

An Evaluation of the Hackman and Oldham Research Compared to Large Sales and Manufacturing Companies and Other Selected Groups

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Abstract

This paper examines data in Hackman and Oldham's Job Characteristics Model (JCM) with studies conducted by the researchers. Motivating Potential Scores (MPS) are examined between larger and smaller-sized organizations throughout the United States and the international environment with comparisons made to Hackman and Oldham's data. The research was to determine (1) Is there a difference between the United States Manufacturing and Retail and the International Multinational companies? (2) Is there a difference between the government in the United States and the governmental sample internationally? (3) Is there a difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researcher in manufacturing and the sales industry? (4) Is there a difference between the US data without the large manufacturing and sales company and the multinational manufacturing company in the international data?

Introduction

To improve operating margins, an executive can increase prices or lower costs. The unintended consequences of decreasing costs may result in lowering motivation, satisfaction, and overall employee morale. To address these issues, Hackman & Oldham (1976), building on Herzberg's two-factor theory (Herzberg, Mausner, & Synderman, 1959), with some theoretical foundations based on the expectancy theory (Evans, Kiggundu, & House, 1979) developed the Job Characteristics Model (JCM). Several studies (e.g., Ford, 1969; Lawler, 1973; Maher, 1971; Meyers, 1970; Special Task Force, HEW, 1973; Vroom, 1964) supported the theory of job redesign. Steers and Porter (1987) found that task redesign can (1) significantly reduce turnover and absenteeism, (2) improve job satisfaction, (3) improve product quality, and (4) improve productivity and outputs.

Muchinsky (2006) noted that despite the popularity of the JCM, few comparison studies have been conducted among companies operating in the U.S. and other parts of the world. To address that issue, Casey, Hilton, and Schmidt (2021) studied the Job Characteristics Model and employee motivation by comparing the Motivation Potential Scores of employees in companies located in the United States with those located in Mexico, Central America, and South America. The significance of this research is that

for the first time, MPS data from smaller companies in the United States and in the international environment will be examined relative to larger companies and the Hackman and Oldham database.

Review of the Literature

Work redesign is an approach to motivation and company reorganization for four reasons: (1) work redesign alters the basic relationship between a person and what they do on the job; (2) work redesign directly changes behavior, which tends to stay changed; (3) work redesign offers, and sometimes forces into one's hands, numerous opportunities for initiating other organizational changes; and (4) work redesign, in the long-term, can result in organizations that re-humanize rather than dehumanize employees (Hackman and Shuttle (1977)). The entire concept of job redesign is based upon the theories of motivation and the motivation literature.

Subsequent to the development of Hackman and Oldham's JCM, numerous research studies have studied workers with the aim of improving personal and organizational outcomes through job redesign. A review of recent JCM literature follows.

Sever & Malbasic (2019) studied the role of the JCM in employee motivation and satisfaction among several companies in Croatia. The Croatian study had a total of seventy-five respondents and employed the Job Diagnostic Survey (JDS), an instrument developed by Hackman and Oldham. The JDS utilizes a five-point Likert scale. In their study, Sever & Malbasic (2019) employed a closed-type question to study the impact of employee motivation and satisfaction. The study found that the psychological state of Meaningfulness of Work (Skill Variety, Task Identity, and Task Significance) was rated high by respondents. In addition, the psychological state of Experienced Responsibility for Outcomes of the Work, as measured by an Autonomy rating, was less than the overall average for Experienced Meaningfulness of Work. The psychological state of Knowledge of the Actual Results of the Work Activities, as measured by Feedback, was less present among respondents. Results showed that the dependent variable of motivation was rated high by employees at 81 percent. Sixty-two percent of employees rated the dependent variable of Job Satisfaction as high.

Sever & Malbasic (2019) found high correlations between JCM variables in the workplace, and motivation was rated positive and moderate, and almost good. The characteristics between the interaction of variables in the workplace and job satisfaction were positive and very good.

Deremirk & Nalla (2018) tested the JCM using the short form of Hackman and Oldham's JDS. The study surveyed 637 Turkish airport police officers. In the study, Deremirk & Nalla (2018) hypothesized that the JCMs five core job dimensions plus extrinsic rewards had a direct, positive impact on work motivation and job satisfaction. Results of correlation tests among items confirmed the hypotheses at the bivariate level lending further support for the JCM.

