Determinants of Effective Utilization of Leader Abilities

Fred E. Fiedler
Frederick W. Gibson

The research cited in this paper was conducted in large part under contract from the Army Research Institute for Behavioral Sciences, contract number 62-4688. The authors are indebted to Doctors M. M. Chemers, R. W. Rice, E. Sundstrom, and W. Butler for permission to use the data of their study. We would like to thank Judith Fiedler and Susan Murphy for their helpful comments on various versions of this paper.

Extensive empirical research has shown that a leader's intellectual ability or experience does not guarantee good performance.[1] This is a very curious finding since leadership obviously requires intellectual effort: leaders have to recognize and anticipate problems, analyze information, make plans and decisions, and evaluate probable outcomes. Moreover, leadership selection methods and management assessment centers place considerable reliance on the leader's intellectual abilities in hiring and promotion procedures. This means that leaders who are relatively more intelligent should perform these critical functions more effectively than the relatively less bright. The empirical results showing low correlations between leader intelligence and performance thus fly in the face of common sense and institutional wisdom. Our attempt to unravel these puzzling findings has led to a "cognitive resource theory" that seeks to provide a satisfactory reason for these counterintuitive findings.

The failure of more intelligent people to perform better or even as well as those with lower intelligence also has concerned various other investigators. Of particular relevance is the work on cognitive interference by D. E. Broadbent, P. E. Cooper, P. FitzGerald, and K. R. Parkes (1982); and especially by I. G. Sarason (1984); and I. G. Sarason, B. R. Sarason, D. W. Keefe, B. E. Hayes, and E. N. Shearin (1986).[2] These authors have shown that anxiety or stress-produced thought processes interfere with the ability to concentrate on complex tasks, especially if these thoughts concern stressful relations.

The work on cognitive interference suggests that this phenomenon may also account for the effect of stress on the leader's use of cognitive resources; specifically, intellectual abilities and technical competence. Our own research has shown that the leader's intellectual abilities do not correlate with performance when the leader reports stress, and especially stress in relations with important others, that is, the boss.[3] This paper summarizes the work on the conditions under which intellectual abilities contribute to effective team performance.

Dr. Fred E. Fiedler is professor of psychology and management and organization at the University of Washington. Mr. Frederick W. Gibson is a researcher at the University of Washington.

Cognitive Resource Theory

J. W. Blades has suggested that we conceptualize the main steps in the process of how the leader's intelligence contributes to the task roughly as follows.[4] The leader (a) devotes intellectual effort to making decisions, plans, and action strategies related to the task; (b) communicates the results to the group members in the form of directions, instructions, and guidance; and (c) commands the support of group members motivated to implement the leader's plans, decisions, and action strategies.

Along the path from the leader's intellectual effort in making plans and decisions to the implementation of these plans and decisions, there are several points where the leader's intelligence may be blocked or diverted from effecting the proper execution of the task. If blocking does occur, the leader's intelligence will, of course, not contribute to group performance.

As mentioned above, various investigators (e.g., R. S. Lazarus, Sarason, C. D. Spielberger, and W. G. Katzenmeyer), have demonstrated that stress can divert the individual from attending to the task.[5] We have found that the ability to concentrate on the task is particularly weak when a relationship with important others is stressful.[6] People who experience stress and anxiety tend to worry about their ability to succeed, wonder what will happen if they fail, or think about getting another job. As a result, they cannot apply their intelligence to the task at hand. In fact, under stress, leaders tend to rely on previously learned behavior patterns, knowledges, and skills.[7] We predict, therefore, that the leader's intellectual abilities contribute more highly to the group's task performance when stress is low than when it is high.

It is also obvious that the best plans, ideas, and decisions cannot help the group unless the leader communicates them to the members. As Blades pointed out, the leader must direct the group in what needs to be done and how it is to be done.[8] These directions will then be followed only if the group is willing and motivated to implement them. In other

words, the leader's intellectual abilities will contribute to performance only if the leader is directive and the group is supportive.

We must also consider under what conditions the group members' intelligence contributes to performance. Blades, Maier, and others have hypothesized that member abilities will benefit group performances only if the leader encourages participation by nondirective behavior.[9] This leadership approach presumably gives the group members an opportunity to contribute to the planning and decision making, provided that the group members are supportive. If they do not share the leader's and the organization's goals they are unlikely to contribute to getting the task accomplished.

