

Developments In Business Simulation & Experiential Exercises, Volume 21, 1994

LEADERSHIP AS A MEDIUM: ITS EMERGENCE AND EFFECT ON PERFORMANCE IN SMALL LEADERLESS GROUPS

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ABSTRACT

This research examined the relationships of individual (but not personality), group, and group dynamics variables to the phenomenon of group leadership emergence in laboratory settings. Using teams as the basic units of analysis, it discovered through the use of Logistic Regression procedure that those variables could be utilized to predict the emergence of small group leaders. However, there was no evidence to support any associations between groups with or without emergent leaders and group performance.

INTRODUCTION

Leadership is a complicated and, sometimes, mysterious phenomenon. Many leaders start as informal leaders. They are then recognized or formalized through appointment or election. Informal leadership is an essential part of the development for formal leadership. It serves as one of the primary building blocks and, yet, it is a concept more ambiguous and abstract by its very nature. This type of leaders attains his/her status by meeting certain unique sets of expectations which others identify as leadership attributes.

In 1920s, the U. S. army selected leaders based upon the premise that the most likely candidates would emerge informally from its rank and file in leaderless group discussion/exercises (Ansbacher, 1951). Since then, leadership emergence in small groups has been the subject of many studies. Personality was predominantly the focus of those studies until 1948 when Stogdill (1948) asserted that personal attributes could no longer be considered as reliable predictors of leadership emergence.

Researchers on leadership emergence have since headed into two different directions. On the one hand, there are those who continued their work on personality related variables because they believed that certain aspects of personality had been overlooked (Homans, 1950; March & Simon, 1958; Emerson, 1962; Blau, 1964; Holland, 1964; Snyder, 1974). There are, on the other, those who shifted their focus to what Holland called "modifiable behavior (1964)," which includes attributes associated with group characteristics and group process. Variables examined under the latter group included group size (Bass & Morton, 1951; Cummings, Huber, & Arendt, 1974; Osborn & Hunt, 1975), communication style (Strickland, et al, 1978; Ketrow, 1991; Schultz, 1978 & 1986), gender and sex (Phillips & Rush, 1980; Schneier & Bartol, 1980; Spillman, Spillman, & Reink, 1981; Wentworth & Andersen, 1984; Goktepe & Schneier, 1988; Eagly & Harau, 1991; Hegstrom & Griffith, 1992), spatial arrangement (Bass, 1954; Cummings, et al, 1974), nature of task involved (Bass & Wurster, 1953; Wentworth & Andersen, 1984) and conflict-handling behavior (Schneier & Hsu, 1989).

Snyder (1974), a member of the former group who stayed on the personality related variables, developed an instrument called "Self Monitoring Scale." His 25-item instrument was designed to measure one's ability and motivation to respond to situational information. This instrument, Snyder argued, was superior to other measurements such as Crowne & Marlowe (1964). That is why it has been widely used to study the relationships of self-monitoring to emergent leaders (Kent & Moss, 1990; Ellis, 1988; Ellis et al, 1988; Garland & Beard, 1979; Snyder, 1974; Snyder & Gangestad, 1986; Watson & Behnke, 1992).

When the feminist movement escalated in the early 70s, whether or not there are significant differences between men and women in their

leadership behavior became an issue of considerable concerns for practical and theoretical reasons. This issue has been more popular. Many studies based their hypotheses on a theory later identified as the gender role theory by Eagly (1987).

According to the gender role theory, sex differences in social behavior tend to follow a simple gender line. In other words, men are more likely to emerge as leaders in small task-oriented groups, whereas women are more likely to be identified as leaders in social-oriented activities. This division between men and women to emerge as group leaders has been supported by a number of studies (Wentworth & Andersen, 1984; Eagly, 1987; Goktepe & Schneier, 1988; Eagly & Harau, 1991).

A recent meta-analysis based upon more than fifty past studies conducted by Eagly and Karau (1991) simply reconfirmed that theory. In essence, they found that men were more likely to emerge as leaders in initially leaderless groups in two situations: 1) activities that were highly task-oriented rather than social-oriented and 2) groups existed for a very brief time period. Women, on the other hand, tended to emerge as leaders in-group situations where high social activities were the focus.

