Towards an Extended Festival Viewing Experience

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ABSTRACT

Media coverage of large-scale live events is becoming increasingly complex, with technologies enabling the delivery of a broader range of content as well as complex viewing patterns across devices and services. This paper presents a study aimed at understanding the experience of people who have followed the broadcast coverage of a music festival. Our findings show that the experience takes a diversity of forms and bears a complex relationship with the actual experience of being at the festival. We conclude this analysis by proposing that novel services for coverage of this type of events should connect and interleave the diverse threads of experiences around large-scale live events and consider involving more diverse elements of the experience of "being there".

Author Keywords

Television; Festival; Multi-screen interaction; User Experience.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Broadcasting large-scale live events, such as music festivals and sports competitions like the Olympic Games and Football World Cup, is very complex and usually involves simultaneous coverage of multiple venues, producing live commentaries, recording interviews from a wide range of participants and may involve multiple points of view over the same event. Further coverage of such events is also often available as part of highlights and magazine shows and increasingly online. Social media updates offer another source of coverage, and include content generated by a wide range of users, including broadcasters themselves, performing participants, spectators present at the venues as well as remote spectators.

On the television viewer side, new technologies such as video recorders [6] and mobile devices [14] are driving a change in viewing patterns, with time-shifted viewing as well as multiple screen interactions becoming more prevalent [30]. These new behaviors provide opportunities for broadcasters to customize the delivery of content but they also add a layer of complexity to the experience of viewing these events. This raises challenges such as how to navigate across content, services and devices.

Finally, an important challenge when covering these events lies in the gap between the experience of spectators on location and those at home. Given how limited and expensive access to some of these festivals has become, broadcasters may be interested in giving their viewers an experience that can compare as much as possible to what they could have had on location. One way of addressing this gap would be to harness emerging immersive forms of television [8, 29] to provide a stronger sense of 'being there' in the audience or even onstage. Another might be to involve physical spectators in the global coverage experience, which may be driven by the widespread use of camera-phones as well as improvements in wireless networking on location. Catch-up television services also add opportunities for onsite spectators to make the recorded version part of their whole experience.

Given this range of possibilities, it is important to properly understand the ways in which viewers experience television coverage of large events and to gain a sense of how they may wish to do this in the future. In this article, we therefore unpack the experience of watching large-scale live events on TV and propose a series of dimensions to describe of the richness and diversity of viewing patterns that can inform the design of future services.

In the following sections, after looking at previous work addressing these issues, we will take the example of a music festival in England, present a two-part study in which we have tried to understand the experience of TV viewers who have watched this festival, discuss the findings of this study and present our implications for design.

RELATED WORK

We start by describing how several of these challenges have been addressed first in the entertainment industry and then

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in the academic literature in Human-Computer Interaction (HCI) and Interactive Television (iTV) research.

Industrial state of the art

International sports events such as the Olympic Games and the Football Association World Cup, being broadcast around the world with considerable budgets, are often used to introduce new technologies, for example ultra-high definition (UHD) or three-dimensional video. Broadcasters have also relied on the prevalence of digital television and broadband internet to distribute more footage. For example, during the 2012 London Olympic Games, the British Broadcasting Corporation (BBC) provided viewers across the UK access to 24 simultaneous high-definition (HD) video streams.

The BBC also took into account multiple-device viewing patterns to extend coverage with mobile and tablet applications and a specific website. Metadata about events was used to organize navigation through content: webpages were created for individual sports, venues and athletes, giving access to relevant video footage and related information about each, including incentives for viewers to try these sports for themselves. Social media were also taken into account, as a complementary source of coverage (Twitter feeds created for the event) or embedded in the viewing experience, with a specific Facebook application that allowed users to comment on specific broadcasts and report their viewing activity.

Prototypes of novel interfaces created by broadcasters for accessing coverage of live events include the *Venue Explorer*, which allows users to zoom in from a UHD master video showing a whole track-and-field stadium to a single zone, the soundtrack being adapted to fit the video content. This was showcased, along with the *Augmented Video Player*, which adds customized dynamic overlays to videos, by the BBC during the Commonwealth Games in Glasgow in 2014. [10]

Augmenting broadcasts by pushing additional content on interactive devices (often described as "second screens", the TV set being the primary screen) has also been seized as an opportunity for third-party players that operate independently of broadcasters, for example *L'Équipe Connect*[1], developed by a daily sports newspaper in France for football games, or *Beamly*[2], a service for all genres of TV displaying show-specific feeds mixing user-generated content (UGC), social media and official content.

