A COMPARATIVE STUDY OF FIELD GOAL ATTEMPT INACCURACIES IN SELECTED MEN'S COLLEGE BASKETBALL GAMES

BY

MICHAEL GLENN SUTTON

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Approved by:

Wm. A. Steinbrecher
Chairman, Thesis Committee

Judy A. Clarke
Member of Health and Physical
Education Department

Roger E. Thomas
Member of Health and Physical
Education Department

E. Ole Larson
Department Chairman

Richard H. Rupp
Dean of Graduate School

VITA

Michael Glenn Sutton was born on March 21, 1956, in Farmville, North Carolina. He attended Winterville School for the first nine years, and D. H. Conley High School for the remaining three years of his public school education. During high school, he participated in basketball and baseball. He entered East Carolina University in 1974, and received a Bachelor of Science Degree in Health and Physical Education from the institution in May of 1978. During his undergraduate education, he worked as Assistant Basketball Coach at D. H. Conley High School.

After accepting a position as Dormitory Director and Assistant Basketball Coach at Lees McRae College, he enrolled in the Graduate School of Appalachian State University in August of 1978. He is completing the work on the Master of Arts Degree in Health and Physical Education.

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by

Michael Glenn Sutton

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ABSTRACT

This investigation was undertaken to determine if there were any significant differences in missed field goal attempts in basketball falling short or long of the basket in selected men's college basketball games, and whether those errors were different in the first half, second half, or the complete game. Films and videotapes of the home games of three North Carolina college basketball teams were studied, and data were recorded. Shots were recorded as short or long for each three time periods: first half, second half, and the complete game. There were 1353 shots recorded from 36 games, and these data were analyzed using a Chi Square Test. It was concluded that shooting errors in men's college basketball games appeared to be mixed in terms of missing short or missing long, similar in type during each half and for the entire game, and similar in type for both the home and visiting teams.

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Chapter I

INTRODUCTION

In 1891 a young instructor named James Naismith, at what is now Springfield College, attempted to find an activity to fill in the void between the football and baseball seasons. Dr. Naismith sought a game that would be interesting, easy to learn, and easy to play in the winter by artificial light (15:33). From this search came the invention of basketball. The object of the game today is the same as it was when the first set of rules was originated in early 1892--to make more goals than the other team within the prescribed time limit (13:27).

The aspect which the majority of coaches, players, and teachers have emphasized the most in basketball is probably shooting. In this area there have been many changes since the origin of the game and players and coaches still seek to improve this skill. To accurately throw an inflated sphere thirty inches in circumference through a metal ring with a diameter of eighteen inches a variety of factors come into interaction. Among these are: balance, relaxation, confidence, and perhaps the most important of all, locating the basket or the coordination between the eyes and the muscles. The ball is propelled toward the basket by the muscles of the arms and body, while the eyes supply the necessary information concerning the direction and distance of the basket (12:37).

There have been many different opinions and theories about shooting a basketball involving style, point of aim or focus, mechanical form, and even where most shots fall in relation to the basket. Some coaches and researchers believe that most shots taken in basketball fall short of the intended target while others note that most shots fall long of the intended target.

Statement of the Problem

The purpose of this investigation was to determine if there were any significant differences in missed field goal attempts in basketball falling short or long of the basket in selected college basketball games, and whether these errors were different in the first half, second half, and the whole game.

Sub-problems

The sub-problems of the investigation were as follows:

1. The selection of subjects
2. The collection of data
3. The organization and analysis of the data collected.

Hypotheses

The hypotheses of the investigation were:

1. There is no significant difference in the number of missed field goals falling short or long of the basket in the first half.

2. There is no significant difference in the number of missed field goals falling short or long of the basket in the second half.

3. There is no significant difference in the number of missed field goals falling short or long of the basket in the complete game.

Definition of Terms

Basket. The basket is a metal ring, 18 inches in diameter, which from any angle on the floor, has a front, back, and center.

