



Arařtırma Makalesi

Geliř Tarihi/Received: 01.03.2021

Kabul Tarihi/Accepted: 08.07.2021

DOI10.17155/omuspd.: 888721

THE EFFECT OF DIFFERENT SOUNDS ON YOUTH FOOTBALL PLAYERS' PASS RATES: A PILOT STUDY

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ABSTRACT

This study examines the effects of different sounds on youth football players' pass rates. The sample group comprised of 20 volunteering youth football players with an average age of 13.2 ± 0.10 years, average height of 1.60 ± 0.5 cm, average weight of 50.4 ± 7.12 kg and average body mass index of 19.59 ± 1.55 kg/m². Pass accuracy was evaluated while the participants listened to vuvuzela sounds as negative sound and fans' sound as positive sound. During the tests, sound level was determined as 80 decibels (dB) and the sound system measured how many passes, accurate passes and inaccurate passes participants made within a minute. The participants had their tests on 3 different days with an interval of 48 hours, with a different sound each day and the sounds were determined with lot method. Pass rates of the participants were measured with a Hit/It pass meter. Statistical analyses were performed using the program SPSS 20. MANOVA was used to determine the difference between the participants' pass percentage performances with different sounds and Bonferonni test was used to determine the differences found. The significance level was $p<0.05$. It was found that inaccurate passes were more common with the vuvuzela sound than with fans cheering or silence. It was also found that the total pass rate with the vuvuzela sound was higher than with the sound of fans cheering or silence ($p>0.05$). As a result, it was found that although young players passed statistically more under pressure, their inaccurate pass rates also increased.

Keywords: Football, pass, sound

FARKLI SESLERİN GENÇ FUTBOLCULARDA PAS ORANLARINA ETKİSİ: PİLOT ÇALIřMA

ÖZ

Bu çalışmanın amacı; farklı seslerin genç futbolcularda pas oranlarına etkisini incelemektir. Çalışmanın örneklem grubunu yaş ortalaması 13.20 ± 1.0 yıl, boy ortalaması 160 ± 0.5 cm, vücut ağırlık ortalaması 50.4 ± 7.12 kg ve vücut kitle indeksi 19.59 ± 1.55 kg/m² olan toplam 20 gönüllü altyapı futbolcusu oluşturmuştur. Katılımcılara sessiz ortamda, olumsuz ses ve olumlu sesli ortamda pas testleri uygulanmış; olumsuz ses olarak vuvuzela sesi, olumlu ses olarak taraftar sesi dinletilmiştir. Testler sırasında ses düzeyi 80 desibel (dB) olarak belirlenmiştir ve ses sistemi 1 dakika süre içerisinde katılımcıların toplam kaç pas, isabetli pas ve yanlış pas yaptığını ölçmektedir. Katılımcılar 48 saat ara ile 3 farklı günde, her bir gün farklı bir ses uygulaması ile testlerini gerçekleřtirmişler ve sesleri kura yöntemiyle belirlemişlerdir. Katılımcıların pas oranları Hit/İt pas ölçer ile gerçekleştirilmiştir. İstatistiksel analizler SPSS 20.00 paket programı kullanılarak gerçekleştirilmiştir. Katılımcıların farklı ses türlerinde pas yüzde performansları arasındaki farkın belirlenmesinde Manova analizi kullanılmış; ortaya çıkan farklılıkların belirlenmesinde Benferonni testinden yararlanılmıştır. Çalışma süresince anlamlılık düzeyi $p<0.05$ olarak kabul edilmiştir. Araştırma sonucunda; vuvuzela sesindeki isabetsiz pas oranının, seyirci sesi ve sessiz durumlardaki puanlardan daha yüksek olduğu görülmüştür. Bunun yanı sıra vuvuzela sesinde toplam pas oranının da seyirci sesi ve sessiz durumlardaki puanlardan daha yüksek olduğu görülmüştür ($p>0.05$). Sonuç olarak genç futbolcuların baskı altında istatistiksel olarak daha fazla pas yaptıkları görülsede pas hata oranları da aynı orantıda yükselmiştir.

Anahtar Kelimeler: Futbol, pas, ses

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INTRODUCTION

Football's popularity has been increasing since the twentieth century. It is played professionally and competitively by today's most important clubs (Bilgin, 2017). This has also led to increased research on football. It is one of the few sports known and played around the world – more than one billion people watched the 2014 Germany World Cup final match (Vonderheide, 2015). Studies have been performed on fans' responses to when referees issue yellow cards or make decisions (Unkelbach et al. 2010; Nevill et al. 1999). However, there are not many studies on effect of sounds, which does affect performance (Sert, 2015).