Broadcasting innovations also impact the experience on location as sports and concert venues are now deploying network infrastructures and mobile applications used together (for which commercial integrated solutions exist [9]) to offer video feeds showing different angles and action replays during live shows.

Participative media in large-scale events

One significant trend in academic research has been to integrate UGC within coverage of live events. Prototypes involving the sharing of media created by local spectators in live events have sought to improve the experience of both other spectators [12, 26], extend coverage and/or make it more personalized [17, 27, 21] as well as to establish a bridge between venues and homes [13].

One source of UGC that has often been associated with large coverage of events is social media. Conversations around events, often gathered around an event-specific keyword (named "hashtag" on Twitter), have been described as "backchannels" commenting on events. It has been argued that these feeds bring audiences *"an augmented live viewing experience"* [16]. In the case of large scale events, visual representations of social media activity have been proposed as a way of giving a thematic overview and as a tool for exploring conversations [15]. This kind of visualization may be synchronized with the live or recorded viewing experience [25].

Addressing the complex structure of events

Another trend in academic research is to address the complex structures of events, for example by offering fine-grained navigation based on the structure of sports games [28], or adapting tools for authoring interactive video narratives [32] for personalizing coverage of events [18].

Works that address the complexity of navigating a diverse content include giving users multiple search strategies by encouraging both targeted search and serendipity [31].

Understanding multiple-screen ecologies

Relevant work also includes understanding how viewers interact with technologies, for example by studying the impact of multiple-screen ecologies [14], video recorders and downloads [6] in households or by handing groups multiple devices to access footage of a complex event [1].

Our review has revealed how a very diverse range of emerging technologies and practices might be harnessed to extend to coverage of major events. The key question then becomes how can broadcasters – and indeed viewers – navigate this landscape, making appropriate choices to shape more powerful future viewing experiences? In short, given a bewildering array of technical possibilities, what is it that viewers might actually want from such coverage? In response, we now present a study to uncover current and future possibilities for broadcasting major public events.

THE GLASTONBURY FESTIVAL AND ITS COVERAGE

Our study focuses on one major event, The Glastonbury Festival of Contemporary Performing Arts, a music and arts festival taking place almost every year in the south-west of

[1] http://www.lequipe.fr/connect/
[2] http://www.beamly.com/

England in late June for five days. In 2014, 135,000 paying spectators attended. The festival extended on nine "main stages" and 78 smaller venues.

Glastonbury has also emerged as being something of a national TV phenomenon in the UK. Radio and television coverage, limited to the last three days of the festival was provided by the BBC, in the form of full concerts as well as edited "highlights". Footage was made available through a wide range of services: 30 hours of video broadcast on TV channels, 50 hours of audio broadcast on four radio stations, live online video from six stages, digital TV interactive services (Red Button) and iPlayer, the BBC's multi-device catch-up service, on which many musical performances were available for 30 days instead of the normal 7-day policy. On iPlayer, individual concerts were available separately and were indexed by performer name.

The BBC had created a specific web site for the festival (http://www.bbc.co.uk/glastonbury/), in which it gave access to all video content, as well as extras such as weather forecasts, a TV and radio program guide, static webcams showing stages and areas. Despite this very broad coverage, some acts were not made available due to artists not allowing the broadcast of their performance (often when they included songs from newly released albums), non-compliance to the corporation's taste and decency guidelines, or technical issues.

The Glastonbury festival in 2014 was broadcast in a context where other live events were scheduled, including the Football World Cup. Audience ratings showed a peak of 2.08 million live TV viewers for Dolly Parton's live performance [2].

There were two parts to our study of the television experience of Glastonbury. First, we undertook an online survey of over 1000 participants designed to elicit data on how they engaged with the current television coverage and their views on how it might be extended in the future. Second, we undertook a structured qualitative study with 17 participants to reveal further finer detail of how people engaged with the coverage on a day-to-day basis.

THE SURVEY

The first part of our study was a survey designed to yield a quantitative overview of how people were following the festival and what their attitudes towards the coverage were. It was delivered online on the week following the festival using an existing service that is routinely used to gather feedback from large numbers of viewers across the United Kingdom, aged 16 and over, on a weekly basis. 1301 participants responded to our survey. Results are summarized in the following table.

