

**SALES FORCE EFFECTIVENESS IN THE
FACE OF GLOBAL COMPETITION:
DETERMINATION OF THE BEST
PREDICTORS OF PERFORMANCE**

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ملخص البحث

تهدف هذه الدراسة إلى تحليل وتقييم العوامل التي قد تؤثر في مدي فاعلية قوة المبيعات مع الوصول في نهاية الأمر إلى التعرف على الخصائص التي توفر تنبؤات صحيحة وثابتة لهذه الفاعلية .
وهناك أهداف ثانوية تتمثل فيما يلي :-

(أ) تحديد العوامل التي توفر أفضل التنبؤات في مجال أداء المبيعات في السلع الصناعية على الصعيد الدولي .

(ب) وضع نظام لتصنيف أداء المبيعات .
وقد تم جمع البيانات والمعلومات من إحدى الشركات العالمية العاملة في مجال إنتاج السلع الصناعية .
كمال تم اختبار الفروض من خلال تطبيق عدة إجراءات إحصائية ، منها :-

- (a) factor analysis.
- (b) discriminant analysis.
- (c) GLM MANOVA.
- (d) multiple regression analysis.
- (e) descriptive statistical analysis.

وقد دلت نتائج البحث على ثبات وصحة مصداقية تطبيق الاختبارات الشخصية كوسيلة لتحديد مستويات أداء قوة المبيعات ، كما أظهرت نتائج الدراسة تدنى تمثيل المرأة وضعف مشاركتها في مبيعات السلع الصناعية، بالرغم من أن درجات تقييم الاختبارات الشخصية والأداء التي استندت هذه الدراسة إليها أظهرت أنه بإمكان المرأة أن يكون مستوى أدائها عالياً في مجال مبيعات السلع الصناعية ، وقد أوصت الدراسة بضرورة قيام الشركة المشاركة بتطبيق نظام تقدير الدرجات الذي أثبتت هذه الدراسة صحته واعتمدت عليه .

Abstract

The primary objective of this study was to analyze and assess factors that may relate to sales force effectiveness with an end goal of identifying characteristics that provide valid and reliable predictions of sales force effectiveness. Subsidiary objectives (a) identified factors that best predict sales performance in global operations in industrial goods and (b) development of a classification system for sales performance.

Data were collected from a globally operating industrial goods manufacturer. Hypotheses were tested through the application of several statistical procedures. Statistical procedures applied included (a) factor analysis, (b) discriminant analysis, (c) GLM MANOVA, (d) multiple regression analysis, and (e) descriptive statistical analysis.

The study findings demonstrated the reliability and validity of applying personality tests as a means of predicting levels of sales force performance. The study also found that women were underrepresented in industrial goods sales, although the personality testing and performance ratings on which the data for this study were based indicated that women can perform at high levels in industrial goods sales. It was recommended that the rating system validated by the study findings should be implemented by the participating company.

Introduction

The success of most companies today is heavily dependent upon the effectiveness of the company's sales force. A company's products may perform well in application and that company may have a positive reputation in the market. If the sales function fails, however, product quality and company reputation may not forestall disaster.

An industrial goods company has experienced problems in sales force effectiveness in the face of global competition. A study was conducted, therefore, to develop a reliable way to predict sales force performance.

Importance of the Study

The globalization of economic activity exposes companies the many competitors that also produce high-quality products and that also have strong market reputations. Global competition, thus, places an even stronger responsibility on a company's sales and marketing function than occurs in purely domestic competition. The increasing intensity of global competition underscores the importance of this study for the industrial goods manufacturer.

Objectives of the Study

To assure that a company's sales force, as a group, is up to the competitive marketing task faced by the company, as well as to assure that a company's sales force will remain effective in the future, a company needs to implement procedures to assess its sales force in contexts that facilitate valid and reliable predictions of sales force performance. The primary objective of this study is to analyze and assess factors that may relate to sales force effectiveness with the end goal of identifying characteristics that provide valid and reliable predictions of sales force effectiveness. Subsidiary objectives of the study are as follows:

1. The first subsidiary objective of this study is to identify those factors that best predict sales performance in a globally competitive industrial goods market.
2. The second subsidiary objective of this study is to develop reliable criteria for the classification of sales performance as "good", "average", or "poor" within the context of the industrial goods manufacturer.

Hypothesis

Hypotheses were tested in relation to each of the subsidiary study objectives. The hypotheses tested were as follows:

❖ Predicting sales force performance objective:

- H₁: There are no statistically significant differences in sales force performance in relation to the gender of the sales representative.
- H₂: Effectiveness in industrial goods sales is associated with an Extroversion Super Scale score of 17.46 or higher on the Eysenck Personality Profiler.
- H₃: Effectiveness in industrial goods sales is associated with a Psychoticism Super Scale score of 16.63 or higher on the Eysenck Personality Profiler.
- H₄: Effectiveness in industrial goods sales is associated with a Neuroticism Super Scale score of 8.55 or less on the Eysenck Personality Profiles.