Lateral deviation. Lateral deviation was the term used to describe those missed field goals which deviated to the left or right of the center of the basket.

Long. Long was the term used to define missed field goal attempts which fell long of the center of the rim or basket.

Longitudinal deviation. Longitudinal deviation was the term used to describe those missed field goals which deviated in front of (short) and behind (long) the center of the basket.

Point of aim or focus. Point of aim or focus was the term used to describe the spot at which a shooter aims, focuses, or directs his attention while shooting.

Short. Short was the term used to define those missed field goal attempts which fell in front of the center of the rim or basket.

Basic Assumptions

The two basic assumptions used in this study were:

1. Shooting a basketball is a neuromuscular skill, subject to the force of the muscles being used and is affected by visual factors.

2. At the high skill levels of college basketball players, the vast majority of errors in missed field goal attempts are in distance or longitudinal deviation and not direction or lateral deviation. This is due likely in that misses in lateral direction are easily evident and compensated for (10:22) and that the direction of the shot is a matter of releasing the ball in a straight line through the body to the goal or basket (13:136).

Delimitations

The investigation was delimited to the following:

1. Basketball game films and/or videotapes of the players from three North Carolina college basketball teams and their home game opponents during the 1978-1979 basketball season were used. These teams included: Appalachian State University, East Carolina University, and the University of North Carolina at Chapel Hill.

2. The missed field goal attempts during each game were divided into time periods of: first half, second half, and the complete game. Each of these time periods had recorded missed field goals which were either short or long and were analyzed and compared individually and as a collective group through the use of a Chi Square Test.

3. All missed field goals were recorded as data except the following: lay-ups, bank shots, desperation shots, offensive tap attempts, blocked or deflected shots, and shots taken during overtime. By using the aforementioned shots, the statistics would not be a true indication of the location of the missed field goals.

Limitations

The investigation was limited in that:

1. Only highly skilled basketball players at the college level were used in the study.

2. All shots taken during the games were not used as data in the investigation.

3. Many factors involved in shooting a basketball under actual game conditions could not be controlled.

4. The data recorded were subject to possible human error on the part of those who filmed or taped the games and the investigator.

Significance

This investigation hopefully offers some evidence which will aid those interested in coaching, teaching, and playing basketball in understanding more about shooting inaccuracies, and enable them to improve and refine the act of shooting a basketball. It is hoped that this study will also aid these people in determining a point of aim or focus while shooting, and will lead to further research in the area of shooting and basketball in general.

Chapter II

REVIEW OF RELATED LITERATURE

There is an abundance of literature dealing with shooting in basketball. The scope of these studies ranges from accuracy improvement to points of aim or focus while shooting. Although there is a wealth of such literature, little has been done in the area of scientifically determining whether the majority of field goal attempts fall short or long in relation to the center of the basket.

Studies on Accuracy

Harvey reported that a study of selected college basketball games between 1949 and 1966 showed that a 40 per cent increase in the number of points occurred. This increase in the number of points resulted from an increase in field goal and free throw attempts because the number of field goal attempts and free throw attempts remained relatively constant over the period (11:22, 26).

Scanlon conducted an investigation to determine if the focus of an individual's attention while performing field goal shooting in basketball had any relationship to accuracy. Fifteen male Springfield College students with previous college basketball experience participated in the study. The subjects were divided into three equal groups and took twelve shots each from nine, fifteen, and twenty-one feet in a straight line with the front of the basket and

perpendicular to the free throw line. Each group was tested from each spot on three different occasions, for a total of thirty-six shots from each designated area for each testing period. The first shooting station had luminous paint on the front of the basket while the second station had luminous paint on the back of the basket, and the third shooting station had luminous paint on the entire basket including part of the net. Scanlon concluded in his study that the most advantageous method of aim was at the back of the rim or basket while the least advantageous method of aim was toward the front of the rim or basket (16:6-13, 85).

