). Together alone: motivations for live-tweeting a television series. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2441-2450. doi:10.1145/2556288.2557070

Severin, W. J. (1967). Another look at cue summation. *AV Communication Review*,*15*(4), 233-245. doi: 10.1007/BF02768608.

Sheffer, M., & Schultz, B. (2010). Paradigm shift or passing fad? Twitter and sports journalism. *International Journal of Sport Communication, 3*, 472-484. doi: 10.1123/ijsc.3.4.472

Smith, J. (2014, October, 1st). Everything you need to know about the psychology of the call to action [Web log post]. Retrieved from https://blog.kissmetrics.com/psychology-of-the-cta/.

Stefanone, M. A., Saxton, G. D., Egnoto, M. J., Wei, W. X., & Fu, Y. (2015). Image attributes and diffusion via Twitter: The case of #guncontrol. *Proceedings of the 48th Hawaii International Conference on System Sciences* (pp. 1788-1797). Kauai, HI.

Stokes, R., & the Minds of Quirk. (2013). *eMarketing: The essential guide to marketing in a digital world* (5th ed). Quirk Education Pty. Retrieved August 16, 2016 from https://www.redandyellow.co.za/wp-content/uploads/emarketing_textbook_download.pdf

Suh, B., Hong, L., Pirolli, P., & Chi, E. H. (2010) Want to be retweeted? Large scale analytics on factors impacting retweet in Twitter network." *Proceedings of IEEE Second International Conference on Social Computing*, 177-184. doi:10.1109/SocialCom.2010.33

Sundar, S. S. (2000). Multimedia effects on processing and perception of online news: A study of picture, audio, and video downloads. *Journalism & Mass Communication Quarterly*, *77*, 480-499. doi: 10.1177/107769900007700302

Sundar, S. S. (2007). Social psychology of interactivity in human-website interaction. In A. N. Joinson, K. Y. A. McKenna, T. Postmes, & U.-D. Reips (Eds.), The Oxford handbook of Internet psychology (pp. 89-104). Oxford, UK: Oxford University Press.

Twitter (2016). *Twitter usage/company facts*. Retrieved October 26, 2016 from https://about.twitter.com/company

van den Putte, B. (2009). What matters most in advertising campaigns? The relative effect of media expenditure and message content strategy. *International Journal of Advertising*, *28*(4), 669-690. doi:10.2501/S0265048709200813

Wang, A. (2006). Advertising engagement: A driver of message involvement on message effects. *Journal of Advertising Research*, *46*(4), 355-368. doi: 10.2501/S0021849906060429

Witkemper, C., Lim, C. H., & Waldburger, A. (2012). Social media and sports marketing: Examining the motivations and constraints of Twitter users. *Sport Marketing Quarterly*, *21*(3), 170-183.

You, Q., & Luo, J. (2013). Towards social imagematics: Sentiment analysis in social multimedia. *Proceedings of the Thirteenth International Workshop on Multimedia Data Mining*. New York, NT.

Zarrella, D. (2009). *The social media marketing book*. Sebastopol, CA: O'Reilly.

Appendix I.
Numbers of Twitter Follower & Live-tweets by Sports Teams

Team	Region	Number of Followers*	Number of Live-tweets
San Jose Sharks	West	463K	67
Oakland A's	West	366K	13
Golden State Warriors	West	2.45M	58
Carolina Hurricanes	South	265K	81
Charlotte Hornets	South	585K	60
Atlanta Braves	South	849K	39
Cleveland Cavaliers	Midwest	1.5M	43
Chicago Cubs	Midwest	1.08M	36
Chicago Blackhawks	Midwest	1.65M	66
Boston Celtics	East	1.96M	24
New York Islanders	East	330K	48
New York Yankees	East	1.88M	5

* Follower counts as of September 26, 2016.

Appendix II.
Predictors of Engagement

	User Engagement (Composite) ß	Dimensions of User Engagement: Retweets ß	Likes ß	Replies ß
Block 1				
Still Image	.09*	.09*	.09*	-.01
Link	-.07	-.06	-.08#	-.09*
Video	-.05	-.03	-.06	-.07
GIF	.01	-.01	.02	-.04
Emoji	.01	.01	.01	-.01
Block 2				
Call to Action	-.04	-.03	-.05	.05
Giveaway	-.06	-.05	-.07	.07
Block 3				
Mention	-.15**	-.13**	-.15**	-.14**
Hashtag	-.02	-.02	-.02	.02
Block 4				
Positive Valence†† (Neutral as baseline)	.21***	.20***	.22***	.16**
Negative Valence	-.02	-.02	-.02	.10*
Block 5				
Baseball† (Hockey as baseline)	.07	.06	.07	.09*
Basketball (Hockey as baseline)	.23***	.20***	.24***	.16**
Time of Tweeting (during game or not)	-.01	.01	-.03	-.03
Scores & Stats (with=1, without=0)	.17***	.18***	.15**	.10*
Total R^2	.18	.16	.19	.10
Adjusted R^2	.15	.13	.17	.07

Note: Sample size = 540. Cell entries are final entry ordinary least squares standardized Beta (*ß*) coefficients.

#*p* = .05, **p* < . 05, ***p* < .01, ****p*< .001. † Type of Sports (i.e., baseball, basketball and hockey) was dummy-coded into two variables of baseball and basketball with hockey as the reference category (or baseline). †† Valence of tweets (i.e., positive, negative and neutral) was dummy-coded into two variables of positive valence and negative valence with neutral valence as the reference category.