Q1. Did you watch or listen to the Glastonbury festival on TV, radio, etc. this year?		*1301*
Yes – go to Q2	28.4%	370
No – jump to Q7	71.6%	931
Q2. Who did you follow the festival with?		*370*
Alone	51.1%	189
With friends	12.4%	46
With partner or relatives	46.5%	172
Q3. Where did you follow the festival from?		*370*
At home	94.9%	351
In transportation	4.1%	15
Other, specify…	3.5%	13
Q4. Why did you follow the festival?		*370*
To listen to live music in general	51.1%	189
For headline artists	37.8%	140
I watch Glastonbury every year	20.0%	50
To discover new artists	13.5%	34
To feel like you are at the festival	9.2%	13
For the presenters	3.5%	74
Other, specify…	17.8%	66
Including: For a specific performer	7.3%	27
Including: Stumbled upon it	4.3%	16
Q5. Did you do anything special to make your watching of the festival a special experience?		*370*
I arranged the room in a particular way	1.9%	7
Invited people or was invited	1.9%	7
I consumed specific food/drinks	4.9%	18
Organized my weekend around specific performers or sessions	6.5%	24
I didn't do anything special	87.6%	324
Q6. Are there parts of the festival that you would like to have seen/heard of more?		370
No/Dont know	62.2%	230
Behind the scenes	18.1%	67
Non-concert entertainment	14.6%	54
The life of festival-goers	11.9%	44
After hours atmosphere	11.6%	43
Accommodation and facilities	8.9%	33
Other, specify *(All responses asked for more or more diverse music coverage)*	3.0%	11
Q7. Which do you think is/would be better?		*1301*
Being at the festival	36.5%	475
Listening on radio	3.3%	43
Watching on television	30.9%	402
Don't know	29.3%	381
Q8. Have you ever been, or would you like to go, to the Glastonbury Festival?		*1301*
I have been there before	6.8%	89
Haven't been, but will try and go one year	10.5%	136
Haven't been and would like to go there in the future, but probably won't be able	16.4%	213
Haven't been and not interested in going	63.1%	821
Don't know	3.2%	42

Table 1. Summary of survey responses

For question 7, participants were asked to justify their answers. Common reasons for preferring being there were "the atmosphere" (over half of non-blank responses) and "the experience", followed by social interactions. Many of

those who preferred the TV experience (70.9% of non-blank responses) described it as better in terms of comfort and/or weather conditions; other reasons were the sound and image quality (17.7%), the ease of selecting performances (8.6%) and the price of tickets (7.4%).

Results were provided broken down by gender, age group, social class and the part of the UK respondents lived in. The strongest difference in patterns this data shows is between age groups. Viewership is fairly constant across age groups, except for the 65 and older, who were 31% less likely to have followed the festival than average. Younger age groups (16-44) have a broader variety of viewing patterns and (especially for the 25-34) are more likely to have followed the festival with friends and/or outside their home. They are also more likely to have multiple motivations to watch it, to be interested in feeling like they're there (twice more than the 45+), to ask for broader coverage, and to be interested in going to the festival in the future. The survey doesn't show significant differences between social classes, apart from more watching in upper and middle classes.

THE QUALITATIVE STUDY

The purpose of the qualitative part of the study was to establish a richer picture of how individuals experienced the festival from home and to elicit a wider variety of facets of this experience. We chose to explore this through self-reporting, participant-driven methods that have commonly been used in HCI to elicit requirements and inform designs in domestic contexts, including for television services [5, 23]: Participants were asked to capture their experience in a multimedia diary [7] and to perform a series of creative activities that acted like cultural probes [20] designed to provoke and elicit further reflections.

Recruitment

17 participants were recruited through ads and mailing lists in two universities in the UK. All participants were students, university employees (academic, technical and administrative), or partners of a student or employee that was also part of the study. 10 of them were female, 7 male and their ages ranged from 19 to 48. 6 were non-British, non-native English speakers. A comparison of the sample (a high proportion of younger participants who are in or have had higher education degrees) with demographic data above leads us to believe that the viewing patterns encountered in the study are more diverse and less home-centric than the average. Targeting this demographic may allow us to support experiences that are less well catered for than a single-screen, living-room based one.

At the time of recruitment, one participant mentioned they would be at the festival during the study before catching up with it on iPlayer upon returning home. Participants were compensated with £40 (~$60) in shopping vouchers.

