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# Cooperative Responses in Competitive Soccer

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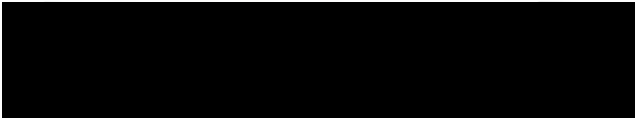
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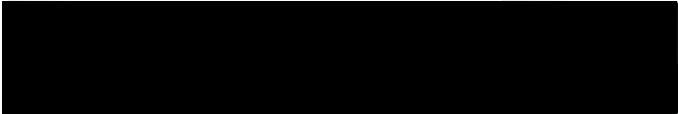
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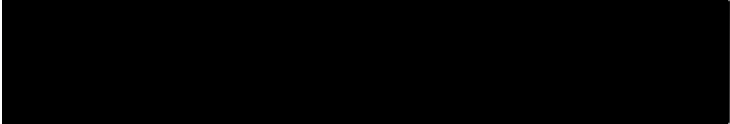
Title: Cooperative Responses in Competitive Soccer.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

  
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Milan Svoboda

The purpose of this study was to discover patterns in  
intra-team cooperation (passing) versus individualistic  
behavior (dribbling) across various age and gender groups.  
A behavioral coding scheme for soccer players in possession  
of the ball was designed to tabulate team responses of  
passing or dribbling behavior in a four-a-side indoor  
tournament. A total of 32 teams, 18 male teams and 14  
female teams, participated in four age brackets. A  
multivariate analysis of variance (MANOVA) generated one

significant result for age and passing behavior. This supported the first hypothesis that intra-team cooperative behavior increased with age. Due to the nonorthogonal nature of the data two separate analyses of variance (ANOVA) were conducted, one for each of the dependent variables. No significant results were generated by these ANOVA's for sex and dribbling behavior. However, there was tenuous confirmation of the second hypothesis, that there is a gender difference in the use of cooperative (passing) responses and individualistic (dribbling) behavior.

COOPERATIVE RESPONSES IN COMPETITIVE SOCCER

by

RODNEY GORDON WILLIAMSON

A thesis submitted in partial fulfillment of the  
requirements for the degree of

MASTER OF SCIENCE  
in  
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Portland State University

1986

TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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## CHAPTER I

### INTRODUCTION

There is little agreement or consistency in the results of developmental studies of cooperation and competition. Age or gender differences found in one study may not be confirmed in another, and contradictory evidence is presented in still another. Further, cooperation and competition research has seldom been conducted in the natural setting of athletic events.

### PROBLEMS IN METHODOLOGY

The bulk of research in cooperation and competition has taken place under laboratory type conditions. In trying to minimize the effects of extraneous factors which may influence results, researchers have produced sterile conditions, some far removed from the natural social environment.

Maccoby and Jacklin (1974) aptly describe some of the problems in past research in competition and cooperation:

competition in real-life settings frequently takes the form of groups competing against groups (as in team sports), an activity that involves with-in group cooperation as well as between-group competition, so that cooperative behavior is frequently not the antithesis of competitiveness. Most research on competition has been conducted in contrived situations that fail to take account of this fact and that do not correspond well with the

naturalistic conditions under which competitiveness is most intense (p. 274).

Much of the research to date has defined cooperation and competition as two distinct and opposite alternatives. In the real world setting of athletic events, primarily team events, these two conditions do not represent dicotomous conditions, as Maccoby and Jacklin have pointed out. What is required is a greater understanding of cooperation and competition as these conditions exist in the real world.

In review of research methodologies focusing on gender differences, Knight and Kagan (1981) found plenty of contradictory works. They state that some studies found "that boys are more competitive and less cooperative than girls" while others "provided evidence that girls are more competitive and less cooperative than boys ", still others "revealed no significant sex differences" (p. 784). Knight and Kagan attribute such conflicting research findings to be due largely to "the confounding of individualism" (p. 784). In their survey of this literature they found there was a failure to define cooperation and individualism in mutually exclusive terms. The reward structure in these studies was such that in order to ensure a reward for oneself, an individual would have to cooperate, since competing would mean to risk losing the payoff. Therefore, to maximize one's own gains (individualism), subjects cooperated, thus confounding cooperation with

individualism.

