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ANALYSIS OF PERCEPTIONS OF TURKISH FANS OF VIDEO-ASSISTANT-REFEREES IN ELITE SOCCER

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ABSTRACT

There has been considerable investment in the use of technology to ensure better accuracy of referees' decisions in several areas of sports. Video-assistant-referee (VAR) system in football is one of them. The purpose of this study was to investigate the fans' opinions of VAR. A quantitative survey was conducted among 1019 football fans for their opinions on the effects of VAR on football. The final instrument used had five factors and 16 items. The construct validity of the 5-factor scale designed to measure the opinions of Turkish football fans on the VAR system, was examined using a confirmatory factor analysis (CFA). Five effects of VAR on football was identified: four positive (competition, referee performance, justice, fair play) and one negative (passion killing). The results indicated that VAR increases the competitiveness between teams, helps referees feel less pressured due to the assistance of VAR and reduces the effect of human error. Fans believe that VAR brought justice and fair play to football, as VAR decision-making does not discriminate. The results of the study can help sports organisations present a better image of VAR after knowing positive and negative views of fans.

Keywords: Competition; Fair play; Justice; Soccer; Sport technology.

INTRODUCTION

In the past decades, technology had a profound impact on sport (Ratten, 2019). Therefore, there has been considerable investment in the use of technology to ensure better accuracy of referees' decisions in a number of areas of sports. These technologies include Hawk-Eye in tennis and Snickometer in cricket, Electronic Line Judge in tennis, Goal Line Technology in football, Fully Automatic Timing system in athletics, 3Play in judo, Video Review in wrestling, and Instant Replay System in volleyball. These technological advancements give the referee more time and information and reduce the probability of missing key elements in making a crucial decision. In this context, football has introduced a Video-Assistant-Referee (VAR) system, which uses video technology assistance to support the referees' decision-making process.

The VAR team watches the livestream of a match from all angles available. The team must check for all potential match-changing situations following the VAR protocol. If they identify that a referee has made a potentially match-changing decision, they inform the referee (Rosetti, 2018). The VAR does not ask the question 'was the decision correct?' but asks 'was the decision clearly wrong?' (IFAB, 2017). Therefore, it does not aim to achieve 100% accuracy for all decisions in a football game, as this would be impossible (IFAB, 2018a). Moreover, the

philosophy of VAR is 'minimum interference – maximum benefit', aiming to reduce unfairness caused by 'clear and obvious errors' or 'serious missed incidents' in relation to four match-changing situations: (1) goals, (2) penalty kicks, (3) straight red cards, and (4) cases of mistaken identity (IFAB, 2018b). During a match, the VAR system constantly checks for these four match-changing situations. It intervenes with the referee and corrects only clear and obvious mistakes or serious missed incidents in these four areas (FIFA, 2018a) since they have the potential to change the direction and outcome of a game.

The use of a VAR System was unanimously approved by The International Football Association Board (IFAB) at its 132nd Annual General Meeting on March 3, 2018 (IFAB, 2018b) after extensive trials between 2016 and 2018. After these trials, the 2018 Football World Cup became the first competition to use a VAR system for all matches and in all venues after its approval by the governing body of football, the Fédération Internationale de Football Association (FIFA), during its Council meeting on March 16, 2018 (FIFA, 2018b).

In the Turkish Football Super League, VAR began to be used in the 2018 - 2019 season. Thus, the Turkish Football Super League became one of the first leagues that implemented the VAR system, along with other major European leagues like Bundesliga (German first division) and the Series A (Italian first division).

Currently implemented in all major leagues, the benefits and drawbacks of VAR are very topical among football fans. Football fans have a long history of hooliganism, cultural attachment and traditions. Football fans have become such powerful and enthusiastic communities that some football clubs have even begun involving them in decision-making, while some fans have forced club owners to either agree with their demands or sell the club (Fişne *et al.,* 2021). However, organisations usually implement their decisions without consulting the fans. Therefore, the implementation of VAR was very controversial among fans and the press. The VAR system caused confusions, misunderstandings and shocked the football world, including fans. Fans often criticised VAR using both legitimate and illegitimate points. However, the opinion of fans is not considered by governing bodies.