Geurin carried out a similar investigation to determine the effects of extraneous visual cues on the accuracy of shooting a basketball. In his experiment, twenty students at Eastern Illinois University who had some competitive basketball playing experience took twenty shots at three different positions around the key area. The control group shot in a lighted gymnasium while the experimental group shot in a darkened gymnasium with the rim of the basket being the only lighted area. Guerin found that the subjects did better in scoring baskets under the lights than when the lights were out (8:7, 13).

Studies on Deviation

Griffith conducted one of the earliest experiments involving distance errors in basketball. Nine men on the varsity freshman team were asked to practice free throws before and after practice. Each subject shot ten shots prior to and after practice twice a week for

four and a half weeks. Each throw was recorded and plotted on a diagram of the basket loop, thus giving an accurate account of those shots that fell too short or too long, as well as those deviating to the left or right of the basket's center. Percentage comparisons of accuracy totals showed no significant differences in the number of shots made before practice as opposed to those made after the practice period, with both having accuracy levels of about 50 percent. There was, however, a difference in the type of error made. The type of error differed significantly as the number of direction error dropped from 22 percent to 11 percent and the number of distance errors increased slightly from 28 percent to 36 percent. Griffith noted that most of the errors lost in direction were gained in distance and posed the question of concern for distance errors since there seemed to be a higher number of distance errors than direction errors. Closer inspection of the data for the subjects revealed that after the experimental period there was an increase in the total of shots missing the basket long. The total of shots missed long was 42 percent for the before practice training period while the number was 34 percent for the after practice period. Even though there was a total increase in the number of shots missing long, there were still more shots missing short of the basket than long of the basket after the practice period. From his findings, Griffith concluded that more shots were missed short than long (9:22, 24, 54).

Edgren concluded that the greater error in accuracy in free throw and field goal shooting was due to distance or longitudinal errors. In studying a ten game intramural schedule, he found that

errors in distance occurred nearly twice as often as errors in direction. He noted that the ability to propel the ball with an even amount of force giving good direction was learned sooner than the ability to perceive distance and muscular feel for distance.(7:161-162). Cooper stated that feedback is information that results from a response and it is most often used to make slight changes in the next response. He noted that a player uses the feedback from a missed shot to make a slight change in his delivery technique. Cooper found that corrections for directional misses were quite immediate and feedback was employed while distance misses were harder to adjust for (5:24).

In a study using sixty-four college students from two classes at Montana State University Ballinger found the longitudinal deviation mean. Each subject took five shots from three different locations, each location being fifteen feet from the basket's center. He concluded that the greater longitudinal mean was the result of greater deviations short rather than by the deviations long (2:4, 5, 48).

Gillespie conducted an experiment involving thirty subjects between the ages of fourteen and eighteen selected from a high school basketball program. Each subject shot one hundred attempts for each of the following shots: lay-up, free-throw, and jump shots. Each missed attempt was recorded as being either near or far in relation to the basket so as to obtain numbers which could be compared with each other. Gillespie found that more jump shots and free throws were missed than were lay-ups. In all three categories he found that of the missed shots, more were missed near than far in realtion to the center of the basket (9:21, 48).

Points of Aim or Focus

Bunn proposed that all shots be bank shots from the point of view of dynamics. He noted that a tabulation of shots indicated that more shots fall short of the intended target than long and that it was probably due to the fact that most players are taught to use the nearest point on the rim as a target. With this as the point of aim or focus, the distribution of shots will be short of and beyond this point. As players tire, they begin to shoot short of their target. It would therefore appear, he proposed, that coaches should emphasize over-shooting with use of the backboard. Thus, short shots would fall into the basket and long ones, particularly with the help of backspin, would drop in from the backboard. Bunn stated that the target certainly should not be the front edge of the basket because a study on shooting as a target in the center of the basket should that scores improved 20 percent over the method of shooting at the front edge of the basket or rim (4:257).

