"What just happened?": Understanding Non-visual Watching Sports Experiences

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ABSTRACT

Sports enhances cultural and social life by bringing individuals and communities together. While sports have a different meaning and importance depending on the culture and people, there is a long history of people watching sports. However, sports viewing can rely on visual information, and not fully accessible to People with Vision Impairments (PVI). In this paper, we present findings from interviews with 43 PVI about their experiences and attitudes toward watching sports. We report on their stories about accessibility challenges, and suggestions for future accessible technologies that could increase the accessibility of watching sports, with a focus on the information needs and modality.

CCS CONCEPTS

• **Human-centered computing** → Accessibility; • **Social and professional topics** → User characteristics; People with disabilities.

KEYWORDS

Visual impairments, Entertainment, Sports

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1 INTRODUCTION

Sports play an important role in cultural, social, global, and economic [2, 9, 16]. People have enjoyed watching sports for long time in human history. While the first international Olympics was held in 1896, these games date back to 776 BC in Ancient Greece [6]. Despite its importance, there are accessibility limitations for People with Vision Impairments (PVI) to watch sports.

Past research identified sports as the fifth-most popular TV program for PVI, but the third-most difficult program to follow [14] given that it can be very fast paced. Audio description is a common solution for PVI to understand visual information in any type of media such as films, theater performances, and exhibitions [18]. The Centre for Access to Football in Europe (CAFE) is trying to provide audio descriptive commentary at all matches during UEFA EUPRO 2020 [1]. The Japan Broadcasting Corporation (NHK) constructed the system to generate automatic audio descriptions for sports programs for the Rio Olympics and Paralympics [10], but it is still not implemented in the real-world. Despite these international efforts and FCC rules requiring local TV stations to provide 87.5 hours per calendar quarter of audio-described programming [4], those programs are focusing on drama, documentary, lifestyle, and children's content. Given the limitations of finding high quality broadcasts of sports, radio broadcasts of sports games have become a popular non-visual alternative [11].

In order to help viewers enjoy fast-paced sports, past research has developed multimodal technological solutions. Past research leveraged real-time haptic feedback using tactile displays for soccer games [3, 13, 17]. IrisVision developed a VR headset for people with low vision to watch sports by recording videos, magnifying images, and replaying it back to the user [8]. Other approaches include automatic captioning based on player's actions [15], analysis of player movement [5], and tracking of a ball [20]. While these technological solutions are promising, there is limited published understanding about the non-visual sports-watching experience. To address this research gap, we investigated experiences, attitudes, and preferences for viewing sports of 43 PVI. We present these results, and their interests and preferences for future technologies.

2 METHODOLOGY

In order to gain a better understanding of their experiences, challenges, and needs of watching sports, we remotely interviewed 43 PVI. We asked questions regarding their fandom, motivation to watch, attitudes towards watching on multiple mediums, and their perceived ability to follow a game (Table 1). Participant ages ranged from 20s to 70s (25 female, 18 male) with 32 identifying as blind, 4 legally blind, and 7 low vision. We recruited participants through the National Federation of the Blind (NFB) research mailing list [12]. Our protocol was approved by our university's institutional review board, participation was voluntary, and no compensation was provided.

3 FINDINGS

Our participants expressed diverse enthusiasm for sports fandom and shared their experiences and challenges to watch sports across radio, TV, and in-person games.

3.1 Fanatic Level

Overall, we found tremendous excitement for sports among PVI and enthusiasm for this area of research. While we only interviewed 43 participants, we were contacted by about 100 PVI who were interested this area of work and excited to be invited to this research,

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Table 1: Overview of Interview Questions and Data

ID	Question		
Q1	**Which describes you best as a sports fan?**		
	Classification	Response	
	Temporary: I watch sports on when I have specific reason(s)	4 (9.3%)	
	Local: I like watching sports games of specific team(s)	15 (34.9%)	
	Devoted: I identify myself as a sports fan, but it is not my core identification	12 (27.9%)	
	Fanatical: I identify myself as a sports fan, and it is very close to my core identification	8 (18.6%)	
	Dysfunctional: Being a fan is my primary method of self-identification	4 (9.3%)	
Q2	**What is your motivation to watch sports? Please rate each item from 1 to 5, where 1 means definitely no, and 5 means definitely yes.**		
	Motivation	Mean	SD
	Eustress: Enjoying competition and stimulation	3.95	1.15
	Self-esteem: Thinking team success as my success	3.31	1.35
	Escape: Escaping from real life's problems	2.71	1.33
	Entertainment: Enjoying as entertainment and recreation	4.33	0.75
	Economic: Betting	1.55	1.07
	Aesthetic: Thinking sports as an art	3.10	1.38
	Affiliation: Enjoying with other people, friends, and family	3.43	1.16
	Family Needs: Watching to be with family	3.19	1.31
Q3	**How do you rate your experience of watching sports on TV, radio, and in-person from 1 to 5, where 1 means very bad, 5 means very good, and why?**		
	Medium	Mean	SD
	Radio	4.54	2.76
	Television	2.76	1.06
	In-person	3.37	1.17
Q4	**How do you think it can improve your experience to enjoy watching sports more?**		

yet were unable to participate due to scheduling constraints. P10 mentioned "*I would love to see sports made more accessible, as I loathe asking my family members to relay the information I missed",* and P11 said "*I happen to enjoy sports, but many aspects are that something regarding sports are too visual for someone who has no vision.*" Overall, our participants demonstrated a range of fandom according to Hunt et al's [7] scale (Table 1, Q1). In this scale, "Temporary" fans are more casual while "Dysfunctional" fans are considered as the most avid. We asked about fandom because we thought that the definition of a "good" experience would depend on the importance of sports to the participants. However, as discussed in Section 4, all participants are consistent about what they need to enjoy watching sports more.