Most of the research on VAR systems has investigated its effects on football matches. Some of this research analysed how the VAR system has changed football statistics, such as the number of goals, fouls, offsides, and yellow and red cards (Carlos *et al.,* 2019; Vergonis *et al*., 2019), while other research focuses on what the system is and how it is being used (Bacigalupe, 2020). Errekagorri *et al.* (2020) discussed the effect of VAR on athlete's performance. Han *et al.* (2020) discussed the VAR impact on matches and on referee performance. Spitz *et al.* (2020) discussed the outcome of technology on the decision making of a referee. While, Samuel *et al.* (2020) presented an integrated conceptual framework of decision-making in soccer refereeing. However, no study was found that took into account the views of fans on the VAR system.

Fans in the sport are major stakeholders as it is fans who create any sport entity as a brand as sport economical and psychological prospects succeed through fans (Smith, 2005). Also, loyal sport fans engage in various forms of behaviour related to sport teams (Funk & James, 2001). In this scenario, it was important to discuss what fans felt about the introduction of VAR. Fans often criticised referees for the decision referees made because fans are loyal and committed to their teams and they do not like losing. Therefore, it is often claimed that referees' decisions are either intentionally or unintentionally biased (Page & Page, 2010; Erikstad & Johanssen, 2020). That is why, it is important to discuss the fans' point of view regarding the introduction of technology.

Five main constructs of VAR usage were identified to better understand how VAR works and its effect on football. The *competition level* denotes the competitiveness during the matches. McGarry *et al.* (2002) have argued that the nature of a sport is competitive. Therefore, sports itself is a competition and a higher competition level is an essential attribute of any sport.

The *passion* for the game is known as strong emotions. Vallerand *et al.* (2008) mentioned that passion is generated from a sense of excitement. Therefore passion would refer as joy, excitement and commitment to the game. *Referee performance* is the decisions that referees make during the course of play. As Samuel *et al.* (2020) noted; decision-making is a critical aspect of soccer refereeing that directly impacts the game. *Justice* in the current study refers to adherence to conduct rules (Goldman & Cropanzano, 2015). It is about error-free decision making, so every player and team get the result on the merit of what they performed. Fairness is about less fouled play both from players and referees. If the referee is fair, he/she becomes unbiased and awards a decision without his/her liking, while if a player is fair, he/she avoids playing a foul game and as a result match will be fairer.

As technology is unbiased, one does not conceive any kind of pressure or does not hold any kind of favour/grudge, thus, its decision should provide more justice and fairness (Haugen, 2019).

PURPOSE OF RESEARCH

The purpose of this study was to investigate the fans' opinions of VAR. As Smith (2005) mentioned, fans are sources of cultural and economic capital for a sport team, such as applauding, buying products and travelling. Furthermore, fans also bring lots of benefits to the team, athletes, and endorses tourism (Hasaan *et al*., 2016), and even the local economy (Guvercin & Mil, 2016).

Fans are amongst the most important stakeholders in sports. In this sense, it is important to know about fans' perception regarding VAR as their opinion matters a lot. For instance, in the age of COVID 19, teams suffered heavy losses due to limited fans activities. Thus, it is important to know the point of view of the fans. Without fans present in the stadium, teams suffer both economically and psychologically. Furthermore, the study results can help sports organisations present a better image of VAR using the knowledge of fans' positive and negative views. To our best knowledge, this is the first study that directly investigates fans' opinions on this matter. Therefore, this study is a pioneering one and can provide a basis for future studies.

METHODOLOGY

Participants

This study involved a total of 1019 football fans in Turkey. In this study, a convenient sampling method, which is a non-probability sampling method, was used. Convenient sampling is one of the most-used sampling methods despite its drawbacks because it is easier, inexpensive and time-saving (Gravetter & Forzano, 2009). In 2019-2020 season, an online questionnaire was sent to a total of 1019 fans through social media pages and research data was obtained. Frequency and percentage distributions of the sample according to the variables included in the questionnaire were obtained, as shown in Table 1.