❖ **Sales force performance classification objective:**

- H₅: Within the company's industrial goods sales operations, "Good" performance compatible with required Eysenck Super Scale scores requires annual sales of \$762,850 or higher.
- H₆: Within the company's industrial goods sales operations, "Average" performance compatible with required Eysenck Super Scale scores is defined by annual sales in the \$520,450-to-\$762,849 range.

Relevant Literature

Three major dimensions of personality theory involve level of generality, level of analysis, and level of adaptability (Revelle, 1995). The levels of generality focus on (a) behavior typical of the human species or how people are similar, (b) trait based or situation-based similarities and differences, or (c) behavioral patterns that are unique to individuals.

Personality tends to be described at a basic level within the context of traits (Carver & Scheier, 1996). Traits may be viewed as one of the perceptual structures used by people to understand other people (Fiske, 1993). In this context, traits are semantic concepts that influence how information is assembled and used by individuals. Traits, thus, may be viewed as "rich semantic structures in which breadth (inclusion) varies inversely with information (specific behavioral description); people use the highest level of abstraction that still describes behavior, moving to more specific levels with unfamiliarity and inconsistency" (Fiske, 1993, p. 162). In other words, a trait is a characteristic way of behaving that may be observed in the actions of an individual regardless of the specific activity in which he or she is engaged. A personality trait, thus, represents the point along a continuum of a personality type that characterizes a person's behavior (Carver & Scheier, 1996). As an example, if the personality type topology of interest is Jung's introvert-extravert categorization, then the trait theory of personality holds that a person is neither all introvert or all extravert. Rather, the trait theory of personality holds that, as a general behavior pattern, a person may be more inward-turning or more outgoing to some degree along the continuum between the polar extremes of complete introversion and complete extraversion.

The most widely accept taxonomy of personality trait descriptors is the Five-Factor Model that focuses on (a) extraversion, (b) agreeableness, (c) conscientiousness, (d) neuroticism—stability or emotionality, and (e) openness—intelligence (Fiske, 1993). Research indicates that each of the five factors is related to psychological well-being and to adjustment in adolescence (McCrae &

Costa, 1991; Graziano & Ward, 1992). Further, Smith & Williams (1992) described a parallel application of the five-factor model in health psychology, where the model can be used to order and integrate existing findings relating personality characteristics and health outcomes.

Specific psychopathological syndromes also have been identified within the model (Ozer & Reise, 1994). Each of the five factors has been related to one or more components of narcissism (Buss & Chiodo, 1991). Additionally, the Five-Factor Model has been applied successfully as an alternative, dimensional framework for understanding personality disorders (Costa & McCrae, 1992). McCrae (1991) concluded that the Five-Factor Model is useful in various domains of clinical assessment. The cross-cultural generality of the Five-Factor Model also has been established (Stumpf, 1993). This finding makes the Five-Factor Model especially useful in counseling environments.

There are, however, some criticisms of the Five-Factor Model (Ozer & Reise, 1994). Some of these criticisms conflict with the assessments of others. Tellegen (1993), as an example, contended that the Five-Factor Model is not sufficiently comprehensive; while McCrae and John (1992) hold that the model is sufficiently inclusive. Wiggins (1992) contended that a consensus exists with respect to two limitations of the Five-Factor Model. First, by focusing on broad superordinate categories, much detail useful for both description and prediction is lost through reliance on the Five-Factor Model. Second, the model is atheoretical and descriptive rather than explanatory. McAdams (1992, p. 348) held that because the Five-Factor Model is capable only of "contextless noncontingent comparisons between persons it is inherently a psychology of the stranger" (p. 348).

Ozer and Reise (1994) held that: "Whether the five-factor model subsumes all of the generally recognized and useful trait dimensions seems, at least in part, an empirical question. Our interpretation of the many reported correlates of each of the five factors suggests at least one important group of individual difference variables that should be, but apparently is not, easily assimilated by the five-factor model. These are the variables subsumed by the well-known second factor of the Minnesota Multiphasic Personality Inventory (MMPI), referred to as ego control. Examination of the MMPI-2 and one hundred adjective markers of the five factors failed to find any clear relations between scales saturated with ego control and any of the five-factor markers. The CPI Socialization scale, which assesses similar content, is also poorly predicted by five-factor scales But even if data continue to suggest that issues relating to impulse regulation cannot be assimilated to the five-factor model, there is little doubt that the model could accommodate to the data, whether by adding facets to existing factors, redefining factors, or even adding factors. Determining whether an alteration of

the model is needed is an important part of the future agenda for research in personality structure" (p. 541).