3.2 Motivations

When thinking about experiences and expectations of sports fans, it is important to understand their motivations to watch sports [9]. Our interviews used all eight motivations from the Sport Fan Motivation Scales [19]. The highest motivation is Entertainment (M=4.33, SD=0.75) and Eustress (M=3.95, SD=1.15), and the lowest is Economic (M=1.55, SD=1.07) and Escape (M=2.71, SD=1.33) (Table 1, Q2). Besides eight motivations in the list, two participants watch sports to learn strategy and statistics. Some participants mentioned they enjoy socialization (Affiliation and Family Needs), but they cannot watch important games with friends and family because they need to concentrate on listening on announcers.

3.3 Experience Satisfaction

Radio. Our participants enjoyed listening to sports on the radio (M=4.54, SD=2.76) (Table 1, Q3), and found it more descriptive than TV. Radio broadcasters understand that their audience does not have access to visual information, and 91% of participants mentioned that radio is very descriptive when compared to TV. P01 commented "*Everybody who is listening (to radio) is blind, we are all equal*", and P04 appreciated radio by pointing out that "*The announcers on the radio really give a great explanation of what's going on, you can take a picture in your head.*" However, some participants mentioned that the quality of radio descriptions used to be better because young announcers did not grow up with radios. Three participants did not listen to radio because they either enough vision to follow actions on screen or preferred the sound quality on a TV.

Television (TV). Watching sports on TV received the lowest satisfaction (M=2.76, SD=1.06) because it is not descriptive enough causing them to ask others what happened. Also, they felt commentators tended to chat about irrelevant information. P40 mentioned that "*TV has become so much interested in the chat that goes with the sports they don't tell you very much about what's happening because... they think you can see it.*" Participants with low vision were concerned about the lack of play-by-play descriptions in TV programs as P19 pointed out "*I am disappointed at the lack of inclusiveness as my vision has gotten worse and worse.*" However, participants still watch sports on TV when they want to watch it with other people. This is reflected in the Motivation questions where "affiliation" and

"family needs" received a score of 4 or 5 from 17 and 18 participants respectively. When something important is happening like a touchdown or power play, our participants described knowing this from the sound of the audience, but they needed to wait a few minutes to understand exactly what happened. Unfortunately, this left them feeling frustrated and disappointed that they could not enjoy the exciting moment at the same time as other viewers. P40 explained "*It's really irritating when you know you're not doing it in absolute real time.*"

In-Person. Most participants enjoy in-person games (M=3.37, SD=1.17) for the atmosphere, the crowds, cheers, weather, food and drinks, and socialization with other fans, friends, and family as P39 commented "*I feel like it's fun, because then you get to like eat good food and like feel the air.*" While they enjoy in-person games, many participants shared that it was hard for them to understand what is happening in the game due to the lack of description and noisy environments, so they need to ask their companions to explain the action. Furthermore, 27 participants listen to the radio during in-person games to get information although radio broadcasting is often delayed by a few seconds depending on the venue. Two participants didn't go to in-person games because it is too noisy and pricy, so they didn't rate the in-person experiences.

4 RECOMMENDATIONS FOR ACCESSIBLE SPORTS WATCHING

When asked about how technology could increase the accessibility of watching sports, participants offered four types of suggestions (Table 1, Q4). ***Play-by-play Descriptions:*** All except two participants mentioned that they need play-by-play descriptions to enjoy watching sports more. They want to know who gets the ball, who makes the touchdown, and who is running. The colors of uniforms and flags, the formation of teams, the condition of the field, and the local weather are also good information to have. ***On-screen visual information***: The on-screen visual information such as scores and the remaining time is also hard for participants to access. They need to ask friends and family every time, which makes them frustrated. ***Accessible Statistics*:** Sports statistics are often complicated with lots of data. Participants did not say that the team or league website is not accessible. However, when the tables contain lots of data, it is hard to access information with screen readers such as Jaws and VoiceOver. ***Creating a more Immersive Experience***: Sound information is a crucial element for PVI when watching sports. It was pointed out that the technology is advancing rapidly: the sounds of the ball and players can be heard more clearly than ever, and participants can have a more pleasurable experience.

5 CONCLUSION

The study has investigated PVI's experiences of watching sports, their challenges and needs by interviewing 43 PVI remotely. PVI identified several situations where it is difficult to follow real-time action and are eager to have play-by-play descriptions. Their experience on the radio is much more satisfying than that on TV, but they still want to watch TV when they are with friends and family. Future solutions aimed to support their experience and add more excitement should provide play-by-play descriptions in any platforms without delay and access to on-screen information. Furthermore, broadcast companies and sports teams/leagues should improve the quality of sound and provide accessible statistics that are easy to read with screen readers.

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