The Test Studies

Let us first consider the relationship of leader intelligence to group performance. To assure that our results would not just apply to certain types of groups, we analyzed data from five different studies to get a preliminary answer to this question. The summary of the main characteristics of the five studies is shown in table 2.

Mess Halls

The first study investigated 52 Army mess halls. Each dining facility is managed by a senior noncommissioned officer (NCO) or mess steward who supervises from two to five cooks in preparing and serving foods for 100 to 200 people and in maintaining sanitary conditions. The work is governed by detailed operating procedures and therefore is highly structured. Performance of the mess halls was rated by company commanders and the post food service officer who agreed on their rankings. The intelligence of mess stewards and cooks was measured with the Henman-Nelson scale.[10] Leader directiveness was measured on a scale that asked cooks to rate the degree to which "the mess steward says what shall be done and how it shall be done."

Army Squads

The second study dealt with 138 Army infantry squad leaders who were responsible for preparing their 10-member units for combat duty, using a detailed training schedule. Squad leaders were closely supervised by a platoon leader and a platoon sergeant who rated their squad leader's performance. The leader's intelligence was based on the Army's qualification battery; directiveness was measured by structuring and production emphasis items from the Stogdill LBDQ XII scale.[11] The squad leaders also rated the degree to which their relationship with the immediate superior was stressful, using a semantic differential scale item "very stressful—not at all stressful."

Public Health Study

The third field study investigated 41 public health teams of two to eight American high school students who volunteered to work in Honduras and Guatemala. These teams performed community development projects and administered vaccination and inoculation clinics. Performance measures were obtained from the director of the project. Directiveness of the leaders was rated by group members, using the structuring items of the LBDQ scale.

Table 2

Summary of the Five Test Studies

Study	*Subjects*	*Intelligence*	*Directiveness*	*Task*	*Performance*
Mess Halls (52)	Stewards	Multiaptitude Scale	Subordinate Ratings	Mess Hall Operation	Company CC Brigade Food Advisor
Army Infantry Squads (138)	Squad Leaders	Vocabulary Scale	LBDQ Structure	Squad Training	Platoon Leader Platoon Sergeant
Public Health Teams	High School Volunteers	Vocabulary Scale	LBDQ Structure	Community Development	Project Directiveness Ratings
Decoding Study (40)	ROTC Cadets Psychology Students	Vocabulary Scale	LBDQ Control	Decode Messages	Number Messages Decoded
ROTC Creativity (56)	ROTC Cadets	Multiaptitude Scale	LBDQ Structure	Inventory Pay Proposal and Fable	Judges' Ratings of Group Products

Decoding Study

Data from a laboratory experiment that Chemers, Rice, Sundstrom, and Butler permitted us to use were generated from 40 teams of college students in the Reserve Officer Training Corps (ROTC) and the psychology department of an urban university.[12] These teams were told to decipher as many short coded messages (cryptograms) as possible in 30 minutes. The number of correct solutions served as the measure of performance. Directiveness was measured by member responses to an item indicating the degree to which the leader controlled what happened in the group. In addition, leaders and group members completed two items indicating the degree of tension and stress they felt in performing the task.

The ROTC Creativity Study

In a second laboratory experiment 54 three-member teams of Army and Navy ROTC cadets were given two tasks: to devise a better formula for paying ROTC cadets of the three services and to invent a fable for school children to illustrate the need for a large peacetime army. Three independent judges evaluated group performance on the first task, and five on the second task. The Multiaptitude Scale measured intelligence of leaders and group members, while leader directive behavior (structuring) was rated by each of the group members.[13] Perceived stress was measured using the Alexander and Husek state anxiety scale.[14] In addition, all sessions were recorded, and typed transcripts were prepared for content analysis.

Results

The five studies indicated the effects of stress on leader effectiveness, the correlation of intelligence to performance, and the consequence of stress on performance of the group. The tests also showed the group response to the different leadership approaches.