In addition to physical and physiological factors, football should be examined in every aspect such as environmental factors that affect performance. For example, external factors such as negative sounds made by fans should be evaluated, which are independent of players' physical or physiological development (Bayraktar et al. 2009). Sounds have a strong effect on some players. To block out the vuvuzela trumpet sound used in the 2010 World Cup, some players used earplugs. Xabi Alonso said, "They make a terrible noise and it's not a good idea to have them on sale outside the ground they try to ban them from being sold on the street" (Guardian, 2009). Sound is defined as the result of pressure changes in the air that activate the eardrum. The human ear can distinguish sound pressure over a very wide area and sound can be very disruptive to performance at high decibels (Öz et al. 2020). Sounds may be very different if the stands are full and this is one of the most important factors that affect football players (Bilgin, 2017).

Passing is one of the most important technical aspects of football and can be disrupted by the sounds of fans. Passing is moving the ball between teammates. Passing should be practiced as a team and players should know why and where they should pass and what the intensity should be before making a pass (Keskin, 2015). Despite all this information, the number of studies determining the effects of different sounds on performance is limited. Therefore, this study can be considered a baseline for future studies. It may help players advance to upper age groups to play in a controlled manner under positive or negative sounds. The aim of this study is to examine the effects of different sounds on youth football players' pass percentage.

METHOD

Twenty youth football players voluntarily participated in this study. On average, they were age 13.20 ± 1.0 years old, 160 ± 0.5 cm tall, weighed 50.4 ± 7.12 kg, and had body-mass indices (BMI) of 19.59 ± 1.55 kg/m². The study was approved by the Aydın Adnan Menderes

Medical Faculty Ethics Committee (E-53043469-050.04.04-5408). Before starting the study, all participants signed a voluntary consent form that described the study's purpose and possible risks. Anthropometric measurements were taken first. On test days, the pass percentage test was performed with a specific sound. There was a rest period of 48 hours between tests of different sounds. Participants performed tests with negative sounds, positive sounds, and silence. Sounds were selected following Otte et al. (2020) and Arıkan (2010) and played over the sound system at 80 decibels (dB), a measure of sound intensity. Before each test, players did a standardized 15-minute warm-up program of 5 minutes of jogging and 10 minutes of active stretching. The Hit/It pass meter device was used to determine the percentage of successful passes. Tests were performed at the Bursaspor youth setup facilities.

Anthropometric measurements:

To measure height we used a Seca brand stadiometer with 1 mm precision. Player stood upright, barefoot, and with only wearing short. We adjusted the sliding caliper on the scale to touch the player's head. The weight of players was also measured with barefoot. Players only wore sports equipment, standing upright, with the soles of the feet in full contact with the metal part of the scale.

Sound Protocol:

Tests were done with three sounds: negative, positive, and silence. Similar to Arıkan's (2010) study, the vuvuzela sound was the negative sound and the sound of fans cheering was the positive sound, following Otte et al. (2020). Sounds were amplified in a sound system at 80 dB. Participants were assigned a test by the lot method on same day as the test.

Hit/It Pass Meter:

Participants' pass percentage measurements were performed with Hit/It pass meter that enables player development such as footbonaut tablea. The Hit/It pass meter, developed by Şumnulu and Gürsoy (2018), measures passes, environmental variables, speed, and correct decision-making abilities of the players. It is a 72-panel system that is 12 meters long and has 10 different game systems. It evaluated the number of passes per minute made by each participant. Passes that touched light sensors were treated as accurate pass while those that did not were treated as inaccurate passes.

Statistical Analysis:

For statistical analysis, the program SPSS 20 was used. In the analysis of the data, first of all, the normality of distributions was tested. To determine the difference between the accurate pass percentages with different sounds, MANOVA comparisons were used. To

determine the difference in the study, Benferonni tests were used. The significance level was $p<0.05$.

RESULTS

This study was conducted to examine the accurate pass rates while listening to different sounds.

Table 1. Demographic characteristics of the participants (n=20)

	n	Min.	Max.	Mean	SD
Age (years)	20	12	14	13.20	1.005
Height (cm)	20	150	168	1.6085	.05204
Weight (kg)	20	40.4	61.3	50.470	7.1262
BMI	20	17.1	22.5	19.590	1.5580

Table 2. In-group passing success rates of the participants according to different sounds

Scores	Group	Mean	SD	F	p	Bonferroni	F (model)	p
Vuvuzela	⁽¹⁾ Total passes	20.45	4.186	153.568	<0.001	1>2	86.025	<0.001
	⁽²⁾ Accurate	17.30	3.164			1>3		
	⁽³⁾ Inaccurate	3.05	2.460			2>3		
Fans Cheering	⁽¹⁾ Total passes	18.70	4.194	199.306	<0.001	1>2	86.025	<0.001
	⁽²⁾ Accurate	15.90	1.651			1>3		
	⁽³⁾ Inaccurate	2.30	1.689			2>3		
Silence	⁽¹⁾ Total passes	18.90	2.245	563.940	<0.001	1>3	86.025	<0.001
	⁽²⁾ Accurate	17.65	2.084			2>3		
	⁽³⁾ Inaccurate	1.25	0.967					

The results show that accurate pass percentages were statistically different while listening to each sound ($p<0.05$). According to the Bonferroni test, there were overall more passes and more accurate passes than inaccurate pass scores while listening to the vuvuzela sound. While listening to fans cheering, there were fewer overall passes. Accurate passes were more common than inaccurate passes. With silence, there were more both total passes and accurate passes than inaccurate passes.