They were however not without exceptions. For example, in a task-oriented group situation, Schneier and Bartol (1980) did not find any substantial differences between male and female to emerge as group leaders over time. One of the major problems associated with this study, however, is that subjects were forced to identify one of their group members to be the group leader regardless whether a leader was actually emerged or not.

Today, the leaderless group phenomenon has become a widely employed technique in various applications. It is often being used for training in both the public and the private sectors. Academicians also like to use it for research to study the new rising stars.

OBJECTIVES AND HYPOTHESES

Simply stated, the objectives of the study were twofold. First, it was intended to identify the individual/group (but not the personality) attributes along with the group dynamics which might help contribute to the leadership emergence within task-oriented small groups. Second, the study sought to examine the effects of leadership emergence in small leaderless groups on group performance.

There were six hypotheses that the study was designed to test.

Hypothesis 1: Group sizes are positively correlated with the emergence of group leaders;

Hypothesis 2: Gender is hypothesized to be highly associated with leadership emergence. More specifically, the more male members there is in a group, the more likely it is for that group to have a leader emerged;

Hypothesis 3: It is more likely for individuals with high achievements to emerge as group leaders;

Hypothesis 4: There is a positive relationship between leadership emergence and membership participation rates;

Hypothesis 5: Apathy is hypothesized to have direct and positive effects on leadership emergence; and

Hypothesis 6: Leadership emergence will have no impact on group performance.

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JUSTIFICATION

There are a number of reasons why this study was important. Firstly, many studies on leaderless groups in the past were carried out in environments other than small group situation. Those that were tended to use one fixed group size of three or four, various group sizes were rarely used.

Secondly, one common and popular approach in studying small leaderless groups in laboratory settings in the past was the reliance of voluntary subjects. Studies using those subjects might be biased due to three factors: a) Voluntary subjects in studies of this nature were in for certain rewards including, but not limited to, monetary rewards; b) Being volunteers, they were more likely to be outgoing persons; and c) Some could be very experienced volunteers. Those subjects sometimes were very aware of their roles in the study, often knowing the primary area of interests of the researchers.

Thirdly, data collection from many studies of this nature in the past was frequently based upon one short discussion/exercise session, the so-called leaderless discussion groups (LDG). Very little information was gathered on leadership emergence in small leaderless groups based upon a longer period of time. A study by Schultz (1978) concluded that certain "positive" factors could be used to predict leadership emergence in meetings of a short duration. But whether those factors can also be used to predict emergent leaders over time is unclear;

Fourthly, past studies of small leaderless groups always assumed that a leader would definitely emerge from the process in each group (Schneier and Bartol, 1980). The present study did not make such prerequisite in studying the leadership emergence phenomenon. It was further recognized that members of small groups in either task-oriented situations or otherwise might sometimes not have an obvious and/or consistent leader emerged after all. In this case, all members were considered to be equal in terms of their participation contribution, and dominance. The fact that often time no leader exists at all in group situations is something that management consultants begin to recognize and are ready to deal with it (p. 46, BusinessWeek, August 31 1992).

Fifth, there has been plenty studies done on either leadership emergence in small group settings or group performance alone (Gosenpud & Mining, 1983; Gosenpud, 1 989; Hornaday & Wheatley 1986; House & Napier, 1983; Miesing, 1982; Norris & Nibuhr, 1980; Vance & Gray, 1967; and Wolfe, 1986). yet the relationships between leadership emergence in groups and group performance have seldom been studied (Remus & Edge, 1991).

Finally, the vast majority of past studies on leadership emergence used individual group member as the unit of analysis. Very rarely, if any, groups were utilized as the unit of analysis, which is what this study was designed to do,

STUDY DESIGN

Sample

The sample consisted of 385 undergraduate seniors in a large eastern state university. The ratio between males and females was about equal. Their ages ranged from 19 to 47 with a mean of about 26 years old. They were all business major seniors enrolling in one of the seven sections of a business capstone policy course.

Procedure

Subjects participated in a computerized business game as part of the capstone policy course. At the outset of the semester, subjects were

divided into two groups randomly. Subjects of one group were instructed to form small work teams ranging from three to seven members each on their own. Subjects of the other group were assigned into teams by instructors with one major consideration in mind. That is to have teams composed of subjects with different, but balanced, majors. There were fifteen teams with three members, forty-seven teams with four members, nineteen teams with five members, six team with six members, and three teams with seven members for a total of 90 teams altogether. Of the total teams, 31 were formed by subjects themselves and 59 were assigned by instructors.