Table 1. **DEMOGRAPHIC DISTRIBUTION OF SAMPLE**

Characteristics	Frequency	Percentage
Gender		
Male	833	81.7
Female	186	18.3
Age		
Under 22	243	23.8
22-30	384	37.7
31-40	241	23.7
Over 40	151	14.8
Education background		
Primary	104	10.2
High School	135	13.2
University	591	58.0
Postgraduate	189	18.6
Supported team		
Galatasaray	278	27.3
Fenerbahçe	229	22.4
Beşiktaş	124	12.2
Anatolian Teams	388	38.1
Athletic background		
Yes	582	57.1
No	437	42.9
Types of fans		
Temporary	321	31.5
Devoted	405	39.7
Fanatic	237	23.3
Hooligan	35	3.4
Other	21	2.1
Total	1019	100.0

Instrument

The study employed a free thought-listing survey technique, as it is used in the social sciences when there is limited knowledge available on the topic (Ross *et al*., 2006; Arai *et al*., 2013). In this process, 30 sports sciences department students of the Sivas Cumhuriyet University, Turkey, were given 10 minutes to write down their one-line impression and any thoughts that came to mind when thinking about VAR in football.

A total of 82 unique items were identified after merging similar items and deleting incomplete items with the help of two researchers with experience in sports marketing, ensuring objectivity and consistency. To purify the instrument, the study adopted an assessment of content and face validity using a panel of experts. The panel members were 10 faculty members in sports sciences who worked at the university (six PhDs and four master's degree). The characteristics of the panel members are presented in Table 2.

The instrument was revised based on the recommendations by the panel. Thus, the final instrument used had six dimensions and 30 items. However, after the data analysis, the instrument decreased to five factors and 16 items.

Table 2. **CHARACTERISTICS OF PANEL MEMBERS**

Panel	Gender	Degree	Profession	Experience
1	M	PhD	Professor of Sports Sciences	22
2	F	PhD	Associate Professor of Sports Sciences	17
3	M	PhD	Associate Professor of Sports Sciences	14
4	F	PhD	Assistant Professor of Sports Management	16
5	M	PhD	Assistant Professor of Sports Management	12
6	M	PhD	Assistant Professor of Sports Management	12
7	F	Master's	Lecturer of Sports Management	15
8	M	Master's	Lecturer of Sports Management	16
9	F	Master's	Lecturer of Sports Sciences	14
10	M	Master's	Lecturer of Sports Sciences	17

Data analysis

The construct validity of the 5-factor scale designed to measure the opinions of Turkish football fans on the VAR system was examined using a confirmatory factor analysis (CFA). The IBM AMOS (Version 25.0) was used for the CFA. Confirmatory factor analysis is a widely used procedure in construct validity analysis, which aims to statistically confirm a predetermined or constructed structure. The structure that should be confirmed, can be constructed through an exploratory factor analysis or by researchers (Kartal & Bardakçı, 2018).

Hunt *et al*. (1999) classify fans into four categories: temporary fans, devoted fans, fanatical fans, and dysfunctional fans (hooligans). To investigate whether the opinions on VAR measured using the five sub-factors differed according to the type of fans, a one-way multivariate analysis of variance (one-way MANOVA) was used. The MANOVA is a multivariate statistical method that tests the significance of the differences between groups in terms of the new resultant variable created as the best linear component of two or more related variables. If the MANOVA identifies a significant difference between groups, an analysis of variance (ANOVA) is applied for each dependent variable (Deryakulu & Büyüköztürk, 2005).

Partial eta squared was taken into account in determining the variance rates explained by the effects. Partial eta squared can be defined as the ratio of variance accounted for by an effect and that effect plus its associated error variance within an ANOVA study (Brown, 2008). Additionally, multiple comparisons were performed to investigate the difference in opinion of the factors for each fan type depending on the significance of the ANOVA results. The F-ratio was used to interpret the statistically significant differences between fan type groups for each factor. The IBM SPSS Statistics for Windows, Version 25.0 was used for these statistical calculations.