#### RESEARCH ON GENDER DIFFERENCES

As Knight and Kagan (1981) have already indicated, there is quite a bit of contradictory research concerning gender differences in cooperation and competition studies. Some researchers, however, have made the effort to deal with the problem of a natural setting and hence produce results more applicable to real life.

Ahlgren and Johnson (1979) found that "females reported more positive attitudes toward cooperation in school and less positive attitudes toward competition in school than did males" (p. 48). They contend that these findings lend credence to studies supporting the stereotypical sex role of females being more cooperative than males. The difficulty with this study, as Ahlgren and Johnson themselves point out, is that they dealt with attitudes and not behaviors. What is needed is a study of gender differences of cooperative behavior.

In a study of preschool age children Szal (1972) used a marble game to measure cooperative, competitive, and uncooperative actions. What she found was that in games between same sexed pairs, girls were more cooperative than pairs of boys. However, boys showed more competitive actions under the same sexed pairs conditions than girls. Another interesting finding, this time between mixed sex pairs, showed that girls got more competitive while boys

became more cooperative than in the same sex pairs condition. This suggests that gender differences in cooperative behaviors in some types of games develop at a relatively young age. How these behaviors develop is open to speculation. Perhaps natural settings such as athletic contests provide an arena where new behaviors can be acquired.

There are many theories that suggest how behaviors are acquired. Mischel (1966), writing on the acquisition of sex-typed behavior, states that "although boys and girls learn the behaviors of both sexes, they differ in the degree to which they perform and value these behaviors" (p. 60). This notion may be appropriate for describing gender differences in behaviors in an athletic setting.

#### RESEARCH ON AGE DIFFERENCES

In a review of developmental research on cooperation and competition, Bryan (1975) states that, "the results of several investigations suggest that cooperation is developmentally linked, decreasing as the child ages" (p. 134). He speculates that this may be due to an increase in competitiveness and not a decrease in cooperation. However, McClintock and Moskowitz (1976) in a forced choice design found cooperative choices increased with age when subjects could receive joint rewards through collaborating their efforts as opposed to attaining only relative gains in a competitive setting. In these two examples of

conflicting research there is a methodological flaw alluded to in Bryan's (1975) study, while McClintock and Moskowitz suggest cooperation is reliant upon the reward structure of the conditions imposed. Many situations in real life have unclear reward allocations or do not present cooperation and competition as opposites.

Brady, Newcomb, and Hartup (1983) have reached another conclusion explaining the conflicting research findings on developmental differences in cooperative behavior. They suggest that "children do not become simply more competitive or cooperative with age, but that they learn to use strategies which are most effective in obtaining desired outcomes" (p. 411). This learning to use appropriate strategies is very much dictated by situational conditions. Children learn which strategy is right for a particular situation because they have faced similar conditions before.

An explanation based on the learning of "appropriate strategies" can be readily applied to athletic settings. Athletes continuously seek ways to improve techniques, overcome opponents, and achieve desired performances. In team sports, learning when to work with teammates and when to apply individual skills is essential to team success. The development of these "appropriate strategies" has been an accepted notion, not a proven one, in the realm of athletics.

## CRITERIA FOR TEAM SUCCESS

Success in the team sport of soccer is a result of many factors. Pepitone (1980) mentions three important variables in an athletic event as being "personal skill, extraneous chance factors over which the person has very little or no control, and the relative skill of each competitor" (p. 77). For a team sport, the factor "intra-team cooperation" can be added.

Certain prior conditions must exist within a team in order for cooperative behavior to develop. Cooperation is possible if a positive correlation exists between an individual's desired goals and those of others in the group (Deutsch, 1962). If one person strives for his or her own goal attainment and by doing so is also promoting the goal attainment of others in the group, then these individuals share promotively interdependent goals" (Deutsch, 1949, p. 132). On a soccer team, players share several such goals, primarily that of scoring, defending, and ultimately, winning. The realization of these goals is achieved through the use of specific behaviors.

Whether a player applies individual skills or works with teammates (cooperative behavior) depends upon the choices made when faced with the individual competitive confrontations that arise in the course of an athletic contest. Deutsch (1962) mentions "if one's goals permit but do not require cooperation, the choice to cooperate or

not will be determined by the effective attractiveness of other perceived alternatives" (p. 294). In soccer, individual skill is epitomized by dribbling the ball, and the alternative, cooperative behavior, would be passing. The relative attractiveness of these alternatives depends upon the players' reading of a constantly changing, fluid set of circumstances.

