Different management impacts of using the orthodox job enrichment model vs. the modified Hackman-Oldham model in the Minuteman line missile combat crewmember job

James W. Kirlin

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DIFFERENT MANAGEMENT IMPACTS OF USING THE ORTHODOX JOB ENRICHMENT MODEL VS. THE MODIFIED HACKMAN-OLDHAM MODEL IN THE MINUTEMAN LINE MISSILE COMBAT CREWMEMBER JOB

By

James W. Kirlin

B.S.B.A., University of Florida, 1976

Presented in partial fulfillment of the requirements for the degree of

Master of Business Administration

UNIVERSITY OF MONTANA

1981

Approved by:

Chairman, Board of Examiners

Dean, Graduate School

5-4-81
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CHAPTER I

PURPOSE AND ORGANIZATION

Problem Statement

The problem statement of this paper is this: The United States Air Force is currently using two job enrichment strategies, Orthodox Job Enrichment and the Leadership and Management Development Command Hackman-Oldham Job Characteristics Model. To date, neither of these has been applied to the Minuteman line combat crew position. The question is, "What are the different management impacts of applying the Orthodox Job Enrichment (OJE) Model versus the Leadership and Management Development Command (LMDC) Hackman-Oldham (H-O) Job Characteristics Model (JCM) to the Minuteman line missile combat crew position?"

Purpose of the Research

The purpose of this research was to discover the different managerial impacts of applying the two models to the Minuteman line crew position. Two research questions were proposed. One research question attempted to discover the impact of one of the critical differences between the models: OJE does not administer attitude questionnaires or interviews during the implementing process, whereas, the LMDC H-O JCM uses an attitude questionnaire called the Organizational Assessment Package (OAP) Survey.

The OAP was developed for use by the LMDC. It provides a means of identifying existing strengths and weaknesses within organizational work.
groups and aggregate work groups, such as directorates. It consists of 109 to 120 questions in a written format. Each question normally requires a response on Likert scales of eight possible choices. The scores of factors are derived by grouping responses to several questions. Various indexes are then computed from analyzing the factors and other variables in different ways. The Motivation Potential Score (MPS) is computed using five major factors. Computation of the MPS is given in Figure 1.

The Motivation Potential Score (MPS) is computed using the following factors:

- Factor 800: Skill Variety
- Factor 801: Task Identity
- Factor 802: Task Significance
- Factor 813: Task Autonomy
- Factor 814: Job Feedback

The formula is:

\[
MPS = \left(\frac{(\text{Skill Variety} + \text{Task Identity} + \text{Task Significance})}{3}\right) \times \text{Task Autonomy} \times \text{Job Feedback}
\]

Value range will be from 1 to 343.

Fig. 1—The Motivation Potential Score


LMDC also conducts one-on-one structured interviews with at least 10 percent of the individuals in a unit. Sometimes, with small units, as many as 50 percent are interviewed. The exact interview structure and the methodology of analyzing the interviews was not available.
The second research question attempted to discover any possible management differences in applying the two approaches to the Minuteman line crew position.

**Research Questions**

The first research question was, "Will Minuteman line crewmembers, untrained in Orthodox Job Enrichment and subjected to an unstructured interview, suggest significantly more hygiene than motivator changes in their job?" The second research question was, "Using the results of the first research question, what are the management implications of the differences between using the Leadership and Management Development Command Hackman-Oldham Job Characteristics Model (LMDC H-O JCM) for enriching the Minuteman line crew position?"

**Definition of Key Terms**

Job Enrichment is a work redesign strategy which attempts to bring about increased productivity and/or worker satisfaction by changing the work itself.

Orthodox Job Enrichment (OJE) is the application of the Motivation-Hygiene Theory to organizations. Its intent is the designing of opportunities for motivator behavior into an individual's job.

LMDC H-O JCM is the job enrichment process based on the Job Characteristics Model of J. Richard Hackman, Greg Oldham, Robert Janson and Kenneth Purdy. The LMDC has made some modifications to the Hackman-Oldham Model and its implementing process to meet its own needs. Its intent is to link basic theory about behavior in organizations and practical technologies for the design and redesign of jobs.
General Background Information

Orthodox Job Enrichment (OJE) is used by the Air Force throughout the Air Force Logistics Command (AFLC). The original OJE was started at the Ogden Air Logistics Center at Hill Air Force Base, Utah in 1974. Successful at Ogden, the OJE program was implemented throughout AFLC beginning in 1977. The original Ogden program was started with the guidance of Herzberg and Associates but the AFLC program continues today using AFLC managers trained and proficient in OJE. From April 1974 to January 1977, 64 projects involving 3,584 workers were started with a cost of $1,109,000 and benefits of $2,747,000. (1) By early 1979, AFLC had 376 job enrichment projects under way. (2)

The Leadership and Management Development Center (LMDC) is at Maxwell Air Force Base, Alabama. The LMDC mission includes providing management consultation services to Air Force commanders, providing leadership and management training for Air Force personnel in their work environment, and performing research in support of the first two objectives. Their consultative role involves organizational problem area identification and recommendations for resolving problems identified.

As such, LMDC is the center for job enrichment consulting services and information throughout the Air Force with the exception of AFLC. Each of the major air commands—SAC, TAC, MAC, AFSC, PACAF, and AFCS—has a job enrichment manager trained by LMDC. The consulting team, usually composed of the major command manager and two LMDC consultants, offers job enrichment assistance to requesting units. By 1978, seventeen job enrichment managers (six from the major air commands and eleven from LMDC) were trained.
General Limitations of the Research Methodology

The first research question uses a one-shot case study method. This method is the most general form of the pre-experimental designs and as such is not considered to be a true experimental design. The experimental variable in the first question is the total of all the experiences each line missile combat crewmember has had since becoming a crewmember. Campbell has defined the experimental variable as, "...the exposure of a group to an experimental variable or event, the effects of which are to be measured." (3) The observation made about the experimental variable is the personal interview conducted with each crewmember. In summary, one observation (interviews) is made of the experimental variable (collective experiences). The observation consists of measuring motivator and hygiene concerns about the job.

One of the values of research is to be able to generalize the findings to a population or universe. The extent to which one can generalize is dependent upon the external validity of the findings.

"External validity asks the question of generalizability: to what populations, settings, treatment variables, and measurement variables can this effect be generalized." (4) Four factors jeopardize the external validity: first, the reactive or interaction effect of testing; second, the interaction effects of selection biases and the experimental variable; third, the reactive effects of experimental arrangements; and fourth, multiple-treatment interference.

The reactive or interaction effect of testing means that a pretest might increase or decrease the respondents sensitivity to the experimental variable and make the population unrepresentative of the universe. This
factor is not relevant in this study because the sample was not administered a pretest. The five individuals who were administered a pretest were not included in the twenty interviews actually used.

The interaction effects of selection biases and the experimental variable means that any effects demonstrated may hold only for the unique population. Specifically, the question is, "Are there characteristics of the line crewmembers of this particular wing that when interviewed about job changes make them unique among line crewmembers of other Minuteman wings?" The model used in this study does not control this bias. An assumption is made that the characteristics of line crewmembers of Malmstrom Air Force Base are similar enough to produce the same observations from line crewmembers of the other Minuteman wings.

The reactive effects of experimental arrangements means that the experiment itself may produce unrepresentativeness. The experimental setting or the interviewee's knowledge of being "tested" can cause effects of their own. To reduce these reactive effects, a pretest was conducted to standardize procedures and formats, as well as to gain experience in interviewing.

Multiple-treatment interference can occur whenever multiple treatments are applied to the same respondents. This effect is not relevant to the one-shot case study. In summary, the first research question is a one-shot case study subject to the external validity issues of the interaction effects of selection biases and the experimental variable, and the reactive effects of the experimental arrangements.

The second research question may also be considered a one-shot case study. The results of the first question are assumed to be the true state of affairs. However, the second research question does have some
special limitations which are discussed later in this paper.

**Nature and Order of Presentation**

The paper is organized to first outline the conceptual frameworks and methodologies used in the research questions. After this, a review of the existing literature on work motivation is presented. The results and conclusions for the first research question are then presented, followed by the results and conclusions for the second research question. Other findings are then summarized and general conclusions drawn. Suggestions for additional research are proposed in Appendix B.
Footnotes for Chapter I


4 Ibid., p. 5.
CHAPTER II

CONCEPTUAL FRAMEWORK AND METHODOLOGY

Theoretical Framework

The theoretical framework of the methodology used in this study is based upon Frederick Herzberg’s Motivation-Hygiene Theory and Orthodox Job Enrichment. This theoretical viewpoint is critical to the first research question and provides the method for comparison in the second question.

A Discussion of the Relationship Between the Research Questions and the Objectives

The first research question examined one difference between the two models. The difference centered on the use of attitude and motivation surveys. LMDC uses such surveys whereas OJE does not. A pre-experimental design was used to test a hypothesis of importance to both theories. The hypothesis is that there is a greater probability of obtaining the hygiene concerns from an attitude survey than the probability of obtaining motivator concerns.

The M-H Theory holds that one dynamic of hygiene is that there are infinite sources of pain in the environment, but there are only limited sources of growth opportunities. Therefore, the theory predicts more hygiene-oriented attitudes can be found than motivator-oriented attitudes when attitudes are surveyed.
Structured questionnaires and interviews as used by the LMDC to measure and survey attitudes have some limitations. The first is the effect of the forced choice. A respondent must answer all the questions on a written questionnaire. Some of the items may be of no importance to him. However, he is forced to produce an attitude about it and rate that preselected factor. The same holds true for structured interviews. Weighting or inclusion of various factors to determine a score or index further compounds the error effect of forced choice.

Two other artifacts, consistency and priming, arise from structured questionnaires and interviews. "Consistency effects refer to the phenomenon in which individuals, when interviewed about their attitudes and beliefs, tend to organize information in consistent ways." (1) Priming means that the questionnaire or interviewer orients the respondent's attention to particular information. "The priming effect occurs in the questioning process when various aspects of the situation are made more salient than they might otherwise be." (2) An example of these artifacts will make this priming effect clear. If the interviewer or questionnaire asks, "Does your job have challenging characteristics?" the respondent focuses on the job itself, rather than features such as pay, status, etc. When asked later about satisfaction, the respondent will tend to answer in terms of challenging characteristics of the job because he has been sensitized to them.

Another effect is the "social acceptance" of the factors. (3) For example, if a person belonged to a group which downplayed status, his response would be affected even though he might place great value on status. Unconscious motives also affect the rating process of a structured questionnaire.
Specifically, the first research question used a personal, unstructured interview to ask line crewmembers to suggest changes they would make in their job. The changes they suggested were coded as involving the hygiene or motivator factors of Herzberg's Motivation-Hygiene Theory. The null hypothesis was that the number of hygiene concerns mentioned will be equal to the number of motivator concerns mentioned. The alternate hypothesis was that the number of hygiene concerns mentioned will be greater than the motivators concerns.

The second research question researched the critical differences between the two approaches in terms of work motivation and analyzed the management impacts of applying each model to the Minuteman line crew position. A "thinkpiece" approach is used to develop a comparison of the two models and to project the possible differences of applying each to the line crew position.

Specifically, the second research question compared the LMDC H-0 JCM to the Motivation-Hygiene Theory's Orthodox Job Enrichment. The critical differences were presented and then followed by the management implications of implementing each model to the line crew position.

