

THE EFFECT OF MIDFIELDERS' BALL CONTROL TIME
AND SHOTS ON GOAL UPON SUCCESSFUL
TEAM PERFORMANCE IN SOCCER

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THE EFFECT OF MIDFIELDERS' BALL CONTROL TIME
AND SHOTS ON GOAL UPON SUCCESSFUL
TEAM PERFORMANCE IN SOCCER

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ABSTRACT

The purpose of the study was to determine if a significant difference existed between the winning and losing teams midfielders' ball control time and the teams' shots on goal. A secondary purpose was to determine if a significant correlation existed between the midfielders' ball control time and shots on goal. The subjects consisted of those individuals who participated at the midfielder position, throughout the course of each game, for each of the nineteen teams involved in the study. The nineteen teams comprised the schedules of the 1975 Appalachian State University and the 1975 Georgia State University Soccer Teams. The winning teams were classified as Group I and the losing teams as Group II.

The midfielders' ball control time was recorded by the investigator, and an assistant, during the time the midfielders were maintaining possession of the ball throughout each game. During most games, shots on goal statistics were available at the official scorer's table; in other instances, the investigator recorded the number of shots taken by a team on the goal.

Application of the t-test determined two significant differences. The first difference favored neither groups' mean midfielders' ball

control time. The second difference favored the mean number of shots on goal taken by Group I. The Pearson Product-Moment Correlation was employed to determine the relationship between the midfielders' ball control time and the number of shots taken by a team on the goal. The discriminant functions analysis was utilized to determine the extent of discrimination between the midfielders' ball control time and the number of shots on goal.

The findings of the study were as follows:

1. The mean difference between the midfielders' ball control time of Group I and Group II was not significant, at the .01 level of confidence.
2. The mean number of shots on goal taken by Group I was significantly greater than the mean number of shots taken by Group II, at the .01 level of confidence.
3. The relationship between the variables of time and the number of shots taken by a team was not significant, at the .01 level of confidence.
4. The extent of discrimination between the time and shots variables was decisively significant to discern that shots on goal were the best predictor of team success.

The following conclusions were drawn from the study:

1. Midfielders' ball control time does not decisively affect successful team performance in soccer.
2. Shots on goal decisively affect successful team performance in soccer.
3. Shots on goal are a reliable predictor of successful team performance in soccer.

Chapter I

INTRODUCTION

A surge of interest in the sport of soccer in recent years has added a new pastime for those individuals who enjoy the value of athletics and competition. The sport has received a considerably larger amount of attention as compared to the amount received several years ago. The development of the sport, on the high school, college and professional level, increases the chances of the sport's values becoming recognized as beneficial. Although extensive research has been performed throughout the field of athletics, the sport of soccer has been relatively untouched. It is the intention of the investigator to increase the literature pertaining to the sport and to add a small amount of verifiable knowledge, within a different category, to the research written thus far.

Authorities in the sport of soccer have displayed numerous opinions and philosophies without actual proof of the ideas which they defend. Many such authorities advocated the idea that soccer games were won by controlling midfield. Enzo Domini stated that, "Effective

midfield play is the key to winning soccer games."¹ This opinion seems to have spread throughout a vast majority of soccer coaches. It prevails today as a major reason teams experience success in competitive soccer. Hubert Vogelsinger, becoming renowned as an authority on the sport, suggested the halfback, or midfielder, had a definite influence upon a team's success, but also stressed teamwork as a major contributor to the outcome of the game.² Other philosophies brought forth the controversy that exists in this particular category. Vickery was an advocate of defense as a major contributor to success in soccer.³ However, Al Miller suggested another variable, passing, as the key to achieving success.⁴ Other factors still exist among several coaches as contributing to a team's success. Numerous ideas increase the difficulty of determining one factor as the major reason a team achieves success. Bradley and Toye stressed skill as a factor that had to be ranked at the top of team success, but stated that surprise

¹Enzo Domini, The Book of Soccer (New York: Van Norstrand Reinhold Co., 1972), p. 104.