#### DEFINITIONS AND OBJECTIVES OF INDIVIDUAL AND COOPERATIVE BEHAVIORS

In soccer the ball is manipulated in various ways to move it into a position where a shot at goal can be attempted. Each time a team has possession of the ball the short term tactical objective is to get the ball into such a position. The immediate objective may be to elude one or more opponents in an attempt to move the ball into a position where a shot can be made with a chance of scoring a goal. This is a team's strategy, to out score the opponent and hence win the game. The tactics used are specific actions that fulfill the overall strategy. The tactics of a team in possession are achieved through distinct methods of locomoting (moving) the ball under control.

Locomotion of the ball while in play is achieved by passing or dribbling. Passing involves propelling the ball, with any part of the body except the arms and hands, from one location to another, usually with the intention of having a teammate then take possession. Except for the



goalkeepers who can also pass by throwing the ball with their hands, all other passes must be made with a part of the body excluding the arms and hands. Dribbling consists of locomoting the ball, again with any part of the body except the arms and hands, from one location to another with no other player, teammate, or opponent achieving possession. In this respect, dribbling is a very individual form of behavior while passing requires collaboration. However, both behaviors are cooperative in the sense that both assist in attaining the team's long range goal (winning). Since passing involves two or more players during a team's possession, it can be inferred that passing is more cooperative because it requires an integrated, coordinated effort by at least two players. Both behaviors are utilized in overcoming opponents and seeking some form of tactical advantage. Players must learn which combination of tactical behaviors is appropriate to achieve immediate and short term objectives.

The attractiveness of cooperating (passing) or applying individual skill (dribbling) is a decision players must make repeatedly during a game. O'Brien (1968) states that "the amount of cooperation in a group is defined by the extent to which group members integrate their efforts in order to achieve the group goals" (p. 429). Passing is the best example of team integration. Dribbling, because of its highly individualistic nature, is less cooperative

since it requires little or no team integration in the short term.

#### DEVELOPMENT OF COOPERATION WITHIN A TEAM

Cooperation within a team develops as a result of the conditions present. Shapira and Madsen (1974) in a cultural study of cooperation and competition of children found that "between-group competition, even when no material rewards resulted from winning, served to reduce internal group conflict and increase within-group cooperation" (p. 143). In this regard the competitive situation across groups enhanced cooperation within each group.

Participants are not required to cooperate as established by the rules of the game, but they may choose to in order to fulfill their team's objectives. In this situation the choice to cooperate is perhaps the best under the immediate conditions. The game shapes participants' behaviors in various ways. For example, as players learn better defensive techniques the result will be that opponents must then seek alternative means of accomplishing tactical objectives in order to realize the team goal (winning). The resulting game takes on a different appearance than it had before. Players must constantly be seeking new ways of fulfilling the tactical requirements of the game. In this way players' behaviors change and therefore should be distinctly different across age groups.

## THE PRESENT STUDY

The purpose of the team analysis of passing and dribbling is to define the parameters of these behaviors across age and gender. As players change and the demands of the game change, so, too, must the behaviors that players depended on in the past. New combinations of behaviors, new patterns in a player's repertoire of tactical responses should develop as players get older and the game changes.

If McClintock and Moskowitz's (1976) research indicating cooperation increases with age is relevant to athletics, younger players should pass less to attain team objectives. As players get older and confront better defensive skills, the players must change the pattern of play from individual to cooperative. The first hypothesis is that there will be an increase in cooperation (passing) with age. As the demands of the game change players must adapt. This adaptation would take the form of an increase in cooperative, team-oriented behavior. Passing, being cooperative, should be utilized more by the older teams than by the younger ones.

If Ahlgren and Johnson's (1979) finding supporting gender stereotypes is applied in the game of soccer, then females should show more positive attitudes toward passing (cooperative) behavior than males. The hope is that these attitudes toward cooperation will manifest themselves in

cooperative behavior rather than individualistic behavior. Also, Szal's (1972) research, if generalized to include older age groups, should confirm gender differences in the use of cooperative behavior. The second hypothesis is that females will display significantly more passing behavior than males of the same approximate age. The corollary of this second hypothesis is that females will show significantly less individual (dribbling) behavior than their male counterparts. Each behavior should be utilized differently by both sexes. Males will dribble more while females will pass more than the other sex.

