

# Analyzing the Social Soundtrack from Second Screens Before, During, and After Real-life Events

## Phase Investigation of Social Media Concerning US Super Bowl 2015

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**Abstract**— The integration of social media technologies with second screen devices facilitates the social interaction concerning online broadcasted media events that we refer to as the social soundtrack. For this research, we assess the change of Super Bowl 2015 related conversations on various social media platforms, namely Twitter, Instagram and Tumblr via categories (commercials, musicals and game) for three phases (Pre, During, and Post). We execute statistical analysis on more than 3,000,000, 800,000 and 50,000 comments from Twitter, Instagram and Tumblr, respectively. We classify the principal phase and category of interaction across all three social media platforms. We additionally investigate the major changes in second screen conversations within the social soundtrack across the categories and phases on all three social network platforms. The research results show that phase-category relationship exists for all three social media platforms. The results find the During phase as the predominant one for all three categories on social media platforms, with the exception of Twitter. The research results are important in identifying the influence of second screens on social soundtrack conversations in terms of sharing of information.

**Keywords**— *Twitter; Instagram; Tumblr; chi-square test; social soundtrack; second screens; social media; social networking.*

### I. INTRODUCTION

Given the use of online social networks (e.g., Facebook, Twitter, Weibo etc.), the community aspects concerning broadcasted media events have greatly increased, as the blending of these technologies permits social conversations and interactions around such events. The combination of broadcasted media events and online social networks has permitted online conversations that convey feelings of togetherness and communication among people, even in dispersed locations. The social network has embedded itself alongside the modern broadcast medium, becoming as a social soundtrack for the event and associated broadcast content, such as advertising.

This social soundtrack is an interesting conversational interactivity that can be both real time (i.e., during the live broadcast) and non-real time (i.e., before or after) based on the timing of event. The social soundtrack concerning such events can happen on various social networks. The integration of these

social networks as the conversational medium in conjunction with real life events marks the emergence of a relatively new phenomenon that greatly augments prior social aspects of such broadcasted mediums. This new technology usage is referred to as the *second screen phenomenon*, although there may be multiple (i.e., more than two) screens involved.

In the second screen phenomenon, the broadcasted media event is shown on the base device where the viewing occurs (i.e., usually the largest screen), while the secondary screen is the computing device (e.g., tablet, smartphone) by which the conversation occurs. It is the secondary screen that allows what we refer to as the *social soundtrack*, the online conversation with others regarding the in real life event. The social soundtrack participants exchange social media posts related to the event via second screen devices in terms of sharing of comments [1]. The interchange of information can happen live (i.e., During the event) or when the show is not live (i.e., Pre or Post of the event, relative the start and end of the event). The content of posts in the social soundtrack may contain different aspects (e.g., actors, directors, costumes, characters, themes, etc. for a show; players, coach, style etc. if the event is a sporting event, or brand, sale; customer preferences etc., if the event is an advertisement). TV broadcast of the events that happens In-Real-Life (IRL) (e.g. Super Bowl, Academy Awards, Music Video Awards, Grammys, etc.) are primary happenings with substantial social tracks, as these events do not lend themselves to recordings for later viewing, unlike, for example, a seasonal TV show.

Therefore, the second screen interaction about an IRL event leads to a social soundtrack that is fixed in duration, with the period bounded by the event's *Pre* and *Post* phases, including the event's *During* phase. The popularity of an IRL event intuitively increases the volume (i.e., number of posts) of social soundtrack from the perspective of commentary left on social media platforms. For this research, we consider Super Bowl 2015 as one such IRL broadcasted media event. It happens once in a year and is a major happening, especially in the US.

Aside from being just a sporting experience, the Super Bowl event involves multiple categories of interest. For the game itself, the teams, coaches and the players are important for viewer engagement. The Super Bowl commercials also

hold distinct appeal for many viewers. The musical performances conducted during the halftime show are also an important facet of this most popular media event in the US.

From a social conversation perspective, there has been little academic research concerning the increasingly important second screen interaction phenomenon and little systemic practitioner investigation. In this research, we investigate the use of the secondary screens during the Pre, During, and Post phases of the Super Bowl 2015 telecast, explicitly examining if viewer second screen interactions concerning Super Bowl commercials, game and musicals differ in Pre, During and Post event phases. As our data collection sites, we select three popular social media platforms, Twitter, Instagram, and Tumblr, to research the changes in second screen interactions through the three Super Bowl 2015 phases.