Discussion of the Sources and Means of Obtaining Data for the First Research Question

Methods Used to Collect Data

Personal interviews were used to collect the data used in the first question. The personal interview method was chosen over a written survey for several reasons. First, the number of hygiene and motivator concerns suggested is important to the hypothesis. The interview allowed the crewmember to speak as long as he could think of things he would
change in his job. This avoided the forced choice affect by allowing the crewmember to mention changes that were most important to him. Second, a written survey with the same question would tend to produce generalized responses which could not be coded because the dynamic could not be demonstrated. Third, only one question was asked to start the interview which avoided the consistency and priming effects of many questions.

Three assumptions were made in using this method. First, it was assumed that the line crewmembers could identify their feelings and propose how they would change their job to increase or decrease those feelings. Second, it was assumed they could identify why they would make a change. Third, it was assumed that the crewmember would propose changes that were "most important" to him.

An open question format was used for all the surveys. See Figure 2 for the foreword to the survey and Figure 3 for the complete interview format. Only one question was asked to start the interview. The question was typed on an index card for the interviewee's reference. The question was, "What are the most important changes you would make in your job? Please be specific." The interviewee was allowed to talk freely about what he would change, for up to a maximum of 30 minutes. Follow-up questions were asked when a response was too general or vague, or when the motivator or hygiene dynamic was not apparent to the interviewer.

All the interviews were recorded on a portable cassette tape recorder. Essence notetaking was not done in order to avoid distracting the interviewee. A verbatim transcript was then prepared from the tapes. When all tapes were transcribed, the tapes were destroyed to fulfill requirements of the Privacy Act. The researcher has retained custody of the transcripts.
(Read orally prior to each interview or present a written copy, if requested):

"This survey comes under the Privacy Act, AFR 12-35, because your voice will be recorded and personal information may be revealed. Participation is entirely voluntary. No action will be taken if you do not participate in the survey. This survey has been authorized IAW AFR 30-23, by AFMPC/ MPCYPS and is assigned survey control number USAF SCN 81-23. This survey is for collecting data to answer a research question of my thesis. The results will be published in aggregate in the thesis."

"Do you wish to participate in the survey?" (If yes, proceed. If no, terminate discussion.)

"I would like to also caution you against discussing classified information."

(Proceed with the rest of interview format.)

Fig. 2--Foreword to Interview
Introduction: "Hello, I'm Jim Kirlin. I'm doing my masters thesis with the University of Montana."

Privacy Act: "Before going further, I would like to read you a Privacy Act Statement." (Read Foreword)

Actual Interview: The interview consists of one question. The question is: "What are the most important changes you would make in your job? Please be specific." "After you have gathered your thoughts, I'll turn on the recorder which can take up to 30 minutes worth. But please feel free to speak any length of time up to that."

(Let interviewee talk.)

(Follow up questions, if required.)

"What changes in ____ (area mentioned) ____ would you make?" (If response too general.)

"Why would you change ____ (area mentioned) ____?" (If motivator or hygiene factor not apparent.)

(When interviewee indicates he can think of no more changes):

"That concludes the interview. Please do not discuss the interview with others until the end of February as I will be interviewing others. Thank you for your participation."

Fig. 3--Interview Format
The interviews were conducted between February 12, 1981 and February 23, 1981. The location of the interviews varied. However, some suggestions were made when arranging a place to meet. Any type of work environment was avoided because of distractions, other people, and possible biases. A neutral environment, such as, at home or at a library was encouraged. Quiet, privacy, and neutralness were the ideal conditions for the interview.

The source of the interviewees was the Minuteman line crewmembers at Malmstrom Air Force Base, Montana. For the purposes of this research, line crewmembers exclude standboard, instructor, and flight commander crews. All are male officers having a rank of second lieutenant through captain. They are certified as either a commander or deputy commander and have between a few months and a few years of combat crew time. While all four squadrons are Minuteman, three squadrons are Improved Launch Control System (ILCS) and one squadron is Command Data Buffer/Guidance Integrated Program (CDB/GIP). The total number of line crewmembers is approximately 135 for the period of 12-23 February 1981. See Figure 4 for a summary of the sample by squadron.

The sample consisted of twenty crewmembers randomly selected from the names of line crewmembers. A name was not used if the crewmember was on leave, did not wish to participate, was familiar with the M-H Theory or OJE, or was in an unusual status, such as, being suspended under the Personnel Reliability Program (PRP). Replacement was accomplished by randomly picking the next name on the list. The crewmembers were contacted by phone, in person or by note and asked if they would participate in an interview being done for thesis work.
<table>
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<th>Number of Line Crewmembers</th>
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<th>Total Available</th>
<th>Total Interviewed</th>
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<td>10th SMS</td>
<td>41</td>
<td>5</td>
<td>36</td>
<td>4</td>
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<tr>
<td>12th SMS</td>
<td>30</td>
<td>4</td>
<td>26</td>
<td>8</td>
</tr>
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<td>33</td>
<td>6</td>
<td>27</td>
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</tr>
<tr>
<td>564th SMS</td>
<td>31</td>
<td>3</td>
<td>28</td>
<td>4(3)**</td>
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<tr>
<td></td>
<td>135</td>
<td>18</td>
<td>117</td>
<td>20</td>
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</table>

*As of February 12, 1981

**Only 3 interviews used due to mechanical malfunction of tape recorder during one interview

Fig. 4—Sampling Data by Squadron

The survey has been approved by the Military Survey Branch of the Air Force Military Personnel Center at Randolph Air Force Base, Texas. The survey control number is USAF SCN 81-23. See Appendix A for the request for approval and the Air Force response.

It should be noted that LMDC was at Malmstrom Air Force Base conducting their surveys during the interview period. Approximately half of the interviews were done prior to their arrival. Mention of the LMDC surveys was made by some in the remaining interviews.
Methods Used to Analyze Data

The raw data was first subjected to an interview analysis. The number of changes was determined by first identifying the major topics discussed in each interview. Each topic contained one or more suggested changes to the job. Two criteria were used to determine how the change was coded. The first criterion was "what was changed about the job." The second criterion was "why the person would change the job." It is important to note that each change suggested could have more than one factor involved and that the number of factors was more important than the actual number of changes. Each change, then, was coded as having one or more of the thirteen factors involved. The factors used in coding and their definitions are listed in Figures 5 and 6.

These factors are the same factors used by Herzberg, Mausner, and Synderman in their studies reported in The Motivation to Work. The definition of each factor was taken from the book, The Motivation to Work. However, one major modification was made to the original definitions of the job-attitude factors. No distinction was made between first-level factors, the objective element of the situation in which the respondent finds a source for his good or bad feelings about the job, and the second-level factors, the feeling element of the situation. This change was made because in this study it is not considered necessary to distinguish between whether the factor was objectively identified or perceived by the individual in order to answer the question proposed. Slippages were coded but not included in the analysis. Slippages occur when a hygiene item is reported as satisfying or the lack of a motivator is reported as dissatisfying. Technical accuracy calls for slippages to be identified and to be excluded from further treatment in this hypothesis.
THE MOTIVATORS

Achievement - Some specifically mentioned success including successful completion of a job, solutions to problems, vindication, and seeing the results of one's work. Feelings of achievement and the absence of achievement were included.

Recognition for Achievement - Some act of recognition to the person from any source. "Negative recognition," that is, criticism and blame also included. Feelings of recognition for achievement included. The emphasis is on the act of recognition.

Work Itself - The actual doing of the job or the tasks of the job mentioned. Feelings of interest or lack of interest in the performance of the job.

Responsibility - Mentioned responsibility for own work, for the work of others, or being given new responsibility. Also included was a loss or lack of responsibility. Feelings of responsibility, lack of responsibility or diminished responsibility.

Advancement - Increased opportunities to achieve in more challenging situations in the unit mentioned.

Growth - The possibility of growth mentioned. Able to advance in his own skills and in his profession. Feelings of possible growth, blocks to growth, for factors perceived as evidence of actual growth included. The "negative" possibility of growth also included.

Fig. 5—The motivators and their definitions for coding.*

*From The Motivation to Work, Herzberg, Mausner and Synderman, pp. 44-49.
THE HYGIENES

Unit policy and administration - Some over-all aspect of the unit was mentioned including the adequacy or inadequacy of unit organization and management, the harmfulness or beneficial effects of the unit's policies, or personnel policy.

Supervision - Characteristics of the supervisor mentioned, including fairness, competence, willingness to delegate responsibility or to teach. Feelings of fairness or unfairness.

Interpersonal Relations - An actual verbalization about the characteristics of the interaction between the person and some other individual. The emphasis is on the "purely social" nature. Group feelings, such as, feelings of belonging or isolation, socio-technical or purely social.

Working conditions - The physical conditions of work, the amount of work, or the facilities available for doing the work were mentioned.

Salary - When compensation was mentioned, including wage or salary increases, or unfulfilled expectations of salary increases. Feelings about salary included.

Status - When some sign or appurtenance of status as being a factor was mentioned. Feelings of increased or decreased status was included.

Security - Signs of presence or absence of job security. Included are tenure and unit stability or instability. Feelings of increased or decreased security were included.

*Fig. 6--The hygienes and their definitions for coding.*

*From The Motivation to Work, Herzberg, Mausner, and Synderman, pp. 44-49.
With the coding completed, a content analysis was done. The number of motivators was summed, as well as the number of hygiene factors for each interview. The results are tabulated by interview number, number of changes, number of hygiene factors for each interview, number of motivator factors for each interview, the total number of factors per interview, total number of hygiene factors, total number of motivator factors, and total number of all factors. Each interview was also designated as obtaining either more hygiene factor or motivator factors. At the completion of this step, the data may be suggestive of an answer to the hypothesis.

A profile analysis of the organization by specific factors was done to determine what kind of organizational profile was suggested by the data. The model used is patterned after the profile used by Herzberg.

**Binomial Test**

The binomial test was chosen for the statistical analysis. The test is nonparametric. That is, the test does not specify conditions about the parameters of the population from which the sample is drawn. This is important because the M-H Theory states that there are infinite sources of pain (a dynamic of hygiene) and only limited sources of growth opportunities (a dynamic of motivators). Again, no distribution is assumed by the binomial test.

The binomial test can also use data on the nominal scale. Nominal data is data that only identify discrete categories or classifications. In this case, the discrete categories are motivators and hygiene.

Further, the binomial test is appropriate for a one-sample case. It can determine whether a particular sample could have come from the specified population. It is a goodness-of-fit test. "The binomial
distribution is the sampling distribution of the proportions we might observe in random samples drawn from a two-class population. That is, it gives the various values which might occur under Ho." (4)

The null hypothesis is that there is no difference between the probability of obtaining hygiene factors and the probability of obtaining motivators. Symbolically, Ho: Ph = Pm = .5, where Ph is the probability of obtaining hygiene factors and Pm is the probability of obtaining motivator factors. The alternate hypothesis is that the probability of obtaining hygiene factors is greater than the probability of obtaining motivator factors. Ha: Ph > Pm. The significance level of .01 is used. That is, α = .01. The number of cases, N, is equal to nineteen. The sampling distribution is given in Figure 7. However, Table D - "Table of Probabilities associated with values as small as observed values of x in the binomial test," provides computed values for N = 25 or less when P = Q = .5, (see Figure 8). This table was used for determining the one-tailed probabilities under Ho for the binomial test. The rejection region is one-tailed and consists of all values of x (where x = the number of interviews reporting more motivators than hygiene) which are so small that the probability associated with their occurrence under Ho is equal to or less than .01.