Each team was instructed to act simply as the top management of a simulated manufacturing company competing against other companies in the same industry (in this case, the same section). No one was given any specific assignments or had a designed role to play within each team. Furthermore, they were neither encouraged nor discouraged to select a formal or informal leader within each team.

Subjects made totally fourteen quarterly business decisions for the semester, which took about three and a half months in real lifetime. At the outset of the semester, background information pertaining to subject's gender, age, major, GPA, work experience, etc. was obtained. At the end of the 1 4th quarter, a simple nine-item checklist on group dynamics based on a seven-point Likert scale was administered to all subjects. In addition, each subject was also asked to indicate whether or not a team leader emerged in the decision making process during the course of the simulation game.

Since leadership emergence in small groups was on an informal basis, a subject could not be biased by explicit role differentiations, which are often the case in formal organizations. Instead, a subject, in his/her efforts to determine such an existence, would judge others against his/her own personal set of expectations. Since the perceptions of leadership qualities might vary substantially from one person to the other, it was expected that some inconsistency in the identification of a team leader among members of the same team might exist. In other words, some teams might unanimously report the existence or non-existence of a team leader, while other teams might have conflicting reports on the existence, or the absence, of a team leader within their own team.

By confirming the emergence of a leader in his/her own mind, a subject would unconsciously give this person the power, status, etc. associated with a leader. (S) he would, therefore, address others, including the leader, in a particular manner. Likewise, (s) he would expect to be treated in a way consistent with the hierarchy (s) he created by his/her own interpretation of the team situation. In an informal situation like the simulated business environment used in this game, the perception of a leadership emergence might influence his/her interpersonal behavior towards other team members.

DATA ANALYSIS

Dependable Variables

LEAD, a dichotomous variable, was used as a dependent variable. A value of "1" was assigned to those teams where an emergent leader was identified and recognized whether by majority or by consensus. A value of "0" was assigned to those teams if no leader emerged in the process of decision making as also viewed by majority or by consensus within their own teams.

With group performance/productivity, two measures were utilized. The first measure was based upon an index generated automatically by the computer from the simulation business game, TEMPERMATICS. In other words, each time the simulation game was run by the computer, a set of index was generated by the computer

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As part of the end results, The index based upon seven factors included total sales, incomes after tax, earnings per share, return on assets, return on equity, return on sales, and stock price.

Since subjects were drawn from seven sections of the business capstone policy course and not all sections had the equal number of teams (three sections had 15 teams each and four other sections had 14, 13, ten, and eight teams, respectively), certain biases could exist so far as the use of computer index as a measure of team performance is concerned. To alleviate the potential problems, a "7" score was calculated to standardize all the index. In addition, all controllable variables, such as the business weekly index, the demand curve, weights of the seven factors, etc. were kept the same throughout the seven sections.

The second measure for group performance was a point system assigned to teams depending on their computer rankings in each industry. For example, a team ranked by the computer as the number one team in performance within its own industry in any given quarter was assigned a value of "1 5" in the point system. Conversely, a team ranked 15th would be given a value of "1" in the point system.

The sum of all the points earned by a team from all 14 quarters plus the cumulative computer rankings became the basis for the second measure of group performance. To ensure that this point system is a reasonable and viable measure of group performance, a correlation analysis using the point system and the index system was conducted. A correlation of 0.69 was found and is considered statistically significant at the 0.0001 level. It was, therefore, decided that both measures would be employed as surrogate measures for group performance in the study.

Methods

A reliability test on the group dynamics variables was first performed using the SPSSX's reliability procedure. Internal consistency test for the group dynamics instrument was found to be 0.69, which is acceptable.

The stepwise Logistic Regression procedure from the SAS/PC package was selected to conduct the group classification analysis using LEAD, a dichotomous variable, as the dependent variable. Teams were used as the basic units of analysis. Team averages for the following variables, where appropriate, were always used in the analysis.

Totally, three different models were tested. The first model was based solely upon variables drawn from individual and group attributes. And there were 11 variables, including GPA (grade point average), KNOW (number of team members known before the class), AGE, SIZE (group size), FORM (group formation), MALE (number of male members in group), FEMALE (number of female members in group), WORK (number of years of full-time work), SEXG (simple sex group vs. mixed sex group), CORE (active group size), and GTYPE (even group size vs. odd group size).