Table 3: Intergroup passing success rates of the participants according to different sounds

Scores		Mean	SD	F (group)	p	Bonferroni	F (model)	p
Total pass	Vuvuzela sound	20.45	4.186	1.371	0.262	-		
	Fans cheering	18.70	4.194					
	Silence	18.90	2.245					
Accurate pass	Vuvuzela	17.30	3.164	3.012	0.057	-	3.186	0.006
	Fans cheering	15.90	1.651					
	Silence	17.65	2.084					
Inaccurate pass	Vuvuzela	3.05	2.460	4.986	<0.001	1>3		
	Fans cheering	2.30	1.689					
	Silence	1.25	0.967					

A multi-factor MANOVA was performed to evaluate differences between sound types (Graph 1). Inaccurate passes were statistically different ($p < 0.05$). The Bonferonni test showed that inaccurate passes were more common while listening to the vuvuzela sound than fans cheering or silence. The total pass rate was also higher with the vuvuzela sound, but this difference was not statistically significant.

Discussion

Football has many factors, from the player to external factors. Although tactics and physiology are important, so is technique such as passing, shooting, and dribbling. Technical training should be initiated at a young age in all sports as well as football (Malina et al. 2007). Passing and pass ratio are key factors in a team's success (Rein, 2017; Zhou, 2018; Mackenzie et al., 2013). Pass rate can also be affected by external factors. Inan (2019) found that the support and intensity of fans in five different leagues was an influential factor in teams' success.

In this study, as a consequence of the vuvuzela sound, youth football players pass more often than in the presence of other sounds, although this difference is not statistically significant. Yet they also made more inaccurate passes ($p < 0.05$). Sound is present in every moment of human life and daily life for listening and communicating (Kawada, 2004). The sports field is a very important setting for coach–player communication. The sound of fans cheering can turn into noise as decibels increase, which can disrupt the player's physiological and psychological balance. This is accompanied by stress, distractibility, and increased heart rate. Studies conducted on this (Arıkan, 2010; Sert, 2015) found that noise had a statistically significant effect on the players' performance. Many factors affect the performance of

players, but this is complex due to the number of factors (Hazar, 2017). In a study examining the effect of sound level on balance, Hazar (2017) showed a significant result in favor of men with eyes open and closed for silent oscillation. The importance of fans in sports has an important place in players' psychology (Bilgin, 2017). In the Bursaspor-Beşiktaş match in 2016, the fans broke a record by reaching 135 decibels with the whistling sound. In a study on this subject, Arslan et al. (2002) revealed that the most annoying types of sounds and noise for athletes are the cheers of the fans (34.8%), the sounds made by the fans with sound makers (30.5%), and the collective whistling sounds of the fans (29.8%). In a study conducted by Otte et al. (2020), football players pass faster while listening to negative sounds and silence than positive sounds.

This can be interpreted as players wanting to pass more quickly in an uncomfortable sound environment and as a result, the rate of inaccurate passes increases. This finding may direct new training methods for young football players under pressure. Furthermore, in our study, the environment with the highest accurate pass rate was a quiet environment. This case once again reveals the importance of the pressure and support of the fans in football. It is thought that technical training to be given to young football players in a positive sound environment can increase their self-confidence and technical capacity. This study agrees with similar studies in the literature.

The results show that inaccurate passes are more common while listening to the vuvuzela sound than while listening to fans cheering or silence. The total pass rate was highest while listening to the vuvuzela sound, but the difference is not statistically significant. In a study on the effect of sounds made by multiple objects on college footballers in Canada, McCaffrey and Dorsch (2017) did not find a difference between the participants in the six-session trial. They did find that participants with sound in the environment followed up faster in the 18-session trial.

Conclusion

In conclusion, external negative sounds make players pass more often but less accurately. They pass more accurately listening to fans cheering or silence. There are few studies on the effects of sounds on football performance so this may be a baseline for future studies. These studies could be done with other sounds, decibel levels, and age groups.

Author Contribution

Idea/Concept, Literature Review, Data Collection, Writing the Article: Alper Kartal

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