²Hubert Vogelsinger, How To Star In Soccer (New York: Four Winds Press, 1967), pp. 40-45.

³Bryon L. Vickery, "Defensive Formations and Tactics In Soccer," Scholastic Coach, 36:32, October, 1966.

⁴Al Miller, Winning Soccer (Chicago: Henry Regnery Co., 1975), pp. 62-63.

moves were also a very important aspect.⁵ Howard Liss delved into the psychological avenue and stated that a team playing a game on its home field stood a better chance of winning.⁶ Gary Rosenthal stated, "It is, of course, important to have control at midfield, but a team can close the openings there only at the expense of opening spaces close to the goal, and this allows goals to be scored."⁷

Controversy plagued the opinions and philosophies of the coaches involved with the sport. Verifiable evidence pertaining to the sport of soccer was extremely limited; however, this study will attempt to unfold avenues which might be pursued by future researchers. Although many factors influence the outcome of a game, the midfielders remain the primary objective of this study. The basic assumption of the investigator supports the idea that the midfielders are a primary reason for a team's success. Midfield ball control decisively influences the outcome of a game. It is the hope of the investigator that the findings will extend the knowledge of soccer coaches who supported the midfield ball control theory as a decisive factor of team success.

⁵Gordon Bradley and Clive Toye, Playing Soccer The Professional Way (New York: Harper and Row, 1973), pp. 109-69.

⁶Howard Liss, Soccer, International Game (New York: Funk and Wagnalls, 1967), pp. 78-85.

⁷Gary Rosenthal, Soccer -- The Game And How To Play It (New York: Sayre Publishing, Inc., 1973), p. 26.

STATEMENT OF THE PROBLEM

What was the effect of midfielders' ball control time and the team's number of shots on goal as related to success in soccer?

PURPOSE OF THE STUDY

The purpose of the study was to determine if a significant difference existed between the winning and losing teams midfielders' ball control time and the teams' shots on goal. A secondary purpose was to determine if a significant correlation existed between the midfielders' ball control time and shots on goal.

DEFINITION OF TERMS

Ball Control - The ability of the midfielders to maintain possession of the ball.

Ball Control Time - The total interval of time the midfielders controlled the ball throughout the course of the game.

Ball Control Initiated - The exact moment at which the midfielders began maintaining possession of the ball.

Ball Control Lost - The exact point in time when the midfielders ceased to maintain possession of the ball.

Midfielders - Those players who linked the offense and the defense, and who otherwise would be classified as halfbacks or linkmen.

The term was used in a more general framework to account for the fact that any given player might play the position during the course of a game.

Success - The term used to designate the winning of the game.

Shot on Goal - The phrase used to designate kicking the ball toward the goal with the intention to score.

DELIMITATIONS OF THE STUDY

There were basically two groups of soccer teams involved in the study. The first group consisted of those teams, including Appalachian State University, that comprised the 1975 schedule of the Appalachian Soccer Team. This group included: Appalachian State University; University of North Carolina at Chapel Hill; Roanoke College; Virginia Military Institute; Belmont Abbey College; East Carolina University; Western Carolina University; Davidson College; The Citadel; Furman University; Florida Technological University; Georgia State University; and The College of William and Mary. The second group consisted of those teams, including Georgia State University, that comprised the 1975 schedule of the Georgia State Soccer Team. This group included: Georgia State University; Oglethorpe University; The Citadel; College of Charleston, Southern Tech Institute; University of Alabama (Huntsville); Mercer University; Florida Technological University; Emory University and Appalachian State

University. A total of nineteen different teams were included, with a total of nineteen different games.

LIMITATIONS OF THE STUDY

An initial limitation was the diverse skill levels of the individuals involved in the study. It was anticipated that the skill levels among the participants would be comparable.

A second limitation was the type of system utilized by each team. The various systems of play utilized at midfield, during the game, were not anticipated.