Ethical considerations

Ethics Board Committee of the Institute of Research and Advanced Studies (IRAS) approved this study (Approval no. SC-RA-010620). All participants provided informed consent forms. The researchers made use of their contacts among sports fans and used their networks to contact participants. Once a contact was established, an online questionnaire was sent to the fans. Participants of the study provided a consent letter attached with the questionnaire.

Prior to reaching questionnaire section, participants had to read the participants information sheet that (i) authorised the authors by giving permission to involve research participants, and (ii) made an agreement between the researchers and the participants outlining the roles and responsibilities towards one another throughout the study. At the end of the sheet, a close-ended question (Yes/No) was asked "I agree to participate in the research study. I understand the purpose and nature of this study and I am participating voluntarily. I understand that I can withdraw from the study at any time, without any penalty or consequences." The "yes" granted access to questionnaire.

RESULTS

A CFA was performed to determine the validity of the scale. As seen in Figure 1, the model consists of 5 sub-factors and 20 items.

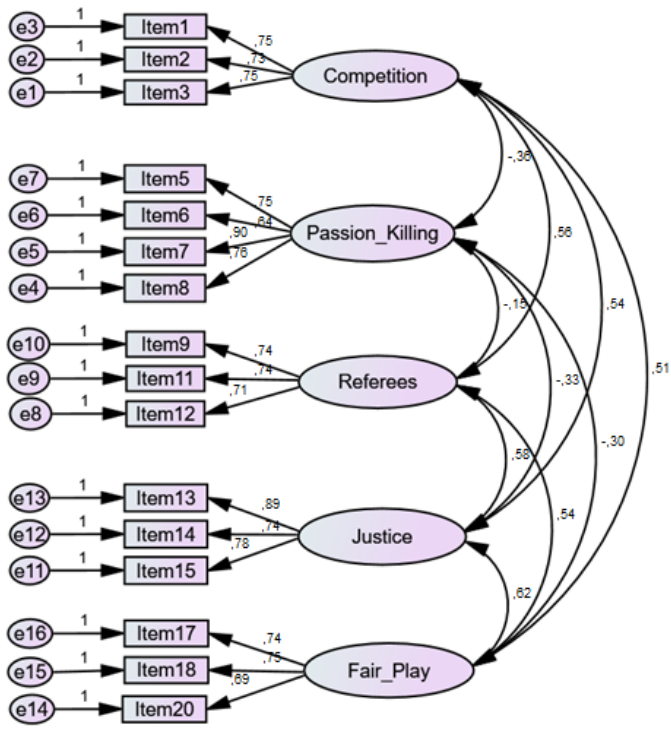

Figure 1. **STANDARD REGRESSION WEIGHTS AND COVARIANCES BETWEEN FACTORS**

Lam *et al*. (2005) stated that items with less than a 0.40 λ value should be removed from the original scale to improve the model. After removing four items from the scale, the CFA produced an acceptable fit for the default model: χ^2/df=4.293, GFI=0.945, IFI=0.955,

TLI=0.925, CFI=0.954, RMSEA=0.094. The interfactor correlations of the scale ranged from -0.36 to 0.62, as seen in Table 3.

Table 3. **CORRELATIONS BETWEEN FIVE FACTORS**

Factors	Competition	Passion killing	Referee performance	Justice	Fair play
Competition	–				
Passion killing	-0.36***	–			
Referee performance	0.56***	-0.15***	–		
Justice	0.54***	-0.33***	0.58***	–	
Fair Play	0.51***	-0.30***	0.54***	0.62***	–

***p<0.01

The interfactor correlations of the scale ranged from -0.36 to 0.62, as seen in Table 3. An important indicator of the construct validity of a scale is that it has convergent and discriminant validities. In the context of convergent validity, Average Variance Extracted (AVE) values that provide information on the compatibility of the items collected for the same factor are considered.

If the AVE value calculated for each factor is greater than 0.5, the scale has convergent validity. Conversely, if the AVE value for any factor is less than 0.5, the scale does not have convergent validity, because the variance arising from the measurement error is greater than the variance explained by that factor. Discriminant validity examines whether the factors in a multi-factor scale measure different structures independently.