In summary, the binomial test is used with the following:

a. Null hypothesis: Ph = Pm = .5 (P = Q .5)
b. Alternate hypothesis: Ph > Pm
c. Significance level: α = .01 and N = the number of cases = 19
d. Sampling distribution: given in Figure 6. For n = 25 or smaller and when P = Q = .5, Table D of Siegel, Figure 7.
e. Rejection region: p < .01
f. Decision: If p < .01, reject Ho, accept Ha.
   If p > .01, fail to reject Ho.
\[
\sum_{i=0}^{X} \binom{N}{i} p^i q^{N-1}
\]

Where:

- \(N\) = The Number of Observations
- \(X\) = The Smaller of the Observed Frequency
- \(P\) = Proportion of Hygiene
- \(Q\) = Proportion of Motivators

Fig. 7—The sampling distribution of the binomial.*

Fig. 8—Table of probabilities associated with values as small as observed values of X in the Binomial Test.

SOURCE: Nonparametric Statistics for the Behavioral Sciences, Siegel.
Pretest

A pretest was conducted to validate the methodology, to gain experience interviewing, and to validate the coding of the interviews. The design, analysis, and changes for the actual interviews are discussed next.

Five crewmembers were selected as they came into the operations building. All agreed to participate and all the interviews were conducted that same day. Various settings were used for the interviews. The question was asked orally and the interviewees allowed to talk as long as they wished.

The results are tabulated in Figure 9. The content analysis shows a total of 70 factors or concerns mentioned, 53 hygienes and 17 motivators. As this sample was small, no organizational profile was done. The number of interviews in which motivator concerns outnumbered hygiene concerns was zero. From Figure 7, it can be seen that with $N = 5$ and $X = 0$, $P = .31$, thus, the sample was large enough to discriminate the significance of the data and fails to reject the null hypothesis. However, finding no interviews with motivation concerns outnumbering hygiene concerns was important to confirming the general direction of the findings.

Several observations about the pretest led to changes in the techniques for the actual interviews. First, the interviews lasted from approximately five minutes to 45 minutes. However, most lasted from 15 to 20 minutes. Much repetition and uncodable material was introduced. As a result, the actual interviews were limited to 30 minutes. This provided some focus timewise for the interviewee and still allowed much
freedom in expressing their most important changes. The assumption was
crewmembers could identify the most important changes within a half hour.

<table>
<thead>
<tr>
<th>Changes</th>
<th>Hygiene</th>
<th>Motivators</th>
<th>Slimmages</th>
<th>Number of Factors</th>
<th>M or H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>6</td>
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<td>2</td>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
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<td>17</td>
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<tr>
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<td>12</td>
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<td>11</td>
<td>19</td>
<td>9</td>
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<td>28</td>
</tr>
<tr>
<td>Totals</td>
<td>52</td>
<td>53</td>
<td>17</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>

*M = more motivator concerns than hygiene concerns
H = more hygiene concerns than motivator concerns

Fig. 9—Summary of content analysis (Pretest).

Second, straying from the question was noted. Some would ask for the question to be repeated. Others would provide elaborate background or generalities although asked to be specific. The assumption that crewmembers could adequately identify changes or concerns is relevant to this observation. To help focus on the question, the question was written on an index card for the interviewee's reference during the actual interviews. Also there was increased use of the "why" follow-up question when appropriate. Third, the interreliability of raters worked out to 90 percent. This percent was considered satisfactory and as a result the coding scheme was not modified.
Special Limitations to the First Research Question

The special limitations to the first research question refer to the internal validity of the results. The question is, "Did in fact the experimental treatments make a difference in this specific experimental instance?" Campbell and Stanley has defined eight different classes of extraneous variables which, if not controlled, might produce effects confounded with the effect of the experimental stimulus. (5)

The effects of history refer to specific events occurring between the first and second measurement in addition to the experimental variable. As the interviews were being done over a period of two weeks, events may have occurred which caused a difference. In addition, the time period itself may have had an effect on the responses. The assumption made is that the time period had no impact on the results and that no event occurred during the time period to affect the interviews.

Maturation effects refer to the processes within the respondents operating as a function of the passage of time per se, including growing older, growing more tired, etc. There are differences between line crewmembers in terms of maturation effects. The experimental variable covers the collective experiences as a crewmember. This can vary from a few months to years. As such, the physical and psychological makeup of the crewmembers change over time.

Testing refers to the effects of taking a test upon the scores of a second testing and is not relevant to the one-shot case study. In addition, the effects of statistical regression operate when groups have been selected on the basis of extreme scores and is not relevant.
Instrumentation effects mean changes in the calibration of a measuring instrument or changes in the observers or scorers used may produce changes in the obtained measurements. In this case, the interview is the instrument. Any variations to the standardized format and procedures, as well as, any variations in the interviewers' manner or interest may produce an instrumentation effect. A pretest was accomplished to gain interviewing experience and validate a standardized format and procedure. The question of rater reliability is addressed in the pretest. An expert in the M-H Theory and the interviewer independently coded the pretest interviews. A reliability index was computed and difference in coding results discussed. The interreliability index for the pretest was 90 percent.

The effects of biases resulting in differential selection of respondents for the comparison groups and the effect of experimental mortality, or differential loss of respondents from the comparison groups are not relevant effects. Also the interaction effects between the extraneous variables are not relevant to the one-shot case study.

In summary, three extraneous variables were found relevant to the study which might confound the effect of the experimental variable. History effects, maturation effects, and instrumentation effects are not controlled in the one-shot case study.

Discussion of the Sources and Means of Obtaining Data for the Second Research Question

The source of the data for the second research question is the profile analysis resulting from the first research question. The assumption made is that the analysis represents the current state of the
attitudes of the line crewmembers. Analysis of the organization profile provides the data for the management implications portion of the second question. The data for the critical differences between the two models is based upon the review of literature in Chapter 3 and further analysis of the theory and process of each model.

Special Limitations to the Second Research Question

There are several limitations to the second question. First, the analysis starts with a static organizational profile as derived from the first question. In reality, the organization is dynamic in nature. The crewmember's concerns and attitudes naturally change too. Therefore, a one picture profile cannot truly represent a complete picture of the organization. Second, the analysis projects into the future. The validity of the assumptions regarding the future comes into question. Obviously, major or unforeseen changes in the people, job, or organization could alter the comparisons. Last, the instrumentation effects are present. That is, the analysis concentrates only on critical differences between the two theories. Yet, the differences cannot all be equally important or significant. Therefore, the criteria for "criticalness" cannot be objectively stated. The results therefore are limited.
Footnotes for Chapter II


2 Ibid., p. 81.


6 Dr. John N. Taylor, Associate Professor of Management, School of Business, AFIT MBA Program, University of Montana, a Postal Doctoral Fellow of Frederick Herzberg, performed the reliability rating of the pre-test codings.
CHAPTER III

REVIEW OF EXISTING LITERATURE

Purpose of Review

The purpose of this review was to survey the literature on work motivation within industrial and organization (I/O) psychology that led to the development of the Herzberg Motivation-Hygiene (M-H) Theory of Motivation and the Hackman-Oldham (H-O) Job Characteristics Job Enrichment Model. It is important to know that each model draws upon different developments and viewpoints within industrial and organizational psychology. An Air Force manager using the models must understand why the theories and models use different approaches and obtain different results if he is to use these theories and models correctly and effectively.

The major framework of analysis is characterized by the following considerations. The approach was historical in nature. Only developments of the twentieth century were covered. The material is presented as chronologically as possible to gain a sense of evolution of thought. Additionally, the literature dealt only with the origin and development of work motivation in the United States. The emphasis was on the classical works of work motivation. This review was not intended to be exhaustive, even of the classics. Further, the literature was reviewed in terms of six central issues of work motivation important to the development of the M-H Theory and the H-O Model. Developments are discussed almost entirely
in these terms. For brevity, only the leading person or persons associated with a theory or an approach are cited. Finally, an attempt was made to distinguish between theories of human motivation and organizational approaches to work. Those theories or approaches not having a significant impact on the development of the M-H Theory or the H-O Model are not discussed.

Introduction to the Concept of Work Motivation
in Industrial and Organizational Psychology

Industrial psychology developed in the early 1900's and is the field from which the study of work motivation evolved. The nature of industrial psychology has been defined by Blum and Naylor (1968) as, "... simply the application or extension of psychological facts and principles to the problems concerning human beings operating within the context of business and industry. (1) Within industrial and organizational psychology, the study of work motivation is one of many fields. Its findings influence every organizational process; how an organization plans, organizes, controls, directs, and coordinates. Specifically, managers have sought to understand motivation in the belief that it is important to worker productivity.

A dictionary definition of motivation serves as a starting point for the discussion. The word "motivation" is derived from the Latin word movere, which means "to move." Motivation is defined as, "that which motivates; inducement; incentive." Motivate is defined as, "to provide something that prompts a person to act in a certain way or that determines volition: incentive" or "the goal or object of one's action." (2) M. R. Jones (1955) has proposed motivation is "how behavior gets started,
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is energized, is sustained, is directed, is stopped, and what kind of subjective reaction is present in the organism while all this is going on." (3) Steers and Porter have identified three common denominators which characterize the phenomenon of motivation: "What energizes human behavior; what directs or channels such behavior; and how this behavior is maintained or sustained." (4) Many more definitions of work motivation have been offered and debated. However, most characterize work motivation in terms of several issues important to the concept of motivation.

Central Issues of Work Motivation

I chose to examine the relevant literature according to six central issues of work motivation. This approach attempted to produce an evolution of thought of the most important concepts of work motivation. Each development cited had an impact on one or more of these issues. Further, the issues chosen are the most pertinent toward understanding the Motivation-Hygiene Theory of Motivation and the Hackman-Oldham Job Characteristics Model. Each theory and approach raises different questions about each of these issues. How each answers these questions is of great importance to understanding the theories and the management impacts of using each. The issues can be identified by the questions most often researched about them.

1. Satisfaction: How is satisfaction defined? What causes satisfaction? How is satisfaction associated with performance? Are satisfaction and dissatisfaction on the same continuum? How is satisfaction associated with behavior and attitudes? How is satisfaction associated with the assumptions of man and application methodology?
2. Behaviors and Attitudes: How are behaviors and attitudes defined? How are behaviors and attitudes associated? How are behaviors associated with satisfaction and performance? How are behaviors and attitudes determined?
3. Group or Individual Approach: Is the approach or theory oriented toward the group or the individual?
4. Performance: How is performance defined? How is performance associated with behaviors and attitudes?
5. Assumptions About Man: What assumptions are made about the nature of man?
6. Application Methodology (process or content orientation): Is the theory or approach oriented toward content or process? The definition used for this concept is given by the following statement. "Process theories try to explain and describe the process of how behavior is energized, how it is directed, how it is sustained, and it is stopped. Such theories attempt to specify how the variables interact and influence one another to produce certain kinds of behavior. By contrast content theories are more concerned with the specific identity of what it is within an individual or his environment that energizes and sustains behavior. That is, what specific things motivate people. The content theories are not centrally concerned with specifying the precise form of the interaction between variables." (5)

**Historical Development**

Hedonism, Instinct, and Drive Theory.