Goldberg (1993b) held that the Five-Factor Model is "more than a short list of broad individual differences variables: It is a highly structured taxonomy. There are misplaced concerns that the five broad dimensions of the model may limit assessors to using superordinate factors instead of more specific traits within the structure. There is no inconsistency in advocating the five-factor model as a general taxonomy and the use of measures of specific traits for particular predictive or explanatory purposes" (p. 183)

Goldberg (1993a) also compared the Five-Factor Model to the "standard north-south and east-west axes of cartography. Just as latitude and longitude permit the precise description of any location on earth, the five-factor model promises the hope of similarly locating personality dispositions. In addition, just as the discovery of how to measure longitude was crucial to navigation; the invention of the five-factor model is a major contribution to personality assessment. Personality psychologists who continue to employ their preferred measure without locating it within the five-factor model can only be likened to geographers who issue reports of new lands but refuse to locate them on a map for others to find. But just as knowing the exact coordinates of the Grand Canyon provides no insight into the geological principles and processes that created this magnificent formation, the five-factor model, per se, offers no insight into the psychological principles and processes that create a personality" (p. 31).

The Eysenck Personality Profiler develops data for (a) individual employee measures on each of the 21 primary scales included in the Eysenck Personality Profiler, (b) individual employee measures on the three superfactors derived from the 21 primary scales, and (c) individual employee measures on the Dissimulation Scale (lie scale). The 21 traits are developed through analysis of the responses to a 426-item questionnaire. Factor analysis is used in developing measures of the 21 traits from the 426 questionnaire items. Within the 21 traits, seven each are associated with a superfactor (e.g., extraversion and so forth). The superfactor value is simply the mean of the seven trait values.

Methodological Approach

Factors are analyzed and assessed that (a) provide insights into the implications of characteristics of members of a sales force for the performance success of the sales force and (b) develop a model for the prediction of sales force effectiveness. The factors analyzed and assessed in this study are as follows:

- ❖ Age distribution of a sales force in relation to the age distribution of the labor force
- ❖ Gender distribution of a sales force in relation to the gender distribution of the labor force
- ❖ Variations in sales force performance in relation to gender
- ❖ The correlation of personality measures of a sales force with the values of the Eysenck Three-Factor Model of Personality
- ❖ The effectiveness of job satisfaction evaluations used by the industrial goods manufacturer

The analyses and assessments delineated above are applied in the conduct of further analyses. The further analyses involve determinations of the following:

- ❖ The best predictors of job performance based on personality measures and performance of the company's sales force
- ❖ The most effective model to apply in order to classify the members of a company's sales force as "Good", "Average", and "Poor" performers
- ❖ The extent to which members of the company's sales force classified as "Good" performers are homogeneous in relation to psychological characteristics

A variety of statistical procedures was applied to performing the data analyses necessary to develop appropriate responses to the above issues. The specific statistical procedures applied in each analysis are identified and explained in the reports of the analyses and assessments. To support these analyses and assessments, relevant data were obtained from a large industrial goods manufacturing corporation. The data are used in this study on the understanding that the names of employees will not be disclosed (such names were not provided to the researcher) and that the name of the participating company will not be disclosed. The data provided include the following:

- ❖ Demographic and organizational information
- ❖ Eysenck Personality Profiler data
- ❖ Job satisfaction data
- ❖ Sales force performance appraisal data
- ❖ Sales force performance achievement data

Results

The results of the research performed are presented in this section of the study. The presentation of the results is grouped with respect to hypotheses.

Results: Hypothesis 1

The age and gender profile of the participating company is compared with the age and gender profile of the labor force. The comparison is based on of descriptive statistical analysis (frequency distribution). The age distribution of sales force employees at the company is presented in Table 1. The comparison of the age distribution of the company sales force with the age distribution of the labor force is presented in Table 1a.

As the data presented in the table indicate, the company employs a lower proportion of older workers in the sales force than the proportion for the labor force. This situation means that the company is in a more favorable position than is the typical organization in relation to the future need to replace older workers. The company is in a particularly strong position in relation to the typical organization in relation to the proportion of workers in their prime working years [ages 25-to-49]. While the company has a very low proportion of workers under the age of 25 in the sales force, this situation is not surprising because of the experience and knowledge required to be effective in business-to-business sales. With respect to worker age, therefore, the company is in a healthy position.

The gender distribution of sales force employees at the participating company is presented in Table 2. The comparison of the gender distribution of the company sales force with the gender distribution in the labor forces is presented in Table 2a.

