

**New Horizons in Simulation Games and Experiential Learning, Volume 4, 1977**  
**DEGREE OF UNIFORMITY IN ACHIEVEMENT MOTIVATION LEVELS OF TEAM**  
**MEMBERS: ITS EFFECT ON TEAM PERFORMANCE IN A SIMULATION GAME**

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## INTRODUCTION

Simulation gaming is rapidly gaining entrance into the curricula of several business schools as a novel pedagogical tool. Many academicians have tried, and are trying, to research various aspects of simulation games and the dynamics of the interactions among game participants. One such aspect is “achievement motivation” which measures an individual’s psychological need to achieve success. This paper describes a study that was done to examine the nature of the relationship between the degree of similarity in the achievement motivation levels of individual members in a team and team performance in a simulation game.

## BACKGROUND

A recent study [31] found a strong positive relationship between the average achievement motivation level in a team and the team’s performance in a simulation game. In this study achievement motivation was measured using a standard instrument developed by Hermans [2]. Game performance was measured by a combined ranking based on team ranks on 21 objective performance criteria over seven quarters of game play. Another study [4] which investigated the relationship between achievement motivation and performance focused on the individual game participant as the unit of analysis. Individual performance was measured by an average “peer evaluation” score, based on the evaluations given to the individual by team peers on six traits. This study found no relationship between individual achievement motivation (measured using the same instrument as in the previous study) and performance.

Neither of the two studies mentioned above explicitly looked at the composition of each team in terms of the distribution of achievement motivation levels in each team. A team whose members have similar achievement motivation levels might experience group processes and performance which are different from those of another team whose members have varying levels of achievement motivation, even though both teams might have the same average achievement motivation level. Such differences in group composition could lead to different peer evaluation scores for individuals on different teams, even though those individuals might have similar achievement motivation levels. This could very well have contributed to the lack of relationship between achievement motivation and individual performance in the second study reported above.

## **PURPOSE OF THE STUDY**

The purpose of this study was to explore the relationship between the extent of similarity in the achievement motivation levels among members in a team and team performance. It was expected that differences, if any, in the dynamics of group behavior due to differences in the distribution of achievement motivation levels of team members would be reflected in team performance. This led to the following hypothesis: "There is a significant relationship between the variance in the achievement motivation levels of team members and the performance of teams which have approximately the same average achievement motivation levels."

## **METHOD**

The sample for the study consisted of 85 undergraduate students enrolled in a junior-level management course at Indiana University. They were divided into 16 teams (each having either 5 or 6 members) for participating in a management simulation game called INTOP [5], which was a major component of the course. The 29-item achievement motivation instrument developed by Hermans [2] was included as part of a general information questionnaire filled out by all students at the beginning of the course. Teams were formed so as to meet the following basic criteria: (a) the average team achievement motivation scores be approximately the same for all teams; and (b) the standard deviation of achievement motivation scores of members in each team be as different as possible across teams. After the team allocations were made the average team achievement motivation scores varied between 13.74 and 15.04, while the standard deviation of achievement motivation scores varied between 0.48 and 5.14 across teams, as shown in Table 1. Teams were also matched as closely as possible on grade point average, academic major, sex and work experience of team members. The game participants were not made aware of the variation in the standard deviation of achievement motivation scores across teams in order to avoid any biasing effect that the knowledge of this key factor might have on team performance, the dependent variable in the study.

Team performance was measured by a combined ranking based on seven objective performance criteria over the final five quarters of game play that were included in the grading scheme for the course. A Spearman rank correlation coefficient ( $R_1$ ) was computed for the relationship between the standard deviation of achievement motivation scores (the lowest standard deviation was given a rank of 1 and the highest a rank of 16) and the team performance rankings.

TABLE 1

<u>Team Number</u>	<u>Average Achievement Motivation score</u>	<u>Standard Deviation of Achievement Motivation Scores</u>
1	14.74	1.14
2	14.92	3.38
3	14.70	0.77
4	14.34	5.14
5	14.99	2.31
6	14.68	2.57
7	14.97	1.54
8	15.04	1.78
9	15.00	0.89
10	13.85	1.97
11	14.20	0.84
12	14.14	1.19
13	14.08	0.48
14	14.85	4.78
15	13.74	3.49
16	13.87	1.36

The interactive nature of a simulation game like INTOP (or QUANTISIM which was used in the studies mentioned above) makes a team's rankings dependent not only on the team's own inputs to the game, but also on the inputs of other teams that compete with it. Thus there could be some pitfalls involved in assuming that an overall team ranking based on "objective" criteria is a true reflection of the quality of a team's efforts and decision making (for a more detailed discussion of this aspect see [1]). In this study, however, of the seven objective performance criteria that were used, one criterion was completely free of this "interactive bias." This criterion was a quarterly cash forecast made by each team. The accuracy of this forecast only depended on the team's understanding of the game and its ability to use past information.

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It was felt that this criterion would truly reflect, without any bias, at least some aspect of a team's ability to perform well. Hence a second Spearman rank correlation coefficient ( $R_2$ ) was calculated for the relationship between the standard deviation of achievement motivation scores and team performance ranks for this criterion alone. The sets of team ranks based on which  $R_1$  and  $R_2$  were computed are displayed in Table 2.

TABLE 2  
Team Rankings Based  
on:

<u>Team</u> <u>Number</u>	<u>Std. Dev. of</u> <u>AM Scores</u>	<u>Overall Team</u> <u>Performance</u>	<u>Cash Forecast</u> <u>Criterion</u>
1	5	4	2.5*
2	12	8	9.0
3	2	7	11.0
4	16	12	2.5
5	11	6	7.0
6	12	13	14.5
7	8	14	4.0
8	9	1	1.0
9	4	11	12.5
10	10	16	14.5
11	3	5	15.0
12	6	15	8.0
13	1	3	6.0
14	15	9	10.0
15	14	2	5.0
16	7	10	12.5

\*Teams that tied for a rank were given average rank.

## **RESULTS**

The correlation coefficients  $R_1$  and  $R_2$  turned out to be 0.182 and -0.196 respectively, which were not statistically significant. There seemed to be no significant relationship between the distribution of achievement motivation levels of team members and team performance. Thus there was very little support from these findings for the hypothesis stated earlier.

## **DISCUSSION**

The above results seem to indicate that the differences in team composition, based on the achievement motivation levels of team members, do not contribute much to the dynamics of team behavior that may have a bearing on team performance. However, the negative sign of  $R_2$  seems to be intriguing. It offers some weak indication that teams with one or two members having high achievement motivation levels relative to other members (i.e. teams with high variance in achievement motivation levels) performed better on the “bias free” cash forecast criterion, compared to teams with more uniform achievement motivation levels. This seems plausible in the sense that the few individuals with relatively high achievement motivation levels on certain teams may have taken upon themselves the responsibility to do their best to achieve success for their teams, at least with respect to those aspects of team performance that were not confounded by the activities of competitors. This interpretation, however tentative, should encourage the development of sound procedures to accurately measure the true performance and decision making capabilities of teams (especially in an interactive game situation). Such procedures would enable researchers to conduct meaningful research to understand the relationships between various team characteristics and performance, and to throw additional light on the complexities of group behavior and performance in a simulation game.

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