12-7-2022

Development of social media opinion leaders during international periodic events

Ali Basyurt
University of Duisburg-Essen, ali-sercan.basyurt@uni-due.de

Felix Brünker
University of Duisburg-Essen, felix.bruenker@uni-due.de

Stefan Stieglitz
University of Duisburg-Essen, stefan.stieglitz@uni-due.de

Florian Buhl
Free University of Berlin, florian.buhl@fu-berlin.de

Christoph Neuberger false
Free University of Berlin, christoph.neuberger@fu-berlin.de

Development of social media opinion leaders during international periodic events

Research-in-progress

Ali Sercan Basyurt
Department of Computer Science and Applied Cognitive Science
University of Duisburg-Essen
Duisburg, Germany
Email: ali-sercan.basyurt@uni-due.de

Felix Brünker
Department of Computer Science and Applied Cognitive Science
University of Duisburg-Essen
Duisburg, Germany
Email: felix.bruenker@uni-due.de

Stefan Stieglitz
Department of Computer Science and Applied Cognitive Science
University of Duisburg-Essen
Duisburg, Germany
Email: stefan.stieglitz@uni-due.de

Florian Buhl
Department of Political and Social Sciences
Free University of Berlin
Berlin, Germany
Email: florian.buhl@fu-berlin.de

Christoph Neuberger
Department of Political and Social Sciences
Free University of Berlin
Berlin, Germany
Email: christoph.neuberger@fu-berlin.de

Abstract

Social networks like Twitter are a central communication channel, where people share their opinions, emotions, and views with the world which is also true during live TV events. These opinions are able to start a discussion and influence the opinion of others. This influence is able to impact the results of televised events such as the Eurovision Song Contest. In the process of sharing information, key groups could be able to be more effective and have a bigger reach at different points of an event. Therefore, their identification is relevant for research, event operators, participants, and fans. We aim to create an understanding of how groups and opinion leaders change over the event period of the contest by conducting a social network analysis based on Tweets. Word clouds will be used to confirm findings from the social network analysis as well as to identify topics within tweets for further research.

Keywords Social Network Analysis, Opinion leaders, Word clouds, social identity theory

1 Introduction

The Eurovision Song Contest (ESC) is an annual event in which countries from all over Europe participate. Viewers of this event are able to share their opinions on the event itself but also on the participants through social media. For this purpose, they can leverage for example related hashtags or comment on the official ESC account and accounts of the participants. The concept of communicating on social media while watching television has the potential to enhance viewer engagement, and increase brand value and content (Guo 2018; Guo and Chan-Olmsted 2015). Tracking social media data such as data from Twitter surrounding the event and its participants thus enables the analysis of the behavior of groups and people surrounding the event. The analysis benefits not only the television stations due to the feedback they receive before, during, or after an event or television show but also advertisers as they gather crucial information on how they can enhance adverts throughout an event in addition to the participants who are able to promote themselves more efficiently. Therefore, Social media such as Twitter helps to create more engaging and memorable events by encouraging the discussion of events and shows. Closely examining and analyzing the data of a television event can therefore yield crucial results in understanding the dynamics created throughout the event (Smith et al. 2019). In this context opinion leaders take on an important role as opinion gatekeepers and amplifiers by garnering and selecting information and passing it on to their social group(Lazarsfeld et al. 1944). They are more influential individuals in social networks based on for example their expertise in a specific area of interest and they an reach and influence others in their social group. In contrast to unplanned events like scandals, natural disasters, or other breaking news, planned events like the ESC offer the unique opportunity to gather and analyze data regarding the event before it takes place. Therefore, it is possible to not only look into group dynamics and how opinion leaders change throughout the actual event but also before the event. This has to our knowledge not been done in research before, instead, opinion leaders were identified for the totality of the tracked data for an event and not at certain points during an event. Thus, we aim at addressing this research gap by answering the following research question:

RQ: How do group dynamics and opinion leaders change before, during, and after an international television event?