Table 1**Employee Age**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 23	1	.9	.9	.9
25	2	1.8	1.8	2.7
26	4	3.6	3.6	6.3
27	7	6.3	6.3	12.6
28	7	6.3	6.3	18.8
29	9	8.0	8.0	26.8
30	7	6.3	6.3	33.0
31	2	1.8	1.8	34.8
32	7	6.3	6.3	41.1
33	6	5.4	5.4	46.4
34	4	3.6	3.6	50.0
35	6	5.4	5.4	55.4
36	2	1.8	1.8	57.2
37	2	1.8	1.8	58.9
38	2	1.8	1.8	60.7
39	2	1.8	1.8	62.5
40	2	1.8	1.8	64.3
41	2	1.8	1.8	66.1
42	6	5.4	5.4	71.4
43	3	2.7	2.7	74.1
44	1	.9	.9	75.0
45	1	.9	.9	75.9
47	2	1.8	1.8	77.7
49	3	2.7	2.7	80.4
50	3	2.7	2.7	83.0
51	1	.9	.9	83.9
53	4	3.6	3.6	87.5
54	1	.9	.9	88.4
55	2	1.8	1.8	90.2
56	2	1.8	1.8	92.0
57	4	3.6	3.6	95.5
59	1	.9	.9	96.4
60	2	1.8	1.8	98.2
66	1	.9	.9	99.1
67	1	.9	.9	100.0
Total	112	100.0	100.0	

Table 1a: Age Comparison — Sales Force & Labor Force

Age Bracket	Company Sales Force	Labor Force
Under Age 25	0.9%	14.5%
Ages 25-34	49.1%	22.5%
Ages 35-49	30.4%	37.5%
Age 50 and Older	19.6%	25.5%

Table 2

Employee Sex

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Men	78	69.6	69.6	69.6
Women	34	30.4	30.4	100.0
Total	112	100.0	100.0	

Table 2a: Comparison of Work Force with Labor Force

Gender	Company Sales Force	Labor Force
Female	30.4%	46.0%
Male	69.6%	54.0%

As the data presented above indicate, employment in the company's sales force is strongly biased toward men in comparison with the gender distribution in the labor force. While the company can claim that the proportion of women experienced in business-to-business sales and in the use of heavy equipment is much lower than the comparable proportion among men, such an argument will not likely shield the company from future problems related to equal opportunity. Thus, the company Sales should plan to develop training programs for women to increase the proportion of women who are qualified for positions on the company's sales force.

The assessment of gender differences in relation to sales force performance measures analyzes gender, as an independent variable, in relation to variations in three sales force performance measures — annual sales revenues, number of clients, and total unit sales, as dependent variables. The statistical procedure applied in the conduct of the analysis is multiple analysis of variance (MANOVA), performed through the SPSS GLM Multivariate function. The criterion for the rejection of the null hypothesis is a findings of statistical significance of the relationship at the $p < .05$ level.

The results of the multivariate analysis are presented in Tables 3 [Tests of between Subjects Effects] and 4 [Multivariate Tests]. As the data presented in these two tables indicate, there are no statistically significant variations at $p < .05$ in sales revenues, number of clients, or total units sold, when these variables are controlled for sales person gender. These findings further strengthen the need for the company to initiate a training program to eventually reduce the male bias in the composition of the company's sales force.

Table 3: GLM MANOVA

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model ^a	Annual Sales [000 dollars]	1.172 ^a	1	1.172	.003	.958
	Number of Clients	4.163 ^b	1	4.163	.753	.387
	Number of Units Sold	41.337 ^a	1	41.337	.018	.893
Intercept	Annual Sales [000 dollars]	389455.172	1	389455.172	906.417	.000
	Number of Clients	11963.985	1	11963.985	2163.592	.000
	Number of Units Sold	425746.908	1	425746.908	187.411	.000
SEX	Annual Sales [000 dollars]	1.172	1	1.172	.003	.958
	Number of Clients	4.163	1	4.163	.753	.387
	Number of Units Sold	41.337	1	41.337	.018	.893
Error	Annual Sales [000 dollars]	47263.105	110	429.665		
	Number of Clients	608.265	110	5.530		
	Number of Units Sold	249889.520	110	2271.723		
Total	Annual Sales [000 dollars]	507169.000	112			
	Number of Clients	14968.000	112			
	Number of Units Sold	749488.000	112			
Corrected Total	Annual Sales [000 dollars]	47264.277	111			
	Number of Clients	612.429	111			
	Number of Units Sold	249930.857	111			

a. R Squared = .000 (Adjusted R Squared = -.009)

b. R Squared = .007 (Adjusted R Squared = -.002)

Table 4: GLM MANOVA**Multivariate Tests^b**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.959	836.415 ^a	3.000	108.000	.000
	Wilks' Lambda	.041	836.415 ^a	3.000	108.000	.000
	Hotelling's Trace	23.234	836.415 ^a	3.000	108.000	.000
	Roy's Largest Root	23.234	836.415 ^a	3.000	108.000	.000
SEX	Pillai's Trace	.016	.568 ^a	3.000	108.000	.637
	Wilks' Lambda	.984	.568 ^a	3.000	108.000	.637
	Hotelling's Trace	.016	.568 ^a	3.000	108.000	.637
	Roy's Largest Root	.016	.568 ^a	3.000	108.000	.637

a. Exact statistic

b. Design: Intercept+SEX

Hypothesis 1 held that no statistically significant differences in sales force performance existed in relation to the gender of sales representatives at the company. The research results presented above and on preceding pages of this sub-section supported the hypothesis, which was accepted by inference.