Chapter II

REVIEW OF RELATED LITERATURE

INTRODUCTION

In the review of related literature, the examination concentrated on those studies relating basically to success in athletics. The studies utilized centered on the physical and psychological attributes contributing to success in athletics. The dearth of literature pertaining to the sport of soccer, and directly related to this study, made the review extremely difficult.

STUDIES RELATED TO THE PHYSICAL ATTRIBUTES CONTRIBUTING TO SUCCESS

The physical attributes consisted mainly of those factors, other than mental or psychological, that influenced a participant or team in achieving success in a particular sport. Studies dealing with the physiological and material aspects related to success were used in the review.

DiGiovanna found differing attributes contributing to success in the sport of basketball, football and baseball. The results from the study indicated that the type, or pattern, of individual who succeeds as a college

football back was one who was moderately larger than the normal individual in weight, chest breadth, chest depth and arm girths. Also, the individual was stronger in leg force, total force, arm pull and push, and had a substantially better vertical jump. The results also indicated that the individuals who succeed in college baseball tend to be shorter in height, have larger arm girths, greater arm pull, greater total force and were substantially more powerful. Concerning basketball, results indicated that height, structure, strength and power, except back force and arm push, contributed to success, with positive differences from the normal group. Factors of body structure, muscular strength and explosive power were associated with success. However, these factors are of varying importance to performance ability in different sports, as each sport had its own unique pattern of success.¹

Hinton and Rarick undertook a study to determine the relationship between the arm, back and leg strengths of college women and basketball achievement. They reported correlations of .55, .45 and .38.²

¹Vincent DiGiovanna, "The Relation of Selected Structural and Functional Measures to Success in College Athletics," Research Quarterly, 14:204, May, 1943.

²Ibid.

Cox showed the relationship between volleyball skill components and team performance. The results of the study indicated that, considered together, the skills of serving, service reception, setting, spiking, spike defense and free ball passing, as measured by adapted statistical charting procedures, were significantly related to team performance, when viewed in terms of winning or losing and in terms of percent of total points scored by the team charted. Serving and free ball passing were of little value in predicting team success, whereas, spiking and spike defense made the greatest contribution. The order of volleyball skills most influential in predicting team success was spiking followed by spike defense, service reception, setting, serving and free ball passing.³

Keller reported a positive relationship between the ability to move the body quickly and success in athletic activities. A person with relatively slow total body reaction time had a better chance of attaining success in the more individual activities such as gymnastics, swimming and wrestling, than in those sports in which the person was required to react to rapidly changing conditions and the movements of

³Richard Hardee Cox, PhD, "The Relationship between Selected Volleyball Skill Components and Team Performance of Mens' Northwest Double A Volleyball Teams", Dissertation Abstracts International -A- Humanities and Social Sciences, XXXIV, No. 9, (1974), 5685A (University of Oregon).

several teammates and opponents, such as in baseball, basketball and football.⁴

Malmisur undertook a study involving Junior Davis Cup Players, and measured selected physical characteristics and the relationship of the characteristics to success in tennis. The results indicated dynamic balance, agility, national championship seedings, national rankings, and ability ratings by experts were significantly related to tennis success. Of the following factors: agility, arm-shoulder coordination, speed, depth perception, reaction time and movement time, dynamic balance, wall rebounding, height and weight, only agility and dynamic balance were significantly related to tennis success.⁵

Donald Barker took the statistics of high school football games and attempted to determine the relationship of these statistics to winning. The results indicated a significant correlation between winning and the score, first half scoring, first downs, total yards gained, yards rushing and interceptions. Penalties received, yards

⁴Louis F. Keller, "The Relationship of 'Quickness of Body Movement' to Success in Athletics," Research Quarterly, 13:154, May, 1942.