Social soundtrack research is important in understanding the usage of secondary screens with IRL broadcast media events to, among other reasons, facilitate retailers, broadcasters, and artists in manage branding and awareness campaigns. Understanding the relationship among phases and category of the social soundtrack for IRL events occurring on different social media platforms also can provide significant culture insights. Research findings, for example, can assist the artists, players, musical companies, channel owners, and advertisers in identifying the timings for launching, scheduling, or promoting music releases, photo shoots and product ads to engage more viewers, promote sales, and earn revenues. Research findings also shed light on social communication in relationship to scheduled IRL broadcast media events and the social interaction in cross technology usage of second screens, including their effect on pop culture and information sharing.

## II. RELATED WORK

While end user enrichment enhances the social possibilities of TV via the user generated content, there has been inadequate research on second screen interactions. Leroy, Rocca, Mancus and Gosselin [2] examined users' second screen behavior concerning where and when people look at their TV. Zhao, Zhong, Wickramasuriya and Vasudevan [3] mined viewers' sentiments concerning US National Football League teams by analyzing the social media tweets. Neither of these research studies measures the interaction effects of social networks and second screens concerning IRL events temporally.

As the concept of seasonal TV (i.e., a broadcasted show scheduled over several weeks with new episodes released at intervals) has decreased, our research focus is on what we refer to as IRL broadcasted media events. These broadcasted media events are those IRL events that are anchored temporally and do not lend themselves to delayed viewing (i.e., recording and watching at a later time). These IRL events can also generate substantial social media conversation that we refer to as the social soundtrack. The social soundtrack is generated on various social media sites using second screens [4, 5, 6].

The specific IRL broadcast media event we examine in this research is Super Bowl 2015. Lee, Ham, Kim, and Kim [7] use Twitter as a social media platform to assess people's interest in car-related commercials during Super Bowl 2012. Shin, Byun and Lee [8] study the second screen interaction on Twitter to

address consumer interest in brands televised during Super Bowl 2014. While prior research examines the usage of social networks to analyze viewer interactions with the technology, it fails to investigate in a systemic manner the interplay among temporal phases of IRL event, various social media platforms, and the inherent categories of the social soundtrack.

Therefore, there are numerous unanswered questions concerning the second screen interaction about IRL events. *How does the social commentary in the Pre phase of an IRL event influence interaction in the During phase? How is social media technology used during the live broadcast of an IRL event? How does the media broadcast of IRL events influence the social soundtracks?* These are some of the questions that motivate our research.

## III. RESEARCH QUESTION

The social environment influences and shapes individual human behavior [9]. The making of broadcasted media events that are more social therefore influences human communication in a socially mediated way, affecting human thoughts and actions. The viewers of an IRL event use online social networks via second screens as the medium of conversation by posting messages concerning the broadcasted event to build social relationships. Therefore, the social soundtrack can both influence and shape the social environment.

For clarity, we define our key constructs:

- **IRL broadcast media event** – event that is anchored temporally and not conducive to delayed viewing
- **Second screen** –computing device used for posting social media content to the social soundtrack
- **Social soundtrack** –collection of social media posts from second screens centered on a particular event

Social media sites allow for broadcasted media events to be accessed and shared by viewers in a variety of ways. The community members can join in discussions while watching the show and have their interactions be viewed and responded to by other members engaging in the social soundtrack. Such conversation may or may not be active during live telecast of the events. Second screen technologies, such as smartphones, tablets, laptops, and even desktops, greatly facilitate these conversations allowing them to occur anytime, but especially during the telecast of the broadcasted media event.

Within the category of major US broadcasted media events broadcasts, there are certain events that draw much higher attention. Such events include The Oscars award ceremony, music video awards shows, Grammys award show, and sport games. Of these events, our research focuses on the Super Bowl 2015, as this program was the most-watched American television broadcast in history, at the time, with an average audience of 114.4 million viewers [10]. Due to the high level of viewership, companies sponsor expensive ads televised during the Super Bowl broadcast (e.g., Budweiser, Nationwide, McDonalds etc.). Super Bowl commercials are an integral aspect of Super Bowl event, and they have become a cultural phenomenon of their own, alongside the game. A substantial

number of people watch the game primarily to see and discuss the commercials. Along with the game and commercials, there popular and iconic performers and musicians (e.g., Katy Perry, Lenny Kravitz, etc. for Super Bowl 2015) take part in pre-game sessions and notably half time shows on game day.