Results: Hypotheses 2, 3, and 4

The Eysenck Personality Profiler develops three superfactor dimensional measure of personality. These superfactor dimensions are Extraversion, Neuroticism, and Psychoticism (Eysenck & Wilson, 1999). The Extraversion, Neuroticism, and Psychoticism in the Eysenck Personality Profiler are identical to the Extraversion/Introversion, Emotional/Stable, and Adventure/Caution Summary Personality Scales reported by the company. The mean values of the Eysenck Three Factor Model of Personality are compared with the mean values of the model for the company's sales force sample. The mean values of the dimensions for the company sample were derived through SPSS descriptive statistical analysis (refer to Table 5).

Table 5: Superfactor Personality Dimensions**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
EPI Extraversion Scale	112	11	28	17.91	3.215
EPI Emotional Scale	112	16	38	31.45	4.078
EPI Adventure Scale	112	13	31	21.21	3.664
Valid N (listwise)	112				

As the comparison data indicate, the personality data at the superfactor level for the company's sales force do not reflect the structure of the Eysenck Three-Factor Model of Personality. The Eysenck Three-Factor Model of Personality (Eysenck & Wilson, 1999) and most studies using the Eysenck Personality Profiler (Jackson, Furnham, Forde, & Cotter, 2000) reflect a pattern wherein the Neuroticism superfactor value is much lower than the Extraversion and Psychoticism superfactor values. The acceptable levels of the Super Factor scores are (a) 17.46 and higher for Extroversion, (b) 16.63 and higher for Psychoticism, and (c) no higher than 8.55 for Neuroticism (Eysenck & Wilson, 1999). For the company's sales force, this pattern is reversed, as the data presented in Table 5a indicate.

Table 5a: Comparison of Company and Model

Superfactor	Company Sales Force	Eysenck Model
Extraversion	17.91	19.40
Neuroticism	31.45	7.77
Psychoticism	21.21	18.48

The Extraversion and Psychoticism values for the company are generally comparable with the Eysenck Three-Factor Model of Personality. The Neuroticism measure for the company's sales force, however, is not only higher than the sales force measures for Extraversion and Psychoticism; it is four times the Neuroticism value in the Eysenck Three-Factor Model of Personality.

The findings presented above and in preceding pages in this sub-section of the study are relevant to Hypotheses 2, 3, and 4. These hypotheses stated that effectiveness in industrial goods sales at the company were associated with (a) Extroversion scores of 17.46 and higher (Hypothesis 2), (b) Psychoticism scores of 16.63 and higher (Hypothesis 3), and (c) Neuroticism scores no higher than 8.55 (Hypothesis 4). The results presented in this sub-section supported Hypothesis 2 (Extroversion) and Hypothesis 3 (Psychoticism). Both hypotheses were accepted by inference. The results presented in this section did not support Hypothesis 4 (Neuroticism). Thus, by inference, this hypothesis was rejected with respect to the company's work force.

Hypotheses 5 and 6

The structure and character of the company's Job Satisfaction Scale were analyzed through the application of factor analysis to the relevant data. Factor analysis was performed with the SPSS program. The selection variable used to assess the 24 measures of job satisfaction was the company's Performance Appraisal rating for the sales force employees. The value of the selection variable was set at "Above Average" performance ("2" in the job performance rating structure). The results of the factor analysis are presented in Tables 6, 7, and 8.

One issue involves the uni-dimensionality of the company's Job Satisfaction Scale. The factor analysis found that the job satisfaction measures used by the company were not uni-dimensional. The factor analysis defined nine components that together explained 81.239 percent of the variation in Performance Appraisal. Five of the nine factors, however, explain 60.9 percent of the variation in Performance Appraisal.

Table 6: Factor Analysis**Communalities^a**

	Initial	Extraction
JS Achievement	1.000	.793
JS Advancement	1.000	.755
JS Benefits	1.000	.697
JS Image	1.000	.897
JS Contribution	1.000	.795
JS Working Hours	1.000	.846
JS Co-Workers	1.000	.691
JS Valued	1.000	.829
JS Feedback	1.000	.817
JS Autonomy	1.000	.857
JS Organizational Influence	1.000	.858
JS Work Group Influence	1.000	.866
JS Job Interest	1.000	.906
JS Job Security	1.000	.780
JS Job Status	1.000	.760
JS Meaningful Work	1.000	.854
JS Personal Growth	1.000	.687
JS Meet People	1.000	.787
JS Pay	1.000	.793
JS Recognition	1.000	.807
JS Responsibility	1.000	.832
JS Supervisor	1.000	.891
JS Use Knowledge	1.000	.884
JS Working Conditions	1.000	.815

Extraction Method: Principal Component Analysis.

a. Only cases for which Performance Appraisal = Above Average are used in the analysis phase.

