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EFFECT OF NUMBER SUPERVISED AND EDUCATIONAL  
LEVEL ON ORGANIZATIONAL EFFECTIVENESS

William H. Hendrix, Lieutenant Colonel, USAF  
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Research was conducted to establish the effects of number of people directly supervised and highest educational level obtained on three criteria of effectiveness (i.e., climate, satisfaction, and perceived productivity). Data were collected on 4786 military and civilian personnel located at five Air Force bases using the Organizational Assessment Package (OAP). Two separate one-way ANOVA's were used to test for differences between the number of people directly supervised by subjects and differences associated with the highest educational level obtained. Number of people supervised differed significantly with larger numbers supervised having higher values on all three criteria. Educational levels differed significantly on the criteria with high school graduates reporting lower values for climate and job satisfaction while doctoral degree subjects reported the lowest values for perceived productivity.

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A School of Systems and Logistics AU-AFIT-LS Technical Report  
Air University  
Air Force Institute of Technology  
Wright-Patterson AFB, Ohio

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August 1980

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Effect of Number Supervised and Educational Level on  
Organizational Effectiveness

William H. Hendrix

and

Nestor K. Ovalle, 2d

INTRODUCTION

The task of improving organizational effectiveness is viewed by most managers and management researchers as one of the major challenges facing organizations (Steers, 1977). Many approaches have been both recommended and employed to enhance an organization's effectiveness. These include programs which focus on such areas as: individual and group goal setting, group problem solving/decision making, job design, individual motivation, and the systematic process of planned organizational change. Many approaches to improve effectiveness have been utilized by the Air Force. Furthermore, the Air Force, like many organizations, has recognized and struggled with the need to identify organizational problem areas requiring management attention. In this regard, one of the more systematic Air Force programs, designed to identify organizational strengths and problem areas, is that used by the Leadership and Management Development Center (LMDC) at Maxwell AFB, Alabama. This task is accomplished by LMDC through the administration of the Organizational Assessment Package (OAP), (Hendrix and Halverson, 1979).

## PROBLEM

During the OAP validation stages a large amount of data were collected. In addition to validating the OAP, analysis of these data was needed to identify the factors related to organizational effectiveness. This paper focuses on research to establish the effect of number of people directly supervised and highest educational level obtained on three criteria of effectiveness.

## METHOD

### Subjects

Subjects consisted of 4786 military and civilian personnel located at five Air Force bases representing six major commands. The sample's composition was: 2% non-high school graduates, 39% high school or GED graduates, 37% some college work, 9% bachelor degrees, 6% some graduate work, 6% master's degrees, 1% doctoral degrees, 78% white, 10% black, 5% hispanic, 7% listed as other than white, black, or hispanic, 86% males, 14% females, 17% officers, 66% enlisted, and 17% civilians.

### Survey Instrument

Data were collected using the Organizational Assessment Package (OAP), an attitudinal survey containing 7-point Likert scales (Hendrix and Halverson, 1979). The OAP included measures of areas relating to the job, one's supervisor, the organizational climate, the perceived productivity of one's work group, and satisfaction.

### Data Analysis

In a previous study (Hendrix and Halverson, 1979), 22 OAP factors were extracted. Three of these factors (General Organizational Climate, Job-Related Satisfaction, and Perceived Productivity) were selected as dependent variables or effectiveness criteria for this study. Each subject's factor score was computed for each of the three criteria. These scores served as inputs to two separate one-way Analysis of Variance's (ANOVA's) to test for (1) significant differences between the number of people directly supervised by subjects, and (2) significant differences associated with the highest educational level obtained by subjects. Subjects, who did not respond to items associated with a given criterion, were deleted from the analysis resulting in unequal n's. The actual n associated with each analysis is provided in the results section. Table 1 provides the two OAP items used for analysis (i.e., number of people directly supervised, and highest educational level obtained).

### RESULTS

#### Analysis 1. Number of People Directly Supervised

General. The analysis of variance summary tables for analysis 1 are provided in Table 2. Figure 1 graphically depicts the differences between standard scores for each criterion by response group.