A multivariate analysis of variance (MANOVA) will be utilized to assess significance between total team passes and dribbling sequences for all age and gender groups. T-tests between each of the age groups will indicate where the greatest significance lies.

## CHAPTER II

### METHOD

#### SUBJECTS

Subjects were  $\underline{n} = 247$  males and females who participated in a soccer tournament sponsored by a local university team. They came as members of  $\underline{n} = 32$  teams,  $\underline{n} = 18$  male teams, and  $\underline{n} = 14$  female teams, with approximately eight players per team. Male teams participated in under 10, under 14, and under 23 age brackets. The mean age for these brackets was 8.8, 12.9, and 20 years respectively. Female teams participated in under 14, under 19, and under 23 age brackets, with mean ages of 12, 16.3, and 21.3 years respectively. Teams in the under 10, under 14, and under 19 age groups all came from urban metropolitan areas in the northwest United States. The under 23 teams came from four year colleges, with the exception of one noncollege female team from a large city.

#### SAMPLING

Over one hundred fifty teams were invited by phone and mail to participate in an indoor 4-a-side soccer tournament. Thirty-eight teams applied for tournament participation.

A minimum of four teams and a maximum of eight were required in each age bracket to warrant a tournament for that age group. One team was rejected because their age bracket had already been filled. Five teams, two female under 10 and three male under 19, were rejected due to an insufficient number of teams in their respective age brackets. Of the male teams, eight participated in the under 10 age bracket, six in the under 14, and four in the under 23. There were five female teams in the under 14 age bracket, four in the under 19, and five in the under 23. (See Appendix A, Table 1).

#### PROCEDURE

An indoor four-a-side soccer tournament was organized for both sexes in four different age groups. Teams played a minimum of two games against same-age and same-sex opponents. The length of games varied according to age. Eight-year olds played two fifteen minute halves, twelve-year olds had twenty minute halves, and the sixteen-year olds and college age teams played twenty-five minute halves. Trophies were awarded for first, second, and third place in each of the age and gender groups. (See Appendix B).

Teams paid an entry fee for the tournament and indicated on their roster the number of players and each player's age. All teams played on the same size field and used the same goals.

Every game was video taped. For each team, player's

game behaviors in two independent seven and one-half minute continuous video time segments were coded. Inter-coder reliability was established as 96% prior to the final coding. A single judge then coded all behaviors of the players in possession of the ball. Each segment was taken from a different half of a game and in most cases from at least two games against different opponents. Analysis of each segment consisted of coding specific behaviors of the player in possession of the ball. The behaviors were: passes, dribbling sequences, shots, freekicks, clearances, goals, and loss of possession. From each team's fifteen minute total time sample (2 x 7-1/2 min.), the total number of passes and the number of dribbling sequences for each team were tabulated.

The total passes and total number of dribbling sequences were utilized in the analysis of data. All other behaviors coded were not relevant to the question of cooperative versus individual behavior. The mean totals for each age and gender group are presented in Appendix C.

## CHAPTER III

### RESULTS

Analysis of the data was threefold. First, a multivariate analysis of variance (MANOVA) utilized the data from all groups (n = 32). Missing data for two cells and unequal n's in most of the other cells made for a difficult analysis (see Appendix A, Table I for cell n's). The second form of analysis was an analysis of variance (ANOVA) between both genders and the U-14 and U-23 age groups (n = 20). These were the only age groups for which data for both sexes was available. This type of 2 x 2 analysis was not hampered by missing cells and the unequal n's were not as divergent as in the MANOVA. The third analysis was a series of t-tests to more accurately fix where differences between groups lie.

The dependent variables of total team passes and total team dribbling sequences were achieved by tabulating team member's behaviors of passing and dribbling in the time samples. Independent variables were age, with four groupings, and gender.

In the MANOVA the independent variables of age and sex, and the dependent variables of total passes for each team and total dribbling sequences for each team generated conjunctive and separate results. The main effect of sex



was not significant in either the multivariate or univariate tests. This indicated that gender differences were not significant for either Passing or dribbling or their combined effect. The main effect of age produced a significant multivariate F result,  $F(2, 10.5) = 2.51$ ,  $p < .05$ . The univariate F tests for age and each dependent variable generated a significant result for passing, at the  $p < .01$  level, but no significance for dribbling behavior. This would seem to indicate that the significant multivariate outcome was due to the strength of the result for passing behavior, rather than the combined effect of passing and dribbling. No significance was found for the interaction effect of age x sex in either the multivariate or univariate tests. Appendix A, Table II, outlines the MANOVA format and results.