In this research, we classify the second screen interactions into three Super Bowl second screen categories: 1) Super Bowl commercials, 2) Super Bowl musicals and 3) Super Bowl game.

There is sizable discussion in the social soundtrack on three aforementioned categories not only during but before and after the Super Bowl event. We label these temporal phases of Super Bowl-oriented social soundtrack conversations as: 1) *Pre* Super Bowl phase, 2) *During* Super Bowl phase and 3) *Post* Super Bowl phase. The *Pre* phase highlights the audience lead up conversation and starts weeks ahead of the game day and continues until the game start with the opening kick-off. The *During* phase is the social soundtrack period of the live game broadcast, from kick off to final second of the game. The *Post* phase is the social soundtrack beginning the moment the game is over until the point that data collection ends.

For clarity, we again define our key variables:

- **Event Category:** classification of posts within the social soundtrack concerning an event’s sub-topics
- **Event Phase:** distinct period of an event for temporal classification of social sounds track posts, typically *Pre*, *During*, and *Post*.

In this research, we selected three social network platforms for data collection: Instagram, Tumblr, and Twitter. Twitter is one of the most popular micro-blogging sites and commonly used as the platform of communication for the social soundtrack. Most micro-blogging services share commonalities [11]. Instagram is a medium of communication where users share online images and videos [12]. Tumblr is second largest microblogging service after Twitter, supporting eight types of posts such as 1) images, 2) videos, 3) audios, 4) text, 5) answer, 6) links, 7) quotes, and 8) chat [13].

For this research, our premise is that there is a phase-category relationship in second screen conversations that exists in each of the three social media platforms. Based on this perception, we formulate our research question to test the relationship among Super Bowl phases and the Super Bowl categories for each of the three social media platforms.

*RQ1. Does there exist a social soundtrack relationship among Super Bowl categories and Super Bowl phases based on social media platform?*

This research question informs retailers and marketers curious as to the dominance of the specific category in a specific phase during second screen communication. To exam the phase-category relationship, we define the following hypotheses.

*Hypothesis 01: There is a relationship between Super Bowl categories and Super Bowl phases in Twitter second screen conversations.*

*Hypothesis 02: There is a relationship between Super Bowl categories and Super Bowl phases in Instagram second screen conversations.*

*Hypothesis 03: There is a relationship between Super Bowl categories and Super Bowl phases in Tumblr second screen conversations.*

This research question identifies the phase-category (in)dependence on each social media platform, thereby, highlight the possible differences each of these social media technologies have in influencing the social soundtrack.

#### IV. DATA COLLECTION

The 2015 Super Bowl took place on the 1<sup>st</sup> of February (Sunday) in University of Phoenix Stadium, Arizona, USA. The kick-off time was 6:30 PM Eastern. The NBC channel broadcasted the event. Super Bowl 2015 is considered the most watched program in American television history. The average number of watchers was 114.5 million, peaking to 118 million during the half time show.

##### A. Data Collection in Super Bowl Phases

As shown in Table 1, we collected data related to Super Bowl 2015 from the 10<sup>th</sup> of January 2015 and continued till the 24<sup>th</sup> of February 2015 on each of the three social media platforms. To collect data from each platform, we utilized the respective APIs and tokens for Twitter, Instagram and Tumblr in corresponding scripts with search queries.

The queries that we used that includes: ‘superbowl’, ‘superbowl xlix’, ‘superbowl 49’, ‘superbowl commercial’, ‘superbowl Ad’, ‘halftime show’, ‘superbowl halftime’, ‘sb49’ and ‘football’. The aim of forming this list of queries was to collect data for this research using each term as a search query on all three social media platforms.

The query list included the terms that occurred most frequently as social media tags (e.g., #superbowlcommercial, #superbowlxlix, #halftimeshow etc.) in a collection of sample data for all social media platforms collected against the seed query named “superbowl”. We collected the sample data for 48 hours (i.e. from 01/06/2015-16:00:00 to 01/08/2015-16:00:00) to identify the potential search queries for this research, and that sample data was not included in the data set used in this research.