In order to answer the question firstly, the current literature is reviewed. Afterward, Tweets from Twitter during the ESC were acquired. Then the extracted data was transformed into an acceptable format in order to conduct time frame-specific social network analysis and create word clouds. The networks then shall be analyzed with regard to the Social Identity Theory. Social identification can reinforce the success of the ESC and the participants, as suggested by Social Identity Theory individuals identify who they are by organizing themselves into social groups (Tajfel and Turner 1986). Their identification with a community and the positive emotions they gain from being part of that group can influence their relationships with the other members (Fujita et al. 2018) For the ESC, each Country from the European Broadcasting Union can participate, exceptions to this rule can also be made. The host country as well as countries known in this event as the big five that contribute the most towards the European Broadcasting Union are automatically qualified for the final. This includes Germany, Italy, France, the United Kingdom, and Spain. The remaining countries participate in two semi-finals where each of the best ten countries qualifies for the finals. A total of twenty-six participants then partake in the final where they perform one after another. After the last performance, each country receives points from the other countries, which is followed by a fan voting to determine the overall result of the Eurovision Song Contest. By addressing this research gap contribution to research is made by identifying how opinion leaders evolve during a televised event and which group becomes more relevant at different times. Additionally, a practical contribution is made by enabling interested parties such as the event operators to communicate with and through the changing opinion leaders throughout the event at the time where they are most effective to increase the interest and the discourse of the event itself.

The paper is structured as follows: first, a literature review of related work is presented, followed by an introduction to the theoretical background of our research the social identity theory. Afterward, the methods used to conduct the research are described followed by preliminary results of the research. Lastly, we conclude with the next steps of our research, limitations, and potential for further research.

2 Literature Review

Twitter as a social media platform is used during major media events to converse about it. It creates a back channel to television or other media through which users can add their own comments to the live event. Twitter hashtags bring users together in communities, which are often passed on to potential viewers in advance by event organizers (Zhao et al. 2011). Broadcasters, organizers, and other operators thus have the opportunity through social media to analyze the resonance of certain developments before,

during, and after a broadcast and can derive various benefits from them such as improving tv shows or even evaluating political discussion topics (Alexandre et al. 2021). Research shows how Twitter represents an unofficial extension of the Eurovision Song Contest, in which viewers can enter into direct communication with other viewers (Highfield et al. 2013). Here, thematic, and geographic clusters of interaction were identified, within which the central positions were taken by, among others, broadcasters and celebrities, who functioned as opinion leaders. (Highfield et al. 2013).
These opinion leaders act in a two-stage process, the so-called Two-step flow of communication (Lazarsfeld et al. 1944). They receive in the first step information from radio, print media, and other mass media and then distribute the information in a second step to the less active members of their social group. According to this theory, the majority of people are influenced by these opinion leaders rather than the mass media directly. Furthermore, this concept dictates that opinion leaders in social groups who have an influence on the people around them are always existent. Accordingly, four main characteristics are attributed to these opinion leaders. (1) they have a wide audience reach, (2) they are considered experts in their environment, (3) they are knowledgeable, and (4) they take a significant role in their networks. Opinion leaders on Twitter include celebrities, political actors, journalists, and influencers. They can trigger interactions and discussions among Twitter users by posting a large number of tweets and/or being frequently mentioned by other users (Alexandre et al. 2021). To determine a user's influence on Twitter, various metrics can be identified such as the number of followers, retweets, mentions, favorites, or likes (Alexandre et al. 2021). According to Wu et al. (2011), almost half of the information that originally comes from the mass media reaches Twitter users indirectly via such opinion leaders. Stieglitz et al. (2018) identified that the dominance of role characteristics shifts in successive crises. Role characteristics related to information distribution and maintaining attention change over time as well.

The aforementioned works show the influence of Twitter on TV events while also describing the central role of opinion leaders. However, as far as to our knowledge research focused on to what extent opinion leaders on Twitter change over the course of a live event is non-existent which is a gap we address through our work.