It was Lambert's opinion that the shooter should train his eyes on a point just over the front of the rim or basket. Then, if the shot is an over-shot, it naturally will become a bank shot, and the ball will drop through the goal (12:38). Allen differed slightly in that he suggested players should not just shoot over the rim, but shoot to clear a spot one foot above the basket (1:150). In shooting above the basket, Mortimer suggested that the best angle for a ball approaching the basket was at fifty-eight degrees with the horizontal (14:242).

Bee compared shooting a basketball to firing a rifle. It is important, he noted, to draw a bead on the target and then concentrate on that point before, during, and after the shot. He suggested that the eyes be trained on a spot bisecting the rim of the basket during the shot (3:56, 71). Sharman stated that the target area a shooter should sight is comparable to a small bull's eye in a rifle target. He noted that a shooter should aim at the back of the rim for three reasons: 1) a shot with the properly imparted backspin can fall in the basket, 2) a ball aimed straight at the back of the rim has a nine inch margin for error theoretically, and 3) a long straight shot will bank in (17:38-39).

Cousy contened that sighting is using the eyes to locate a target in space; and while the eyes are focused on the target, they become a type of computer which constantly updates the pictures of the target or point of focus. Consequently, the smaller the point of focus, the greater the accuracy. Therefore, since a person cannot focus on empty spaces, such as the empty spaces of the goal, he should choose a sighting point as near as the real target as possible. For shots other than the bank, the shooter should choose either the front or the back of the rim as a target and hold that focal point from the second the shot is begun until it is completed. Cousy suggested that it is best just to drop the ball over the rim and even if the ball is slightly off, there is a chance it will drop to the goal or hand on the rim for an easy follow shot (6:37-38).

Chapter III

PROCEDURES

Sub-Problem One

In order to study the location of missed field goal attempts under actual game conditions, some method of obtaining subjects which could be observed during the actual game in which they played had to be devised. Since the investigator could not be at many different places at once, game films and/or videotapes were used to collect the necessary data. After corresponding with several college coaches to find out which teams filmed or taped their games, it was decided to select three which filmed or videotaped all of their home games. After receiving permission from the respective coaches, the following teams were selected: Appalachian State University, East Carolina University, and the University of North Carolina at Chapel Hill. Each of the teams expressed a willingness to aid the researcher in his endeavor and allow the investigator to systematically review the games and record the shots taken by the players during the games.

Sub-Problem Two

The data were collected by visiting each of the schools involved in the study and personally reviewing each of the school's individual game films or videotapes. This was accompished during a three week period beginning March 9, 1979, and ending March 30, 1979. Each game

film or videotape was analyzed by the investigator with a 20 minute rest interval between sessions in order to avoid eye fatigue. Each shot which was selected for use was recorded on tabulation forms which were divided into three sections, with two subdivisions for each section. The sections were divided into first half, second half, and the complete game while the subdivisions used denoted whether the shots fell short or long of the basket.

Sub-Problem Three

The data collected consisted of the first half, second half, and complete game totals of the short and long shots by all of the players and were analyzed through the use of a Chi Square Test. The totals of all the home games for all of the schools involved in the study were the final data analyzed. The final totals of short and long misses were analyzed in regard to each of the separate time periods involved. The shots mi-sed short were compared to the shots missed long in each of the time periods as well as compared to each separate time period for the misses short and long respectively. By using the chi square method of analyzing the data, the researcher could compare the observed and expected frequencies for the short and long misses in each of the three time periods and compare the computed values to discover whether there were significant differences.

Chapter IV

RESULTS AND DISCUSSION

A total of 1353 shots in 36 games were recorded during this investigation. This total was the sum of all three teams and their home opponents. The data were analyzed through the use of the Chi Square Test with one degree of freedom at the .05 level of significance. The Chi Square Test was used to compare the observed frequency with the expected frequency in order to measure significant differences if they occurred. A computed chi square value of 3.841 was needed for rejection of any of the null hypotheses.

The data collected for Appalachian State University and its opponents in 12 games represented 34.1 percent of the total shots or 461. Of those 461 shots, Appalachian State University took 223 or 16.5 percent of the total shots, while its opponents took 238 or 17.6 percent.