The second analysis was a separate analysis of variance (ANOVA) for each of the dependent variables, passing and dribbling, using U-14 and U-23 age groups ( $n = 20$ ). An ANOVA was also run for the combined total activity of each age and gender group. Total activity was the sum of total passes and total dribbling sequences. No significance was found in the ANOVA for passing. In the ANOVA for dribbling no significance was found for the main effect of age or the interaction effect. The main effect of sex and dribbling was somewhat suggestive ( $p < .08$ ), although not reaching the significant level. The ANOVA for all groups and total activity produced no significant

results. However, the main effect of age and total activity was near the minimum significance level ( $p < .07$ ). Appendix A, Table III, provides the ANOVA format and results.

T-tests indicated where the greatest variance existed between all groups. The U-10 and U-14 male groups when compared with each other showed a significant difference in their use of passing,  $t(12) = 4.42$ ,  $p < .001$ . Significance ( $p < .01$ ) was also found between the U-23 and U-10 male groups respectively, and the U-19 and U-14 female groups respectively, for passing behavior alone. No significance was found between any of the groups and dribbling.

## CHAPTER IV

### DISCUSSION

Support for the first hypothesis, that dribbling and passing behavior patterns vary with age, was partially provided by the MANOVA results. The significance of the main effect of age on passing indicates that this behavior is utilized in different ways by various age groups.

The t-tests indicated that the greatest increase in passing behavior occurred between the U-10 and U-14 males. There was less of an increase when the youngest and oldest male groups were compared. The results also found an increase in passing behavior between the U-19 and U-14 female groups. No significant increase in passing behavior was found between the oldest and middle (U-14) male age groups. Since the ANOVA results for age and passing were not significant, it may be due to the exclusion of the youngest age group in this analysis. One possible interpretation of these findings is that passing behavior develops significantly for males between the approximate ages of eight and thirteen years. Since no U-10 age group for females participated in the study any inference would be unfounded.

No relationship between age and dribbling behavior was found. Dribbling may likely have a different

developmental schedule than passing. It may be that dribbling behavior develops at a later age than passing. only further research looking specifically at this question could substantiate these ideas.

The second hypothesis regarding the relationship between gender and dribbling behavior was supported tenuously ( $p < .082$ ). Although not significant, this result does indicate that there may be a difference in the use of dribbling behavior by gender that only a larger sampling would show. There was no significant effect of sex on passing behavior. It would seem that both sexes share similar reliance on passing, but a slightly dissimilar use of dribbling.

There are several possibilities for the lack of significant findings here. The small sample of teams ( $n = 32$ ) and their distribution into age and gender groupings produced obvious difficulties. Analysis was difficult because of these unbalanced cells and further complicated by nonexistent data in two of the originally anticipated eight cells.

The cross-sectional design of this study may not be adequate to answer the questions which were posed. Because of the confound in a cross-sectional design between age and cohort, this design does not allow us to state conclusively that age related differences are in fact developmental. These differences may instead be due to a number of

influences which are dependent on the historical era through which children of different ages develop, such as variations in the quality of coaching, the development of the game in this country or lack of it, and opportunities to play which may not have existed in the past for some groups.

The indoor game may also have affected players' behaviors in an unanticipated manner. By providing an environment dissimilar to the outdoor game, the behaviors produced by players may also have been influenced. One last consideration is the nature of the teams themselves. Of the behaviors displayed, it is unclear whether the team totals are truly representative of teamwork or are the result of several dominant players' behaviors. This dominant player notion would, of course, be different for each team depending on its composition of individuals. In this case, variation in team behaviors may have been due to the composition of the team rather than inter-player teamwork.

Perhaps the most important contribution of this study is the use of a behavioral coding scheme in an athletic event. The coding of behaviors and subsequent analysis have potential benefits for coaches and players. Individual or team analysis will be able to provide better understanding of the occurrence of certain behaviors.

In conclusion, males and females may differ in the use of individual behavior, but not in the use of cooperative behaviors. The hypothesis that each gender

displays a different pattern of behavior as the means of attempting to achieve desired long term goals has not been conclusively proven.

The different developmental pattern suggested for dribbling and passing can help define coaching methods most appropriate for various age groups. A more in depth study that included a wider selection of younger age and gender groups would help clarify speculation about these patterns of development of cooperative and individual behaviors.