Scientific Management and the Hawthorne studies are benchmarks in
the early twentieth century for the behavior sciences and the study of work motivation. Their significance is best understood in light of the prevailing theories and approaches of the time.

One of the earliest and most pervasive notions of the 1900's was the principle of hedonism. Hedonisms' basic tenet was that individuals seek pleasure and avoid pain. Steers and Porter state, "Most psychological theories of motivation, both early and contemporary, have their roots—at least to some extent—in the principle of hedonism." (6)

The Instinct Theory of Motivation was also widely accepted during the first quarter century. Instinct theorist such as James (1890), McDougall (1908), and Freud (1915) saw individuals as possessing automatic predispositions to behave in certain ways, depending on internal, and external cues. In addition, motivation was seen as unconscious. Several criticisms are made of instinct theory. First, the list of instincts kept growing so as to make them useless. Second, the notion of differences in individual dispositions was becoming an accepted notion. Third, the question of learned versus predisposed behavior arose.

The drive theories proposed by Thorndike (1911) and Woodworth (1918) were also popular. They assumed that decisions concerning present behavior were based in large part on the consequences or rewards of past behavior. In addition, man possessed a "drive" or reservoir of energy that impelled him to behave in certain ways.

Scientific Management

Scientific Management was the first major management theory to develop in the twentieth century. Although it had earlier roots, Scientific Management matured under Frederick W. Taylor and Henri Fayol in the early 1900's. The scientific management of the traditional approach simplified,
standardized and specialized jobs. Man was viewed as an economic and rational being. Wren states, "The ethic of scientific management was readily apparent in the focus on the individual, the emphasis on efficiency, and the social benefits to be derived from application of the scientific method." (7)

The rise of scientific management's interest in efficiency led to the birth of industrial psychology. The idea that a worker should be used as efficiently as machinery is the basis of the early industrial psychologist. "The earliest objective of industrial psychologist was the maximum efficiency of the individual in industry and his optimum adjustment." (8)

Scientific management theory has made many assumptions about the nature of man and satisfaction. Man was seen as disliking work, working only for money and incapable of self-determination. Better pay plans, simple jobs and close supervision were methods used to insure that the rewards motivated the workers. Essentially, the satisfaction of the worker was not important because jobs were considered inherently dissatisfying. Only the physiological needs of the worker were considered relevant to the design of efficient jobs. As such, scientific management was a highly process oriented approach.

**Hawthorne Findings**

The studies done by Elton Mayo, F. J. Roethlisberger and others at the Hawthorne Western Electric Plant between 1927 and 1937 are also recognized as a classic milestone in understanding work motivation. Their findings were many. The inconclusive results of experimenting with illumination let Roethlisberger to declare, "We have a classic example of trying to deal with a human situation in nonhuman terms."
The experiments had obtained no human data; they had been handling electric light bulbs and plotting average output curves. Hence, their results had no human significance." (9)

A new approach was developed to obtain the "human data." The interviewing of the workers started in 1928 and lasted several years. Eventually, the researchers developed a conception of the worker in terms of attitudes and behaviors. They found that, "The behavior of workers could not be understood apart from their feelings or sentiments. Second, the sentiments are easily disguised and hence are difficult to recognize and to study and third, that manifestations of sentiments could not be understood as things in and by themselves, but only in terms of the total situation of the person." (10)

Figure 10 illustrates this increasingly sophisticated view. Another significant finding to emerge was the view of a man as a social being and a member of groups. The Bank Wiring Observation Room results demonstrated that even output was a form of social behavior.

The Hawthorne studies are generally considered to be the genesis of the Human Relations Theory of Management. Two important characteristics of this theory have evolved. First, the primary focus is the individual as a socio-psyehological being and what motivates him. Second, the study of management centers on interpersonal relations. (1) In practice, managers attempted to create a work force with high morale and make workers feel important. Opening vertical communications, and increasing the amount of routine decisions a worker could make were also important objectives.

The Hawthorne findings challenged the assumptions that man was purely economic being and that his primary motivations centered on
physiological needs. Post-Hawthorne work became interested in the assumption that man was primarily motivated by social and group needs. (12) Security and social needs, rather than physical needs, became the focus of rewards. Equally important is the managerial assumption that satisfied workers would be productive workers.

**STAGES OF FINDINGS ABOUT ATTITUDES**

I. Change —----------- Response

II. Change —----------- Response
   /   \
   Attitudes (Sentiments)

III. Change —----------- Response
   /   \
   Attitudes (Sentiments)
   /   \
Personal History Social Situations at Work

Fig. 10--Stages of Findings About Attitudes by Hawthorne Experimenters

**SOURCE:** *The Hawthorne Experiments*, F. J. Roethlisberger.

**Lewin and Group Dynamics**

The work of Kurt Lewin, a social psychologist, is important because of his development of group dynamics and expectancy theory. Lewin is known as the father of group dynamics for his significant
contributions to the research and theory of group dynamics. Cartwright
and Zander have defined group dynamics as, "a field of inquiry dedicated
to advancing knowledge about the nature of groups, the laws of their
development, and their interrelations with individuals, other groups,
and larger institutions." (13) Further, Cartwright states, "In care­
ful usage of the phrase, 'group dynamics' refers to the forces operating
in groups. The investigation of group dynamics, then consists of a study
of these forces: what gives rise to them, what conditions modify them,
what consequences they have, etc." (14)

Lewin was able through various studies to identify some of the
basic characteristics of groups. Lewin and his colleagues, "demonstrated
that groups, through perceptions and interactions of their members, have
a personality of their own that is observable in terms of cohesiveness,
motivations, beliefs, goals, values, actions, and purposive direction.
These group forces are seen as superseding consideration of individuals
in the group; the group assumes a personality that is more than a com­
posite of members' individual personalities." (15) Further, group
dynamics holds that, "The behavior, attitudes, beliefs, and values of the
individual are all firmly grounded in the groups to which he belongs." (16)

The focus of group dynamics is very important to the development
motivation theory. The idea of introducing changes through groups rather
than individuals led to further research on the group effects on individ­
ual motivation. Further, the idea of people participating in changes was
discovered and researched. The emphasis on the dynamic nature of an
individual and groups allowed a more sophisticated view of work motiva­
tion.

In 1935, Lewin also presented a cognitive theory of behavior that
used the terms "valence" and "expectancy." "Valence" meaning the attractiveness of an outcome and "expectancy" meaning the likelihood that an action will lead to a certain outcome or goal. A number of motivation theories have grown out of Lewin's early cognitive theory.

Maslow

One of the most important works of Abraham Maslow is his motivation theory. Maslow first proposed his Theory of Human Motivation in 1943. A basic sketch of the theory holds that there are at least five sets of goals, which are called basic needs. These needs are physiological, safety, love, esteem, and self-actualization. These goals are arranged in a hierarchy of prepotency. That is, the appearance of one need usually rests on the prior satisfaction of another, more pre-potent need.

Several characteristics of Maslow's Theory are important to the development of work motivation theory. One of the most important characteristics is that it tends to be problem centered rather than means centered. Maslow defined means centering as, "The tendency to consider that the essence of science lies in its instruments, techniques, procedures, apparatus, and its methods rather than its problems, questions, functions, or goals." (17) This dichotomy is analogous to the content or process orientation issue proposed in this paper.

Maslow's other characteristics center on the differences between individuals. The theory holds that the degree of fixity of the hierarchy of basic needs can vary with each individual. That is, an individual might value self-esteem needs over love needs. Further, most people are more often unconscious than conscious of the basic needs. Some people
may, however, become conscious of them.

Two other characteristics deal with motivations and determinants of behavior. The theory specifies that most behavior is multi-motivated. Rather than one specific need, several or all of the basic needs tend to determine motivational behavior. The other point is that not all behavior is determined by the basic needs and not all can be called motivated. Further, the strength of motivations can vary among individuals.

The impact of a satisfied need is also important. "If we are interested in what actually motivates us, and not in what has, will, or might motivate us, then a satisfied need is not a motivator." (18) Given this, Maslow postulates that a healthy man is primarily motivated by his needs to develop (actualize) to his fullest. An unhealthy person is characterized as not actualizing.

In terms of the central issues, Maslow's Theory is a content oriented and dynamic theory focused upon the whole individual. The theory proposed five major goals of behavior arranged in an hierarchy of basic needs. Simply put, most behavior is goal oriented. The satisfaction of a basic need leads to the rising importance of the next higher need. Given that a man is a perpetually wanting animal, a healthy individual is primarily motivated by self-actualization needs.

Review of Empirical Literature

Two major reviews in the 1950's reviewed the literature on attitudes, satisfaction and performance. They are the Brayfield and Crockett Review (1955), and the Herzberg, Mausner, Peterson and Capwell Review (1957).

Brayfield and Crockett examined and summarized the empirical
literature through July 1954, which dealt with the relationships between employee attitudes and employee performance. They made several conclusions. They summarized that, "there is little evidence in the available literature that employee attitudes of the type usually measured in morale surveys bear a simple- or, for that matter, appreciable- relationship to performance on the job. The data are suggestive mainly of a relationship between attitudes and two forms of withdrawal from the job." (19) The two forms of withdrawal from the job are absenteeism and turnover. Further, "there depends upon a group norm, and that performance level may be changed by changing the group norm in a direction desired by management." (20)

The Herzberg, et al, review of literature through the summer of 1955 summarized many topics, such as, factors related to job attitudes, effects of job attitudes, and social aspects of the job. Though many conclusions were drawn, only two are cited here: First, "These results show that there is frequent evidence for the often suggested opinion that positive attitudes are favorable to increased productivity. The relationship is not absolute, but there are enough data to justify attention to attitudes as a factor in improving the worker's output." (21) They noted that the correlations were low and the studies had many qualifications. Second, "The work group sets a standard for the output of its members." (22)

The general consistency of the findings of both reviews is important. Most research since Hawthorne had postulated that satisfaction caused performance. The reviews caused researchers to rethink the connection between satisfaction and performance. The alternate hypothesis that performance caused satisfaction became the focus of future motivational research.
Herzberg's Motivation-Hygiene Theory and Orthodox Job Enrichment

The review of literature by Herzberg, et al, led Frederick Herzberg to propose his own theory of human motivation. Herzberg first presented his Motivation-Hygiene Theory in 1959 and further developed it in 1966. (23) (24) A brief outline of the theory is presented. Satisfaction and dissatisfaction are seen not as opposites but on separate continuum. Rather, the opposite of dissatisfaction being no dissatisfaction and the opposite of satisfaction being no satisfaction. Motivator factors can create satisfaction and hygiene factors can prevent dissatisfaction but cannot contribute to satisfaction. Further, man operates simultaneously from two different sets of needs. Hygiene factors are focused upon when man like an animal seeks to avoid pain. Motivator factors are focused upon when man as a human seeks psychological growth. The theory also specifies the factors and their frequency of occurrence. See Figure 11.

Some characteristics of the Motivation-Hygiene Theory in terms of the central issues are discussed starting with the concept of satisfaction. Satisfaction and dissatisfaction are on different continuums. Motivators are the primary cause of satisfaction. The motivators are achievement, recognition, work itself, responsibility, advancement and growth. The hygiene factors are the primary causes of dissatisfaction. The hygiene factors are company policy and administration, supervision, interpersonal relations, working conditions, salary, status, and security.