The analysis for Appalachian State University's opponents' shots resulted in a chi square value of 0.6084 which was not significant at the .05 level (see Table 1). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by Appalachian State University's opponents in the first half, second half, or complete game.

Table 1

Frequencies and Chi Square Values for Appalachian State University's Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	58	55	0.1636
Long first half	52	55	0.1406
Short second half	61	64	0.1636
Long second half	67	64	0.1406
Complete game	238	238	0.6084

The analysis of the shots taken by Appalachian State University resulted in a chi square value of 0.3610 which was not significant at the .05 level (see Table 2). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by Appalachian State University in the first half, second half, or complete game.

Table 2

Frequencies and Chi Square Values for
Appalachian State University

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	52	54.2422	0.0927
Long first half	60	57.7578	0.0935
Short second half	56	53.7578	0.0870
Long second half	55	57.2422	0.0878
Complete game	223	223.0000	0.3610

In analyzing the combined data for Appalachian State University and its opponents, a resulting chi square value of 0.0163 was computed which was not significant at the .05 level (see Table 3). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by Appalachian State University and its opponents in the first half, second half, or complete game.

Table 3

Combined Frequencies and Chi Square Values for Appalachian State University and Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	110	109.3145	0.0043
Long first half	112	112.6855	0.0042
Short second half	117	117.6855	0.0040
Long second half	122	121.3145	0.0039
Complete game	461	461.0000	0.0164

The data collected for East Carolina University and its opponents in 12 games represented 35.7 percent of the total shots or 483. Of those 483 shots, East Carolina University took 259 or 19.1 percent of the total shots, while its opponents took 224 or 16.6 percent. The analysis for East Carolina University's opponent's shots resulted in a chi square value of 0.2041 which was not significant at the .05 level (see Table 4). The null hypothese were accepted since there were no significant differences in the number of shots missed short or long by East Carolina University's opponents in the first half, second half, or complete game.

Table 4

Frequencies and Chi Square Values for East Carolina University's Opponents

	Observed Frequencies	Expected Frequencies	X^2 Values
Short first half	57	58.6786	0.0480
Long first half	67	65.3214	0.0431
Short second half	49	47.3214	0.0595
Long second half	41	52.6786	0.0535
Complete game	224	224.0000	0.2041

The analysis of the shots taken by East Carolina University resulted in a computed chi square value of 0.6592, which was not significant at the .05 level (see Table 5). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by East Carolina University in the first half, second half, or complete game.

Table 5

Frequencies and Chi Square Values for
East Carolina University

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	65	68.2625	0.1560
Long first half	71	67.7375	0.1571
Short second half	65	61.7375	0.1724
Long second half	58	61.2625	0.1737
Complete game	259	259.0000	0.6592

In analyzing the data for East Carolina University and its opponents, a resulting chi square value of 0.8467 was computed which was not significant at the .05 level (see Table 6). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by East Carolina University and its opponents in the first half, second half, or complete game.

Table 6

Combined Frequencies and Chi Square Values for East Carolina University and Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	122	127.0393	0.1999
Long first half	138	132.9607	0.1910
Short second half	114	108.9607	0.2331
Long second half	109	114.0393	0.2227
Complete game	483	483.0000	0.8467

The data collected for the University of North Carolina and its home opponents in 12 games represented 30.22 percent of the total shots 409. Of these 409 shots, the University of North Carolina took 193 or 14.26 percent of the total shots, while its opponents took 216 or 15.96 percent. The analysis for the University of North Carolina's opponents' shots resulted in a chi square value of 1.4945 which was not significant at the .05 level (see Table 7). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the University of North Carolina's opponents in the first half, second half, or complete game.