TABLE I. SUPER BOWL 2015 DATA BY SOCIAL MEDIA PLATFORMS

	Twitter	Instagram	Twitter
<b>Vol.</b>	3,112,789	811,262	51,569

TABLE II. START AND END DATES AND TIMES FOR SUPER BOWL PHASES

	Start Date Time	End Date Time
<b>Pre Super Bowl</b>	1/10/2015- 00:00:00	2/1/2015-18:29:59
<b>During Super Bowl</b>	2/1/2015-18:30:00	2/1/2015-22:30:00
<b>Post Super Bowl</b>	2/1/2015-22:30:01	2/24/2015-00:00:00

The data collection period is divided into three temporal phases, as discussed above. Table 2 shows the date and time of each Super Bowl phase.

We further show the distribution of the posts collected during the three Super Bowl phases on the three social media platforms in Table 3 and Table 4. Table 3 shows the data collected during each Super Bowl phase, while Table 4 shows the mean per hour during each phase.

TABLE III. SUPER BOWL 2015 DATA PRE, DURING AND POST BY SOCIAL MEDIA PLATFORMS

	Pre Super Bowl	During Super Bowl	Post-Super Bowl
<b>Twitter</b>	1,753,458	35,525	1,323,806
<b>Instagram</b>	452,761	16,459	342,042
<b>Tumblr</b>	24,695	6,544	20,330

In Table 3, one notices that though the volume of posts for Pre and Post-Super Bowl phases are higher than that During phase. However, the rate of second screen interaction is lower than the During Super Bowl phase (see Table 4).

TABLE IV. HOURLY MEAN VOLUME OF SUPER BOWL 2015 DATA PRE, DURING AND POST BY SOCIAL MEDIA PLATFORMS

	Pre Super Bowl	During Super Bowl	Post-Super Bowl
<b>Twitter</b>	3211.46	8881.25	2500.76
<b>Instagram</b>	829.23	4114.75	630.86
<b>Tumblr</b>	45.23	1636	38.39

Given that we considered Twitter, Instagram and Tumblr, we explore the data types post on Instagram and Tumblr.

TABLE V. VOLUME OF TYPE OF POSTS IN PRE, DURING AND POST PHASES ON TUMBLR

	Pre Super Bowl	During Super Bowl	Post-Super Bowl
<b>Answer</b>	15	10	17
<b>Audio</b>	112	2	53
<b>Chat</b>	32	30	47
<b>Link</b>	526	22	334
<b>Image</b>	18,112	3662	14,027
<b>Quote</b>	74	44	79
<b>Text</b>	3975	2426	4262
<b>Video</b>	1849	348	1511

TABLE VI. VOLUME OF TYPE OF POSTS IN PRE, DURING AND POST PHASES ON INSTAGRAM

	Pre Super Bowl	During Super Bowl	Post-Super Bowl
<b>Image</b>	424,384	15,049	313,644
<b>Video</b>	28,377	1,410	28,398

Table 5 and Table 6 present the different types of posting supported by Tumblr and Instagram respectively and the number of postings in our data set of each type. In Table 5, we

observe that among the three phases, there are three major types of postings on Tumblr. Blogs containing images hold the first position, followed by texts and videos. ‘Audio’ has the least volume in the During phase, while for Pre and Post-Super Bowl phases, “answer” is the least common. In Table 6, on Instagram, we collected two types of media posts. It is noted that community members post images more than videos.

### B. SuperBowl Interaction Categories

Once we had collected the data from the three social media sites, we classified the data into the three categories (commercials, halftime, and game) of second screen interactions on each social media platform. The categories are identified by means of the keywords collected from the relevant websites. The keywords are in lower case letters and are extracted from websites regarding Super Bowl commercials [14, 15], Super Bowl halftime show [16] and Super Bowl game [17].

The query list of Super Bowl commercial keywords contains the ad titles (e.g., ‘mercedes’, ‘coca cola’, ‘wix’ etc.), titles of the themes / videos for the ads (e.g., ‘real strength’, ‘like a girl’ etc.), the popular name of the brands (e.g., coke, burrito etc.), hashtags associated with the spots (e.g., ‘#realstrength’, ‘#likeagirl’, ‘#itsthateasy’ etc.) and the first and last names of actors participated in Super Bowl commercial videos (e.g., ‘liam’, ‘neeson’, ‘braylon’, ‘o neil’, ‘o-neil’ etc.).