For a scale to have discriminant validity, the AVE value of both factors must be greater than the square of the correlation coefficient between these factors [$AVE_1 > r^2$; $AVE_2 > r^2$] (Fornell & Larcker, 1981).

As can be seen in Table 4, AVE values of all factors are greater than 0.5. For all factor binaries, the AVE value of each factor is greater than the square of the correlation between the two factors (Table 3). These findings provide important evidence for the convergent and discriminant validity of the scale.

The MANOVA results given in Table 5 show that there is a statistically significant difference between how each type of fan views the VAR system (Wilks' Lambda(λ)=0.845; $F(15,2733.3)=11.441$; $p<0.001$). Additionally, 5.4% of the variability in the dependent variable is explained by types of fan (Partial $eta^2=0.054$).

As presented in Table 5, the results of the ANOVA tests indicated that the temporary, devoted, fanatic, and hooligan fans had statistically significant effects on the *competition* ($F(3,994)=9.895$, $p<0.001$), *passion killing* ($F(3,994)=8.635$, $p<0.001$); *referee performance* ($F(3,994)=9.174$, $p<0.001$); *justice* ($F(3,994)=46.382$, $p<0.001$); and *fair play* ($F(3,994)=35.464$, $p<0.001$). At the same time, while the dependent variable explained at the

highest rate by the independent variable, "justice" (Partial eta^2=0.123), the dependent variable explained at the lowest rate “passion killing" (Partial eta^2=0.025).

Table 4. **FINAL FORM OF SCALE AND FACTOR LOADINGS**

Items	Competition	Passion Killing	Referee Performance	Justice	Fair Play
VAR System improves the football quality of our league.	0.751				
VAR System reduces discussions about referee decisions.	0.749				
VAR System increases competition in our super league.	0.728				
VAR System is not suitable for the spirit of football.		0.897			
Football was more enjoyable with mistakes.		0.759			
VAR System decreases the pleasure of watching football.		0.749			
VAR System causes a decrease in the joy after a goal because fans worry it will be under VAR review.		0.640			
VAR System significantly reduces referee errors in our league.			0.741		
Referees have no right to make mistakes after the VAR System.			0.739		
Referees face less criticism/blame after the introduction of VAR.			0.706		
VAR System prevents injustice in our super league.				0.887	
VAR is not fair to my team.				0.785	
VAR System is implemented fairly for all teams in Turkey.				0.736	
VAR System ensures more fair play in the game.					0.745
Voice records must be explained to the public for more transparency.					0.741
VAR System is preventing tricky practices in football.					0.691
AVE	0.55	0.59	0.53	0.65	0.53
Cronbach α	0.76	0.85	0.75	0.71	0.72

After the significant differences between the types of fans were identified using Tukey’s HSD test, a Bonferroni correction was used to identify where the differences lay. Therefore, α level of 0.05/6≅0.008 was set to test for multiple comparisons.

Table 5. **RESULTS OF ONEWAY MANOVA FOR TYPES OF FANS**

			ANOVA					MANOVA			
Factors	Types of Fans	Mean±SD	Sum of Squares	df	Mean Square	F	Partial eta^2	Hyp df	Error df	F	Partial eta^2
Compe-tition	Temporary	3.27±1.02	34.504	3	11.501	9.895***	0.029				
	Devoted	3.11±1.06									
	Fanatic	2.79±1.16									
	Hooligan	2.75±1.26									
Passion killing	Temporary	2.87±1.08	31.462	3	10.487	8.635***	0.025				
	Devoted	3.06±1.08									
	Fanatic	3.30±1.16									
	Hooligan	3.47±1.21									
Referee perfor-mance	Temporary	3.16±0.93	25.678	3	8.559	9.174***	0.027	15	2733.3	11.441***	0.054
	Devoted	3.00±0.95									
	Fanatic	2.73±1.02									
	Hooligan	2.89±1.13									
Justice	Temporary	3.05±0.87	119.54	3	39.846	46.382***	0.123				
	Devoted	2.66±0.91									
	Fanatic	2.19±1.04									
	Hooligan	1.89±0.87									
Fair Play	Temporary	2.89±0.73	72.586	3	24.195	35.464***	0.097				
	Devoted	2.61±0.86									
	Fanatic	2.25±0.88									
	Hooligan	1.94±0.89									