3 Theoretical Background

The Social Identity Theory was introduced in 1979 by Tajfel et al. to understand how individuals perceive others and themselves through memberships in various groups. Social identity tells an individual who they are depending on their group membership since these social groups provide their members with a shared identity. Tajfel argued that individuals divide others into groups and categories. This is further described as a normal cognitive process, based on the tendency to group things. Often individuals conform in their behavior with features they identified as part of the social group's identity to maintain associations with the group and other members (Fujita et al. 2018).
In this process, society is differentiated into them and us, and both the similarities within a group and the differences within the same group are identified. The group to which an individual belongs is called the in-group and other groups are called out-groups (Tajfel and Turner 1979). The core of this theory is focused on three principles: 1. part of an individual's self-concept is drawn from their affiliation to social groups. 2. the focus is on the collective self, meaning the individual concept in relation to fellow group members. 3. In-group and out-group behaviors are created through social identification (Turner and Oakes 1986). This theory has been utilized for various topics in the domain of social media from analyzing the impact of social media on sports fan reactionary behavior (Mudrick et al. 2016) to understanding why young adults buy products that social influencers endorse through it (Croes and Bartels 2021).

The theory of social identity plays a vital role in how opinion leaders emerge due to the members of their social groups being similar to them and in the analysis of social dynamics within social groups due to favourably associating with users and therefore leaders within their group instead of outside which is why it is the theoretical basis of our research into the development of opinion leaders during an event.

4 Methods

Twitter data was acquired by using a tracking tool in alignment with the tool described by Stieglitz et al. (2022). The collected data is divided into two datasets based on their content and keywords used for tracking. Only English Tweets were collected. The first dataset is focused on experts and contains keywords related to experts' accounts that are solely dedicated to the ESC like Eurobuzz, BBC Eurovision, or Eurovoix. In total twenty-two, search terms were tracked throughout the duration from the 3rd of May 2021 until the 1st of June 2021. This results in 114.000 entries within the dataset. The

second dataset is dedicated to general hashtags that are related to the ESC such as #ESC2021 or #Eurovision. Overall, five search terms are tracked in the same time frame as the expert's data set. This resulted in approximately 1.771.000 entries within that dataset. The datasets were transformed into formats that can be interpreted by the social network analysis software Gephi and code in the programming language R for word clouds. Gephi represents users as nodes and connections between users as edges in a graph. Therefore, the relevant information such as usernames and user ids as well as information on which user retweeted which user was extracted and imported to Gephi. For the word clouds the Tweets were pre-processed, meaning symbols, emojis, punctuation, and stop words such as "to" were removed from them so that only words with a direct meaning remained. The word clouds show the most frequently used words in the tracked Tweets for each timeframe. Within this work they were utilized to check which usernames are being most frequently referenced in the online conversation as a additional measure to identify opinion leaders and to verify several of those identified in the network.

Afterward, the data is split into eight different timeframes from before the semi-finals until the day of the finales which was then further divided into the timeframe until the start of the final, performances, voting phase, the reactions, and the days after the final. Within the timeframes, different user types were identified. In the networks created by Gephi, blue nodes represent the official ESC accounts. News outlets that dedicate themselves solely to the ESC are colored green. Bloggers are individuals with their own blogs without any main theme and are shown in orange. Public services are represented in yellow while Influences are selected accounts with more than one thousand followers and are represented in purple. Lastly, ESC Superfans are a category firstly introduced by Highfield et al. (2013) and are described as fans who dedicate a part of their personality to the ESC and are added on the recommendation of said paper and are colored red. Opinion leaders within the networks were determined based on their reach by identifying the user accounts with significantly more retweets than others in the network due to their opinions having the biggest impact.