⁵Charles Michael Malmisur, PhD, "Selected Physical Characteristics of Junior Davis Cup Players and Their Relation to Success in Tennis", Comprehensive Dissertation Index, XXVII, No. 9 (1966), 2853 (Ohio State University).

penalized, number of punts, punting average, percent of passes completed and yards passing were not significantly correlated with winning.⁶

STUDIES RELATED TO THE PSYCHOLOGICAL ATTRIBUTES CONTRIBUTING TO SUCCESS

The psychological attributes consisted mainly of those factors, other than the physical attributes, that influenced a participant, or team, in achieving success in a particular sport. Studies dealing with the mental aspects related to success were used in the review.

Philip Inciong conducted a study to determine if any relationship existed between a coach's leadership style and the team's success. The study was performed on high school head basketball coaches. The conclusions drawn from the study indicated leadership styles of task oriented, or interpersonally oriented high school head basketball coaches appeared to be unrelated to team success.⁷

Cavins undertook a study involving professional baseball teams. The purpose of the study was to determine if having a home

⁶Donald G. Barker, "Correlates of Winning Football," Scholastic Coach, 33:54-55, May, 1964.

⁷Philip Alexander Inciong, PhD, "Leadership Styles and Team Success," Dissertation Abstracts International -A- Humanities and Social Sciences, XXXV, No. 6 (1974), 3493A (University of Utah).

field advantage made any significant difference in the outcome of the game. The conclusions were that some factor, or factors, favorable to victory of the team playing in its own city, and its own park, seemed to exist in professional baseball. Major league teams won, in a period covering six consecutive years and more than 7,000 games, eleven games at home for every nine won away from home.⁸

LaPlace tried to find the relationship between personality and success in professional baseball. The results of the study indicated the dominant trait in the personality pattern of major league players, as revealed by one's profile, to be strong 'drive' which was expressed as ambitiousness, aggressiveness and vigorousness. These characteristics were probably the forces that provided the propulsion necessary to attain success.⁹

Dr. G. W. Hartmann conducted a study to determine the constituents of a good football team. The results of the study indicated that a team was successful when it learned the science of football by distributing its intervals of practice rather than concentrating them.¹⁰

⁸Harold M. Cavins, "A Study to Discover the Relative Numbers of Baseball Games Won at Home & Away From Home In The Major Leagues," Research Quarterly, 9:59, December, 1938.

⁹John P. LaPlace, "Personality and It's Relationship to Success in Professional Baseball," Research Quarterly, 25:317-18, October, 1954.

¹⁰Dr. G. W. Hartmann, "What Constitutes A Good Football Team?", Research Quarterly, 1:94, March, 1930.

Apparently, knowing when and how long to practice justified the attributes needed to obtain success.

Olsen found the relationship between differing psychological capacities to success in college athletics. The findings indicated that of twenty correlations to determine whether significant differences existed between reaction time, depth perception and span of apprehension and sport skills, only two were found to be significant at the .05 level of confidence. The two were a +.477 for discriminatory reaction time and soccer ability; and a +.395 for simple reaction time and offensive hockey skill.¹¹ Within the limitations of this study, there would appear to be no real relationship between the psychological capacities utilized and success in college athletics.

SUMMARY OF RELATED LITERATURE

In reviewing the literature, two types of attributes, contributing to success, were described: the physical attributes and the psychological attributes. The physical attributes involved studies dealing with the physiological and material aspects related to success

¹¹Einar A. Olsen, "Relationship Between Psychological Capacities and Success in College Athletics," Research Quarterly, 27:88, March, 1956.

in athletics, such as: selected structural and functional measures,¹² and game statistics.¹³ The psychological attributes involved studies dealing with the mental aspects related to success in athletics, such as: personality,¹⁴ and psychologically having a home field advantage.¹⁵

¹²DiGiovanna, p. 204.

¹⁴LaPlace, pp. 317-18.

¹³Barker, pp. 54-55.

¹⁵Cavins, p. 59.