The query list of Super Bowl halftime keywords contains the first name and last name of the performers of the halftime and the pre-game show (e.g., ‘lenny’, ‘kravitz’, ‘katy’, ‘perry’ etc.), terms that describes the half time show (e.g., ‘shark’, ‘palm’, ‘beach’, ‘flames’ etc.) and the songs (e.g., ‘teenage dream’, ‘california gurls’ etc.).

The query list of keywords related to Super Bowl game contains the first name and last name of the players, coaches, umpires, referees, commentators (e.g., ‘brady’, ‘julian’, ‘edelman’ etc.), the field positions (e.g., rusher, ‘quarter back’, ‘quarter-back’, ‘red zone’ etc.), teams (‘patriot’, ‘seahawks’, ‘hawks’ etc.) and other key terms related to game (e.g., ‘punt’, ‘fumble’, ‘tackle’, ‘intercept’, ‘etc.’).

We then assigned the posts on each social media platform in Super Bowl commercials, in Super Bowl halftime show, or in Super Bowl game category, depending on the presence of terms from the respective keywords lists.

We did not assign the posts to any category that has terms from more than one keyword lists. For Twitter and Tumblr, we check the presence of the terms in tweets and blogs, while for Instagram the terms are checked in the caption of the posts. We have 190,410 Twitter postings, 70,305 Instagram postings and 9,705 Tumblr postings that belong to more than one category. We did not incorporate these mixed category postings in this research as we considered Super Bowl commercials, Super Bowl halftime show and Super Bowl game category as mutually exclusive variables. Apart from that, there are 99523 tweets; not included in the analysis; that don’t belong to any category, such as soccer related tweets as “football” is used as the search query for data collection. In Asia, Europe and South

American countries “football” is synonymous to soccer, unlike USA and Canada.

As shown below, Figure 1, Figure 2 and Figure 3 are snapshots of Super Bowl commercials, Super Bowl musicals and Super Bowl game category postings on Twitter, Instagram, and Tumblr respectively.

**| BREAKING - First look at our #Budweiser #SuperBowl ad. <http://t.co/BxLqZr22HE> |**

**| just entered to be one of those people who runs on the field during superbowl halftime for Katy. Jesus what I become |**

**| "@Aneerinyourear: 4. Picks for the Superbowl?" Brady or Rodgers |**

Fig. 1. Snapshot for commercial, halftime show, and game posts on Twitter

**| By far, our fav #SuperBowlAd was #PuppyLove by #Budweiser. What was your fav? |**

**| I like Katy Perry so what... #shesAwesome #SuperBowlHalftime #IamAFirework #ExcuseMyScream |**

**| #tombrady left hanging lol #PatriotsvsSaints #nflhalftimeshow #nfl |**

Fig. 2. Snapshot for commercial, halftime show, and game post on Instagram

**| Global Be(er) Responsible Day. "Friends Are Waiting". Budweiser |**

**| Katy Perry stans waiting for February |**

**| Go Patriots. #tombrady #gameday |**

Fig. 3. Snapshot for commercial, halftime show, and game posts on Tumblr

Once collected, we segregated the count of posts collected across the weeks for all three social media platforms across all three Super Bowl categories into five minutes intervals. We then further segregate the categorical time-count data as Pre, During and Post- phases by annotating the time shown in Table 2. So, each social soundtrack has phase-interaction and category time counts (five min) that are used as the unit of analysis in testing the research hypotheses.

## V. METHODOLOGY

We use SPSS to evaluate our research hypotheses. For our research question, we perform chi-square tests to determine the phase-category relationship.

Three 3x3 (phase x category) contingency table can be constructed from the distribution of the categories for second screen Super Bowl conversations on Twitter, Instagram and Tumblr respectively, as shown in Table 7.

For the research question, the chi-square test was performed on 3x3 phase-category contingency tables (see Table 7) where each cell  $C_{ij}^k$  gives the observed frequency of second screen interaction in Super Bowl phase  $i$  for interaction category  $j$  on social network platform  $k$ .

The critical value of the  $F^{ANOVA}(2, > 120)$  is 2.996 at the 95% confidence interval ( $\alpha = 0.05$ ). The second screen interactions in five minute time intervals of each category over the three Super Bowl phases are used as the unit of analysis or independent variable.