Description

The qualitative study took place in four stages:

1. A first questionnaire was sent via email to participants to capture their previous experience of the festival and their plans for this year's coverage.
2. During the festival, participants were asked to document their experience by keeping a multimedia diary in which they were encouraged to take photographs and screen captures from activity on their computers and mobile devices. At the same time, they were given a series of creative activities. These could be returned either via email or through an upload platform that was set up before the study. Briefs for activities were sometimes deliberately ambiguous to provoke deeper reflection [19]. Activities will be detailed along with findings.
3. After the end of the festival, participants had to complete a short online questionnaire about how, how much and what type of coverage they had watched or listened to and their attitudes towards it.
4. Finally, exit interviews were scheduled and conducted either face-to-face or by phone. All participants were interviewed, one couple being interviewed jointly. These were semi-structured interviews, aimed at enriching and explaining the results of the previous phases: general questions were asked about how participants did their planning, how their experience was interwoven with other activities and what they enjoyed about the festival. Then, a selection of their submissions from diaries and creative activities were recalled to understand the context in which they were produced as well as spark conversations about various aspects of the festival.

Findings

In this section, we will present findings from each phase of the qualitative study.

First questionnaire

The first questionnaire, taken by 16 out of 17 participants has shown a broad range of previous experience of the festival: a majority of them (11) had never been physically to the festival, and one had been there "13 or 14 times" before; only three (all originating from outside the UK) had never watched or listened to any coverage of it.

When asked how they planned to follow the festival, participants responded with a broad range of services and devices: live television and radio, online videos, BBC iPlayer, Sky+ (a video recording service and set-top box provided by a satellite operator), newspapers and social media (mostly Facebook and Twitter).

Questions about how viewing would be focused showed that, though a majority of participants were planning to focus on artists they already liked (with one who was mostly interested in a single band), some would focus on the headliners, others would look for smaller stages, including locations where friends may be watching live and other were envisioning a more spontaneous way of navigating content. One participant was specifically

interested in looking at what *"most people talk about the next day"* to *"be part of the conversation"*.

Participants who had been to the festival were also interested in following entertainment outside the main concert stages that isn't well covered by the BBC, such as the "dance area" (P11) or *"anything about other [non-concert] stuff going on that the festival [whose] addition is what makes the festival for [P13]"*.

Attitudes towards watching it versus being there were also explored and the results were consistent with the survey: by not being there, participants felt they would miss the atmosphere, an "experience", the sociality of the event and the ability to see performers live. P14, who had been there in previous years, thought that *"coverage no matter how good [can't] compensate"* for missing this.

On the other hand, being at home means better comfort, is less costly and easier due to the low availability of tickets. Even though being there gives access to more artists (only a fraction being filmed), the home experience allows switching between performers without having to walk and seeing acts that happen simultaneously on different stages.

The multimedia diary

13 participants sent diaries, 12 of which included images. Common types of images included updates from social media (for 6 participants), screen captures or photographs of screens showing BBC video coverage as it was being watched (8 participants), screen captures of the BBC's Glastonbury website (6), of the festival's official website (2) and of articles talking of the festival on news websites and apps (6).

Images showing the festival being watched confirmed that it was mostly a home-based experience (e.g. when showing a TV screen in a living room) and that a variety of devices were used to watch video (tablets, computers and TV sets). P8 sent a full screen capture of his computer screen including several process windows to show how he was working at the same time as he was watching. P11 sent a link to a video she *"thought was incredible"*.

Creative activities

Assiduity in performing the creative tasks was very variable: 11 participants did at least one creative activity, 6 did at least five, and none did all. Activity uptake ranged from 10 participants for the most popular task to only 2. The interview showed that participants who skipped the activities or the diary did it because they were not expecting that level of commitment from the study, had external unexpected commitments or didn't feel creative enough. Activities were:

a. *Annotating the festival's official program*, which had a strong impact on participants' experience as it exposed them to the variety of available performances and led them to do more planning than they would have done otherwise if at all. Most participants made a list of performances they wanted to see, with strategies ranging from looking for one's favorite bands to more exploratory and "broad-minded" ones, including choosing performers because their name sounded interesting. Several participants mentioned they would probably favor exploratory patterns on location and sticking to artists they know at home.

b. *Imagining "covert reporting"* technologies to get extra coverage, which elicited types of coverage that participants found interesting, e.g. capturing the *"festival goer's perspective"* (P14), *"interviews with bands live on stage"* or *"what goes on […] when the final acts have finished"* (P3), as well as technical issues (e.g. going quickly from stage to stage, battery life, sound levels). One participant devised a system that tried to balance giving extra information to a covert reporter with letting them enjoy the festival. One participant also used this activity to call for more interactivity between festival goers and the stage (by sending text messages to a big screen).