TABLE 1

Background Information Items Analyzed by ANOVA

Response Group	Item Statement
	How Many People Do You Directly Supervise (i.e., Those You Write Performance Reports On):
1	1. None
2	2. 1 to 2
3	3. 3 to 5
4	4. 6 to 8
5	5. 9 to 12
6	6. 13 to 20
7	7. 21 or more
-----	
	Your Highest Educational Level Obtained Is:
1	1. Non-high school graduate
2	2. High school graduate or GED
3	3. Some college work
4	4. Bachelor's degree
5	5. Some graduate work
6	6. Master's degree
7	7. Doctoral degree

TABLE 2

Analysis of Variance Summary Table for Number of People Directly Supervised

---

General Organizational Climate

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	3	50.3169	51.14	.001
Within Groups	4104	.9839		
Total	4108			

Job-Related Satisfaction

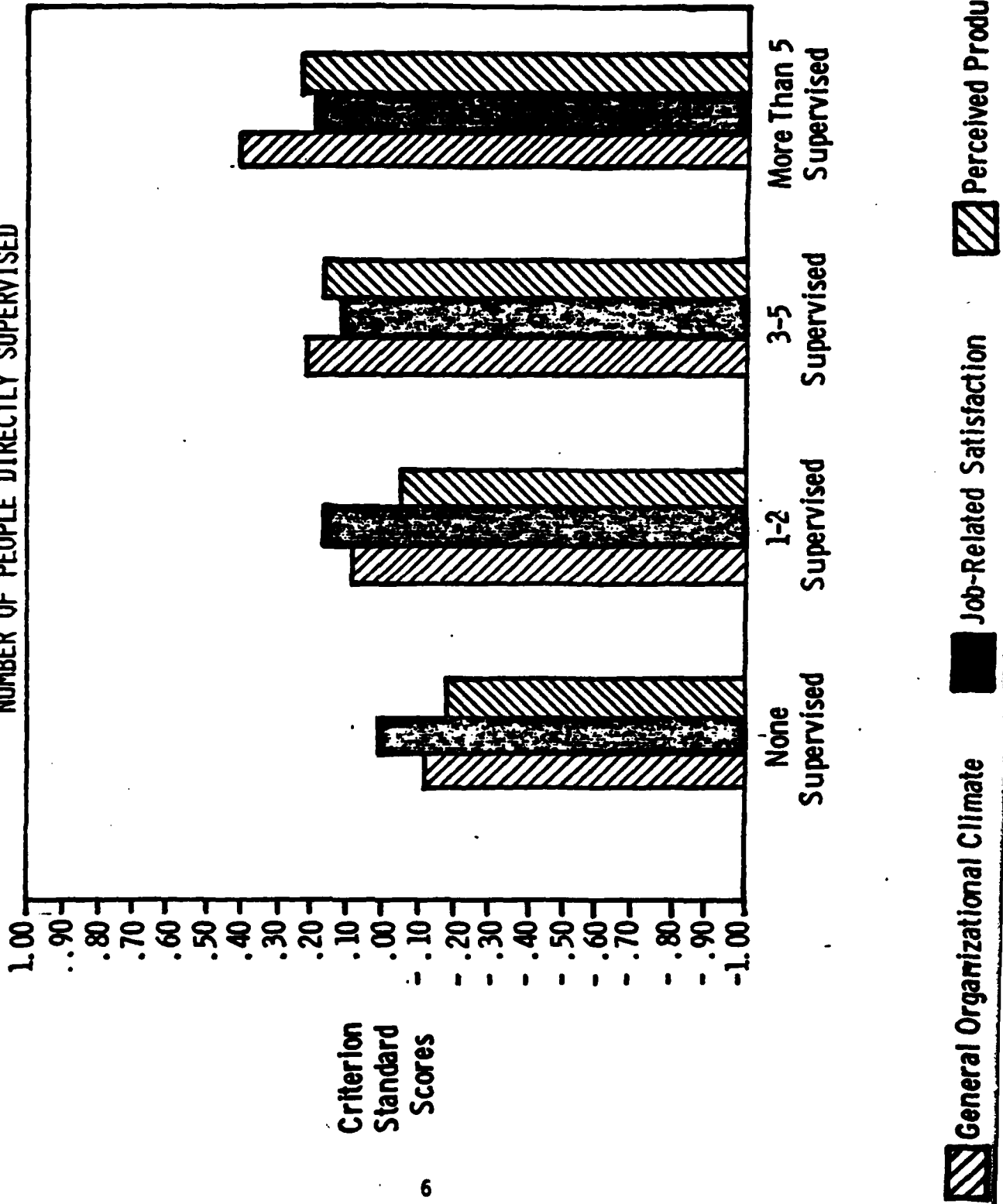
<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	3	4.9845	4.20	.006
Within Groups	3875	1.1871		
Total	3879			

Perceived Productivity

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	3	37.4730	31.63	.001
Within Groups	4201	1.1947		
Total	4205			

---

**FIGURE 1**  
**NUMBER OF PEOPLE DIRECTLY SUPERVISED**



General Organizational Climate

Job-Related Satisfaction

Perceived Productivity

General Organizational Climate (n=4108). The analysis of variance indicated a significant ( $p < .001$ ) main effect. The Newman-Keuls Sequential Range Test indicated significant differences between all pairs of means except for response 2 (1 to 2 people) and 3 (3 to 5 people) which were not significant.