Using the JCM, Allan, Collisson, & Duffy (2018) tested recommendations that helping others leads to more meaningful work. Building on previous theory, prosocial work interventions were incorporated to measure their effects between Task Significance and Meaningfulness of Work. To that end, three separate studies were analyzed. Allen,

Collisson, and Duffy (2018) found that across all three studies, helping others resulted in participants experiencing more Meaningfulness of Work.

Blanz (2017) surveyed 734 social workers in Germany. A replication study of 101 new persons was also conducted. As with previous research studies in the for-profit sector, the German social workers showed consistent and positive correlations for the five job core characteristics as well as the three psychological states in not-for-profit settings. This research found all JCM variables correlated positively with job satisfaction as mediated through the three psychological states.

Ali, Said, Yumus, Kader, Latif, and Munap (2014) studied job motivation and satisfaction in the fast-food industry. The study included 122 completed surveys and found good internal consistencies. The research studied job satisfaction, task identity, task significance, and autonomy. More specifically, this study analyzed the relationship between job characteristics and job satisfaction among managers. The study confirmed the findings of Hackman and Oldham model.

Ayandele and Nnamseh (2014) studied the JCM in the civil service field within the African setting. The study concluded that the JCM was valid in both European and African settings, and in the manufacturing and service industries. The researchers recommended that managers in the civil service field acknowledge individual differences because people respond differently to work enrichment strategies in organizational settings. The study supported the overall validity of the JCM.

Moloi (2014) utilized the JCM to study 11th and 12th-grade educators in fourteen selected secondary schools. Their study investigated JCM's five core job dimensions and their relationship to race and gender. The study analyzed JCM results in 15 Qwaqwa schools and found the theory to be valid. Moloi (2014) recommended further studies be conducted to confirm or disprove the propositions of the JCM.

Siruri and Cheche (2021) discussed the relationship between JCM and the Herzberg Two Factor Theory. This study put forth that better work environments, continuous training, and personal considerations can enhance the rate of job enrichment. It is assumed that good work environments help improve hygiene factors while continuous training correlates to skill variety, motivation activities, and personal considerations correspond to individual differences and feedback in the JCM model.

Review of the Research

In this paper, the researchers compared the US means for a large US retail company (Table 1, Column C, a large US manufacturing company (Table 1 Column D), and a large international multinational manufacturing company (Table 2, Column L) with the mean scores in the Hackman and Oldham database. This was done because, upon observation of the raw data, the MPS for the three largest firms in this study appeared more consistent with those in Hackman and Oldham's database. In the international arena, the researchers wanted to study why the MPS for the multinational manufacturer in Guatemala was higher relative to other international companies.

Table 1: Means for the Studies in the Service, Manufacturing, and Retail Industries United States											
Dimensions	A	B	C	D	E	F	G	H	I	J	Average Means
			n=192	n=330	n=89	n=21	n=18	n=11	n=26	n=13	n=700
Skill Variety	4.80	4.20	4.89	4.46	4.05	4.51	3.84	4.00	4.21	4.00	4.30
Task Identity	4.40	4.30	3.94	5.25	3.89	3.83	3.69	3.13	3.93	3.13	3.95
Task Significance	5.50	5.30	5.31	5.59	4.48	4.5	4.48	4.34	4.19	4.34	4.80
Autonomy	4.80	4.50	4.67	5.30	3.56	3.8	3.56	3.59	4.03	3.59	4.14
Feedback	4.44	4.70	4.07	4.05	3.36	3.78	3.36	3.80	3.44	3.80	3.88
MPS*	104.52	97.29	89.59	109.47	49.52	61.47	59.86	52.21	57.01	52.10	69.87*
69.87 = (4.30+3.95+4.80)/3(4.14*3.88)											
Legend:											
A. Hackman & Oldham Mean for Sales Industry											
B. Hackman & Oldham Mean for Manufacturing Industry											
C. United States Study #1 Manufacturing Company											
D. United States Study #2 Major Retailing Company Multinational											
E. United States Study #3 Hospital (Service)											
F. United States Study #4 Public Service Police Department											
G. United States Study #5 Non-Profit Organization Assisted Living Facility											
H. United States Study #6 Retail Sector Banking											
I. United States Study #7 Service Industry US											
J. United States Study #8 Food Service US											

