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A Discriminant Analysis of Team Cohesiveness among High-Performance and Low-Performance Elite Football Players

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Abstract

This study investigates group cohesion among elite male football players. The study had two purposes; firstly, to assess the role of different parameters of team cohesiveness (Group-Task and Group-Social) among the high and low performance football players; and secondly, to develop a discriminant model for classifying football players into high or low performance groups on the basis of group cohesion parameters. Two hundred eight male elite football players from All India Inter University were selected for the study. The Group Environment Questionnaire was administered to the subjects prior to the tournament and the data were obtained on four parameters: Group Integration-Task (GI-T), Group Integration- Social (GI-S), Individual Attraction to the Group-Task (IAG-T) and Individual Attraction to the Group-Social (IAG-S). On the basis of the performance of the teams forty eight samples were retained for the final study in such a manner that 24 football players were from the first five teams and twenty four subjects were from the last five teams. The data was analyzed using the SPSS ver. 20. The mean values of all the four group cohesion parameters were significantly higher among high performance football players in comparison with low performance players. Further, a discriminant model was prepared to classify football players into high and low performance groups on the basis of cohesion variables. A discriminant function Z was developed ($Z = -6.72 + 0.13$ (GI-T) $+ 0.11$ (GI-S) $- 0.04$ (IAG-T) $+ 0.18$ (IAG-S)). The attained discriminant model classified correctly 79% of the cases in the sample. The variable Individual Attraction to the Group-Social (IAG-S) had the highest discriminating power among the four group cohesion parameters. The discriminant function Z developed in the study classified the male football players into the low performance category, if its value was positive and into the high performance category, if negative.

Key Words: Discriminant, cohesiveness, performance.

Introduction:

To be successful a team must be cohesive, they may not interact or socialize away from the club but once they are all there they must be unified. "Cohesion is the ability for a group of individuals to join together and create a combined unit, and it is what sets apart teams of individuals and successful teams."

For individual activity in a team to be transformed into a group product, communication, coordination, and interaction are necessary. These factors can be relatively ineffective, and losses in efficiency may occur. In Steiner's (1972) group effectiveness model it is noted that actual group productivity often falls short of potential productivity owing to faulty group

processes. Steiner has identified two main sources of reduced productivity: 1) co-ordination losses, comprising the group's failure to optimally co-ordinate the contributions of the individual members, and 2) motivation losses, due to the members not exerting maximal effort in group settings. In the latter case, motivation losses appear to be due to the fact that, under some circumstances, individuals reduce their efforts when working in groups compared to when they work alone.

Cohesion is viewed as a multi-dimensional construct, and especially the distinction between task cohesion and social cohesion has proven to be important in order to understand cohesion, and its effect on team performance (Cota, Longman, Evans, Dion, & Kilik, 1995; Mudrack, 1989; Mullen & Copper, 1994). In a meta-analysis on cohesion and team performance Mullen and Copper (1994) found that commitment to

task (analogous to task cohesion) was significantly related to performance.

Aim of this study

In sports like volleyball, basketball and soccer where a great deal of group cohesion is required for good performance, a very few studies have been conducted concerning strategies coaches should adopt to develop group cohesion among team players. The purpose of this study was to compare task cohesion and social cohesion between the high and low performance football players and to develop criteria for classifying male football players into high or low performance groups by using discriminant analysis on the basis of group cohesion parameters investigated in this study included Group Integration-Task (GI-T), Group Integration-Social (GI-S), Individual Attraction to the Group-Task (IAG-T) and Individual Attraction to the Group-Social (IAG-S).

Table -1

Mean and Standard deviation on cohesion parameters of elite football player

Variable	High Performing	Low Performing	Mean Difference
Group Integration-Task	18.29 ± 3.36	15.08 ± 4.83	3.21*
Individual Attraction to Group Integration-Social	23.17 ± 5.00	16.83 ± 5.38	6.34*
Group-Task	23.21 ± 5.48	21.96 ± 5.00	1.25*
Individual Attraction to Group-Social	20.13 ± 5.18	16.00 ± 3.1	4.13*

*significant at 0.05

Materials and Methods:

An initial sample of two-hundred and eight male football players who participated in the All India Interuniversity football championships were tested for their group cohesion parameters. The data was collected

on all these subjects before the commencement of the tournament by using the Group Environmental Questionnaire (GEQ) developed by Carron et al. (1985). On the basis of team performance in the championships forty eight samples were retained for the final study in such a manner that twenty-four players came from the first five teams and another twenty-four from the last five teams in their ranks. Thus, the players were classified into high- and low-performance groups. The GEQ was used to assess four dimensions of team cohesiveness. The first dimension was Individual Attraction to Group-Task (IAG-T) which reflects an individual team member's feelings about their involvement in team's productivity, goals and objectives, and it is characterized by such items as "I am not happy with the amount of playing time I get" and "I don't like the style of play on this team". The second dimension was Individual Attraction to Group-Social (IAG-S) which measures individual team members' feelings about their personal involvement, desires to be accepted, and social interrelation with the group characterized by items such as "Some of my best friends are on this team" and "I don't enjoy being part of social activity of this team". The third parameter was Group Integration-Task (GI-T) which reflects the individual team member's task-oriented closeness and bonding within the team as a whole, for example, "We all take responsibility for any loss or poor performance by our team". Finally, the last dimension was Group Integration-

Social (GI-S) which determines how individuals assess the group as a whole. The focus of these dimensions was to assess the coherence of the team around the task and social activities, characterized by items such as "Our team members rarely party together". The questionnaire consisted of 18 items, with each scored on a 9-point scale ranging from "Strongly agree" to "Strongly disagree". Each item in the questionnaire was either $+ve$ stated or $-ve$ stated. The questionnaire comprised five items for IAG-S, four items for IAG-T, five items for GI-T and four items for GI-S. The score for each category was calculated by summing the values and dividing them by the number of items in a given category.

Results

The data obtained was subjected to two different kinds of analysis. Firstly, a comparison between high-performing and low-performing football teams was made on all four group cohesion parameters by using the independent t-test at the level of significance of 0.05. Secondly, the data was analyzed by using discriminant analysis for developing discriminant function for classifying individuals into high and low performance groups. Both analyses were carried out with the use of SPSS software package (ver. 20.0). The results so obtained are discussed in this section. Table I shows the comparison of mean values between high and low performance groups in all four group cohesion parameters. There was a significant difference between high performance and low performance groups in all group cohesion parameters i.e., IAG-T, IAG-S, GI-S, GI-T. Furthermore, it may be concluded that the mean scores of all four group cohesion parameters were significantly higher in the high performance

group than in the low performance group. Thus, it may be interpreted that the environmental cohesion was very high among the high performing football players. This is true also because much of the success in the game depends upon the understanding among the players for performing the appropriate moves. The data was further analyzed by using discriminant analysis and the obtained results are shown in Tables II to VI. The unstandardized discriminant coefficients are shown in Table II. These coefficients were used to develop the discriminant function. The resulting discriminant model included all four variables because all of them were found to have a significant discriminant power. Thus, the discriminant function developed by using these discriminant coefficients was as follows:

$$Z = -6.72 + 0.13 \,(GI\text{-}T) + 0.11 \,(GI\text{-}S) - 0.04 \,(IAG\text{-}T) + 0.18 \,(IAG\text{-}S) \quad (1)$$

The value of Wilks' lambda distribution as shown in Table III is 0.46 and therefore the discriminant model can be considered to be good enough for developing a discriminant.

Table II. Unstandardized canonical discriminant function coefficients

	Function
Group Integration-Task (GI-T)	0.13
Group Integration-Social (GI-S)	0.11
Individual Attraction to the Group-Task (IAG-T)	-0.04
Individual Attraction to the Group-Social (IAG-S)	0.18
(Constant)	-6.72

Table III. Wilks' lambda distribution function

Test of Function(s)	1
Wilks' lambda	0.46
Chi-square	21.36
Df	4
Sig.	0.00

The value of Wilks' lambda falls between 0 and 1. A lesser Wilks' lambda value indicates the robustness, whereas its higher value indicates the weakness of the model.

Since the value of chi-square in Table III is significant (p =

0.00), it may be inferred that the discrimination criterion between the two

groups is highly significant. Table IV is a classification matrix which provides the summary of correct and incorrect classification of subjects in both groups by the discriminant model. It can be seen that the percentage of correct classification amounted to 79%, which is fairly good and therefore it may be concluded that the discriminant model is efficient.

Table V shows the relative strength of the variables selected in the discriminant model on the basis of their discriminating power. The variable with a higher coefficient is more powerful in discriminating between the two groups. Since the coefficient of IAG-S is 0.66, i.e. maximum, therefore the discriminant power of this variable is maximum as well.