Chapter III

PROCEDURE OF THE STUDY

OVERVIEW

The purpose of the study was to determine if a significant difference existed between the winning and losing teams midfielders' ball control time and the teams' shots on goal. A secondary purpose was to determine if a significant correlation existed between the midfielders' ball control time and shots on goal. The study utilized those individuals who participated, as midfielders, for each of the nineteen teams involved in the study. Since it was possible for different individuals to participate at the midfield position throughout the course of a game, the study focused strictly on the position of midfield, and not the individuals involved. Nineteen groups of midfielders were used, with a total of nineteen games being recorded. Eleven games comprised the schedule of the Appalachian State University Team and eight games comprised the schedule of the Georgia State University Team.

SELECTION OF THE SUBJECTS

Subjects were members of the nineteen teams comprising the schedules of both the 1975 Appalachian State University and the Georgia State University Soccer Teams. The subjects were those members of each team participating at the midfield position throughout the course of each game. Individual subjects were not utilized, as the study concentrated on the ball control time of each group of midfielders.

TESTING APPARATUS

Stop Watches - Two Wakmann stop watches were used to record each teams midfielders' ball control time. The smallest unit of time, which was one-tenth of a second, was utilized.

PROCEDURE FOR RECORDING TIME

Prior to each game, the type of system utilized by each team was determined by the investigator, through the official score sheet and consultation with each coach. Thus, the individuals participating at the midfield position were determined prior to each game.

The investigator, and assistant, utilized the stop watches to record each team's midfield ball control time. At the precise moment when a midfielder touched the ball during the game, the watch being utilized for that particular team began to record the time. This watch

continued to run until control was lost by either the original midfield ball controller, or a midfield teammate. Since the study focused on the teams' midfield ball control time, and not on midfield ball control time by an individual, the watches continued to run while interpassing between midfielders of the same team continued. The study concentrated on the effect of the midfielders' ball control, and, in essence, a midfielder maintained control until a player, other than a midfielder, touched the ball, or until the ball last played by a midfielder was unplayable or went into the goal. The watches were allowed to run when control began and were not stopped until one of the above circumstances prevailed.

The smallest unit of time on the stop watches being utilized was one-tenth of a second. Throughout the course of the season, several instances occurred whereby control of the ball was gained or lost so quickly that it was impossible to record the time on the watches. In order to alleviate this factor, the investigator added one-tenth of a second to the time of that particular midfielder's ball control. Therefore, the smallest amount of time that any given group of midfielders could control the ball was one-tenth of a second.

PROCEDURE FOR RECORDING SHOTS

As defined in Chapter I, a shot on goal was the phrase used to designate kicking the ball toward the goal with the intention to score. To

record the total number of shots on goal, taken by each team, the statistician and investigator had to discern between a ball played with the intention to score and one played without the intention to score.

Official game statistics were kept at the scorers table, for each team, during each game. During most games, shots on goal statistics were available at the official scorers table; in other instances, the investigator recorded shots on goal.

STATISTICAL ANALYSIS

To determine if the midfielders' ball control time and the total number of shots on goal were decisive factors contributing to team success, a t-test was employed to determine if significant differences existed between the winning and losing teams' midfielders' ball control time. A t-test was also utilized to determine if a significant difference existed between the winning and the losing teams' shots on goal. A Pearson Product-Moment Correlation¹ was utilized to determine if a significant relationship existed between the midfielders' ball control time and the number of shots on goal. A discriminant functions analysis was utilized to further analyze the

¹David H. Clarke and H. Harrison Clarke, Research Processes In Physical Education, Recreation, and Health (New Jersey: Prentice-Hall, Inc., 1970), p. 221.

relationship between the midfielders' ball control time and the number of shots on goal. The null hypothesis was tested for each analysis at the .01 level of confidence.

Chapter IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of the study was to determine if a significant difference existed between the winning and losing teams midfielders' ball control time and the teams' shots on goal. A secondary purpose was to determine if a significant correlation existed between the midfielders' ball control time and the shots on goal. A discriminant functions analysis was calculated to determine the extent of discrimination between the two variables.