Table 2: Means for the Studies in the Service, Manufacturing, and Retail Industries Non-U.S.													
Dimensions	A	B	C	D	E	F	G	H	I	J	K	L	Average Means
	n=233	n=152	n=108	n=175	n=28	n=15	n=158	n=354	n=157	n=134	n=54	n=62	n=1,630
Skill Variety	3.77	3.71	3.70	3.77	4.03	3.52	3.72	3.74	3.87	3.56	3.50	3.916	3.73
Task Identity	3.01	3.35	3.62	3.95	4.21	3.72	4.07	3.27	3.44	3.38	3.57	4.069	3.64
Task Significance	2.50	3.10	3.17	3.70	3.35	4.01	4.32	3.29	3.44	3.34	3.44	3.609	3.44
Autonomy	2.86	2.72	3.88	3.70	3.85	3.70	3.68	3.13	3.32	3.23	3.22	3.887	3.45
Feedback	3.50	3.48	3.95	3.70	3.24	3.31	3.17	3.12	3.72	3.36	3.51	3.747	3.48
MPS *	31.79	32.05	53.53	52.05	48.20	45.93	47.09	33.53	44.26	37.19	39.58	59.291	43.26*
43.26 = (3.73+3.64+3.44)/3(3.45*3.48)													
Legend:													
A. Non-United States Study #1 Bank in Nicaragua (Service)													
B. Non-United States Study #2 Bank in Guatemala (Service)													
C. Non-United States Study #3 Food Service in Nicaragua													
D. Non-United States Study #4 Small Service Business in Mexico													
E. Non-United States Study #5 Bank in Costa Rica													
F. Non-United States Study #6 Retail in Belize													
G. Non-United States Study #7 Retail in Honduras													
H. Non-United States Study #8 Retail in El Salvador													

- I. Non-United States Study #9 Retail in Ecuador
- J. Non-United States Study #10 Government in Mexico
- K. Non-United States Study #11 Retail in Panama
- L. Non-United States Study #12 Manufacturing in Guatemala Multi-National

The Guatemalan multinational is a large company with operations in many countries. Much of the management in the plant comes from the United States, and US management and manufacturing processes in the plant are US-based. The researchers believe this may be the reason the MP scores are much closer than other US MP scores compared to the international scores.

R1: Is there a significant difference between the United States Manufacturing and Retail and the International Multinational Company?

H1: There is a significant difference between the United States Manufacturing and Retail and the International Multinational Company?

Ho: There is no significant difference between the United States Manufacturing and Retail and the International Multinational Company?

Chart 1. ANOVA: Single Factor-US Major sales and manufacturing and Guatemalan Multinational						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Column 1	5	22.88	4.576	0.32668		
Column 2	5	24.65	4.93	0.41755		
Column 3	5	19.228	3.8456	0.03057		
				0.7748		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3.057873	2	1.528936	5.919992	0.016265	3.885294
Within Groups	3.099199	12	0.258267			
Total	6.157072	14				

There is no difference in the data for this ANOVA when evaluating the Major US firms compared to the Multinational in Guatemala.

Another interesting discovery is that the US “E through J” sample is similar to the international scores “A through K” sample. Why did the researchers find this difference? More specifically, why is there a difference in international studies between smaller companies and Guatemalan multinational manufacturing company? Could it be that the smaller companies in this study are similar in size as compared to the Guatemalan multinational? Could it be that these smaller organizations operate in non-manufacturing sectors of the economy? Leading to our second research question to examine the United States “F” sample of a police department and an international “J” sample of

governmental operations in Mexico. Both are in the government sector. Now we will evaluate their scores.

Table 3: Government in the US and International Comparison			
Dimensions	Government US	Government International	Variance
	n=21	n=134	
Skill Variety	4.51	3.56	.95
Task Identity	3.83	3.38	.45
Task Significance	4.5	3.34	1.16
Autonomy	3.8	3.23	.57
Feedback	3.78	3.36	.42
MPS	61.47	37.19	24.28

The US scores are higher in every dimension. Feedback was the closest with a .42 variance, followed by task identity with a .45 variance. Task significance had the highest variance with a 1.16. In the US task significance is 1.16 higher than the international sample indicating this is much more important for the US government sector than the international. Also, skill variety was .95 higher in the US than international sector, followed by autonomy which was .57 higher for the US sample.

A major difference was in the Motivating Potential Score. The US was 61.47 compared with the international sample of 37.19.

R2: Is there a significant difference between the government in the United States and the governmental sample internationally?