On the other hand, the coefficient of IAG-T was –0.26, which shows that this variable had the least discriminant power among the four variables. The purpose of this study was to obtain a decision model for classifying male football players into high or low performance groups. This can be done by using the discriminant function (Z) developed in the equation (1) above. Table VI

Table IV. Classification matrix

Levels of performance				Predicted group membership
Original count		High	Low	Total
	High	19	5	24
	Low	8	16	24
%	High	79.16	20.83	100.0
	Low	33.33	66.66	100

79.0% of originally grouped correctly classified cases

Table V Standardized canonical discriminant function coefficients

	Function
Group Integration-Task (GI-T)	0.52
Group Integration-Social (GI-S)	0.68
Individual Attraction to the Group-Task (IAG-T)	-0.32
Individual Attraction to the Group-Social (IAG-S)	0.70

Table VI. Functions at group centroids

Levels of performance	Function
Low	-0.896
High	0.896

Unstandardized canonical discriminant functions evaluated at group means

Mean of Group 1   Mean of Group 2

− 0.844   0   +0.844

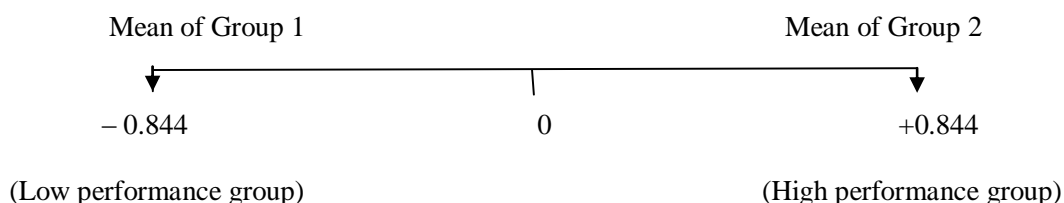(Low performance group)   (High performance group)

Figure 1. Means of the transformed group centroid

Discussion:

The study sought to answer three research questions. The first question was whether the group cohesion parameters differ significantly between high and low performance male football players. Secondly, we were interested to know as to whether it is possible to develop a robust discriminant model on the basis of group cohesion parameters.

Thirdly, whether the model so developed can be effectively used for classification in the future. Since high and low performance groups differ in all four group cohesion parameters the first question was well answered. In this study all cohesion parameters were significantly higher among the high performing football players than low performing football players.

Since the percentage of correct classification of cases was 79% hence the developed model can be considered effective. This answers the second research question. Since the discriminant model in this study is developed on the basis of a small sample thus the level of accuracy shown in the classification matrix may not hold for all future classifications of new cases, therefore one should take caution in using this model. In order to obtain more accurate findings it is suggested that such future research studies may be undertaken on larger samples.

The findings of the present study suggest that team performance during competition depends upon many factors, one of which is the ability of team members to work together. The coach often refers to this ability as team work or togetherness, while the researcher refers to it as group integration or group cohesiveness. The most effective sport team does not necessarily comprise the best skilled players only, but players who must possess the ability to effectively interact with teammates to obtain a group-desired goal as contributing to team effectiveness. It is admittedly accepted that the higher the cohesiveness of a team is, the more effective the team will be. However, this assumption is based on feelings and perceptions which may not be borne out in reality. Just because you enjoy the team atmosphere does not necessarily mean you are definitely going to win more games. The key research question for sport psychology is to prove that teams with greater cohesion are more successful.

Conclusions

When a team achieves their season goals, each player feels supported, appreciated, and

respected for the effort they have put forth for the benefit of the team. True team cohesion happens when everyone understands and commits to their individual roles, and everyone understands, supports, and respects their teammates' and coaches' roles.

This study offers clear evidence that in team sports the interplay between group members influences their confidence to attain important goals. In soccer, a forward might set a goal to score at least once per game. The likelihood of this outcome is influenced by the number of shots on goal, the extent of the team's offensive play, etc. In short, a forward relies heavily on the contribution of other players. Thus, goal setting in soccer should involve all players on the team to promote a perception that players are working toward common ends.

The implication of these findings is that coaches and sport psychologists may be well advised to assess team cohesion and develop team-building strategies to improve task cohesion. Specifically, coaches could work on making sure that team members are clear about and happy with team goals and the level of shared commitment. They could also work on developing team communication and shared responsibility, i.e. developing the 'we' mentality.

A limitation of the present study is the small sample size which led to the adoption of a generous alpha level. Thus, there is a clear need for further research to cross-validate the findings from the present study on a different and larger sample. A second limitation of the present study derives from using the players as subjects to collect data. It is possible that some players might have hidden their real thoughts while responding to the questionnaire items. The readers are advised to use the findings of this study under the discussed limitations.

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