c. *An "iSpy guide",* in which participants could list sights to spot at the festival. Participants mostly filled it with features of the festival-going experience, including the appearance and behavior of spectators. A recurring item was the presence of celebrities, who are seen as an expected but seldom seen feature of the festival for British viewers. P14, who was the only participant who had both attended the festival in previous years and taken this activity, included specific items, such as iconic people or behaviors as well as performances, locations or moments not covered by the BBC.

d. *Recording oneself (audio or video) as a reporter.* Most participants who took this activity described the bands that they particularly enjoyed, one insisted on the specific atmosphere of a stage and another one used this activity to relate how upset he was that a performance had not been made available on iPlayer.

e. *Creating a list of awards:* Most of these were given to bands, though a few were also awarded to spectators that were spotted in the coverage. They were used to point out performers that were particularly entertaining, had interesting gimmicks, were better or worse than expected or didn't correspond to the usual musical styles found in this festival.

f. *Creating a newspaper cover.* Four participants undertook this activity, including two who wrote a short article commenting on the line-up of the festival.

g. *Crafting a festival-themed* frame to put around their mobile device. Two frames were made and mixed visuals and text.

h. *Summarizing their experience* by creating a playlist or a story using photographs: seven participants made a playlist and three used photographs.

Overview questionnaire

The questionnaire was taken by 16 out of 17 participants. Their experience was mostly home-based, with all participants reporting watching it or part of it from home. 11 participants also followed it from the place they work or study and 5 while commuting. The social viewing patterns were varied, with 3 participants reporting following coverage of the festival exclusively alone, 4 participants exclusively with others and the remaining 9 partly alone and partly with others. Co-viewers were part of the household for 9 participants, and 5 participants watched it with friends or colleagues. One participant also mentioned hearing the festival being played on the radio in a store.

Participants used a varied ecology of devices to consume festival coverage, with 11 using their TV set, 6 a video recorder, 7 tablets (all of which used it at least to watch videos and 6 for accessing other content), 11 smartphones (of which only 2 participants used it for video or audio coverage). Computers were the only type of device used by all 16 participants, including 3 who did not use any other type of device. Radios were only used by 6 participants.

Participants' Glastonbury experience was strongly video-based, with all participants reporting watching over one hour of video coverage and 9 out of 16 over five hours. Both live video (13 participants) and time-shift (12) were common modes. 8 participants also mentioned watching videos that were not part of the official coverage, e.g. non-festival clips of bands performing at the festival on Youtube. A couple of participants mentioned Soundcloud, an online music service, as they were interested in types of music not well covered by the BBC and were looking for dance music sets that were recorded by DJs themselves, directly from the mixer output.

On the other hand, 4 reported following no audio-only coverage at all and none five hours or more. 8 listened to the live BBC radio channels, 2 caught up later with radio coverage and 6 listened to non-festival recordings of artists present in Glastonbury. Interviews showed that some participants who listened to the festival on the radio did it as part of their usual radio-listening routines and not specifically to access festival coverage.

Websites accessed in relationship with the festival included the festival's website (reported by 13 participants), the BBC's website (12), Facebook (11). In the questionnaire Wikipedia was reportedly used by 3 participants, but 3 more mentioned it in the interviews. General news websites and newspapers were reported by 4 participants in the questionnaire but 4 more included captures of news websites in their diaries. Newspapers quoted included, for most participants, dailies, and one also mentioned specialized magazines about music.

Other questions about viewing patterns showed that most participants (10) had planned to watch specific artists, most (11) knew which artists would be playing before starting to watch, most (11) chose what to listen by jumping between channels and most (11) discovered new artists.

The questionnaire also looked at attitudes towards the coverage: a large majority of participants enjoyed the festival (all but one agreeing or strongly agreeing with that statement), enjoyed the selection of artists (15), enjoyed how the shows were and thought the technical quality of the coverage was good (14).

Finally, attitudes towards the study were explored: in general, participants found it time-consuming, but they didn't find that it distracted them from watching the festival. For half of them, it even had a positive impact on their enjoyment of the experience.