Table 7

Frequencies and Chi Square Values for the University of North Carolina's Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	57	52.5093	0.3841
Long first half	49	53.4907	0.3701
Short second half	50	54.4907	0.3770
Long second half	60	55.5093	0.3633
Complete game	216	216.0000	1.4945

The analysis of the shots taken by the University of North Carolina resulted in a computed chi square value of 0.5364 which was not significant at the .05 level (see Table 8). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the University of North Carolina in the first half, second half, or complete game.

Table 8

Frequencies and Chi Square Values for
the University of North Carolina

	Observed Frequency	Expected Fequency	X^2 Values
Short first half	58	55.4715	0.1153
Long first half	48	50.5285	0.1265
Short second half	43	45.5285	0.1404
Long second half	44	41.4715	0.1542
Complete game	193	193.0000	0.5364

In analyzing the data for the University of North Carolina and its opponents a resulting chi square value of 2.0233 was obtained which was not significant at the .05 level (see Table 9). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the University of North Carolina and its opponents in the first half, second half, or complete game.

Table 9

Combined Frequencies and Chi Square Values for the University of North Carolina and Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	115	107.8142	0.4789
Long first half	97	104.1858	0.5154
Short second half	93	100.1858	0.4956
Long second half	104	96.8142	0.5334
Complete game	409	409.0000	2.0233

The data collected for the three teams and their opponents in 36 games yielded a total of 1353 shots. Of those 1353 shots, the three home teams took 675 shots or 49 percent of the total shots, while their opponents took 678 shots or 49.3 percent of the total. The analysis of the combined data for the three teams' opponent's resulted in a computed chi square value of 0.7169, which was not significant at the .05 level (see Table 10). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the visiting teams in the first half, second half, or complete game.

Table 10

Combined Frequencies and Chi Square Values for the Visiting Teams

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	172	166.4897	0.1824
Long first half	168	173.5103	0.1835
Short second half	160	165.5103	0.1750
Long second half	178	172.4897	0.1760
Complete game	678	678.0000	0.7169

The analysis of the combined data for the three home teams resulted in a computed chi square value of 0.1846, which was not significant at the .05 level (see Table 11). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the three home teams in the first half, second half, or complete game.

Table 11

Combined Frequencies and Chi Square Values for the Three Home Teams

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	175	177.7867	0.0437
Long first half	179	176.2133	0.0441
Short second half	164	161.2133	0.0482
Long second half	157	159.7867	0.0486
Complete game	675	675.0000	0.1846

In analyzing the data for the three home teams and their visiting opponents, a resulting chi square value of 0.0943 was computed, which was not significant at the .05 level (see Table 12). The null hypotheses were accepted since there were no significant differences in the number of shots missed short or long by the three home teams and their visiting opponents in the first half, second half, or complete game.

Table 12

Combined Frequencies and Chi Square Values for the Three Home Teams and Visiting Opponents

	Observed Frequency	Expected Frequency	X^2 Values
Short first half	347	344.1789	0.0231
Long first half	347	349.8211	0.0244
Short second half	324	326.8211	0.0228
Long second half	335	332.1789	0.0240
Complete game	1353	1353.0000	0.0943

After applying the Chi Square Test to each sub-group and then as a total group, there were no significant differences in the number of shots missed short or long in the first half, second half, or complete game. The total number of shots was 1353 from 36 games, involving 33 different college teams. There were 675 total shots missed by the three home teams, while 678 shots were missed by their 33 visiting opponents. Out of the 1353 total shots, 671 were missed short (347 in the first half and 324 in the second half), while 682 were missed long (347 in the first half and 335 in the second half).

Chapter V

SUMMARY, CONCLUSION, AND RECOMMENDATION

Summary

This investigation attempted to determine whether there were any significant differences in missed field goals attempts in basketball falling short or long of the basket in selected men's college basketball games, and whether these errors were different in the first hald, second half, and the complete game. Using three North Carolina college basketball teams' home game films and videotpes, chi square values were computed for shots missed short and long in the first half, second half, and the complete game. There were 1353 shots recorded from 36 games involving 33 different teams. No significant differences in the number of shots missed short or long during any of the time periods were found after testing at the .05 level.