5 Preliminary results

Figure 1 shows the changes throughout the timeframes in the general dataset. It shows that the official channels and public services are always closely clustered. At the start of the data collection (1) the official accounts are centered with the other groups located around them. This shifts for the remainder of the datasets as normal users are mostly in the center, with the superfans mixed among them. More users interacted during the second semi-final (3) than in the first one (2). This might be because the second semi-final is closer to the weekend than the first one allowing users to engage more with the event. Networks 4 to 6 of figure 1 show the differences throughout the day of the final. Most interaction occurs during the performances (5), again it can be observed that the superfans are interacting among the regular watchers, however, they are tightly clustered, so it is feasible to say that they also heavily interact with each other. During the voting process (6) it seems that the superfans are again mixed among the regular users but stretched wider, while influencers are further away. The reactions towards the voting phase (7) are also stretched wider, but it can be seen that the superfans gain a lot of attention in that phase. After the event (8) the general attention of the media shifts and public broadcasters are no longer present. ESC-specific news outlets are more centered and seem to gain importance after the ESC concluded as they connect to the official account as well as influencers and superfans more frequently.

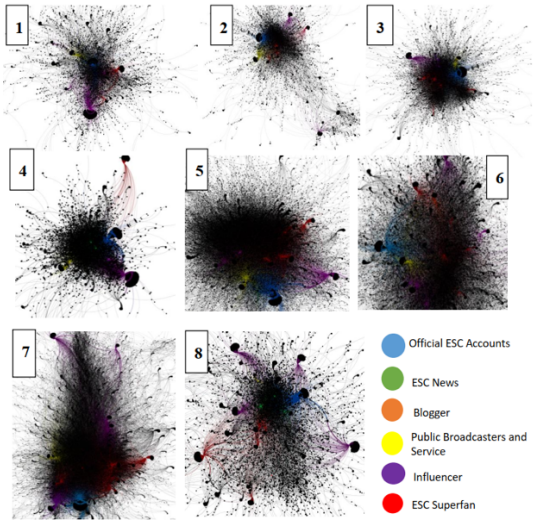

Figure 1 Network analysis of the General Dataset throughout the different timeframes

From this observation over the different timeframes, it can be deduced that the opinion leaders change during the event. Before the event mainly influencers and official accounts of the participants are important. As the Event is getting closer this shifts to the public broadcasters these developments could be due to the topic shift in their Tweets towards the ESC leading to them becoming part of the in-group in accordance with the Social Identity Theory. During the main event, especially the superfan accounts and official broadcasters are opinion leaders. After the event mainly superfans and influencers remain as the opinion leaders this could be due to the the other groups shifting their Tweets away from the ESC and losing their position in the in-group superfans and influencers stay as members.

The expert's dataset offers additional insights. Figure 2 visualizes the changes throughout the different timeframes in this dataset. Influences are again very active before the start of the event (1). Even though the official account was not tracked in the dataset it is part of the network analysis. Confirming the observations for the opinion leader before the event in the general data set. From the Interactions, it can be seen that the public services do not interact with other users while the ESC-specific outlets interact with other outlets and fans. Over the course of the day of the final (4 to 6), the public broadcasters tend to gather more users around them than the specific news outlets. This again proves the observations that public broadcasters are the opinion leaders during the main event. Only after the event (7) has concluded the ESC-specific news outlets receive a similar sized audience to the public broadcasters. When taking the remaining time frame into consideration (8) the public broadcasters tend to no longer talk about the event, and the ESC news outlets take their place in the discussion. This observation could also be seen in Figure 1 and highlights the fact that once the event is concluded it is no longer of interest to the general public and therefore not talked about. In the expert dataset, the opinion leaders change from the ESC-specific news outlets to the public broadcasters and then back to the ESC-specific news outlets, which is in accordance with the general dataset. This could be due to them leaving the in-group due to a shift in their Tweet-topics away from the ESC while the others stay on topic and in the group.

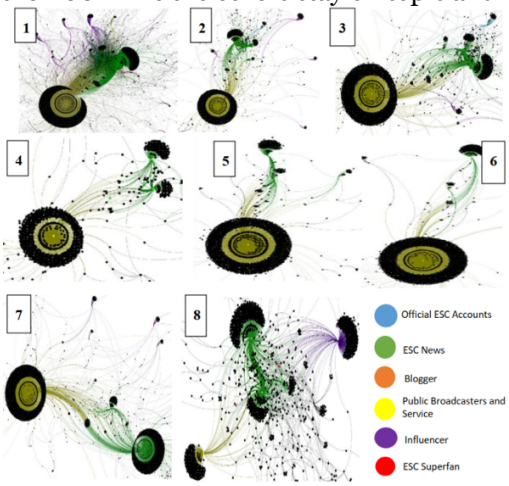

Figure 2 Social Network Analysis of Experts Data Set

The size of the datasets requires high memory capacity for the machine learning process which was not available. Therefore, a random sub-sample containing about one-third of the tweets for each period was used.