Table 7: Factor Analysis

Total Variance Explained^a

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.562	23.173	23.173	5.562	23.173	23.173
2	2.854	11.892	35.065	2.854	11.892	35.065
3	2.649	11.037	46.102	2.649	11.037	46.102
4	1.972	8.219	54.320	1.972	8.219	54.320
5	1.587	6.612	60.932	1.587	6.612	60.932
6	1.438	5.992	66.925	1.438	5.992	66.925
7	1.282	5.341	72.266	1.282	5.341	72.266
8	1.138	4.743	77.009	1.138	4.743	77.009
9	1.015	4.230	81.239	1.015	4.230	81.239
10	.886	3.691	84.930			
11	.687	2.864	87.793			
12	.603	2.515	90.308			
13	.526	2.190	92.498			
14	.412	1.718	94.216			
15	.322	1.344	95.559			
16	.263	1.097	96.657			
17	.202	.840	97.497			
18	.176	.733	98.230			
19	.161	.672	98.902			
20	.113	.472	99.374			
21	6.465E-02	.269	99.644			
22	3.753E-02	.156	99.800			
23	3.160E-02	.132	99.932			
24	1.639E-02	6.829E-02	100.000			

Extraction Method: Principal Component Analysis.

a. Only cases for which Performance Appraisal = Above Average are used in the analysis phase.

Table 8: Factor Analysis

Component Matrix ^{a,b}

	1	2	3	4	Component	5	6	7	8	9
JS Achievement	.318	.610	-.210	.213	-.231	-.247	.188	.250	.134	
JS Advancement	.637	-.54E-02	.490	-.154	-.66E-02	-.78E-02	.185	-.870E-02	.159	
JS Benefits	-.189	-.753E-02	-.623	-.111	-.407	.188	.187	-.133	-.480E-02	
JS Image	-.237E-02	-.123	-.67E-02	.151	.479E-03	.501	-.624	.264	.380	
JS Contributor	.255	.732	.695	.13E-02	.402	.128	.689E-02	.817E-02	1.960E-02	
JS Working Hours	-.205	.228	.561	-.381	-.74E-02	.481	-.127E-02	.250	-.108	
JS Co-Workers	-.958E-02	.279	9.107E-02	.493	.444	.380	-.486E-02	9.442E-02	-.121	
JS Valued	.756	4.611E-02	-.835E-02	-.350	.220	-.109	-.201	.117	-.108	
JS Feedback	.657	.221	-.201	1.946E-02	-.664E-02	.286	.360	.284	-.105	
JS Autonomy	5.682E-02	-.247	.183	7.863E-02	.345	-.250	.465	.566	.186	
JS Organizational Influence	.833	-.195E-02	.244	8.125E-02	5.960E-03	-.104	-.116	-.181	-.217	
JS Work Group Influence	.584	.264	.302	.436	-.311	.153	-.181	1.005E-02	-.143	
JS Job Interest	1.901E-02	.560	.532	.231	.196	-.375	-.115	-.545E-02	.246	
JS Job Security	.551	.557	-.110	6.507E-02	7.880E-02	.124	8.410E-02	-.343	5.503E-02	
JS Job Status	.776	-.307E-02	-.728E-02	.275	.116	4.642E-02	-.115	7.893E-04	-.216	
JS Meaningful Work	-.121	.700	.322	-.185	-.128	-.278	-.225	-.847E-02	.273	
JS Personal Growth	.736	.700	.412	-.218	-.128	.103	1.779E-02	8.334E-02	1.768E-03	
JS Meet People	-.874E-02	-.561	.282	.277	.438	1.322E-02	-.278E-02	-.657E-02	-.148	
JS Pay	.340	-.547	.282	-.400	1.175E-02	-.158	-.140	-.161	.281	
JS Recognition	.727	-.803E-02	-.896E-02	-.204	-.142	.125	-.205E-03	.239	.359	
JS Responsibility	.747	.409	.136	8.389E-02	.157	-.156	-.107	6.613E-03	.146	
JS Supervisor	.175	.145	-.117	-.289	.285	.478	.402	-.402	.321	
JS Use Knowledge	.270	.329	-.429	.356	-.574	8.582E-03	.244	-.289	.353	
JS Working Conditions	-.292	-.232	.429	.356	-.574	2.389E-03	9.272E-02	7.445E-02	.146	

Extraction Method: Principal Component Analysis.

a. 9 components extracted.

b. Only cases for which Performance Appraisal = Above Average are used in the analysis phase.