Final Interviews

Participants had generally very positive attitudes towards the breadth of coverage of the event, except for P7 who was frustrated by the fact that some performances had not been made available on iPlayer. One feature that was seen as particularly enjoyable was the possibility to switch between performances, though participants did it in very different ways: fast-forwarding on a video recorder, using the red button in a TV-based experience, using the Glastonbury website on a computer or the iPlayer app on a tablet. Attitudes towards the Highlights TV program were more ambivalent, with some participants happy to see a broad diversity of both concerts and other parts of the festival, but other frustrated by not seeing more than a few songs of each set or not knowing in advance what the program would contain. One participant noted that some segments covering the general atmosphere of the festival and non-concert entertainment venues, being included only in the highlights and therefore part of longer video clips, were hard to search for when catching up.

BBC presenters were a disputed feature of the coverage: some participants described them as talking too much in general or too much about their own experience of the festival rather than about the festival itself or the artists. On the other hand, some participants enjoyed the work of presenters, though different personalities appealed to different viewers: some preferred the older, more familiar ones and others liked younger, more dynamic ones or those who *"seem[ed] to be enjoying themselves"*.

Participants were questioned on how they used online media to complement their coverage and asked to comment relevant diary contributions. For news websites and social media, two different patterns were visible: either participants were actively looking for updates about the festival, or this was part of a news-checking or social media-checking routine. Another example of how Glastonbury fits into a daily routine was given by a participant who took a picture showing the weather forecast on her TV, on which she commented by saying that the presenter would specifically mention the weather at the festival location.

Social media could be used to obtain "official" coverage, either through feeds from news outlets or the official festival accounts, as well as personal points of views. Though in most cases, these "unofficial" personal experiences came from friends and acquaintances of participants, some turned to the personal social media accounts of band members, BBC journalists or the organizing team.

Facebook statuses posted by two participants who had been to the festival before but couldn't go that year included sharing very specific "insider" knowledge, as they mentioned locations outside the main stages and foods served at the festival in posts targeting friends who were or had been to the festival. One of them, P14, also noted that she and a group of friends who normally go to Glastonbury changed their profile pictures on Facebook to images of the festival and posted about what they would have done if they had been there.

A couple of participants also noted that social media updates were not expected to be live, and that they would normally have to wait until the next morning. P15, who was at the festival during the study, left her smartphone at home due to its battery life and only posted pictures and updates on social media after the festival.

Patterns of attention were also investigated and showed a broad range of levels of engagement, from the festival being played as a background sound to a focused attention on the video. Participants reported watching or listening to Glastonbury while commuting, working or doing household tasks. Focus on the festival was often driven by the pattern of other activities, with participants' attention increasing during pauses in activities, or by the general pattern of the day, in which evenings are dedicated to sitting in front of the television.

The interview also covered group dynamics and strategies participants used to select content as part of a group. Recording and queuing, as well as using catch-up services, was seen as very useful in making sure each household member gets to see what they want to, even when conflicting concerts happen simultaneously. In some cases, some members of the household took more control, for social reasons (such as P9, who chose to watch what others were choosing as she *"didn't want to isolate [her]self from [her] family"*) or when one acts as a recommender (*"[she] has wider music tastes than me, and she'll give me recommendations […] so I was probably letting her decide"*, P8). Social dynamics may also distract participants away from the festival, as two participants reported having friends or relatives staying at home during the festival.

How participants discover and get recommendations of artists that match their tastes, be it during the festival or as part of their general music consumption, emerged as a theme during the interviews. Recommendations for music may come from friends or algorithms (one participant used an online recommending service to select acts), as well as serendipitous discovery and following radio stations, magazines and specialized websites. For some, the festival was not only used to discover new artists, but also to update their knowledge of bands they already like: several participants reported that they only knew a few songs of a given artist and that watching a full set would expose them to a broader repertoire. Participants were also familiar with tunes without being able to name the song or band is and hearing these during the festival help them learn them. Two important pieces of information about artists were often searched for on YouTube and Wikipedia: what their greatest hits are and where they're from.

Whether the event was watched at the same time as it was happening was not an issue for most participants, and the convenience of watching it at any time was more valued than it being live. Participants who watched the World Cup the same weekend prioritized it over Glastonbury, which was justified by the fact that knowing the scores in advance is seen as spoiling the experience of watching sports and that such spoilers are hard to avoid. P14 mentioned that knowing the event is live was important as it added to her feeling of presence.

Most participants who had been to the festival combined this experience with watching it on TV, the motivations being catching up with missed performances, remembering one's experience and sharing it with others, e.g. after the festival, P15 watched it with a relative to make him understand what it was to be there. Participants have also tried to locate themselves on videos and still images, and P15 also complemented her souvenirs of the festival by looking for pictures her friends posted on social media.