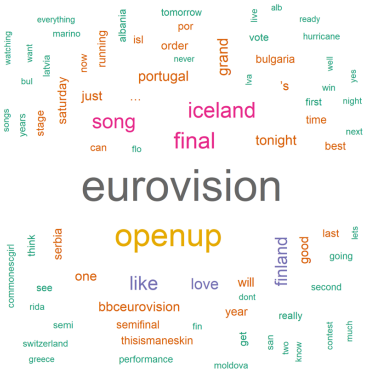

Figure 3 Wordclouds of the second semi-final from the general dataset

The results of the word clouds are exemplarily shown for the general dataset in Figure 3 for the second semifinal. The word cloud for the first period, which covers the time before the semi-finals, shows ESC news outlet users such as wiwibloggs or Eurobuzz as well as the official Twitter channels of the participants. The winner of the contest Maneskin is among the most present together with the Finnish participant Blind Channel. On the day of the first semi-final, a new actor emerges from the Public Broadcast category with BBC Eurovision, which is the most mentioned term in the tweets.

Thus, looking at the general dataset from the word cloud, it can be said that prior to the live events Public Broadcaster probably did not have as much interest in the BBC Eurovision, however, as the main event approached their presence increased and peaked at the time of the performances. Following the live event, the BBC Eurovision presence again decreased. It is also noteworthy that the winner's channel was already present during the semi-final and between it and the final event though they only participated in the final. Thus, it is possible that the increased social media presence of a participant before and during a live event, who was often one of the opinion leaders, has an impact on the results of the contest.

Looking at the expert's dataset, the behavior of the public broadcaster BBC Eurovision is similar to that of the general dataset. The presence becomes stronger towards the live event and flattens out after it. However, a significant difference to the other dataset can be found in the channels of the contestants, the contestants James Newman from the United Kingdom received significantly higher attention than the winner Maneskin. The increase in attention could be attributed to the fact that only English Tweets were collected and that in accordance with the Social Identity Theory the audience identified with the contestant from the United Kingdom due to their own affiliation with the UK and the language. It should also be mentioned that Wiwibloggs was always among the opinion leaders, especially before and after the event.

The connections between the different groups are also insightful. The BBC channel took a passive role and never retweeted. The ESC blogs only communicated with each other and the superfans predominantly reacted to other superfans in accordance with the Social Identity Theory due to their perceived similiarities as their peers and in-group. The Social Identity Theory can explain this behavior of the individual groups, according to which people identify and group themselves with similar people. In this process, the mindset and opinion of the group are also adopted. Considering that only English Tweets were collected it becomes clear that users identify with their compatriots, as the word clouds show that especially during and after the scoring sessions, users cover the jury's 0-rated James Newman and blame the jury instead of the performance. Another strong evidence of national identity recognition from Social Identity Theory is the often-used word Brexit immediately after the scoring. Thus, it is implied that the British feel disadvantaged because of their nationality and the decision to leave the European Union. This aligns with the in-group vs out-group sentiment of the Social Idenity Theory where the in-group consisting of British users align with their contestant as a member of their in-group and attribute the negative scoring to the out-groups being unfair due to external factors such as Brexit and ultimately express their opinions on the out-groups through curses.

6 Conclusion and further steps

Through social network analysis and complementary word clouds, we identified that opinion leaders change at different times during a televised event such as the Eurovision Song Contest in addition to how they change. In doing so a research contribution to how opinion leaders evolve during a televised event and which group becomes more relevant at different times is made. This further contributes to practice by enabling interested parties such as the participants or the operating entity of these events to identify the opinion leaders at the different periods during the event and communicate with and through them to increase interest and the discourse of the event.