Conclusions

The following conclusions were drawn based on this investigation:

1. Shooting errors in men's college basketball games appear to be mixed in terms of missing short and missing long.

2. Shooting errors in men's college basketball games appear to be similar in type during each half and for the entire game.
3. Shooting errors in men's college basketball games appear to be of similar type for both home and visiting teams.

Recommendations

This investigation revealed some information regarding the location of missed field goal attempts in basketball. Further study of this particular subject is suggested by the investigator with some modifications. Suggestions for similar studies include:

1. Studies recording the location or spot each shot is taken from as well as where it falls in relation to the basket; to see what relationship, if any, distance from the basket has to longitudinal errors.
2. Studies using more teams; in order to obtain a wider sample which might eliminate possible geographical biases or philosophical coaching biases.
3. Studies using high school and professional players and teams as subjects; in order to compare various levels of players who might be less skilled or more highly skilled than those used.
4. Studies using girls and women as subjects; to compare these subjects at different levels and with men in order to detect possible variations.

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Appendix A

Missed Field Goals by Appalachian State University's Opponents

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	2	4	7	4	17
Game 2	7	7	8	9	31
Game 3	6	4	6	8	24
Game 4	7	4	6	7	24
Game 5	5	4	4	3	16
Game 6	2	5	5	5	17
Game 7	3	6	5	4	18
Game 8	4	2	1	5	12
Game 9	8	5	4	5	22
Game 10	4	2	3	4	13
Game 11	4	4	6	7	21
Game 12	6	5	6	6	23
Totals	58	52	61	67	238

Appendix B

Missed Field Goals by Appalachian State University

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	4	3	4	6	17
Game 2	6	6	6	4	22
Game 3	7	10	5	4	26
Game 4	2	2	3	3	10
Game 5	5	7	7	7	26
Game 6	6	6	8	6	26
Game 7	4	5	4	4	17
Game 8	2	6	3	2	13
Game 9	3	3	1	3	10
Game 10	3	2	4	7	16
Game 11	3	3	7	3	16
Game 12	7	7	4	6	24
Totals	52	60	56	55	223

Appendix C

Combined Totals of Missed Field Goals by Appalachian State University and Opponents

	Short first half	Long first half	Short second half	Long first half	Totals
Game 1	6	7	11	10	34
Game 2	13	13	14	13	53
Game 3	13	14	11	12	50
Game 4	9	6	9	10	34
Game 5	10	11	11	10	42
Game 6	8	11	13	11	43
Game 7	7	11	9	8	35
Game 8	6	8	4	7	25
Game 9	11	8	5	8	32
Game 10	7	4	7	11	29
Game 11	7	7	13	10	37
Game 12	13	12	10	12	47
Totals	110	112	117	122	461

Appendix D

Missed Field Goals by East Carolina University's Opponents

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	7	5	6	3	21
Game 2	3	5	3	3	14
Game 3	4	8	3	4	19
Game 4	4	5	5	7	21
Game 5	4	4	2	0	10
Game 6	4	6	6	5	21
Game 7	4	5	6	5	20
Game 8	4	7	3	3	17
Game 9	5	7	3	3	18
Game 10	9	5	6	8	28
Game 11	7	6	4	6	23
Game 12	2	4	2	4	12
Totals	57	67	49	51	224

Appendix E

Missed Field Goals by East Carolina University

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	5	9	4	5	23
Game 2	5	7	9	6	27
Game 3	6	7	5	6	24
Game 4	10	8	3	6	27
Game 5	2	2	3	3	10
Game 6	5	4	7	5	21
Game 7	5	5	5	6	21
Game 8	3	6	4	3	16
Game 9	5	4	5	6	20
Game 10	5	8	5	5	23
Game 11	6	7	7	4	24
Game 12	8	4	8	3	23
Totals	65	71	65	58	259