The analysis of data consisted of utilizing each teams midfielders' ball control time and each teams total number of shots on goal. A t-test was applied to the mean midfielders' ball control time and shots on goal of the winning and losing teams. A Person Product-Moment Correlation was applied to the winning and losing teams' mean number of shots on goal and to the teams' mean midfielders' ball control time. All time recorded was reduced to seconds. The winning teams were classified as Group I and the losing teams were classified as Group II.

ANALYSIS OF THE EFFECT OF THE MIDFIELDERS'
BALL CONTROL TIME THROUGH A
NINETEEN GAME SEASON

The mean ball control times through nineteen games, for Group I and Group II, were utilized. The mean ball control time, per game, for Group I was 473.905 seconds. For Group II, the mean ball control time, per game, was 338.684 seconds. The t-value, illustrating the difference between the mean ball control times of both groups, was 2.59, which was not significant at the .01 level of confidence. Table I illustrates this value.

TABLE I

ANALYSIS OF THE DIFFERENCE BETWEEN THE MEAN BALL
CONTROL TIME OF THE WINNING TEAMS AND
THE LOSING TEAMS THROUGH
NINETEEN GAMES

Variable	Groups	Number of Cases	Mean Times	t-Value	Degrees of Freedom	Probability
Time	Group I	19	473.905	2.59*	36	.01
	Group II	19	338.684			

*A t-value of 2.72 required for significance at the .01 level of confidence.

ANALYSIS OF THE EFFECT OF THE TOTAL
NUMBER OF SHOTS ON GOAL
THROUGH A NINETEEN
GAME SEASON

A significant difference between the mean number of shots on goal taken by the winning and losing teams was investigated. The mean number of shots on goal through nineteen games, taken by Group I and Group II, were utilized. The mean number of shots on goal taken by Group I, per game, was 21.7895. The mean number of shots on goal taken by Group II, per game, was 9.4211. The t-value illustrating the difference between the mean number of shots on goal of both groups was computed. Table II reveals the significant t-value of 4.27 at the .01 level of confidence for the mean number of shots on goal taken by both groups, per game.

TABLE II

ANALYSIS OF THE DIFFERENCE BETWEEN THE
TOTAL NUMBER OF SHOTS ON GOAL TAKEN
BY THE WINNING TEAMS AND THE LOSING
TEAMS THROUGH NINETEEN GAMES

Variable	Groups	Number of Cases	Mean Shots	t-Value	Degrees of Freedom	Probability
Shots	Group I	19	21.7895	4.27*	36	.01
	Group II	19	9.4211			

* A t-value of 2.72 required for significance at the .01 level of confidence.

ANALYSIS OF THE RELATIONSHIP BETWEEN THE
MIDFIELDERS' BALL CONTROL TIME AND THE
NUMBER OF SHOTS ON GOAL THROUGH A
NINETEEN GAME SEASON

The mean ball control times of Group I and Group II were 473.905 seconds and 338.684 seconds, respectively. The mean number of shots on goal taken by Group I was 21.7895 shots and the mean for Group II was 9.4211 shots. The Pearson Product-Moment Correlation illustrating the relationship between the midfielders' ball control time and number of shots on goal was computed. Table III reveals the non-significant correlation of .34394, at the .01 level of confidence,

between the midfielders' ball control time and the total number of shots on goal.

TABLE III

ANALYSIS OF THE CORRELATION BETWEEN THE
WINNING AND LOSING TEAMS' MEAN
MIDFIELDERS' BALL CONTROL
TIME AND MEAN NUMBER OF
SHOTS ON GOAL THROUGH
NINETEEN GAMES

Variable	Groups	Means	Correlation	Degrees of Freedom	Probability
Time	Group I	473.905	.34394*	36	.01
	Group II	338.684			
Shots	Group I	21.7895			
	Group II	9.4211			

*A correlation of .418 required for significance at the .01 level of confidence.