H1: There is a significant difference between the government in the United States and the governmental sample internationally?

Ho: There is not a significant difference between the government in the United States and the governmental sample internationally?

The researchers ran a one-way ANOVA.

Chart 2. ANOVA: Single Factor-Governmental in the US and Mexico						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Column 1	5	20.42	4.084	0.14803		
Column 2	5	16.87	3.374	0.01418		
Total				0.16221		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1.26025	2	0.630125	6.798094	0.022887	4.737414
Within Groups	0.64884	7	0.092691			
Total	1.90909	9				

Here the F value is larger than the F critical, meaning there is a statistically significant difference in the data.

Why was there a difference in the scores for the governmental operations in the US versus Mexico? For the US companies, it appears more emphasis was placed on skill variety, task identity, task significance, autonomy, and feedback.

As confirmation of the validity of the researchers' data, their findings were compared to the Hackman and Oldham data.

Next, the researchers analyzed the MP scores for manufacturing and retail in the US and compared those to the findings in the Hackman and Oldham database.

R3: Is there a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researcher in manufacturing and the sales industry?

H1: There is a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researchers in manufacturing and the sales industry?

Ho: There is not a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researchers in manufacturing and the sales industry?

Dimensions	A	B	C	D
			n=192	n=330
Skill Variety	4.80	4.20	4.89	4.46
Task Identity	4.40	4.30	3.94	5.25
Task Significance	5.50	5.30	5.31	5.59
Autonomy	4.80	4.50	4.67	5.30
Feedback	4.44	4.70	4.07	4.05
MPS	104.52	97.29	89.59	109.47
Legend:				
A. Hackman & Oldham Mean for Sales Industry				
B. Hackman & Oldham Mean for Manufacturing Industry				
C. United States Study #1 Manufacturing Company				
D. United States Study #2 Major Retailing Company Multinational				

Here the researchers found the US samples for the sales industry as determined by Hackman and Oldham to be 104.52 as compared to the findings of the researchers to be 109.47, with only a 4.95 variance.

When comparing the manufacturing sector, Hackman and Oldham's research indicated 97.29 whereas the researchers computed 89.59 or only a 7.7 variance.

The question here is why are the two samples so close? The researchers believe it is due to the fact that Hackman and Oldham and the researchers both surveyed larger manufacturing and retail companies which were similar in size and product lines.

SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	5	23.94	4.788	0.19472		
Column 2	5	23	4.6	0.19		
Column 3	5	22.88	4.576	0.32668		
Column 4	5	24.65	4.93	0.41755		
				1.12895		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.419055	3	0.139685	0.49492	0.690887	3.238872
Within Groups	4.5158	16	0.282238			
Total	4.934855	19				

The F is lower than the F critical meaning the Hackman and Oldham and US Manufacturing and Retail are similar.

Table 5: US Sample without large Retail and Manufacturing Companies						
	n=89	n=21	n=18	n=11	n=26	n=13
Skill Variety	4.05	4.51	3.84	4.00	4.21	4.00
Task Identity	3.89	3.83	3.69	3.13	3.93	3.13
Task Significance	4.48	4.5	4.48	4.34	4.19	4.34
Autonomy	3.56	3.8	3.56	3.59	4.03	3.59
Feedback	3.36	3.78	3.36	3.80	3.44	3.80
MPS	49.52	61.47	59.86	52.21	57.010	52.10

Table 6: International sample without multinational manufacturing company.											
	n=233	n=152	n=108	n=175	n=28	n=15	n=158	n=354	n=157	n=134	n=54
Skill Variety	3.77	3.71	3.70	3.77	4.03	3.52	3.72	3.74	3.87	3.56	3.50
Task Identity	3.01	3.35	3.62	3.95	4.21	3.72	4.07	3.27	3.44	3.38	3.57
Task Significance	2.50	3.10	3.17	3.70	3.35	4.01	4.32	3.29	3.44	3.34	3.44
Autonomy	2.86	2.72	3.88	3.70	3.85	3.70	3.68	3.13	3.32	3.23	3.22
Feedback	3.50	3.48	3.95	3.70	3.24	3.31	3.17	3.12	3.72	3.36	3.51
MPS	31.79	32.05	53.53	52.05	48.20	45.93	47.09	33.53	44.26	37.19	39.58

The F value is greater than the F critical, so there is a difference in the data.