***p<0.001

Table 6. **RESULTS OF MEAN COMPARISON FOR TYPES OF FANS**

Factors	**Group (I)**	**Group (J)**	**MD (I-J)**	**SE**
Competition	Temporary	Devoted	0.16	0.08
		Fanatic	0.47*	0.09
		Hooligan	0.51	0.19
	Devoted	Temporary	-0.16	0.08
		Fanatic	0.32*	0.09
		Hooligan	0.36	0.19
	Fanatic	Temporary	-0.47*	0.09
		Devoted	-0.32*	0.09
		Hooligan	0.04	0.20

Table 6. **RESULTS OF MEAN COMPARISON FOR TYPES OF FANS *(cont.)***

Factors	Group (I)	Group (J)	MD (I-J)	SE
Passion Killing	Temporary	Devoted	-0.19	0.08
		Fanatic	-0.43*	0.09
		Hooligan	-0.60	0.20
	Devoted	Temporary	0.19	0.08
		Fanatic	-0.24	0.09
		Hooligan	-0.41	0.19
	Fanatic	Temporary	0.43*	0.09
		Devoted	0.24	0.09
		Hooligan	-0.17	0.20
Referee performance	Temporary	Devoted	0.16	0.07
		Fanatic	0.43*	0.08
		Hooligan	0.27	0.17
	Devoted	Temporary	-0.16	0.07
		Fanatic	0.27*	0.08
		Hooligan	0.11	0.17
	Fanatic	Temporary	-0.43*	0.08
		Devoted	-0.27*	0.08
		Hooligan	-0.17	0.17
Justice	Temporary	Devoted	0.39*	0.07
		Fanatic	0.85*	0.08
		Hooligan	1.15*	0.16
	Devoted	Temporary	-0.39*	0.07
		Fanatic	0.46*	0.08
		Hooligan	0.76*	0.16
	Fanatic	Temporary	-0.85*	0.08
		Devoted	-0.46*	0.08
		Hooligan	0.30	0.17
Fair Play	Temporary	Devoted	0.29*	0.06
		Fanatic	0.65*	0.07
		Hooligan	0.95*	0.15
	Devoted	Temporary	-0.29*	0.06
		Fanatic	0.36*	0.07
		Hooligan	0.67*	0.15
	Fanatic	Temporary	-0.65*	0.07
		Devoted	-0.36*	0.07
		Hooligan	0.30	0.15

***p<0.008 MD=Mean Difference SE=Standard Error

The results indicated that the temporary (M=3.27) and devoted (M=3.11) fans are statistically more likely to believe that VAR affects competition scores than fanatic fans (M=2.79; p<0.008). Fanatic fans (M=3.30) are statistically more likely than temporary fans

(M=2.87) to believe that VAR kills the passion of the game ($p < 0.008$). However, the temporary (M=3.16) and devoted (M=3.00) fans are statistically more likely to think that VAR helps the referee's performance than fanatic (M=2.73) fans are ($p<0.008$).

For the justice factor mean scores, the temporary fans (M=3.05) are statistically more likely to believe that VAR provides more justice than the devoted (M=2.66), who in turn are more likely to believe this than the fanatic (M=2.19) and hooligan (M=1.89) fans ($p<0.008$). Lastly, similar to the results of the justice factor, temporary fans (M=2.89) are statistically more likely to believe that VAR increases fair play than devoted (M=2.61) fans, who are in turn more likely to believe this than fanatic (M=2.25) and hooligan (M=1.94) fans ($p<0.008$; Table 5 and Table 6).