One implication of the finding related to dimensionality is that the company would be in a better position to evaluate job satisfaction in a way that contributed to employee performance if it were to develop dimensional measures. Five dimensional measures are much more manageable than are nine dimensions.

The factor analysis also found that several of the job satisfaction variables were most prominent in the measurement of job satisfaction in relation to the five factors identified than were the others. These findings imply that the company can target specific employee initiatives to boost job satisfaction among the sales force employees.

Multiple regression analysis was applied to the data to identify the best predictors of job performance by the company's sales force employees. The dependent variable used in all of the multiple regression analyses was employee Performance Appraisal.

When the three personality dimensions were used as the independent variables (refer to Table 9), the dependent variables explained only 2.8 percent of the variation in Performance Appraisal. When the Dissimulation (lie scale) was added as a fourth independent variable, the four independent variables explained only three-percent of the variations in Performance Appraisal. The ineffectiveness of three of these variables as predictors is emphasized by the finding that the Extraversion superfactor alone explains 2.4 percent of the variation in performance appraisal.

Table 9: Multiple Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.168 ^a	.028	.001	1.024

a. Predictors: (Constant), EPI Adventure Scale, EPI Emotional Scale, EPI Extraversion Scale

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.277	3	1.092	1.043	.377 ^a
	Residual	113.143	108	1.048		
	Total	116.420	111			

a. Predictors: (Constant), EPI Adventure Scale, EPI Emotional Scale, EPI Extraversion Scale

b. Dependent Variable: Performance Appraisal

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.372	1.024		1.339	.183
	EPI Extraversion Scale	4.870E-02	.032	.153	1.534	.128
	EPI Emotional Scale	1.419E-02	.024	.057	.586	.559
	EPI Adventure Scale	7.440E-03	.028	.027	.266	.790

a. Dependent Variable: Performance Appraisal

When all 24 of the job satisfaction factors are entered into a multiple regression as independent variables, they explain 17 percent of the variations in performance appraisal (refer to Table 10). Most of these variables, however, contribute little to the explanation of the variations in performance appraisal, while their inclusion would increase the task of performance management greatly.

Table 10: Multiple Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.412 ^a	.170	-.059	1.054

a. Predictors: (Constant), JS Working Conditions, JS Organizational Influence, JS Working Hours, JS Autonomy, JS Meet People, JS Image, JS Supervisor, JS Job Interest, JS Pay, JS Contribution, JS Co-Workers, JS Achievement, JS Benefits, JS Use Knowledge, JS Recognition, JS Responsibility, JS Advancement, JS Job Status, JS Work Group Influence, JS Meaningful Work, JS Feedback, JS Valued, JS Job Security, JS Personal Growth

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.802	24	.825	.743	.794 ^a
	Residual	96.618	87	1.111		
	Total	116.420	111			

a. Predictors: (Constant), JS Working Conditions, JS Organizational Influence, JS Working Hours, JS Autonomy, JS Meet People, JS Image, JS Supervisor, JS Job Interest, JS Pay, JS Contribution, JS Co-Workers, JS Achievement, JS Benefits, JS Use Knowledge, JS Recognition, JS Responsibility, JS Advancement, JS Job Status, JS Work Group Influence, JS Meaningful Work, JS Feedback, JS Valued, JS Job Security, JS Personal Growth

b. Dependent Variable: Performance Appraisal

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.920	.176		16.599	.000
	JS Achievement	-2.90E-02	.031	-.131	-.943	.348
	JS Advancement	7.374E-03	.020	.052	.373	.710
	JS Benefits	4.333E-03	.029	.019	.150	.881
	JS Image	-1.25E-02	.039	.038	-.323	.747
	JS Contribution	-4.30E-03	.029	-.021	-.148	.883
	JS Working Hours	2.329E-02	.031	.105	.753	.453
	JS Co-Workers	1.517E-02	.031	.062	.485	.629
	JS Valued	3.687E-03	.023	.024	.159	.874
	JS Feedback	5.750E-03	.022	.041	.264	.792
	JS Autonomy	-2.65E-02	.026	-.116	-1.012	.314
	JS Organizational Influence	-2.69E-02	.025	-.193	-1.076	.285
	JS Work Group Influence	3.398E-02	.028	.178	1.232	.221
	JS Job Interest	-1.04E-02	.035	-.045	-.296	.768
	JS Job Security	-1.52E-03	.023	-.010	-.067	.947
	JS Job Status	1.031E-02	.025	.056	.407	.685
	JS Meaningful Work	9.093E-03	.031	.045	.295	.769
	JS Personal Growth	-1.50E-02	.020	-.120	-.742	.460
	JS Meet People	-6.68E-02	.039	-.208	-1.733	.087
	JS Pay	8.815E-03	.020	.055	.451	.653
	JS Recognition	2.220E-02	.021	.176	1.082	.282
	JS Responsibility	4.135E-02	.026	.222	1.581	.118
	JS Supervisor	-3.24E-02	.024	-.176	-1.354	.179
	JS Use Knowledge	-1.92E-02	.041	-.062	-.471	.639
	JS Working Conditions	-2.74E-02	.036	-.104	-.761	.449