Job-Related Satisfaction (n=3879). The analysis of variance indicated a significant ( $p < .006$ ) main effect. The Newman-Keuls Sequential Range Test indicated a significant difference between response 1 (none) and the combined responses 4, 5, 6, and 7 (6 to 21 or more).

Perceived Productivity (n=4205). The analysis of variance indicated a significant ( $p < .001$ ) main effect. The Newman-Keuls Sequential Range Test indicated all pairs were significantly different except for response 3 (3 to 5 people) and the combined responses 4, 5, 6, and 7 (6 to 21 or more).

Discussion. The data indicate a consistent relationship between number of people directly supervised and all three criteria of effectiveness. Specifically, it was found that all three criteria increased as the number of personnel supervised increased. Subjects who reported more than five personnel supervised had the highest values for all three criteria and subjects who reported "none" supervised had the lowest values on the criteria.

#### Analysis 2. Highest Educational Level Obtained

General. The analysis of variance summary tables for analysis 2 are provided in Table 3. Figure 2 graphically depicts the differences between standard scores for each criterion by response group.

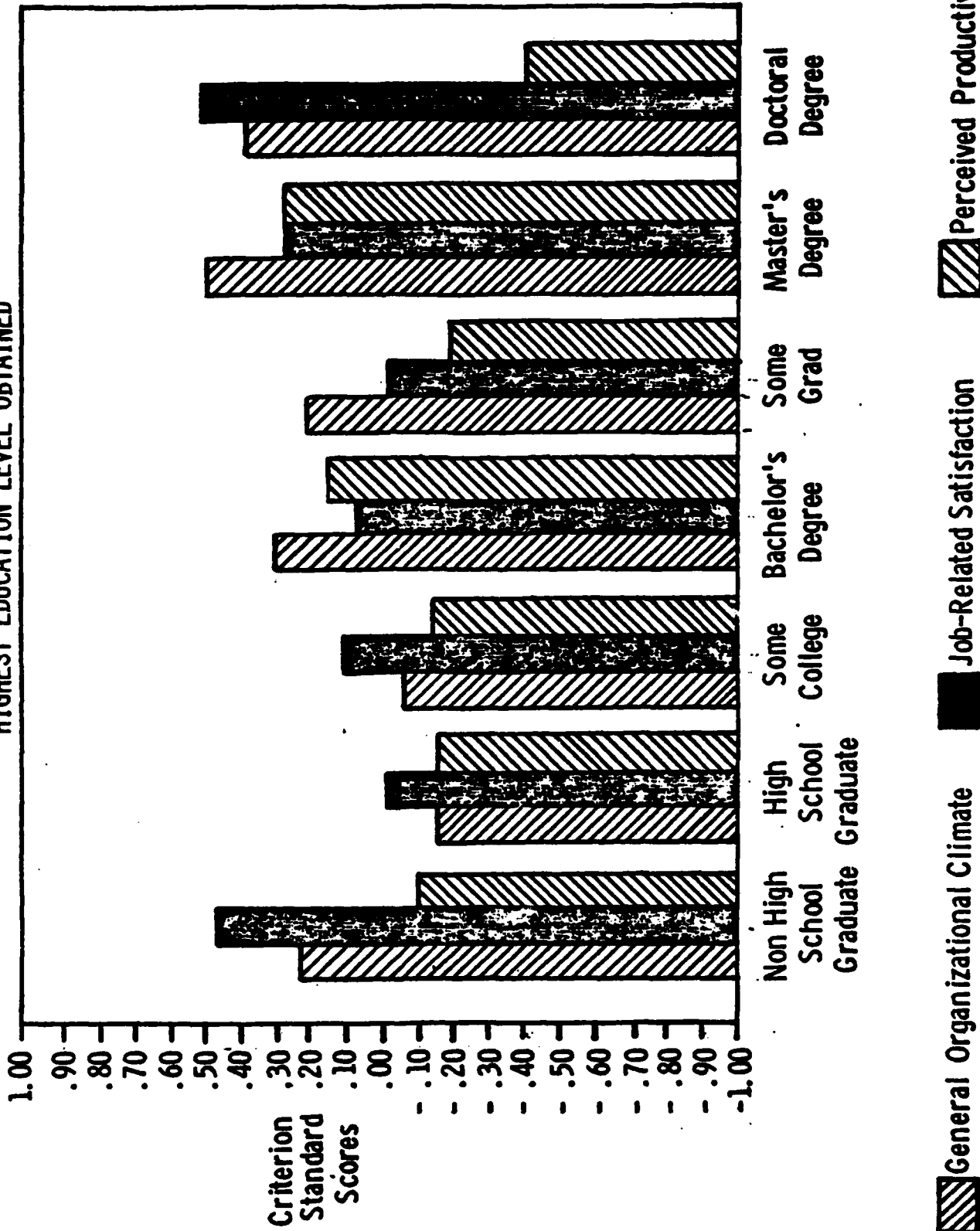


TABLE 3

## Analysis of Variance Summary Table for Highest Educational Level Obtained

General Organizational Climate				
<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	6	32.0869	32.93	.001
Within Groups	4101	.9745		
Total	4108			
Job-Related Satisfaction				
<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	6	7.8822	6.68	.001
Within Groups	3872	1.1797		
Total	3879			
Perceived Productivity				
<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between Groups	6	12.4350	10.41	.001
Within Groups	4198	1.1947		
Total	4205			

FIGURE 2  
HIGHEST EDUCATION LEVEL OBTAINED



General Organizational Climate (n=4108). The analysis of variance indicated a significant ( $p < .001$ ) main effect. The Newman-Keuls Sequential Range Test indicated: (1) significant differences between response 2 (high school graduate or GED) and all other responses; (2) significant differences between response 3 (some college work) and all other responses, and (3) significant differences between response 6 (master's degree) and response 4 (bachelor's degree) and response 5 (some graduate work).

Job-Related Satisfaction (n=3879). The analysis of variance indicated a significant ( $p < .001$ ) main effect. The Newman-Keuls Sequential Range Test indicated: (1) significant differences between response 1 (non-high school graduate) and response 2 (high school graduate or GED), (2) significant differences between response 2 (high school graduate or GED) and response 3 (some college work), and (3) significant differences between responses 2, 3, 4, and 5 (high school graduate or GED--some graduate work) and response 6 (master's degree) and response 7 (doctoral degree).