R4: Is there a significant difference between the US data without the large manufacturing and sales company and the multinational manufacturing company in the international data?

H1: There is a significant difference between the US data without the large manufacturing and sales companies?

Ho: There is not a significant difference between the US data without the large manufacturing and sales companies?

This ANOVA leaves out the large retail and manufacturing in the US and the larger manufacturing internationally.

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	5	19.34	3.868	0.19027
Column 2	5	20.42	4.084	0.14803
Column 3	5	18.93	3.786	0.18158
Column 4	5	18.86	3.772	0.20517
Column 5	5	19.8	3.96	0.0979
Column 6	5	18.86	3.772	0.20517
Column 7	5	20.47	4.094	0.13688
Column 8	5	15.64	3.128	0.25767
Column 9	5	16.36	3.272	0.14387
Column 10	5	18.32	3.664	0.09393
Column 11	5	18.82	3.764	0.01173
Column 12	5	18.68	3.736	0.17978
Column 13	5	18.26	3.652	0.06737
Column 14	5	18.96	3.792	0.19017
Column 15	5	16.55	3.31	0.06385
Column 16	5	17.79	3.558	0.05202
Column 17	5	16.87	3.374	0.01418
Column 18	5	17.24	3.448	0.01837
				2.23957

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	6.341752	18	0.35232	2.769636	0.001201	1.750999
Within Groups	9.03176	71	0.127208			
Total	15.37351	89				

Summary of Results

Analysis of the research questions and hypotheses

R1: Is there a significant difference between the United States Manufacturing and Retail and the International Multinational Company?

The researchers did not find support for the research question.

H1: There is a significant difference between the United States Manufacturing and Retail and the International Multinational Company? The researchers did not find support for the alternative hypothesis.

Ho: There is not a significant difference between the United States Manufacturing and Retail and the International Multinational Company? The researchers did find support for the null hypothesis.

R2: Is there a significant difference between the government in the United States and the governmental sample internationally?

The researchers found a statistically significant difference between the government in the United States and the governmental sample internationally.

H1: There is a significant difference between the government in the United States and the governmental sample internationally? The researchers found support for the alternative hypothesis.

Ho: There is not a significant difference between the government in the United States and the governmental sample internationally? The researchers did not find support for the null hypothesis.

R3: Is there a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researcher in manufacturing and the sales industry?

The researchers found there was not a significant difference between the data for sales and manufacturing.

H1: There is a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researchers in manufacturing and the sales industry? The researchers did not find support for the alternative hypothesis.

Ho: There is not a significant difference between the data for Sales and Manufacturing found by Hackman and Oldham and the researchers in manufacturing and the sales industry? The researchers did find support for the null hypothesis.

R4: Is there a significant difference between the US data without the large manufacturing and sales company and the multinational manufacturing company in the international data?

The researchers found there was not a statistically significant difference in the sample.

H1: There is a significant difference between the US and International data without the large manufacturing and sales companies? The researchers did not find support for the alternative hypothesis.

Ho: There is not a significant difference between the US and International without the large manufacturing and sales company? The researchers did find support for the null hypothesis.

Conclusion

Based on feedback from an earlier publication, the researchers wanted to determine if there was a significant difference between the United States Manufacturing and Retail and the large International Multinational company. The findings showed a difference in the comparison data, with the F value larger than the F critical, and the results were much different from when the researchers evaluated the three large companies from the smaller ones.

Next, the researchers studied a governmental entity in the United States and one in Mexico, finding there was a difference in this data with the F higher than the F critical. Once again, the researchers reviewed this data breaking it out from the other samples in the database.

The third research question analyzed the sales and manufacturing studies done by Hackman and Oldman and the researchers found the outcomes were very similar. Here the F value was lower than the F critical meaning there was no significant difference in the data.

For the fourth research question, the researchers examined whether a significant difference existed between the US data without the large manufacturing and sales company and the multinational manufacturing company in the international data. Here the F score was larger than the F critical finding there was a difference in the data.

Suggestions For Future Research

The researchers suggest future studies be conducted for comparisons with specific retail, food service, and smaller manufacturing and sales companies both in the United States and the international environment to determine if other differences exist. To facilitate future research, the researchers have surveys totaling 2,330 employees in their database with 1,630 international responses and 700 US responses. The researchers recommend additional studies in other countries and industries be conducted for future research studies. Another recommendation for future research is to compare results to those by Hackman and Oldham.

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