Behaviors lead to attitudes with an attitude and value system developing to justify behaviors. Trying to change a person's attitudes does not lead to change in behavior. Motivated behavior is a function of
the ability of the individual, the opportunity to express his ability and reinforcement given to the individual.

**FACTORS AFFECTING JOB ATTITUDES**

<table>
<thead>
<tr>
<th>Factors Characterizing 1,844 Events on the Job that Led to Extreme Dissatisfaction</th>
<th>Factors Characterizing 1,753 Events on the Job that Led to Extreme Satisfaction</th>
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</thead>
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<tr>
<td>Recognition</td>
<td>Work Itself</td>
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<tr>
<td>Work Itself</td>
<td>Responsibility</td>
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<tr>
<td>Responsibility</td>
<td>Advancement</td>
</tr>
<tr>
<td>Advancement</td>
<td>Growth</td>
</tr>
<tr>
<td>Growth</td>
<td>Company Policy and Administration</td>
</tr>
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<td>Supervision</td>
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<td>Work Conditions</td>
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<td>Salary</td>
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<td>Relationship with Peers</td>
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<td>Security</td>
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<td>81 Motivation</td>
<td>Ratio and Percent</td>
</tr>
<tr>
<td>Ratio and Percent</td>
<td>80% 60 40 20 0 20 40 60 80%</td>
</tr>
</tbody>
</table>

Fig. 11--Factors Affecting Job Attitudes, as reported in 12 Investigations.

The basis of the theory is found in individual psychology. The focus is on the whole individual and his two need systems. Performance is an outcome of motivated behavior in the work setting. This can occur when the organization is not suffering hygiene shock and allows employees the opportunity to experience the motivators.

The major assumption is that man operates on two need systems simultaneously. In the hygiene need system man is like an animal, he can suffer from an infinite number of physical and psychological hurts. His hygiene needs are cyclical in nature and have an escalating zero point. The other existence of man is that of a human being who has a need for psychological growth. The sources of psychological growth are limited in nature. His psychological growth or motivator needs are additive in nature and have a nonescalating zero point.

In terms of application methodology, the Motivation-Hygiene Theory is a content-oriented theory. The application methodology, called Orthodox Job Enrichment, is process-oriented.

Orthodox Job Enrichment (OJE) is the application of M-H Theory to organizations. The word "Orthodox" is descriptive of the use of the M-H Theory to job enrichment as there are many job enrichment approaches using other theories as a basis. The intent of OJE is the designing of opportunities for motivated behavior into an individual's job. It is a systematic, gradual approach to organizational change. The OJE Model is shown in Figure 12. The major components are the principles of vertical job loading, the ingredients of a good job, motivators involved, and experienced outcomes. The consulting process of OJE is outlined in Figure 13.
### Principles of Vertical Loading

The principles of vertical loading are the techniques for making a good job which produces the dynamics of the motivators that result in the outcomes.

<table>
<thead>
<tr>
<th>PRINCIPLES OF VERTICAL LOADING</th>
<th>INGREDIENTS OF A GOOD JOB</th>
<th>MOTIVATORS INVOLVED</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removing some controls while retaining accountability</td>
<td>Direct Feedback</td>
<td>Achievement</td>
<td>Improved Job Performance</td>
</tr>
<tr>
<td>Increasing the accountability of individuals for own work</td>
<td>Client Relationship</td>
<td>Recognition for Achievement</td>
<td>Improved Job Satisfaction</td>
</tr>
<tr>
<td>Giving a person a complete natural unit of work</td>
<td>New Learning</td>
<td>Work Itself</td>
<td></td>
</tr>
<tr>
<td>Granting additional authority to an employee in his activity; job freedom</td>
<td>Scheduling</td>
<td>Responsibility</td>
<td></td>
</tr>
<tr>
<td>Make periodic reports directly available to the worker himself rather than to the supervisor</td>
<td>Unique Expertise</td>
<td>Advancement</td>
<td></td>
</tr>
<tr>
<td>Introducing new and more difficult tasks not previously handled</td>
<td>Control over Resources</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>Assigning individuals specific tasks, enabling them to become experts</td>
<td>Personal Accountability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Fig. 12—Orthodox Job Enrichment (OJE) Model
Use a sell, not push, approach

Educate with seminars from the top of the unit downward until a line of commitment reaches from the top to the basic working unit

Establish Executive, Coordinating and Implementing groups

Give 40 to 60 hours of OJE training to each group

Use brainstorming in the Implementing group to develop ideas for enriching the job

Implement changes at the lowest working unit

As the basic job changes, start the process at the next higher work unit

Expand horizontally within the organization to other projects

Fig. 13—The OJE Consulting Process

Lawler, Porter, Hackman, and Oldham

The works of Edward Lawler III, Lyman Porter, J. Richard Hackman, and Greg Oldham are important to the development of the Hackman-Oldham Job Characteristics Model.

Lawler and Porter in a 1967 article summarized, "The evidence indicates that a low but consistent relationship exists between satisfaction and performance, but it is not at all clear why this relationship exists." (25) They proposed that performance causes satisfaction. Their model predicts that performance produces intrinsic and extrinsic rewards. These rewards then produce satisfaction. Further, their approach attempts to maximize the relationship between satisfaction and performance. Later, they proposed their expectancy theory. In general, it postulates that the effort an individual exerts is a function of his
expectation that the effort will lead to an outcome and the attractiveness or valence of the outcome.

In 1971, Hackman and Lawler in an extensive study, outlined their conceptualization of the interaction between job characteristics and individual differences based upon expectancy theory of motivation. (26) Among other propositions, they proposed four core dimensions or job characteristics—variety, autonomy, task identity and feedback—that are related to the intrinsic motivation of workers who desire higher order need satisfaction. Their theory holds that, "...job characteristics actually cause the differences in employee satisfaction, motivation, performance and absenteeism..." (27) Further, they found individual differences in need strength moderate the effects of job characteristics on employee behavior and attitudes. This difference in individual need strengths is opposite to the idea that the objective state of the job characteristic is directly related to behaviors and attitudes.

Hackman, Oldham, Robert Janson, and Kenneth Purdy proposed in 1975, a comprehensive job enrichment strategy for work redesign and introduced a set of tools for diagnosing existing jobs. (28) Their complete Job Characteristics Model is in Figure 14.

The theory holds that there are three psychological states critical in determining a person's motivation and satisfaction. The five "core" characteristics of jobs elicit the psychological states. The personal and work outcomes are the results of a person experiencing the critical psychological states. A set of "implementing concepts" is proposed as action steps to improve the core job dimensions. The concept of employee growth need strength that links the core job dimensions and the psychological states means that high growth need individuals are more
IMPLEMENTING CONCEPTS → CORE JOB DIMENSIONS → CRITICAL PSYCHOLOGICAL STATES → PERSONAL AND WORK OUTCOMES

- COMBINING TASKS
- FORMING NATURAL WORK UNITS
- ESTABLISHING CLIENT RELATIONSHIP
- VERTICAL LOADING
- OPENING FEEDBACK CHANNELS

SKILL VARIETY → TASK IDENTITY → TASK SIGNIFICANCE

EXPERIENCED MEANINGFULNESS OF WORK

- EXPERIENCED RESPONSIBILITY FOR OUTCOMES OF THE WORK
- KNOWLEDGE OF THE ACTUAL RESULTS OF THE WORK ACTIVITIES

HIGH INTERNAL WORK MOTIVATION
HIGH QUALITY WORK PERFORMANCE
HIGH SATISFACTION WITH THE WORK
LOW ABSENTEEISM AND TURNOVER

EMPLOYEE GROWTH NEED STRENGTH

Fig. 14—The Hackman-Oldham Job Characteristics Model

likely (or better able) to experience the psychological states when their objective job is enriched than their low growth need counterparts. The link between the psychological states and the outcomes means that individuals with high growth need strength will respond more positively to the psychological states.

The Job Diagnostic Survey (JDS) was developed by Hackman, et al, to measure motivation potential in a job. The motivation potential score (MPS) derived is now used by LMDC although LMDC uses a slightly modified questionnaire called the Organization Assessment Package (OAP) survey.

The Leadership and Management Development Center (LMDC) has modified the Hackman-Oldham approach for its own use. This model will be referred to as the LMDC H-O JCM. The model used by LMDC is illustrated in Figure 15. Note that the notion of goal clarity has been added. The consulting process of the LMDC is shown in Figure 16. Key definitions are presented in Figure 17.

The analysis of the characteristics of the Hackman-Oldham Job Characteristics Model in terms of the central issues begins with the concept of the satisfaction.

Satisfaction is viewed as a function of the attainment of rewards. Satisfaction and dissatisfaction are on the same continuum. High satisfaction with the work is one of the personal and work outcomes when the job characteristics operate through the psychological states. An individual's growth need strength moderates the link between the psychological states and the outcomes. Satisfaction and performance are both outcomes of the psychological states rather than having any cause and effect relationship.
IMPLEMENTING KEY JOB PSYCHOLOGICAL EXPECTED CONCEPTS VARIABLE STATE OUTCOMES

COMBINE TASKS

REMOVE UNNECESSARY CONTROLS

ESTABLISH CLIENT RELATIONSHIPS

SCHEDULE OWN WORK

PLAN AND CONTROL OWN WORK

SKILL VARIETY
TASK IDENTITY
TASK SIGNIFICANCE

AUTONOMY

GOAL
CLARITY

EXPERIENCED MEANINGFULNESS OF WORK

EXPERIENCED RESPONSIBILITY FOR WORK OUTCOMES

KNOWLEDGE OF ACTUAL RESULTS OF WORK ACTIVITIES

EXPERIENCED CLARITY OF EXPECTATIONS AND PERCEIVED JOB CHALLENGE

EXPECTED OUTCOMES

IMPROVED JOB SATISFACTION

IMPROVED ATTITUDES
LOWER TURNOVER
BETTER ATTENDANCE
LOWER COSTS

IMPROVED QUALITY OF PRODUCT

IMPROVED JOB PERFORMANCE
INCREASED EFFORT
INCREASED PRODUCTIVITY

Fig. 15—The LMDC Job Enrichment Model

Felt need by Sqdn Cmdr for Job Enrichment

Contacts JE Consultant for preliminary discussions

Diagnosis using job attitude survey and interviews

Data feedback by consultant and decision to proceed

Goal setting: what does client want JE to accomplish

Supervisors Workshop
- concepts
- workflow analysis
- brainstorming

Non-supervisors Workshop
- concepts
- brainstorming

Implementing Group evaluates ideas to see if worth further study

Ideas Analyzed
- advantages
- disadvantages
- recommendations

Sqdn Cmdr & Implementing Group decide to implement or not

Implement: ACTION

Evaluate
- Did the jobs change?
- Were the goals met?
- Final report.

* LMDC or commander may choose not to proceed

Fig. 16—The LMDC Job Enrichment Consulting Process

<table>
<thead>
<tr>
<th>Skill Variety</th>
<th>Doing different things: using different valued skills, abilities, and talents.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Identity</td>
<td>Doing a complete job from beginning to end, the whole job rather than bits and pieces.</td>
</tr>
<tr>
<td>Task Significance</td>
<td>The degree of meaningful impact the job has on others; the importance of the job.</td>
</tr>
<tr>
<td>Autonomy</td>
<td>Freedom to do the work as one sees fit; discretion in scheduling, decision-making, and means for accomplishing a job.</td>
</tr>
<tr>
<td>Feedback</td>
<td>Clear and direct information about job outcomes or performance.</td>
</tr>
<tr>
<td>Goal Clarity</td>
<td>Knowing and understanding what specific objectives or goals apply to the job and their relative priorities.</td>
</tr>
</tbody>
</table>

Fig. 17--Definitions of Key Job Variables-1MDC Model


With respect to behaviors, the individuals' cognitions about their own behavior will or will not lead to particular outcomes potentially available in the work situation.