Having been there also creates a tension due to expectations of missing out. P8 decided to limit his viewing to the main stage concerts as he expected that broader coverage would him *"feel like [he] was not there even more"* and P14, though she started with similar negative expectations, *"enjoyed it much more than [she] thought [she] would"*.

Participants may also wish to make sure the two experiences are kept separate. This was the justification for P8's decision not to catch up after coming back from the festival the previous year and he also feared that his memories of a performance he had *"really enjoyed"* would be affected by watching an excerpt on TV that viewers had rated poorly. P15 was glad that coverage misrepresented the festival as *"quite a commercial thing"*, as this gap between media and reality made her *"enjoy it more"*.

Communications by spectators at the festival were not only limited by network coverage (which some participants described as good) and battery life, but also by the fact that festival goers enjoy being "cut off" from what they call the "outside world". Another reason for not sharing was linked to who communications would be targeted at: P8 didn't publish any updates as *"the people that [he] mostly*

communicate[s] with were there anyway". On the other hand, P2, who had been to another festival, would post more updates than usual on social media as she wanted to share the fact that she was *"doing something exciting"*.

Though few participants directly said they felt they were there, various levels of immersion were reported. The quality of filming made P16 *"feel like you're on the stage or in the front row"*. P19 reported similar feelings when using headphones at a loud volume and P14 thought that quality *"makes up for not being there"*. Having lived the experience by oneself also added to the feeling of presence, with P15 declaring *"watching it again was exactly like being there"* and P14 thinking she wouldn't have felt connected to the festival if she hadn't been there.

DISCUSSION

Here we initially describe how our findings show that there is no single obvious trend of how participants engage with the event, but rather a multiplicity of routes through which participants experience this event. This is why, rather than offering a single way for broadcasters to address our results, our conclusion is that this multiplicity should be respected. We also conclude that these multiple routes should be interleaved to take advantage of the complementarity between specific personal experiences, and between the festival site and home, which we might treat as being a distinctive, complementary setting for festival experiences rather than as a competitor to "being there".

A diverse experience

Our findings have shown a diversity of viewing patterns when following the Glastonbury festival. These tend to revolve around a typical experience that happens at home, is consumed alone or shared with members of the same household, focuses on videos of familiar headline acts while occasionally jumping channels to try out new music, is motivated by the music itself, often incorporates information about the festival from newspapers and social media, and is accessed as part of viewers' regular media routines. This experience typically involves a familiar technological repertoire [11] including both live and time-shifted videos. This said, our findings also revealed other patterns that complement or disrupt this "canonical" experience, making it more personal, including:

- The festival as a support for a sociable experience (within a wider group that may be at the festival, away from it, or even split between locations).
- Television complementing, recalling or sharing one's experience of having been at the festival.
- Following friends around while they are at the festival.
- Collecting performances of one's favorite band.
- Listening to the festival as background music.
- Searching for specific content not covered by TV.
- Discovering what a live music festival is and understanding its wider cultural context.
- Discovering (and helping others discover) new music.

This diversity of viewing experience reveals that there is no "one size fits all" approach to broadcasting such events. Instead, it is important to develop services that improve the personalization of coverage, for example by scheduling playlists or sharing recommendations. This mirrors the findings of previous research on viewing patterns for complex events [1] which stressed the importance of supporting scheduling and queuing, as well as giving users awareness of the structure of their viewing and its relation to liveness, and an overview of available content [12].

Our study also suggests that coverage might usefully be extended to smaller stages and non-concert entertainment. This could be addressed by increasing the discoverability of existing content as well as providing raw footage used in highlight programs. This footage may be proposed as part of automated compilations generated on the basis of viewers' preferences, as proposed by Frantzis et al. [18]. However, it will become increasingly difficult for broadcasters to muster the resources to cover all aspects of large-scale events, suggesting the adoption of crowd-sourced videos to cover gaps in coverage as explored in previous research [13, 17].

Trajectories through viewing experiences

While it is necessary to consider more personalized viewing journeys, our study also points to the potential benefits of interleaving these journeys in various ways. This might involve connecting people who assume different roles, for example those present at the festival (spectators, organizers, reporters, performers) with remote viewers: the former might then guide the latter through available coverage or, conversely, the TV viewer may help a festival goer navigate the location.