ANALYSIS OF THE DISCRIMINATION BETWEEN THE
MIDFIELDERS' BALL CONTROL TIME AND
SHOTS ON GOAL OF THE WINNING AND
LOSING TEAMS THROUGH A
NINETEEN GAME SEASON

Two discriminant function measurements were utilized in the study. The first measurement was applied to the variable of shots on goal of Group I and Group II. A discriminant score of 18.256179 was computed. The second measurement was applied to the variables shots on goal and midfielders' ball control time, utilizing both groups. A discriminant score of 9.570820 was computed. When the midfielders' ball control time was utilized, the discriminant score was reduced from 18.256179 to 9.570820, thus indicating that shots on goal had a greater influential value relating to team success. Table IV reveals these discriminant scores which distinguish between the winning and losing teams' midfielders' ball control time and shots on goal.

TABLE IV

DISCRIMINANT SCORES OF SHOTS ON GOAL AND
MIDFIELDERS' BALL CONTROL TIME
VARIABLES FOR THE WINNING
AND LOSING TEAMS
THROUGH NINETEEN GAMES

Variables	Groups	Discriminant Scores
Shots	Group I	18.256179*
	Group II	
Shots and Control Time	Group I	9.570820*
	Group II	

*Score required to achieve success.

Chapter V

SUMMARY, FINDINGS, DISCUSSION OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The primary purpose of the study was to determine if a significant difference existed between the winning and losing teams midfielders' ball control time and the teams' shots on goal. A secondary purpose was to determine if a significant correlation existed between the midfielders' ball control time and shots on goal. A discriminant functions analysis was utilized to further analyze the relationship between the midfielders' ball control time and the number of shots on goal.

The midfielders' ball control time was recorded by the investigator, and an assistant, during each game of the 1975 Appalachian State University and the Georgia State University soccer seasons. Two stop watches were used to record the time during which possession of the ball was maintained by a midfielder. When available, the shots on goal were taken from the official statistic sheets kept at the official scorer's table. In other instances, the investigator recorded shots on goal.

The subjects consisted of those individuals who participated at the midfield position for any one of the nineteen teams involved in the study. The nineteen teams were those teams that comprised the 1975 soccer schedules of Appalachian State University and Georgia State University. The winning teams were classified as Group I and the losing teams as Group II.

A t-test was utilized to determine if significant differences existed between the winning and losing teams midfielders' ball control time. A second t-test was utilized to determine if significant differences existed between the winning and losing teams shots on goal. A Pearson Product-Moment Correlation was utilized to determine if a significant relationship existed between the midfielders' ball control time and the number of shots on goal.

FINDINGS

1. The difference between the mean midfielders' ball control time of Group I and Group II was not significant at the .01 level of confidence.
2. The mean number of shots on goal taken by Group I was significantly greater than the mean number of shots taken by Group II, at the .01 level of confidence.
3. The relationship between the variables of time and the number of shots taken by a team was not significant, at the .01 level

of confidence.

4. The extent of discrimination between the time and shots variables was decisively significant to discern that shots on goal were the best predictor of team success.

DISCUSSION OF THE FINDINGS

It was the assumption of the study that midfielders' ball control time and the number of shots on goal, taken by a given team, would be decisive factors in contributing to team success. As Domini stated, in the introduction, effective midfield play was apparently a tremendous factor in determining the outcome of a game.¹ However, the results of this study indicated that a significant difference did not exist between the mean midfielders' ball control time. The t-value of 2.59, illustrating the non-significant difference between both groups midfielders' ball control time was close to the required level of significance of 2.72. Within the limitations of this study, the results indicated that no real difference existed between the winning and losing teams midfielders' ball control time. The difference between the mean number of shots on goal taken by Group I and Group II was found to be significant at the .01 level of confidence. Contrary to the midfielders' ball control time, this

¹Enzo Domini, The Book of Soccer (New York: Van Nostrand Reinhold Co., 1972), p. 104.

finding indicated that the mean number of shots on goal taken by Group I was significantly greater than the mean number of shots taken by Group II.