The model appears to have an individual orientation. The basis is individual psychology. The level of individual growth need strength moderates the relationships of the theory and individual differences are as important as the objective job characteristics. People can value rewards differently and attach different valences to potential outcomes. The implementing process, however, makes use group dynamics.
Performance is an outcome of the three psychological states. The assumptions made about man by the model are not made explicit by the authors. It appears based on the research that man is viewed as a rational being. He uses his cognitive sense to determine what behavior will lead to and to determine the likelihood of the rewards. Individuals also differ in how they value rewards and in the strength of their needs.

Summary of the Position of the Two Approaches in Work Motivation Research

The purpose of this section is to summarize how the Herzberg Motivation-Hygiene Theory and the LMDC Hackman-Oldham Job Characteristics Model differ in work motivation theory. This is best done by answering the question: How did each theory draw upon the developments of the central issues of work motivation theory?

Motivation-Hygiene theory draws upon the following: The tenet of hedonism that man seeks to avoid pain is similar to the dynamic of hygiene—avoidance of pain. Instinct theory provides a notion of internal cueing and the unconsciousness of motivation. The scientific theory of management provided a focus on the individual for productivity and emphasized productivity as the goal. Hawthorne provided the knowledge that the "human data" of behaviors, attitudes, and social situations was important to productivity and satisfaction. The Hawthorne discovery of man as a social being, rather than as a economic being, and Lewin's group dynamics are used by Motivation-Hygiene to describe the hygiene factor, interpersonal relationships. Maslow's Need Theory is similar to M-H in that they are based on the human need for growth. Maslow's esteem and self actualization needs are similar to the motivators of M-H theory.
In addition, the physiological, safety and love needs are similar to the hygiene factors of M-H theory. Lastly, both literature reviews forced a different theory to be postulated, namely, performance (behavior) determined satisfaction (attitude).

The LMDC Hackman-Oldham Job Characteristics Model draws upon the following: From Instinct theory to some extent, the notion of "predispositions" although individual differences in "predispositions" is heavily emphasized. From Drive theory, that decisions concerning present behavior are based in large part upon the consequences or rewards of past behavior. This is the beginning of the expectancy theory. From Hawthorne, the significant findings of a man as a social being and a member of groups. This is the beginning of a branch of theory oriented toward the importance of the group. This was furthered by the human relations movement's emphasis on interpersonal relations. From Kurt Lewin, the model draws upon his cognitive or expectancy theory. The attractiveness of outcomes, "valence," and the likelihood of outcomes, "expectancy," are a moderating links in the Job Characteristics Model. Lewin's discoveries about group dynamics are used extensively during the implementing process of job enrichment. From Maslow, the model takes the "need for growth" as the goal for behavior. It also makes heavy use of the idea that individuals can vary in the strength of all needs. The reviews of literature led Lawler and Porter to propose rewards as an interviewing link between performance and satisfaction. They then developed expectancy theory to explain the motivating quality of rewards. The work of Hackman and Lawler is the forerunner Job Characteristics Model. Their attempt to show the interaction between job characteristics and different individuals drew upon expectancy theory and provided all the major components of the Hackman-Oldham Job Characteristics Model.
Footnotes for Chapter III


8 Ibid.


10 Ibid., pp. 7-26.


18 Ibid., p. 57.


20 Ibid., pp. 396-424.


22 Ibid., p. 150.


27 Ibid., pp. 259-86.

CHAPTER IV

THE FIRST RESEARCH QUESTION

Statement of the First Research Question

The first research question is, "Will Minuteman line crewmembers, untrained in Orthodox Job Enrichment and subjected to an unstructured interview, suggest significantly more hygiene than motivator changes in their job?" The purpose of this chapter is to answer that question by the methodology outlined in Chapter II. Of prime importance are how many and what hygienes and motivators were suggested and whether the differences are significant.

What Hygienes and Motivators Were Suggested?

The results of the content analysis are summarized in Figure 18. Of the 20 interviews conducted, one was not usable due to a mechanical malfunction of the tape recorder. Several observations were made about the data.

The number of changes totaled 116 for the 19 surveys. This varied from only one change to 22 changes with the average number of changes suggested being approximately six. Interview No. 3 suggested 22 changes and was thought to be an extreme occurrence as the next highest number of changes was 11.

An analysis of the hygiene concerns shows 140 concerns mentioned. This gives a change to hygienes ratio of one to 1.2. The number of hygiene
concerns varied from only one to 24 with the average being 7.3. Again, interview No. 3 produced 24 hygienes with the next highest producing 14 hygienes. A total of 48 motivator concerns produced a change to motivator ratio of one to 4.3. This averages to 2.5 motivators concerns per interview. It should be noted that six interviews produced no motivator concerns at all.

<table>
<thead>
<tr>
<th>Changes</th>
<th>Hygiene</th>
<th>Motivators</th>
<th>Slippages</th>
<th>No. of Factors</th>
<th>M or H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>24</td>
<td>5</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>11</td>
<td>14</td>
<td>9</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>10</td>
<td>4</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>15</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>17</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

Totals 116 140 48 2 189
Average 6.1 7.4 2.5 N/A 9.9

Fig. 18—Summary of Content Analysis

Two slippages were noted in the interviews. Again, these were separated out to avoid confounding the data. The treatment of slippages
and their use in answering the question are beyond the scope of this paper. It can be noted that the two slippages were in the service of hygiene and would not affect the results of either interview in which they were coded.

The total number of factors mentioned was 189 or approximately 10 per interview. The hygienes accounted for almost 75 percent of the factors with the motivators accounting for the remaining 25 percent.

An organizational profile analysis was also accomplished. Figure 19 summarizes the data by motivator and hygiene factors. Figure 20 is a chart of the same data. Figure 20 may be compared to Figure 11 in Chapter III for understanding the following discussion.

The motivators obtained basically follow the usual organizational profile. The major exception to the normal pattern was the achievement factor. Achievement was coded only four times and represented only 8.33 percent of the motivators coded. This would normally be expected to range from 30 to 40 percent with a critical incident survey. Otherwise, the frequency of the motivators are generally consistent with a normal organizational profile.

The hygiene side of the profile produced an almost perfect match to the normal profile. Interpersonal relations appears to be under represented with only 5 percent of the hygiene factors coded.

The data suggests, then, that the organizational profile has developed from the data is that of a normal organization experiencing the typical problem of having people with ability with jobs that offer limited opportunities for achievement, and a limited social climate. Further, it appears the four missile operations squadrons at Malmstrom are not suffering any major hygiene shocks. Consequently, there are no major disturbances within the squadrons causing unusual concerns among the crewmembers. This
conclusion is important because it suggests that the number of concerns is not unduly influenced by an abnormal psychological atmosphere within the squadrons.

<table>
<thead>
<tr>
<th>Motivators</th>
<th>Number of Concerns</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>4</td>
<td>8.33</td>
</tr>
<tr>
<td>Recognition for Achievement</td>
<td>13</td>
<td>27.08</td>
</tr>
<tr>
<td>Work Itself</td>
<td>9</td>
<td>18.75</td>
</tr>
<tr>
<td>Responsibility</td>
<td>11</td>
<td>22.93</td>
</tr>
<tr>
<td>Advancement</td>
<td>4</td>
<td>8.33</td>
</tr>
<tr>
<td>Growth</td>
<td>7</td>
<td>14.58</td>
</tr>
<tr>
<td>Total Motivator Concerns</td>
<td>48</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hygienes</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Policy and Administration</td>
<td>57</td>
<td>40.70</td>
</tr>
<tr>
<td>Supervision</td>
<td>40</td>
<td>28.57</td>
</tr>
<tr>
<td>Interpersonal Relationships</td>
<td>7</td>
<td>5.00</td>
</tr>
<tr>
<td>Working Conditions</td>
<td>20</td>
<td>14.29</td>
</tr>
<tr>
<td>Salary</td>
<td>4</td>
<td>2.86</td>
</tr>
<tr>
<td>Status</td>
<td>6</td>
<td>4.29</td>
</tr>
<tr>
<td>Security</td>
<td>6</td>
<td>4.29</td>
</tr>
<tr>
<td>Total Hygiene Concerns</td>
<td>140</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Fig. 19—Summary of Profile Data by Specific Factor

The statistical test used to determine the significance of the data was the binomial test. The assumptions, methodology and distribution were outlined in Chapter II. Briefly,

Null Hypothesis: \( P_h = P_m = .5 \)

Alternate Hypothesis: \( P_h > P_m \)

\( \alpha = .01 \)

\( N = 19 \)

Rejection Region: \( P < .01 \)
Fig. 20—Organizational Profile by Specific Factor
Each interview was coded as producing more hygiene concerns or more motivator concerns. The results are provided in Figure 18. Eighteen surveys were coded as producing more hygienes. Only one survey was coded as producing more motivator concerns than hygienes. Thus, for the binomial test, $X = 1$. Using Figure 7, Table of Probabilities, in Chapter II, a value of $P$ for $X = 1, N = 19$ is zero. Thus, $P < .01$ and is in the rejection region. The null hypothesis, $P_h = P_m = .5$ is rejected. The alternate hypothesis, $P_h > P_m$ is accepted. That is, the probability of obtaining hygiene factors is not equal to the probability of obtaining motivators. Further, the probability of obtaining hygiene factors is significantly greater than the probability of obtaining motivator factors.

Conclusions for the First Research Question

The data suggests several conclusions for the first research question. First, an organizational profile of the line crews suggests a normal profile. The crewmembers do not appear to be influenced by any major abnormal situations within their units. Second, a binomial test of the data suggests that the probability of obtaining hygiene concerns is significantly greater than the probability of obtaining motivator concern. This is in agreement with the motivation-hygiene theory which states that a dynamic of hygiene is that there are infinite sources of pain from the environment. Also, a dynamic of motivators is that there are only limited sources for growth opportunities. Therefore the findings are consistent with the Motivation-Hygiene theory.

The conclusions are important for the attitude questionnaires and interviews used by the LMDC. Chapter II identified several limitations when using a structured questionnaire such as the OAPS. These included
the forced choice effect, the weighting and inclusion of various factors, consistency and priming artifacts, social acceptance bias and the question of unconscious motives. The methodology of this paper attempted to dampen the effect of the first three affects while not addressing the last two directly. The methodology of the first research question suggests that the attitudes found in this research survey are not significantly influenced by the effects of forced choices, different weightings, inclusions or exclusion of factors, or the consistency and priming effects. Now the question arises, "What happens when a person's attitudes are surveyed using a questionnaire, such as used by LMDC?"