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APPENDIX A

TABLE 1

MEAN AGES AND POPULATION SIZE OF EACH GROUP

<u>Mean Age and Population Size (N)</u>				
Sex	U-10	U-14	U-19	U-23
Male	8.8 yrs n = 8	12.9 yrs n = 6		20 yrs n = 4
Female		12 yrs n = 5	16.3 yrs n = 4	21.3 yrs n = 5
				N = 32

TABLE II

MULTIVARIATE ANALYSIS OF VARIANCE  
 FORMAT AND RESULTS

Gender	Age			
	U10	U14	U19	U23
Males	n=8 Mp=23.7 Md=20.7	n=6 Mp=40.3 Md=20.6		n=4 Mp=37.7 Md=28.2
Females		n=5 Mp=35.8 Md=18.8	n=4 Mp=50 Md=23.7	n=5 Mp=41.6 Md=19.6

Mp = Mean passes

Md = Mean dribbling sequences

Multivariate test of significance

	Value	df	F	p
age	.68	6	2.51	< .05
sex	.12	2	1.44	ns
age X sex	.16	2	1.91	ns

Univariate F-test : Age

Source	SS	df	ms	F	p
passing	2092.75	3	697.58	4.13	< .01
dribbling	81.76	3	27.25	.52	ns

TABLE III

## ANALYSIS OF VARIANCE 2X2 FORMAT AND RESULTS

Gender	Age	
	U14	U23
Males	n = 6	n = 4
Females	n = 5	n = 5

Dependent Variable : Passing

Source	SS	df	ms	F	p
age	14.05	1	14.05	.08	ns
sex	2.93	1	2.93	.01	ns
age X sex	86.05	1	86.05	.54	ns

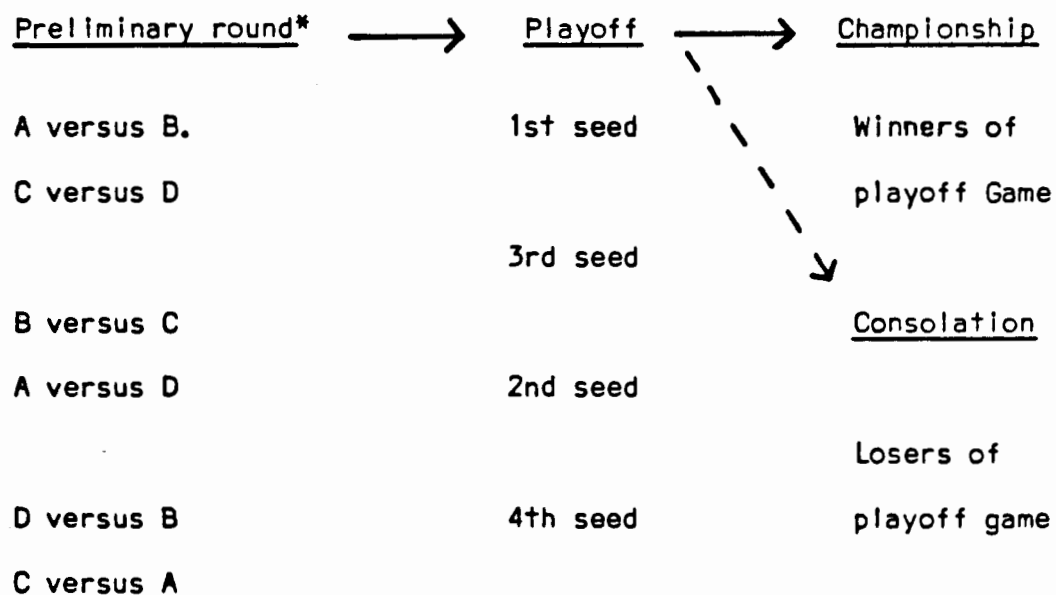
Dependent Variable : Dribbling

Source	SS	df	ms	F	p
age	83.27	1	83.27	2.39	ns
sex	119.43	1	119.43	3.43	< .08
age X sex	56.34	1	56.34	1.62	ns

APPENDIX B

FIGURE 1

STANDARD TOURNAMENT FORMAT FOR EACH  
AGE AND GENDER BRACKET



\*Point system established seeding

APPENDIX C

FIGURE 2

GRAPHIC REPRESENTATION OF GROUP MEANS