DISCUSSION

This study concentrated on the change in competition due to the introduction of VAR in football. The focus of the study was to enquire the VAR among fans to know their opinion about the introduction of technology in football. Empirical results via confirmatory factor analysis (CFA) confirmed that (1) VAR is contributing to the *competition level* in football; (2) VAR is *killing the passion* for the game, (3) VAR helps the *referee performance*, (4) VAR encourages *justice*, and (5) VAR is *increasing fairness* in football. These results are discussed further in detail below.

Competition

According to the results, VAR makes football leagues more competitive. The introduction of VAR increased the quality of football and the competition in the league, while reducing the unfair decisions made by referees, thereby making competition fairer and more equal. Competitiveness lies at the core of sports, as Loland (2002) identified that sports refer to competitive activities. In this sense, more competition and competitiveness are essential for sports. In the current study, it was identified that the introduction of VAR makes football more competitive. This is in line with Leveaux (2010), who argues that VAR improves the playing environment and assists referees or umpires to promote fair play.

In this vein, when the International Cricket Council introduced the decision review system (DRS) to cricket to make umpiring decisions more correct, India opposed the idea. While other countries adopted the technology, matches in India did not have it. However, after a few years, India had to adopt the DRS because it was an effective mitigator of human error which increased the competitiveness of the matches (McLoughlin *et al*., 2013). Past studies have identified that fans like the competition as competitiveness of a sport team or an athlete is an antecedent of loyalty (Hoegele *et al.* 2014). It is natural that sport fans in this study acknowledged that VAR in football increases competitiveness in this context.

Passion-killing

According to the results of current study, VAR is killing the passion among fans. Technology always has been a disputed issue. For instance, Ross (2008) mentions a popular claim that technology is killing sports in some ways. As the current study focused on football, football is known for its fluency, and, unlike most American sports, it often plays an advantage when a foul is committed to keep the flow at full swing. However, participants of the study blamed VAR for destroying the spirit of football, as it decreased the pleasure of the game and,

especially after a goal, caused doubt instead of joy. In this context, Haugen (2019) argued that football could become "boring" because of VAR.

Furthermore, many social media activists opposed VAR because it affects the flow of the game and thus ruins the sport (Harrison, 2018). McLoughlin and Dawson (2017) found that critics argue that technology (VAR and DRS) is a 'gimmick' that is turning sports into a 'computer game'. Furthermore, technology is often blamed for the loss of the human element in a sport (Johnson & Taylor, 2016).

The current study is in line with past studies as some authors argue that technology has negative effects on the certain sport consumers (Yang & Cole, 2020), one of which is making it less exciting. For instance, VAR decreases the joy and excitement of a football match (Haugen, 2019; Bacigalupe, 2020) and 'kills' the beauty of the game (Petersen-Wagner & Ludvigsen, 2019).

Other sports have learned significantly from technology implementation errors and improved the system, while football's VAR system is still in its very early stages, which is why errors are making the situation worse and fans claim that VAR is killing the spirit of football.

Referee performance

This current study investigates how the role and image of referees have changed after the introduction of VAR. The study found that VAR helped the referees as it significantly reduced their errors and, after VAR, referees faced less criticism from fans and the media. Past studies have identified that referees intentionally or unintentionally are influenced by their biases, such as those against a team or an athlete (Hlasny & Kolaric, 2015), home biases and social pressures (Reilly & Witt, 2013), extra added time and wrong foul calls (Brimberg & Hurley, 2009). Therefore, verbal and physical abuse has increased, with referees identifying issues emanating from players, coaches and spectators (Rayner *et al.,* 2016). In this scenario, VAR provides a way for referees to ease the blame, as there is less human error and technology intervenes to correct a decision. As past studies have suggested, the introduction of technology is a possible factor that could increase the level of refereeing (Yang, 2018).

Fans have also claimed that referees have no more right to commit a mistake due to VAR. This is a natural phenomenon as past studies also identified that technology could make referee error free. For instance, VAR helps referees avoid making mistakes that significantly influence the outcome (Haugen, 2019; Bacigalupe, 2020), as the technology is supposed to help umpires and referees with their decisions (McLoughlin & Dawson, 2017). Fans are so committed to their teams that they cannot face a defeat. Fans blamed referees for their loss and thus terms like Fergie Time developed (Butler & Butler, 2017) (Fergie Time is a named after former Manchester United manager Sir Alex Ferguson, is metaphor for the awarded excessive additional time, providing them an opportunity to change the outcome of a match). However, after the technology introduction, fans are hoping that referee performance should be improved.