The findings of this study also indicated that no significant relationship existed between the variables of ball control time and shots on goal. However, the fact that a significant difference existed between the groups' shots on goal suggested that the non-significant correlation was due to the midfielders' ball control time.

The discriminant functions analysis indicated an extreme amount of discrimination between the time and shots variables. The degree of discrimination favored the shots variable as a predictor of team success. This fact supports the correlation analysis implying that shots on goal are the most precise predictor of team success. The ball control time adversely influenced the correlation.

Contrary to the assumption of this study, the investigator determined that midfielders' ball control time was not the decisive factor that influenced a team's success. The investigator also determined that shots on goal had a greater influence on team success.

CONCLUSIONS

The following conclusions were drawn from the study:

1. Midfielders' ball control time does not decisively affect successful team performance in soccer.

2. Shots on goal decisively affect successful team performance in soccer.

3. Shots on goal are a reliable predictor of successful team performance in soccer.

RECOMMENDATION

The investigator would recommend that a study be conducted on midfielders illustrating ball control within designated areas of the field, and the effect upon successful team performance in soccer.

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APPENDICES

APPENDIX A

MIDFIELDERS' BALL CONTROL TIME PER GAME
FOR GROUP I

GAMES	TIME IN SECONDS
G ₁	372.7
G ₂	490.9
G ₃	323.5
G ₄	450.1
G ₅	696.7
G ₆	560.8
G ₇	403.9
G ₈	341.5
G ₉	343.5
G ₁₀	412.2
G ₁₁	453.7
G ₁₂	561.8
G ₁₃	821.6
G ₁₄	427.6

APPENDIX A (Continued)

G ₁₅	119.1
G ₁₆	1002.2
G ₁₇	510.3
G ₁₈	359.6
G ₁₉	352.5

APPENDIX B

MIDFIELDERS' BALL CONTROL TIME PER GAME
FOR GROUP II

GAMES	TIME IN SECONDS
G ₁	349.2
G ₂	488.4
G ₃	344.0
G ₄	415.4
G ₅	484.5
G ₆	43.1
G ₇	171.5
G ₈	424.0
G ₉	398.8
G ₁₀	307.8
G ₁₁	363.0
G ₁₂	297.0
G ₁₃	309.0
G ₁₄	412.3

APPENDIX B (Continued)

G ₁₅	227.1
G ₁₆	490.6
G ₁₇	355.6
G ₁₈	303.4
G ₁₉	250.3

APPENDIX C

TOTAL NUMBER OF SHOTS ON GOAL PER GAME
BY GROUP I

GAMES	SHOTS ON GOAL
G ₁	30
G ₂	14
G ₃	20
G ₄	22
G ₅	20
G ₆	23
G ₇	34
G ₈	9
G ₉	16
G ₁₀	12
G ₁₁	20
G ₁₂	39
G ₁₃	24
G ₁₄	23

APPENDIX C (Continued)

G ₁₅	8
G ₁₆	26
G ₁₇	49
G ₁₈	18
G ₁₉	7

APPENDIX D

TOTAL NUMBER OF SHOTS ON GOAL PER GAME
BY GROUP II

GAMES	SHOTS ON GOAL
G ₁	10
G ₂	12
G ₃	26
G ₄	11
G ₅	18
G ₆	8
G ₇	0
G ₈	13
G ₉	5
G ₁₀	22
G ₁₁	8
G ₁₂	2
G ₁₃	9
G ₁₄	8

APPENDIX D (Continued)

G ₁₅	3
G ₁₆	5
G ₁₇	4
G ₁₈	9
G ₁₉	6

APPENDIX E

MEAN VALUES OF THE MIDFIELDERS' BALL CONTROL
TIME AND SHOTS ON GOAL OF
GROUPS I AND II

VARIBLE	SUBJECTS	MEAN VALUE
Time	Group I	473.905 Seconds
Time	Group II	338.684 Seconds
Shots	Group I	21.7895
Shots	Group II	9.4211

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