Effect of Stress. To determine how stress affected the leader's ability to apply intelligence to the job, we divided the groups in each study into those in which the leader reported low, moderate, or high stress. We then asked how leader intelligence and group performance correlated in these subgroups. In groups with leaders who reported high stress, intellectual abilities did not contribute to performance (see table 3). In groups in which leaders reported low stress, the correlations were low but consistently positive.

Directiveness and Group Support. A second hypothesis, first advanced by Blades, predicted high correlations between leader intelligence and performance only if the leader was directive and supported by the group. This hypothesis was tested by subdividing the groups in each study into those with leaders rated above and below the mean on directive behavior, and then into groups reporting relatively high or low support of the leader and the group. Group support was measured using a "group atmosphere" scale of 10 bipolar items initially developed by Fiedler.[15] Table 4 displays the correlations between intelligence and performance for directive and nondirective leaders with high or low group support. As hypothesized, we found a high correlation between leader intelligence and group performance only in supportive groups with directive leaders. In the other three types of groups these correlations were weak or negative.

Table 3

Correlations between Leader Intelligence and Group Performance under Conditions of Low, Moderate, and High Stress

Study	*Performance Criterion*	*Correlations* Low Stress	Mod Stress	High Stress
Squadron Leaders	Leader Performance	.43** (46)	.27 (41)	–.01 (31)
Public Health	Performance on Community Development	.21 (15)	.22 (11)	–.16 (14)
Decoding	Number Messages Decoded	.21 (13)	–.53* (15)	–.19 (12)
ROTC Creativity	Team Performance			
	Pay Proposal	.27 (18)	.20 (18)	.10 (17)
	Fable	.39 (18)	.02 (19)	.30 (17)
Mean		.30	.23	.02

NOTE: The purpose of the tripartite subdivision of the sample was to determine whether stress affected performance in a curvilinear manner. Subdividing the sample at the median of the stress scale and the tripartite subdivision yielded similar findings.
*p<.05
**p<.01

Table 4

Correlations between Leader Intelligence Scores and Performance for Conditions in which the Leader Is Directive or Nondirective with High or Low Group Support

Study	Situational Control	Directive Behavior: High; Group Support: Low	Directive Behavior: High; Group Support: High	Directive Behavior: Low; Group Support: Low	Directive Behavior: Low; Group Support: High
Mess Hall	Cooks' GA	.56* (13)	–.09 (13)	.21 (11)	–.05 (11)
Squadron Leader	Leader GA	.49** (27)	.39# (24)	.13 (26)	.03 (30)
Public Health	Member GA	.56# (10)	.43 (10)	–.58 (8)	.06 (10)
Decoding^	Leader GA		–.29 (8)		–.68* (12)
ROTC	Leader GA:				
Creativity@	Pay Proposal	.58* (13)	.27 (14)	.12 (12)	.16 (15)
	Fable	.75** (13)	.06 (14)	.23 (12)	–.21 (15)
Mean Correlations		.58	.19	.14	–.18

\# p< .10
* p< .05
** p< .01
^ Group support was low in all teams in the decoding study.
@ Correlations for study were averaged.

Given the consistency of this finding across the studies, we conclude that the results are quite robust.

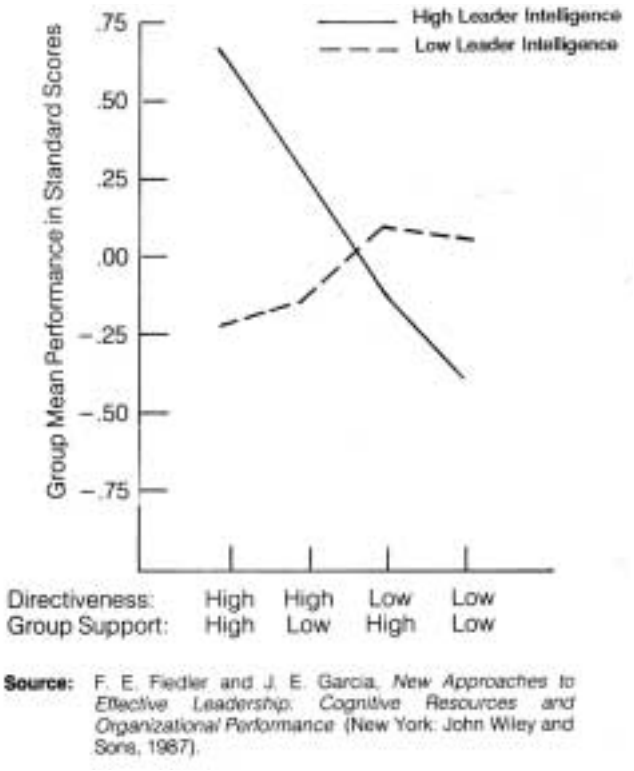
There has been a great deal of controversy about the relative virtues and advantages of directive versus nondirective and participative leadership. To determine whether groups with directive or nondirective and participative leaders are more effective, we computed the average performance of the groups that had relatively bright and dull leaders.