However, one limitation of our research is that only English Tweets were considered for an international event. Therefore, in future research, we intend to include Tweets from all languages natively spoken in the participating countries. Furthermore, due to memory limitations in the R software, it was not possible to include all data. Therefore, randomly subsampled data was used. In future research, we will use a computer with higher computing power to include all data. In addition to addressing these limitations as our next steps, we will further analyze the social networks and word clouds for additional insights and apply our approach to data from the ESC 2022. Moreover, in future research, the identified groups at different points during an event could be leveraged in a machine learning approach with the goal of improving their predictive power to correctly forecast the winner of such an event.

7 References

Alexandre, I., Jai-sung Yoo, J., and Murthy, D. 2021. "Make Tweets Great Again: Who Are Opinion Leaders, and What Did They Tweet About Donald Trump?," *Social Science Computer Review*.

Croes, E. and Bartels, J. 2021. "Young adults' motivations for following social influencers and their relationship to identification and buying behavior." *Computers in Human Behavior* 124 : 106910.

Fujita, M., Harrigan, P., and Soutar, G. N. 2018. "CAPTURING AND CO-CREATING STUDENT EXPERIENCES IN SOCIAL MEDIA: A SOCIAL IDENTITY THEORY PERSPECTIVE," *Journal of Marketing Theory and Practice* (26:1–2).

Guo, M. 2018. "How Television Viewers Use Social Media to Engage with Programming: The Social Engagement Scale Development and Validation," *Journal of Broadcasting and Electronic Media* (62:2).

Guo, M., and Chan-Olmsted, S. M. 2015. "Predictors of Social Television Viewing: How Perceived Program, Media, and Audience Characteristics Affect Social Engagement With Television Programming," *Journal of Broadcasting and Electronic Media* (59:2).

Highfield, T., Harrington, S., and Bruns, A. 2013. "TWITTER AS A TECHNOLOGY FOR AUDIENCING AND FANDOM: The #Eurovision Phenomenon," *Information Communication and Society* (16:3).

Lazarsfeld, P. F., Berelson, B., and Gaudet, H. 1944. "The People's Choice New York: Duell," in *Sloan and Pearce*.

Mudrick, M., Miller M., and Atkin D. 2016. "The influence of social media on fan reactionary behaviors." *Telematics and Informatics* 33.4: 896-903.

Smith, L. R., Pegoraro, A., and Cruikshank, S. A. 2019. "Tweet, Retweet, Favorite: The Impact of Twitter Use on Enjoyment and Sports Viewing," *Journal of Broadcasting and Electronic Media* (63:1).

Stieglitz, S., Basyurt, A., and Mirbabaie, M. 2022. "SMART-Portal: A Data Tracking Tool for Research Purposes from Social Media and News Websites," in *Proceedings of the 55th Hawaii International Conference on System Sciences*.

Stieglitz, S., Mirbabaie, M., and Milde, M. 2018. "Social Positions and Collective Sense-Making in Crisis Communication," *International Journal of Human-Computer Interaction* (34:4).

Tajfel, H., and Turner, J. 1979. "An Integrative Theory of Intergroup Conflict - Organisational Identity: A Reader," *Oxford University Press*.

Tajfel, H., and Turner, J. C. 1986. "The Social Identity Theory of Intergroup Behaviour. In (Eds), (Pp.).," in *Psychology of Intergroup Relations*.

Turner, J. C., and Oakes, P. J. 1986. "The Significance of the Social Identity Concept for Social Psychology with Reference to Individualism, Interactionism and Social Influence," *British Journal of Social Psychology* (25:3).

Wu, S., Hofman, J. M., Mason, W. A., and Watts, D. J. 2011. "Who Says What to Whom on Twitter," in *Proceedings of the 20th International Conference on World Wide Web, WWW 2011*.

Zhao, S., Zhong, L., Wickramasuriya, J., and Vasudevan, V. 2011. "Analyzing Twitter for Social TV: Sentiment Extraction for Sports," in *CEUR Workshop Proceedings* (Vol. 720).