The second model utilized variables associated with group dynamics derived from the instrument administered at the end of the simulation game. They were nine of them: APTHY, indifferent attitude expressed by members; COMMN, poor team communication; CONFR, willingness to confront; EFORT, degree of group efforts devoted to task; EVEN, even participation; GRASP team's ability to handle the task; HOST, degree of hostility among members; LISTN reception of other's opinions; and TRUST, level of distrust among members.

The final model was a pooled model using only those variables that were identified as the important variables in the previous two models.

RESULTS

Table 1 displays the descriptive statistics for both the individual and group attributes as well as the group dynamics.

**TABLE 1
DESCRIPTIVE STATISTICS**

Variable	Mean	SD	variable	Mean	SD
GPA	2.97	0.24	EVEN	5.62	1.12
SIZE	4.14	0.97	CONFR	5.41	0.98
CORE	3.85	0.86	EFORT	5.22	1.19
MALE	2.33	1.51	LISTN	5.78	0.99
FMALE	1.94	1.34	APTHY	2.45	1.17
KNOW	0.65	0.76	COMMN	2.13	1.11
SEXG	0.73	0.44	HOST	2.05	0.96
GTYPE	1.58	0.49	GRASP	5.62	0.84
AGE	25.64	4.55	TRUST	2.03	1.15
WORK	4.81	4.06			
FORM	1.66	0.53			

Individual and Group Model

The Logistic Regression procedure identified four individual and group variables as shown in Table 2 as the important variables to separate those teams with leadership emergence from those without. Those four variables are SIZE, FORM, FMALE, and KNOW.

**TABLE 2
CLASSIFICATION FUNCTIONS**

Variables	Individual	Dynamics	Combined
SIZE	0.2574		0.3973
FORM	0.2519		0.3553
FMALE	-0.2996		-0.2785
KNOW	-0.2342		0.2532
EVEN		1.1009	1.1616
CONFR		-0.4378	-0.6276
EFORT		0.5949	0.6014
LISTN		-0.7119	-0.5403
APTHY		0.6020	0.3900

A positive classification function weight associated with SIZE (0.2574) indicates that the larger the group size, the better chance it is to have a leader emerged. FORM also carries a positive sign, 0.2519 meaning it is more likely that emergent leaders would result from teams assigned by instructors than teams formed by subjects themselves.

The inclusion of FMALE with a negative weight (-0.2996) suggests that as the number of female team member's increases, the likelihood of having leaders emerged within those teams are decreased. The negative sign associated with the variable of KNOW, -0.2342, implies that the more members one knows prior to the class, the less chance there is to have a leader emerged in the decision making process from that team.

Group Dynamics Model

Among the group dynamics variables that were found to be important, there were five of them. EVEN, EFORT, and APTHY each carries a positive classification function weight, while CONFR and LISTN have negative weights. Specifically, the strong positive weight (1.1009) that EVEN carries was unexpected. It was unexpected for two reasons. First, a negative weight was anticipated in the hypothesis. Second, not only the sign was wrong, but also it carried the

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highest absolute weight among all variables. A negative weight for EVEN simply suggests that teams with even participation from team members are more likely to have emergent leaders reported.

The positive sign (0.5949) associated with EFORT dictates that the higher the level of group efforts devoted to task-oriented activities by members of a team as a whole, the higher the chance for that team to come up with a reported leader. APHY, having carried a positive sign (0.6020) suggests that if more members of a team expressed their indifferent attitudes toward the task activities, it is more likely to force other team member(s) to take a leading role in that team.

The negative sign displayed by CONFR suggests that the more confrontation there was among team members, the less likely it is for a leader to emerge in those teams. LISTN, being a variable with a negative sign, indicates that the lower the degree of listening and accepting other members' opinions during the group decision making process, the higher the probability that a leader would emerge.

Group Classification

Table 3 presents the classification results obtained by each of the three models. The first model based upon four important individual and group variables was able to classify 56%, or 25 out of 45, of the total teams correctly into the category where emergent leaders were reported and 58%, or 26 out of 45, into the category where no leaders were identified.

The group dynamics model using five important group dynamics variables had a total correct classification rate of 60%, or 54 out of 90, leaving 40% of the total teams to be misclassified. Individually, 60% each of the teams were correctly grouped regardless whether emergent leaders were reported or not.