Justice

Participants of the current study agree that the VAR system prevents injustices, making the league fairer for all teams. This result agrees with past studies, such as Melin (2018), who mentioned that technology serves as a guarantee of justice in sporting competitions because applying technology in decision-making ensures that the decisions are correct. Moreover, when officials make errors, there may be a claim of a miscarriage of justice, and technology can be used to avoid these claims (Johnson & Taylor, 2016). It is believed that injustice at the pitch

brought aggression outside the pitch (fan aggression) (Van der Meij *et al*., 2015). However, past studies have identified that technology reduced mistakes and error ratio and helped in producing more correct decisions (Leveaux, 2010; Carlos *et al.,* 2019; Ghosh *et al*., 2019; Murray & Varley, 2019) that provides more justice for the teams. Therefore, VAR helps to bring justice to the game by avoiding human error that can lead to undue favour for a team.

Fair play

Participants of this study agreed that VAR is increasing fair play and preventing tricky practices (making complicated decisions easier and fairer). This agrees with past studies, as Sheridan (2003) has noted that technological innovations can shape 'fair play' norms, as the increasing use of technology in some elite sports can detect rule violations. Past studies have claimed that people tend to be more cooperative when they perceive that a process is fair and less cooperative, when they perceive it is unfair (Simmons, 2010). Fairness makes the competition better both physically and ethically (Henne, 2014). As a result, after VAR introduction there is less aggression observed both in fans and athletes. For instance, Carlos *et al.* (2019) demonstrate that there was a decrease in the number of fouls and yellow cards after the implementation of VAR. Therefore, the results of the study shed light on the importance of VAR, as it is a source of fair play in the game because it removes the fear of misjudgement and bad decisions by referees. Moreover, as fair play is best understood as rule-following (Sheridan, 2007), the role of VAR is indispensable in this regard.

LIMITATIONS

This study focused entirely on Turkish football fans. Also, the study opted for convenient sampling rather than a random sample to identify VAR implications among fans. As Bae *et al*. (2015) mentioned that different target markets among the countries for sport marketers may cause the differences in the results. Therefore, it is required to conduct a study on a broader scale involving fans of other countries and sports using random method of selecting participants to make results more generalised.

CONCLUSION

This study focuses on the opinions of fans on the implementation of VAR. Best (2011) argued that football leagues used to implement decisions without consulting fans, even though fans are directly affected by their decisions. Fans are amongst the most important stakeholders in sports, and, therefore, their opinion matters a lot. Therefore, a study that investigates fans' opinions is a useful addition for both academia and practitioners.

The study identified five effects of VAR on football: four positive ones and a negative one. According to the fans, VAR increases the competition between teams, helps referees who are less pressured due to the assistance of VAR and reduces the effect of human error. Fans also indicated that VAR brought justice and fair play to football, as VAR decision-making does not discriminate. One negative effect that was identified is that VAR is killing the passion in the sport, because it increases the stoppage time and uncertainty for important moments of the game (when a goal is scored or a foul is claimed for a penalty kick). The findings of the study provide a picture of fans' thinking on VAR. Moreover, the results of the study can help sports

organisations present a better image of VAR after knowing the positive and negative views of the fans.

The results of the study are important for managers of sport federations. Fans indicated that VAR could be solution to many problems faced in the past (criticism, aggression). But now the problem is correct implementation of VAR. Also, fans are more critical than ever before VAR introduction, because now federations have no excuse of mistakes and error. Therefore, a better strategy is needed to implement the VAR to attain best results. Fans also indicated that VAR has the negative affect, namely killing the passion of the game. For that purpose, sport federations have to think how to make a game free flowing. Transparency is another issue in this regard. However, it is important to show direct instant replay on the stadium screens, making things more transparent.

Conflict of interest

The authors declare that there is no conflict of interest.

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