Appendix F

Combined Totals of Missed Field Goals by East Carolina University and Opponents

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	12	14	10	8	44
Game 2	8	12	12	9	41
Game 3	10	15	8	10	43
Game 4	14	13	8	13	48
Game 5	6	6	5	3	20
Game 6	9	10	13	10	42
Game 7	9	10	11	11	41
Game 8	7	13	7	6	33
Game 9	10	11	8	9	38
Game 10	14	13	11	13	51
Game 11	13	13	11	10	47
Game 12	10	8	10	7	35
Totals	122	138	114	109	483

Appendix G

Missed Field Goals by the University of North Carolina's Opponents

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	6	5	8	9	28
Game 2	2	1	4	4	11
Game 3	5	5	6	7	23
Game 4	8	4	3	3	18
Game 5	5	2	2	5	14
Game 6	5	4	3	2	14
Game 7	3	6	6	6	21
Game 8	3	3	4	7	17
Game 9	6	6	2	6	20
Game 10	4	5	7	7	23
Game 11	3	2	2	2	9
Game 12	7	6	3	2	18
Totals	57	49	50	60	216

Appendix H

Missed Field Goals by the University of North Carolina

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	5	4	4	4	17
Game 2	8	6	6	6	26
Game 3	2	2	2	4	10
Game 4	3	4	3	4	14
Game 5	6	4	2	3	15
Game 6	3	1	2	5	11
Game 7	5	8	3	0	16
Game 8	5	4	7	4	20
Game 9	5	3	5	5	18
Game 10	5	4	4	4	17
Game 11	5	4	2	4	15
Game 12	6	4	3	1	14
Totals	58	48	43	44	193

Appendix I

Combined Totals of Missed Field Goals by the University of North Carolina and Opponents

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	11	9	12	13	45
Game 2	10	7	10	10	37
Game 3	7	7	8	11	33
Game 4	11	8	6	7	32
Game 5	11	6	4	8	29
Game 6	8	5	5	7	25
Game 7	8	14	9	6	37
Game 8	8	7	11	11	37
Game 9	11	9	7	11	38
Game 10	9	9	11	11	40
Game 11	8	6	4	6	24
Game 12	13	10	6	3	32
Totals	115	97	93	104	409

Appendix J

Combined Totals of Missed Field Goals by Visiting Teams

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	15	14	21	16	66
Game 2	12	13	15	16	56
Game 3	15	17	15	19	66
Game 4	19	13	14	17	63
Game 5	14	10	8	8	40
Game 6	11	15	14	12	52
Game 7	10	17	17	15	59
Game 8	11	12	8	15	46
Game 9	19	18	9	14	60
Game 10	17	12	16	19	64
Game 11	14	12	12	15	53
Game 12	15	15	11	12	53
Total	172	168	150	178	678

Appendix K

Combined Totals of Missed Field Goals by Home Teams

	Short first half	Long first half	Short second half	Long first half	Totals
Game 1	14	16	12	15	57
Game 2	19	19	21	16	75
Game 3	15	19	12	14	60
Game 4	15	14	9	13	51
Game 5	13	13	12	13	51
Game 6	14	11	17	16	58
Game 7	14	18	12	10	54
Game 8	10	16	14	9	49
Game 9	13	10	11	14	48
Game 10	13	14	13	16	56
Game 11	14	14	16	11	55
Game 12	21	15	15	10	61
Totals	175	179	164	157	675

Appendix L

Combined Totals of Missed Field Goals for Visiting and Home Teams

	Short first half	Long first half	Short second half	Long second half	Totals
Game 1	29	30	33	31	123
Game 2	31	32	36	32	131
Game 3	30	36	27	33	126
Game 4	34	27	23	30	114
Game 5	27	23	20	21	91
Game 6	25	26	31	28	110
Game 7	24	35	29	25	113
Game 8	21	28	22	24	95
Game 9	32	28	20	28	108
Game 10	30	26	29	35	120
Game 11	28	26	28	26	108
Game 12	36	30	26	22	114
Totals	347	347	324	335	1353