Figure 4 shows the average standardized performance scores of these groups on the vertical axis and the four types of groups (directive/nondirective, supportive/nonsupportive) on the horizontal axis. The performance of the relatively more intelligent leaders is indicated by the solid line and that of less intelligent leaders by the broken line. The figure illustrates that groups performed well if their leaders were either intelligent and directive or else relatively less intelligent but nondirective. The less intelligent leaders who were nondirective and participative performed rather well, presumably because they relied on the intellectual abilities of their brighter group members. The moral seems to be, "if you've got brains, speak up; if you are not so bright, let others do the talking." These results are especially intriguing not only because they make intuitive sense, but also because they show the specific conditions under which a directive or nondirective and participative leadership approach is likely to be most effective.

Behavioral Implications. The dysfunctional consequences of stress on group performance were further investigated in an analysis of the ROTC creativity study. Groups were divided into three subgroups on the basis of the perceived stress (high, medium, and low) reported by the group leader. The typewritten transcripts were then rated by three independent judges to determine the number of ideas the leader or members contributed and the amount of time the leader or the group members spent talking.

The results indicate that more intelligent leaders under stress talked more than did the less intelligent leaders in similar circumstances. Furthermore, this tendency became more pronounced as the session progressed and leaders felt pressure to finish in time. In groups led by more intelligent leaders, the members contributed fewer creative ideas than did members in groups led by less intelligent leaders. Again, this trend became more pronounced toward the end of the session. These findings suggest that the more intelligent leaders tend to "babble" under stress and thus keep others from making constructive comments. As a result, fewer ideas are presented in the course of the task session, thus decreasing creative performance.

The transcript analysis of the ROTC sessions also provides some insight as to the effect of leader directiveness. Directive leaders consistently talked more and presented more ideas than did their less directive counterparts. This



Source: F. E. Fiedler and J. E. Garcia, *New Approaches to Effective Leadership: Cognitive Resources and Organizational Performance* (New York: John Wiley and Sons, 1987).

Figure 4. Mean Performance Scores of Relatively Intelligent and Less Intelligent Leaders in Four Different Types of Group Situations

difference was most evident when leaders reported high stress and became even greater in the last portion of the group session. Directive leaders also presented more new ideas than did nondirective leaders as the session proceeded, whereas less directive leaders presented fewer new ideas. The directiveness of the leader also tended to reduce the number of new ideas expressed by the group members and again particularly so in the last third of the session.

Concluding Remarks

Cognitive resource theory attempts to identify the role of intelligence in determining leadership effectiveness and group performance. We can now suggest some of the conditions in which intelligence contributes to the performance of a group or organization, and we are able to suggest why directive or nondirective leaders are not always successful. A directive leader who does not understand the problem or has poor judgment will almost certainly do a worse job than a nondirective leader who may be less bright but is willing to listen to others.

But why do nondirective leaders who are intelligent perform so poorly in at least some studies? One reason might be that group members interpret the leader's failure to give directions as letting them down. Group members may not know how to react to a leader who is obviously very bright but refuses to tell people what to do. The members may wonder whether the leader is trying to put them on the spot or is unwilling to participate. Although much has been written about the advantages of nondirective and participative leadership, our data show that this leadership style may be effective only if the leader is less bright and has the support of the group. Whether these effects also will be found in larger organizations still needs to be examined.

Our research has important implications for selection and placement. If we want people to use the intellectual abilities for which they were selected, we must not only develop tests to measure these abilities but also provide conditions under which these abilities will be applied. Selecting the smartest person at great expense and then placing this individual with a stress-generating boss is not only wasteful but counterproductive.