This idea of connecting remote viewers with participants "on the ground" is reminiscent of previous attempts to create mixed reality performances and games that bring together so-called "street players" with "online players" to create new participatory media experiences. Studies of such experiences led to the idea that they can be designed in terms of various kinds of "interactional trajectories", extended journeys that integrate the physical and digital aspects of media experiences and that become interleaved to create rich social experiences [4]. We propose that this approach of designing interleaved trajectories might also inspire the design of future broadcast services for cultural events. We might identify "canonical" trajectories for different classes of participants, for example those who are going to the festival, those who have been before but cannot go this time, those who have never been but may go in the future, and those who only enjoy viewing from home. We might then interleave these to create new social viewing experiences as noted above.

Trajectories also encourage exploration of how experiences extend over time as well as how they are reflected on and recounted afterwards. Thus, a festival-goer may bookmark performances or locations on site to inform her subsequent catch-up experience; musical selections done when viewers are strongly engaged with content may be used to inform what will play when they listen to it in the background. Festivals may also be interleaved with other experiences in people's lives, and coverage may connect with long-term engagement in music or with media related routines. Finally, we should recognize that people often engage with cultural events over much longer time periods, potentially over a lifetime. This line of thinking encourages us to realize the potential of relating the current viewing experience to those of previous years. For example, a viewer may wish to reach back into their personal archive to recall performances from previous festivals that they have watched or attended.

Towards a socially immersive experience

Our study revealed mixed feelings about the importance of "being there" when watching large-scale live events from home, as this depends on sound and image quality, previous knowledge of the event, personal expectations and connections with people on location. This is consistent with previous literature [22] that has described presence as a subjective phenomenon depending on three dimensions: realism of stimuli (or "media richness"), realism of social interactions and the fact that one's interactions have an impact on the remote or simulated environment. One valid response to this observation would be to seek to improve these dimensions of the experience in order to increase the sense of "being there" for the remote viewer.

However, we also encountered viewers for whom an increased sense of being there was not desirable, for example participants who have been to the festival and wished to maintain this as unique and distinct from home viewing, or participants who simply would much prefer to be there for real. This invites us to treat the broadcast experience of Glastonbury not as a mere reproduction of a festival viewer's experience but as a distinct cultural experience in its own right. As Hollan and Stornetta have argued, improving the experience of remote communication may have more to do with embracing technological affordances than reproducing elements of presence [24]. The fact that around half of viewers watch coverage with others, and evidence that a minority are even willing to rearrange their setting or engage in special festival activities while watching, such as eating special foods, point to opportunities for extending the experience of viewing large-scale live events to a more socially immersive experience *at home*. How then might broadcasters enable viewers to create more powerful local shared festival experiences at home?

We end our paper by suggesting some possibilities for achieving this. Families might embrace the multiplicity of screens and other devices within the household to create a "festival at home" experience. The living room might become the main stage, devices in other rooms might be tuned into smaller stages, and radios in the kitchen and other communal areas might play ambient audio feeds from the festival site. People might even fall asleep to noises from the campsite. Community events might be encouraged, with stages distributed across a neighborhood or within a public place. An extended festival experience might also mean connecting TV viewers with live music, arguably the heart of the festival experience, and inviting them to watch or perform live music at the time of the festival, or sing-along to broadcast performances.

Whatever their form – the above ideas are only initial speculations intended to inspire further research – such ideas invite broadcasters to also reconsider how they engage views with events and the kinds of material that they should broadcast. In addition to capturing and showing high-quality footage from the major stages, it may also be beneficial to transmit ambient media and other data streams (e.g. unmixed or ambient audio, karaoke-like feeds of lyrics, schedules and news events) that enable viewers to create a more atmospheric sense of the event at home, perhaps even combining these with "maker kits" containing suggestions and tools for creating their own extended family and community viewing experiences.

Future work will involve designing the prototype of a service that supports such experiences, and deploying it around a festival. The evaluation of this prototype in a real world, "in the wild" setting, will offer the opportunity to conduct a second iteration of user studies, whose results will complement the findings described above and enrich our knowledge of the festival viewing experience.

CONCLUSION

We have described a study aimed at unpacking the experience of watching a broadcast large-scale live event. The results show that this is a complex and diverse experience that is interwoven in multiple ways with the lives of viewers. We recommended designing novel services for the coverage of this type of event that would embrace this diversity by offering an experience that would be more personalized and social, and include user-generated content. We proposed to design the festival viewing in terms of multiple interleaved trajectories and as a socially immersive experience.

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