**TABLE 3
CLASSIFICATION MATRIX**

	Attributes		Dynamics		Combined	
	L	NL	L	NL	L	NL
Leader	25	20	27	18	30	15
No Leader	19	26	18	27	17	28
% Correct	56.7%		60.0%		64.4%	

Four variables from the first model and five from the second model identified by the logistic discriminant technique were used to form the third model. Eventually, five variables were identified by this model as important ones to separate teams with leadership emergence from teams without leadership emergence. Those five are: SIZE, KNOW, EVEN, EFORT, and LISTN. Collectively, they contributed an overall correct classification of 64.4% (58 out of 90) leaving 35.6% to be misclassified. This overall classification was accomplished through the correct classification rates of 67% (30 out of 45) from teams with emergent leaders and of 62% (28 out of 45) from teams without any leaders emerged.

Team Performance

With regard to team performance, a T-test was carried out. The result of the analysis ($F= 1.23, p < 0.36$) revealed that how teams performed in the simulation game over the course of semester had nothing to do with the existence, or the lack, of emergent leaders. This lack of any statistical relationships between group leaders and group performance implies that team performance achieved by teams with emergent leaders could not be differentiated by teams without any leaders emerged.

DISCUSSION

The results revealed and discussed above showed that teams with or without emergent leaders could be distinguished. The separation can be made solely on individual and group attributes, or on group dynamics variables, or on the combination of the two. The first model identified four individual and group variables, whereas the second model identified five group dynamics variables to be important ones. However, the individual and group attribute model was the weakest of all, since it only had a correct classification rate of 57%, which is merely seven percentage points higher than by chance.

The first model basically signals that teams with leaders emerged in the decision making process can be generalized as follows: 1) they tend to be relatively larger in size or to have more members among themselves; 2) teams are more often assigned by instructors with heterogeneous members in terms of their majors than organized by subjects themselves where members with homogeneous background in terms of majors are found; 3) there are fewer female members in the teams; and 4) members usually do not know each other until they have become part of the same team.

The identification of the team size, SIZE, as an important variable signals that the larger the size of a team the more likely it is to have a leader emerged. This findings certainly supports an early claim made by Bass and Norton (1951) which found a positive correlation between group size and leadership emergence. This finding is also consistent with the findings of Cummings, Huber, and Arendt (1974). Thus, the first hypothesis regarding team size is supported.

The identification of the variable, FEMALE, in the first model is expected and understood. In essence, this result signals that as the female membership increases, the chances to have a leader emerged in the process within a team decreases. This findings are consistent with many studies on the relationships between gender and leadership (Wentworth & Andersen, 1984; Goktepe & Scheier, 1988; Eagly & Harau, 1991) and further confirm Eagly's role theory, which basically claims that behavior exhibited by members of task-oriented groups tends to follow the traditional gender line. That is, males are more involved in task-oriented activities, whereas females are more in line with social-oriented activities. As a result, the second hypothesis pertaining to gender is also supported.

Since GPA was not an important variable to separate teams with and without leadership emergence, the hypothesis number three regarding achievements is rejected. This rejection is, nonetheless, explainable. In this study, grade point average (GPA) was used as a surrogate to achievement. Since the Business School of this eastern state university is an upper level professional school, students who want to be business majors are required to submit another application for admission to the Business School after they have completed 45 credits. One of the admission criteria is students' GPA based upon the 45 completed credits. The standard used by the Business School is 2.85 out of 4.00. Due to the keen competition, students who eventually are admitted into the Business School usually have an GPA of 3.00 or higher. In other words, all business major students have high GPAs.

It is not surprised, though not anticipated, to have both FORM, group formation, and KNOW, number of team members known prior to the class, included in the model. Due to the nature of the simulation game, whoever has the task knowledge, usually a subject with accounting or finance major, was more likely to stand out as a team leader. Since teams assigned by instructors tended to have members who were more balanced, or heterogeneous, in terms of majors than teams formed by themselves, which tended to have more homogeneous members, it's easier and understandable for assigned teams to have leaders emerged.