Perceived Productivity (n=4205). The analysis of variance indicated a significant ( $p < .001$ ) main effect. The Newman-Keuls Sequential Range Test indicated response 4 (bachelor's degree) and response 6 (master's degree) each differed significantly from responses 2, 3, 5, and 7.

Discussion. The data indicate that subjects who were high school graduates (or GED) perceived the General Organizational Climate to be lower than did other subjects; the highest perceptions were held by master's degree subjects, followed next by doctoral degree subjects. High school graduates (or GED) reported lower Job-Related Satisfaction than did other subjects; the

highest job satisfaction was reported by doctoral degree subjects, followed next by non-high school graduates and master's degree subjects. Doctoral degree subjects perceived productivity to be lower than did other subjects, the highest perceptions were held by master's degree subjects, followed next by bachelor's degree subjects.

#### SUMMARY

This paper assessed the relationship between two factors (number of people directly supervised and highest educational level obtained) to determine if they were related to three criteria of organizational effectiveness. The findings suggest that both factors are related to perceived organizational effectiveness. The positive relationship found between effectiveness and the number of personnel supervised suggests that effectiveness is improved by providing opportunities for more supervisory responsibility. Additionally, the data suggest that management must recognize the association between members' perceptions of climate, satisfaction and productivity and the members' educational levels. Of particular concern are the findings that the two smallest groups, non-high school graduates and personnel with doctoral degrees, expressed high levels of job-related satisfaction but low levels of perceived productivity. In order to explain these effects, the dynamics of these relationships for all the subgroups must be explored in greater depth.

A basic premise of this study was that in order to enhance effectiveness, in itself a multidimensional construct, we need to identify its relationships with a variety of factors. This study suggests two (of many) which appear to be significantly related to the criteria of organizational climate, job-related satisfaction, and perceived productivity.

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