Hackman and Oldham have recognized several limitations to their Job Diagnostic Survey (JDS), from which LMDC's OAPS was developed. "One is that the job characteristics are not independent of one another and show positive intercorrelations." (1) This is an instrument problem and has not been resolved. The multiplication factor in the motivating potential score (MPS) tends to exaggerate measurement errors. Also, "the validity of some of the JDS scales remain unestablished." (2) The survey can be easily faked and is subject to consistency effects. Further, the "concept of growth need strength, key to the underlying work motivation theory, and its measurement in the JDS has not been validated." (3)

In summary, attitude measurement as done by the LMDC with the OAPS appears to have major limitations. Several effects produce biased attitudes and measurements. The forced choice effect, the weighting and inclusion of various factors, consistency and priming artifacts, social acceptance, bias the question of unconscious motives, and the fakeability of the survey produce unreliable data. The validity of some of the measurements remain unestablished and therefore of questionable use.
Footnotes for Chapter IV


2 Ibid., p. 314.

3 Ibid., p. 314.
CHAPTER V

SECOND RESEARCH QUESTION

The second research question is, "Using the results of the first question, what are the management implications of the differences between using the LMDC H-O JCM and the OJE model for enriching the Minuteman line crew job?" The purpose of this chapter is to answer that question and draw some conclusions about the comparison.

The viewpoint taken to answer this question was important. The method of comparison was to first assume a Motivation-Hygiene theory and OJE viewpoint. Then, it was conceptualized that the LMDC H-O JCM was applied to the line crew position. Differences were then noted and discussed.

The issue of the criticalness of the differences must be defined. While the models differ in theory and techniques, theory differences are less obvious or understandable to the manager. Most likely, the techniques are the most visible to the manager. The resulting differences in application process usually point out the possibility of different impacts. The measure of criticalness is the major differences in application which produce significantly different results.

The Issues

The first critical difference centers on the use of attitude measurement. The surveying of attitudes most likely sensitizes the crewmembers to their own attitudes. This sensitized awareness can increase
the person's cognitive dissonance causing small problems to increase in importance and other possible problems to be recognized. Gathering attitudes may also tend to legitimize the expectation that, "management now knows how I feel--now they will do something about it." An attitude survey may also produce attitudes which were not previously present.

Further, attitude surveys may tend to distort or sensitize hygiene concerns among the crewmembers. Results of the first research question suggest that significantly more hygiene concerns are available. Just surveying attitudes with regard to unit policy, supervision, pay, etc., may significantly increase hygiene pain from the member's environment. Also, because hygiene was measured, it may take on more significance for the person than it normally would. Given that more hygiene concerns usually surface than motivators concerns, the manager could endlessly chase down "ghost" or nonlegitimate hygiene problems. Some hygiene issues are real and solvable by management while others are only perceived problems and unsolvable.

How the model handles hygiene or rather, how it does not handle hygiene issues is also important. If crewmembers are surveyed twice with nothing done by the manager or consultant, perceived problems may arise. For example, the crewmember may perceive a lack of management interest in his complaint. This apparent loss of management credibility can only exaggerate the dissatisfaction with supervision. This sensitization to hygiene and then apparent lack of follow-through can also occur at the brainstorming sessions. The workers are encouraged to "blow off steam" at the beginning. This worker brainstorming produces many hygiene considerations. Then these ideas are set aside to focus on ways to produce the job characteristics.
Another difference concerns the nature of the consultation. LMDC provides only a few hours of training to the workers in a short time. Their underlying theory about human motivation is not presented. As a result, the knowledge tends to be shallow, cookbookish, and imparts little wisdom about human motivation. Managers are left with a few techniques to apply and some long distance advice. The impact is that the manager does not possess enough knowledge to sustain an enrichment project and make it his own. The maxim that "a little knowledge is dangerous" applies. When something in the enrichment project goes awry the manager is illequipped to properly remedy the situation.

The issue of performance and the affect of the enrichment effort is also crucial. After all, performance is the goal of the manager. LMDC seems to survey without measuring performance at any stage. To return to a unit six months later, survey, and state that moral has improved is not of prime importance to the manager. LMDC measures of satisfaction make no statement about increases or decreases in performance. For commanders who do not implement a job enrichment effort, an increase in moral may be due to the "Hawthorne effect," instrumentation, maturation, history, or testing effects.

Another critical difference is the LMDC method of participation of the workers in brainstorming their own job. This is a human relations technique of worker participation. A lack of knowledge or understanding about other work units at the worker level can restrict the amount and quality ideas to enrich the job. Also, a feeling of participation may produce a decrease in dissatisfaction with the hygienes but cannot produce satisfaction.

A long term critical difference arises in how the LMDC model fine
tunes or increases performance after the initial six months. If the supervisors leave the organization, no one is left to support or fine tune the job enrichment effort. Another result would be decreased satisfaction among the workers in the unit as things returned to normal. Even without supervisors leaving, the attempt to fine tune can be hampered by a lack of adequate supervisor training in job enrichment. Once the most obvious changes are made, the supervisor may not know how to make more sophisticated and powerful changes and continue to make further changes as people grow.

The use of group goal setting also can produce different impacts. Participation by members of the work unit can cause several problems. The goals set can be inappropriate, unfair and can be used to manipulate the workers. In addition, the goals may be restricted as an informal group might. Further, there is a greater probability of hygiene oriented goals being established.

Several important conclusions can be made for the second research question. First, attitude surveys sensitize people to their attitudes and produce new attitudes. This can create additional problems, for management. Further, hygiene concerns become sensitized and endless. A manager could chase down many nonlegitimate hygiene problems. A perceived lack of follow through on hygiene concerns raised by the surveys and brainstorming can only exaggerate the dissatisfaction with supervisors. The consultation process is too short and shallow to be effective. Managers and their successors are left with little knowledge of human motivation and are ill equipped to carry out a job enrichment process. The measurement of performance is ignored at the expense of measuring satisfaction creating the question of worth of an LMDC effort. The human relations
technique of worker participation in changing their job creates short
term feelings of importance while limiting the amount and quality of ideas.
Additionally, the use of group goal setting can create inappropriate,
unfair, manipulative and hygiene oriented goals.
CHAPTER VI

SUMMARY OF OTHER FINDINGS

The purpose of this chapter is to summarize any data or findings of the research which was not planned as a part of the research. Most of these findings arose from the first research question.

Several observations were made about the actual interviewing. All the crewmembers were highly cooperative when asked to participate, even though some did not personally know the researcher. But all knew by the introduction that I was in AFIT and therefore a crewmember. A few rejections had been anticipated and this did not occur.

When mentioned, the LMDC surveys were seen in a negative context. Crewmembers were unhappy that their time off was being used, that the survey questions weren't clear, or that it didn't cover their problems. Unhappiness with having to take more other surveys was also mentioned.

Some crewmembers stated that they really hadn't thought about what changes they would make in their job. This might have been due to a lack of time on the job, mere contentment or a lack of expression of thoughts into verbalized changes. This was unexpected though most could go on to produce some changes and concerns. Some were able to identify their feelings and concerns rather well, but were unsure how to change the job. The researcher had anticipated, that a change would be followed by the "why" and their feelings. Most, but not all, did this.

Some crewmembers showed very intense feelings about various issues.
During an interview several concerns and changes might be mentioned. Then, a particular topic would be expressed emotionally, with great repetition and searching on the part of the interviewee. Even hostility was expressed. Clearly, the magnitude of these feelings would be hard to rate on any scale.

Another observation is the difference in description and meaning of commonly known occurrences. Though the descriptions were roughly the same, each account included different facts or details. The same occurrence produced varying concerns and changes. Additionally, most examples and incidents cited seem to have occurred within the last year.

The word "they" was used a great deal of the time. Often it was obvious by context who was being referred to. At other times, the word seems to imply anyone from a flight commander to the SAC commander. Also, the word "they" would be used in reference to unit policy or administration. It appears that the dissatisfaction with a policy became personalized in the form of a commander or supervisor. This did not present a problem with coding but was unanticipated.

A confusion about what was most important to be changed seems to exist. Often a person would state at the beginning the most important change he would make. At other times it would come some time near the end of the interview. It appears they attempted to evaluate the relative importance of their changes and to select the most important one even though this was not asked for.

Some confusion on the part of the interviewee as to whether he was communicating clearly was noted. The same concern was repeated or many examples would be given. Occasionally, questions like, "Do you know what I mean?" were asked. It seemed that it was important to them to state exactly what they were thinking to the interviewer, and to be
understood correctly. Further, some would end the interview by a modifying statement. Examples are, "It's not that bad of a job, but . . ." or "It's not that I hate my job. It's just that . . ." This might be due to the person's awareness of his expression of feelings and his attempt to somehow balance them. It also might be due to the awareness of the interviewer and the interviewee's desire not to be seen as a "complainer."
CHAPTER VII

GENERAL CONCLUSIONS

The purpose of this chapter is to summarize the general conclusions of the paper. A restatement of the objectives and purposes is provided, as well as, the conclusions for the research questions. Following this are conclusions with respect to how well the stated objectives and purposes were accomplished. A discussion of the implications of the study with respect to the Air Force and the Minuteman Missile Crew Force concludes the chapter.

Restatement of Objectives and Purpose

The purpose of this research was to discover the different managerial impacts of applying the two models, the LMDC Hackman-Oldham Job Characteristics Model (LMDC H-O JCM) and Orthodox Job Enrichment (OJE) to the Minuteman line crew position. Two research questions were proposed. One question attempted to discover the impact of one critical difference between the models. OJE does not administer attitude questionnaires or interviews during the implementing process, whereas, the LMDC H-O JCM uses an attitude questionnaire called the Organizational Assessment Package (OAP) Survey. The second question attempted to discover the differences in applying each to the Minuteman line crew position.
Conclusions with Respect to the Research Questions

The first research question was, "Will Minuteman line crewmembers, untrained in Orthodox Job Enrichment and subjected to an unstructured interview, suggest significantly more hygiene than motivator changes in their job?" The data suggests several conclusions. First, an organizational profile of the line crews suggests a normal profile, low in achievement and interpersonal relationships. The crewmembers do not appear to be influenced by any major abnormal situations within their units. Second, a binomial test of the data suggests that the probability of obtaining hygiene concerns is significantly greater than the probability of obtaining motivator concerns.

In summary, attitude measurement as done by the LMDC with the OAPS appears to have major limitations. Several effects produce biased attitudes and measurements. The forced choice effect, the weighting and inclusion of various factors, consistency and priming artifacts, social acceptance, bias, the question of unconscious motives, and the fake-ability of the survey produce unreliable data. The validity of some of the measurements remain unestablished and therefore of questionable use.

The second research question was, "Using the results of the first research question, what are the management implications of the differences between using the Leadership and Management Development Command Hackman-Oldham Job Characteristics Model (LMDC H-O JCM) for enriching the Minuteman line crew position."

Several important conclusions can be made for the second research question. First, attitude surveys sensitize people to their attitudes and produce new attitudes. This can create additional problems, for management.
Further, hygiene concerns become sensitized and endless. A manager could chase down many nonlegitimate hygiene problems. A perceived lack of follow through on hygiene concerns raised by the surveys and brainstorming can only exaggerate the dissatisfaction with supervisors. The consultation process is too short and shallow to be effective. Managers and their successors are left with little knowledge of human motivation and are ill equipped to carry out a job enrichment process. The measurement of performance is ignored at the expense of measuring satisfaction creating the question of worth of an LMDC effort. The human relations technique of worker participation in changing their job creates short term feelings of importance while limiting the amount and quality of ideas. Additionally, the use of group goal setting can create inappropriate, unfair, manipulative and hygiene oriented goals.