Cognitive resource theory will not be the last word in understanding the role of cognitive resources in leadership. However, the work should contribute to a better understanding of the role of intellectual abilities in organizational performance, and point to methods for applying this knowledge in military and civilian organizations.

Notes

1. B. M. Bass, *Stogdill's Handbook of Leadership* (New York: Free Press, 1981); E. E. Ghiselli, "Intelligence and Managerial Success," *Psychological Reports* 12 (1963): 898; R. D. Mann, "A Review of Relationship between Personality and Performance in Small Groups," *Psychological Bulletin* 56 (1959): 241–70; R. M. Stogdill, "Personal Factors Associated with Leadership: A Survey of Literature," *Journal of Psychology* 25 (1948): 35–71.

2. D. E. Broadbent, P. E. Cooper, P. FitzGerald, and K. R. Parkes, "The Cognitive Failures Questionnaire (CFQ) and Its Correlates," *British Journal of Clinical Psychology* 21 (1982): 1–16; I. G. Sarason, "Stress, Anxiety, and Cognitive Interference: Reactions to Tests," *Journal of Personality and Social Psychology* 46 (1984): 929–38; I. G. Sarason, B. R. Sarason, D. W. Keefe, B. E. Hayes, and E. N. Shearin, "Cognitive Interference: Situational Determinants and Traitlike Characteristics," *Journal of Personality and Social Psychology* 1 (1986): 215–26.

3. F. E. Fiedler and J. E. Garcia, *New Approaches to Effective Leadership: Cognitive Resources and Performance* (New York: John Wiley and Sons, 1987).

4. J. W. Blades, *The Influence of Intelligence, Task Ability, and Motivation on Group Performance* (PhD diss., University of Washington, Seattle, 1976).

5. R. S. Lazarus, *Psychological Stress and the Coping Process* (New York: McGraw-Hill, 1966); Sarason, "Stress, Anxiety, and Cognitive Interference"; C. D. Spielberger and W. G. Katzenmeyer, "Manifest Anxiety, Intelligence, and College Grades," *Journal of Consulting Psychology* 22 (1959): 278.

6. V. Barnes, E. H. Potter III, and F. E. Fiedler, "Effect of Interpersonal Stress on the Prediction of Academic Performance," *Journal of Applied Psychology* 68, no. 4 (1983): 686–97; D. F. Borden, *Leader-Boss Stress, Personality, Job Satisfaction and Performance: Another Look at the Interrelationship of Some Old Constructs in the Modern Large Bureaucracy* (PhD diss., University of Washington, Seattle, 1980).

7. Fiedler and Garcia, *New Approaches to Effective Leadership.*

8. Blades, "Influence of Intelligence"; J. W. Blades and F. E. Fiedler, *The Influence of Intelligence, Task Ability, and Motivation on Group Performance* (Organizational Research Technical Report, University of Washington, Seattle, 1973): 76–78.

9. N. R. F. Maier, *Problem Solving and Creativity in Individuals and Groups* (Belmont, Calif.: Brooks/Cole, 1970).

10. T. A. Lamke, M. J. Nelson, and J. L. French, *The Henman-Nelson Tests of Mental Ability* (Boston: Houghton Mifflin, 1973).

11. R. M. Stogdill, "Personal Factors Associated with Leadership: A Survey of the Literature," *Journal of Psychology* 25 (1974): 35–71.

12. M. M. Chemers, R. W. Rice, E. Sundstrom, and W. Butler, "Leader Esteem for the Least Preferred Co-worker Scale, Training, and Effectiveness: An Experimental Examination," *Journal of Personality and Social Psychology* 31 (1975): 401–9.

13. E. E. Cureton and L. W. Cureton, *The Multi-Aptitude Test* (New York: McGraw-Hill, 1967).

14. S. Alexander and T. R. Husek, "The Anxiety Differential: Initial Steps in the Development of Measures of Situational Anxiety," *Educational and Psychological Measurement* 22 (1962): 325–48.

15. F. E. Fiedler, *A Theory of Leadership Effectiveness* (New York: McGraw-Hill, 1967).