TABLE VII. 3X3 CONTINGENCY TABLES FOR TWITTER, INSTAGRAM AND TUMBLR

Super Bowl Phase	Twitter		
	Commercials	Musicals	Game
Pre	350,259	506,035	737,011
During	10,525	12,029	11,057
Post	253,745	362,113	580,082
	Instagram		
	Commercials	Musicals	Game
Pre	92,864	136,431	185,784
During	2,683	5,748	6,249
Post	71,464	109,458	130,276
	Tumblr		
	Commercials	Musicals	Game
Pre	6,934	7,560	5,914
During	2,594	1,834	1,889
Post	4,746	5,370	4,023

## VI. RESULTS

Chi-square tests were carried out to test three hypotheses associated with the research question.  $\chi^2_{critical} = 9.49$  with  $df = 4$  at  $\alpha = 0.05$

*Hypothesis 01: There exists a relationship between Super Bowl categories and Super Bowl phases in second screen conversations on Twitter.*

From 3x3 contingency table shown in Table 7 for Twitter, we carry our chi-square test where  $\chi^2_{(4, 0.05)} = 4501.75$  and p-value  $\ll 0.05$ . For Twitter there exists a relationship between Super Bowl phases and Super Bowl categories. Hypothesis 01 is fully supported.

*Hypothesis 02: There exists a relationship between Super Bowl categories and Super Bowl phases in second screen conversations on Instagram.*

We perform chi-square test on the 3x3 contingency table for Instagram shown in Table 7. The  $\chi^2_{(4, 0.05)} = 891.36$ , p-value  $\ll 0.05$ . The result supports hypothesis 02 and shows the existence of phase-category relationship for Instagram.

*Hypothesis 03: There exists a relationship between Super Bowl categories and Super Bowl phases in second screen conversations on Tumblr.*

The chi-square test on 3x3 contingency table for Tumblr (see Table 7) supports hypothesis 03 as the test results  $\chi^2_{(4, 0.05)} = 190.25$  with p-value  $\ll 0.05$ . So, there exists dependence between Super Bowl phases and Super Bowl categories.

## VII. DISCUSSION AND IMPLICATIONS

### A. Discussion of Results

For this research, we examine the research question pertaining to second screen interactions highlighting the use of three social networks in sharing information in the social soundtrack about Super Bowl 2015, in three phases, *Pre*, *During* and *Post*, of the IRL media event broadcast. Three categories (*commercials*, *halftime show*, and *game*) concerning the Super Bowl 2015 event are formed for each phase.

Our research question addresses the (in)dependence among the phase and categories on each of the social media platforms has having different social soundtrack attributes.

### B. Implications

Regarding the practical implication of the research findings, the increased rate of interaction via a second screen in the *During* phase of leads to the increased rate of potential diffusion of information concerning different event categories. This information diffusion is accomplished by sharing, publishing, and commenting via various types of posts or artifacts (e.g. audio, image, video, etc.) among conversation participants on the various social media platforms. The excitement and the curiosity of different aspects of Super Bowl (e.g. brands, songs, artists, teams. etc.) weeks before media events broadcast of the kickoff (i.e., *Pre* phase) may drive to increase the second screen interaction in the *During* phase of the event.

Diverse brands may compete to hire those players as their prospective brand ambassadors for their products or service. Fans generally idolize sports stars and the artists. So, the logo of the brands these celebrities use may have a great impact on potential consumers, and the social soundtrack may provide insight on which of the celebrities may be the most impactful brand ambassadors. This insight may increase the sales of the product indirectly and generates profit long terms. The integration of IRL broadcasted media events with the social soundtrack via social networks shrinks the virtual distance between brands and consumers. Thus, the social soundtrack highlights a rise in potential brand recall, boosting advertising campaigns, and enhancing sale possibilities via word-of-mouth advertising using perhaps advanced temporal analysis [18].

## VIII. CONCLUSION

In this research, we analyze second screen interactions concerning Super Bowl 2015 as presented in the social soundtrack around this IRL event. We examine our research question from the perspective of human information processing, both in terms of the volume and pace of comments posted. In sum, we believe that our research provides valuable contribution concerning understanding user behavior and interaction while viewing mass media broadcast of IRL event

in an emerging avenue of social soundtrack research. In future work, we aim to determine how different elements in the second screen conversation on diverse interaction categories change in *Pre*, *During*, and *Post* phases of the IRL event.

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