Conclusions With Respect to How Well the Stated Objectives and Purposes Were Accomplished

The objectives and purposes of this paper were achieved. However, the findings would have been stronger if there had been fewer limitations to the methodology. Much more time and expense would have been required on the part of the researcher. In general, though, each question was answered well enough to provide useful information. The first research question was accomplished with a much more objective (process) method. This is due to its "testability" and the clear distinction between the two models on the use of attitude measurements. The second research question was much more subjective (content) in its method. The "think-piece" approach does not lend itself to objectively identifying "the answer." A determination of whether the objectives were accomplished
becomes difficult to assess. Nevertheless, the researcher feels that enough analysis of the models was done to warrant the conclusions and feel that some wisdom or insight was gained into the human dimensions of the problem.

Discussion of the Implications of the Study
With Respect to the Air Force and the Minuteman Missile Crew Force

Even with the limitations of this study, the implication of this study for the Air Force and the Minuteman missile crew force should be considered. The possible implications are significant.

My first recommendation is to propose the question, "Which job enrichment model should be used for the Minuteman crews?" At this time, a SAC commander at any level has no choice but to choose the LMDC methodology. This paper has questioned the ability of LMDC to adequately apply job enrichment to the crew position. Bringing a possible inadequate solution to bear on the crew position puts more at risk than the manager or crewmembers may gain.

In light of this study, the Air Force should also reconsider why two different job enrichment theories are continued in use. This study suggests enough critical differences and outcomes between the two to demonstrate that there are possible differences in effectiveness. An evaluation by the Air Force of the two strategies seems warranted.

Another recommendation is for the Air Force to consider just how well their managers and commanders are prepared to handle and complete an LMDC enrichment program. This study has suggested that commanders do not understand LMDC job enrichment theory, techniques and methodology to
adequately apply them to their unit. This lack of understanding increases
the probability of failure. Clearly, a more comprehensive effort is
needed to train Air Force commanders, managers, and supervisors about job
enrichment. Deciding the merits of alternate job enrichment strategies
then becomes especially crucial.

An important recommendation for the Air Force in using the LMDC
method concerns the heavy use of attitude measurement prior to an LMDC
job enrichment effort. This study suggests this is harmful to the mission
of the Air Force. Further, actual measurement is highly suspect. Command­
ers are being asked to make decisions on this questionable data. Clearly,
they must have a better understanding of the "how" and "why" of attitude
measurement prior to make decisions based on it.

In conclusion, the Air Force and the Minuteman line crewmembers
have much at stake in the application of a job enrichment effort to their
position. The application of either strategy should be implemented only
after a more careful consideration of the theory, methodology and techni­
ques of each model. Only when this is done can Air Force managers under­
stand the differences and impacts of using each. Understanding this, the
manager may choose and apply a job enrichment strategy best suited to for
the Minuteman line crew position.
APPENDIX A

AUTHORITY TO CONDUCT A SURVEY
REPLY TO
ATTN OF: Captain James W. Kirlin 10 December 1980
SUBJECT: Authority to Conduct a Survey

TO: AFMPC/MPCYPS

1. The purpose of this letter is to request authority to conduct personal interviews with Minuteman Line Crewmembers of the 341SMW (SAC), Malmstrom AFB, MT.

2. I am a missile staff officer with the Missile Procedures Trainer Branch (DOTM) of the 341SMW. I am working on my thesis for an MBA degree with AFIT/Det #5, Malmstrom AFB, MT and the University of Montana. My thesis sponsor is Dr. John N. Taylor, D.B.A., AFIT/Det #5, University of Montana, Malmstrom AFB, MT.

3. The following information is provided IAW AFR 30-23, para 8a:

   a. Title of Survey: Job Change Interview

   b. Statement of Purpose, Justification, and Preferred Administration Time: The problem statement of my thesis is: The Air Force is currently using two job enrichment models, the Orthodox Job Enrichment model and the modified Hackman-Oldham model. The purpose of my research is to discover the critical differences that might exist between each in terms of motivation and to analyze the management impacts of applying each model to the Minuteman Line Combat Crew job. The purpose of the personal interview is to answer my first research question: Will Minuteman Line crewmembers, untrained in job enrichment and subjected to an Organizational Assessment Package Survey (OAPS)-type question, suggest significantly more hygiene than motivator changes in their job? This survey is justified for several reasons. The information on this topic is not available. No current programs exist to obtain this information. The survey will produce little burden to the individuals and will not interfere with any Air Force mission. Preferred time administration is January 1, 1981 until January 31, 1981. This survey will be conducted at no cost to the Air Force.

   c. Foreword: The individual will be read a Privacy Act Statement in compliance with AFR 12-35, para 8. See Attachment One before the survey. No personal information is sought or asked, but it is expected individuals will reveal items of a personal nature about themselves. Social Security Numbers will not be asked for or recorded. The person's voice will be recorded and transcripts typed. At the conclusion of the study the tapes will be degaussed.
The transcripts will be viewed by only Dr. Taylor and myself. Excerpts will be quoted in the thesis. A number will be assigned to each interview for purposes of recoding data. The individual will be cautioned not to mention classified information.

d. Hypothesis: The null hypothesis \( (H_0) \) is \( p_m = p_h = .5 \). That is, there is no difference between the probability of finding more hygiene factors mentioned than motivators. The alternate hypothesis is \( p_h > p_m \).

e. Population: The specific population is the Minuteman line crewmembers assigned to the 341SMW (SAC), Malmstrom AFB, MT. The size of the population is approximately 160 individuals. This is reduced by approximately 15 individuals who have been exposed to job enrichment.

f. Sample: The sample will be a random sample from the population. The size of the sample is 20 individuals.

g. Selection of Sample: A list of names in the population will be placed in a hat. Twenty names will be drawn and asked if they will participate. Additional names will be drawn to replace those not wishing to participate.

h. Conducting the Survey: A pretest of the survey of five interviews will be conducted to validate the actual procedures. The survey (actual) will be conducted in a mutually agreeable, non-work or neutral environment, such as a library or home. Answers will be recorded on a tape cassette. The one-on-one personal interview will be conducted IAW the format in Attachment Two. The length of the interview is solely dependent upon the interviewee. I will be the sole interviewer and no others will be permitted to participate or watch.

i. Statistical Analysis: The plan consists of an interview analysis by content and number of suggestions. Coding of the interviews into hygiene and motivators will be done by myself. Dr. Taylor will do this also for interreliability of raters, although his codings will not be used. The total number of hygiene and motivator factors will each be summed. The Binomial Test, which is a nonparametric test for one-sample cases of nominal data, will be applied. The level of significance will be .01.

j. Tabulating Results: Results will be shown by tables. A table will accompany each step of the analysis from raw data to final results. Results will be published in aggregate.
k. Use and Disposition of Results: The results will be published in my Master's thesis and kept on file at the University of Montana library. I would like to forward a copy to 341SMW/D0 and higher if appropriate. The results will be available to the Air Force Human Resources Laboratory (AFHRL). Disposition of the transcripts will be IAW AFR 12-30.

l. Copy of my interview format: See Attachment Two.

m. Project Officer: Captain James W. Kirlin
   341SMW/DOTM
   Malmstrom AFB MT 59402
   Autovon 632-2226

n. Thesis Sponsor: Dr. John N. Taylor
   AFIT/Det #5
   University of Montana
   Malmstrom AFB MT 59402
   Autovon 632-3428

 o. A copy of my approved proposal is Attachment Three.

4. I would sincerely appreciate your expediting this request as your approval is vital to the completion of my thesis.

JAMES W. KIRLIN, Capt, USAF

3 Atch
1. Proposed Foreword
2. Interview Format
3. Proposal
Job Change Interview

To 341SMW/DOTM (Capt Kirlin)

This letter documents the telephone conversation of 2 Jan 81 providing you a survey control number (SCN). A control number of USAF SCN 81-23 was assigned and expires on 28 Feb 81.

FOR THE COMMANDER

WILLIBORD T. SILVA, Lt Col, USAF
Chief, Research & Measurement Div
APPENDIX B

SUGGESTIONS FOR ADDITIONAL RESEARCH
The purpose of the appendix is to provide suggestions for future research on this and related topics.

It is suggested that this paper and its data and conclusions be the beginning of a more thorough test of the first research question. A true experimental design could be devised to reduce the limitations and increase the internal validity of the findings. More refined procedures for use are suggested by the data and other observation made in Chapter VI.

This paper could also serve as a basis for a more thorough comparison of the two models. An actual project is highly recommended. For example, using the LMDC H-O JCM in one unit and the OJE model in a comparable unit should produce interesting and valuable comparisons.

The interviews gathered should be used to test other concepts of either theory. An analysis or comparison of the data found in the interviews with the results of the OAPS should be done. Preliminary answers for other research questions about M-H theory can be found in the surveys.

A thorough analysis of the similarities and differences between the job characteristics model and the Air Force version as used by LMDC is suggested. This would help to clarify what assumptions and techniques the Air Force is making and using that are not directly supported by the original model.
APPENDIX C

DEFINITION OF TERMS
JOB ENRICHMENT - Job enrichment is a work redesign strategy which attempts to bring about increased productivity and/or work satisfaction by changing the work itself.

ORTHODOX JOB ENRICHMENT (OJE) - Is the application of the Motivation-Hygiene Theory to organizations. Its intent is the designing of opportunities for motivator behavior into an individual's job.

LMDC HACKMAN-OLDHAM JOB CHARACTERISTICS MODEL - Is the job enrichment process based on the job characteristics model of J. Richard Hackman, Greg Oldham, Robert Janson, and Kenneth Purdy. The LMDC has made some modifications to the Hackman-Oldham model and its implementing process to meet its own needs.

MOTIVATION-HYGIENE THEORY - A theory of human motivation proposed by Frederick Herzberg in 1959 and developed further in later years.

HYGIENE - A concept of the M-H Theory. Hygiene factors are seen as one set of needs of man based on his need to avoid pain. They are unit policy and administration, supervision, interpersonal relationships, working conditions, salary, status, and security.

MOTIVATORS - A concept of the M-H Theory. Motivator factors are seen as the other set of needs of man based on his need for psychological growth. They are achievement, recognition for achievement, work itself, responsibility, advancement and growth.
LEADERSHIP AND MANAGEMENT DEVELOPMENT COMMAND - The Air Force unit which provides management consultation services to Air Force commander, leadership and management training to the Air Force personnel in their work environment, and performs research in support of the first two objectives. As such, LMDC is the center for job enrichment consulting services and the major commands except AFLC.

ORGANIZATIONAL ASSESSMENT PACKAGE SURVEY - Patterned after the Hackman-Oldham Job Diagnostic Survey. The OAPS was developed by LMDC to identify existing strengths and weaknesses within organizational work groups and aggregate work groups, such as directorates. It is a written questionnaire with approximately 100 questions and uses Likert scales.

MOTIVATION POTENTIAL SCORE - An index derived from the OAPS to diagnose existing jobs and to evaluate the effects of work redesign.

MINUTEMAN LINE CREWS - For the purposes of this paper, missile combat crewmembers belonging to one of the four missile operations squadrons at Malmstrom Air Force Base, Montana. Evaluator, instructor, and flight commander crews were excluded.
SOURCES CONSULTED

BOOKS


Herzberg, Frederick; Mausner, Bernard; Peterson, Richard O.; Capwell, Dora F. Job Attitudes: Review of Research and Opinion. Pittsburgh: Psychological Service of Pittsburgh, 1957.


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PERIODICALS