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The inclusion of KNOW, number of members known prior to the class, with a negative sign signifies that the more members one knows prior to the class, the less likely it is to have a leader emerged. This is because teams that were formed by themselves usually picked their members in terms of the following criteria: 1) whether they were friends or not; 2) whether they lived in the same dorms or not; 3) whether their faces looked familiar or not, if they were not yet friends at that time. It is easier for a group of strangers to accept someone among themselves to be their leader. It is harder to accept a friend as the leader, especially if they have hung out together during off class, unless that perceived leader happens to be the leader of the group that hangs together. In that sense, the negative sign that KNOW carries makes a lot sense.

The group dynamics model reveals the following general characteristics of teams with emergent leaders: 1) there is an even participation among team members in the decision making process; 2) group efforts towards task-oriented activities are high; 3) teams tend to have more indifferent members to the decision making process, or teams tend to have more free riders; 4) team members are less willing to confront each other, perhaps in fear of hurting other members' feeling; and 5) team members are not willing or ready to listen and accept other's opinions or suggestions.

It is not surprised to see that indifference or apathy, APATHY, was included in the model. Basically, what it means is that the high the number of team members who shows their indifference or apathy toward the decision making process, the more likely it is to have those who shoulder the responsibilities of the indifferent members to be viewed as leader of that team. Naturally, the indifference or apathy displayed by team member(s) in a decision making process could be attributed to many factors, which are certainly important and should be studied. Those issues are nevertheless beyond the scope of this study. The fact that certain team member(s) did not actively participate in the decision making process and other members took more serious approaches to their roles and responsibilities certainly qualified those active member(s) to be team leaders. Hare (1976) uncovered that leaders and followers could be distinguished by their overall rates of participation. Therefore, the fifth hypothesis is also supported.

The presence of EVEN in the model is both a good and a troubling sign. It is a good sign because it was expected to be an important variable, as the fourth hypothesis would indicate. It is a bad and troubling signal because a wrong kind of sign, a negative one, appeared as opposed to a positive one. This finding actually contradicted with our hypothesis. According to Stein and Heller (1979) group leaders are inclined to control the pace, direction, and agenda as well the frequency of participation by their members either intentionally or unconsciously. This being the case, how then can we claim that teams with leaders emerged tended to have more even rate of membership participation? Besides, this finding is also different from a study by Hsu and Eng (1983) where EVEN showed a correct sign, a positive one. Teams without leaders normally do not have such problems and members are usually more free to participate at will. Therefore, equal participation by team members without any leaders would be the normal than exception. But this certainly would not be the case for a group with an emergent leader among themselves.

In the early part of the twenty-century, confrontation or conflict was always viewed as detrimental to organizational efficiency and therefore should be kept to a minimum. Modern theorists on organizational behavior no longer view confrontation or conflict as an unnecessary evil. One study (Hoffman and Maier, 1961) found that groups composed of heterogeneous members, who frequently had conflict interest and opinion, usually generated better results than groups with homogeneous members. Here, the existence of CONFR,

confrontation or conflict, tended to help leaders emerge from their own teams. How and why this is the case is unclear. Perhaps, it offered an opportunity for a potential leader to show her/his leadership qualities to other team members.

EFFT is included is because it is believed that the higher an effort one shows, the more likely that person would be perceived as a leader. This might be attributed to the visibility of that person displayed. This seems to confirm the positive relationship between visibility and leader emergence uncovered in a study by Offermann (1986).

In the absence of any positive relationships between group performance/productivity and group leadership, the final hypothesis is also rejected. The findings of the study do provide further evidence to support an early study by Remus and Edge (1991), where the relationship of group performance to group leadership could not be established. This may also explain why today's top management consultants tend to play down the importance of leader's role in-group productivity (BusinessWeek, August 31, 1992).

In view of the above findings and discussion, two points have been observed and are worth mentioning.

First, we have learned from this study that individual and group, as well as group dynamics, variables can be good predictors of leadership emergence because of the high correct classification rates that are achieved by these models. One can not help but wonder what effects would that have if personality variables were included in the study.

Second, The study uncovered that there was no evidence to support any relationships, positive or negative, between the group performance and group leadership emergence. While the results support the findings of an earlier study, it is nevertheless unclear as to how much of this rejection was attributable to the potential built-in bias caused by the use of different numbers of teams in various industries. It seems unlikely that this type of bias can be resolved soon. The only way to overcome this bias is to come up with some sort of mechanism so that comparisons of group performance between or among teams in different industries could be achieved meaningfully and reliably.

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