a. Dependent Variable: Performance Appraisal

A sub-set of five of the job satisfaction measures is more manageable and still explains 8.4 percent of the variation in performance appraisal (refer to Table 11). The five job satisfaction measures are (a) being valued, (b) opportunity to meet people, (c) recognition, (d) responsibility, and (e) opportunity to use knowledge. When the Extraversion superfactor is added to this group, the six independent variables explain 10.1 percent of the variation in performance appraisal (refer to Table 12).

Table 11: Multiple Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.290 ^a	.084	.041	1.003

a. Predictors: (Constant), JS Use Knowledge, JS Valued, JS Meet People, JS Responsibility, JS Recognition

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.779	5	1.956	1.944	.093 ^a
	Residual	106.640	106	1.006		
	Total	116.420	111			

a. Predictors: (Constant), JS Use Knowledge, JS Valued, JS Meet People, JS Responsibility, JS Recognition

b. Dependent Variable: Performance Appraisal

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.917	.122		23.902	.000
	JS Valued	8.067E-03	.018	.053	.461	.646
	JS Meet People	-5.46E-02	.032	-.170	-1.714	.089
	JS Recognition	5.700E-03	.015	.045	.382	.704
	JS Responsibility	3.669E-02	.019	.197	1.908	.059
	JS Use Knowledge	-4.65E-02	.031	-.149	-1.514	.133

a. Dependent Variable: Performance Appraisal

Table 12: Multiple Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.317 ^a	.101	.049	.999

^a Predictors: (Constant), EPI Extraversion Scale, JS Valued, JS Meet People, JS Use Knowledge, JS Responsibility, JS Recognition

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.718	6	1.953	1.959	.078 ^a
	Residual	104.702	105	.997		
	Total	116.420	111			

^a Predictors: (Constant), EPI Extraversion Scale, JS Valued, JS Meet People, JS Use Knowledge, JS Responsibility, JS Recognition

^b Dependent Variable: Performance Appraisal

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.174	.546		3.982	.000
	JS Valued	8.601E-03	.017	.057	.494	.623
	JS Meet People	-5.66E-02	.032	-.176	-1.781	.078
	JS Recognition	4.608E-03	.015	.037	.309	.758
	JS Responsibility	3.526E-02	.019	.190	1.840	.069
	JS Use Knowledge	-3.88E-02	.031	-.124	-1.246	.215
	EPI Extraversion Scale	4.183E-02	.030	.131	1.394	.166

^a Dependent Variable: Performance Appraisal

Coupling the Extraversion superfactor with a single dimension of job satisfaction would be one approach to a revised selection procedures for sales force personnel. Extraversion is compatible with sales performance. If a person is not satisfied with her or his job, there is no reason to believe that they will suddenly become satisfied in sales. If a person is satisfied with her or his job, however, there is no guarantee that present satisfaction will translate into top performance in the sales force. A better selection method might be to retain only the Extraversion superfactor from the personality measures and use this factor to

select personnel for training as industrial sales persons. Only those people attaining high performance in the sales training then would be added to the company's sales force. A scaled down job satisfaction dimension should be retained, but it should not serve as a selection tool for people to join the sales force.

The issue of classifying the performance of sales force employees as "Good", "Average", or "Poor" was analyzed through the application of discriminant analysis. The results of the analyses are presented in Tables 13, 14, and 15. The selection variable used in the analysis was Sales force employee gender, with a value statement indicating male. Therefore, the analysis was based on male employees. The independent variables were annual sales and number of customers per sales force employee.

Table 13: Discriminant Analysis

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		78	69.6
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Unselected	34	30.4
Total		34	30.4
Total		112	100.0

Table 14: Discriminant Analysis

Group Statistics

Performance Class		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
Good	Annual Sales [000 dollars]	93.48	9.553	21	21.000
	Number of Clients	13.52	1.692	21	21.000
Average	Annual Sales [000 dollars]	59.09	9.288	33	33.000
	Number of Clients	11.21	2.288	33	33.000
Poor	Annual Sales [000 dollars]	45.00	11.519	24	24.000
	Number of Clients	9.96	1.781	24	24.000
Total	Annual Sales [000 dollars]	64.01	21.424	78	78.000
	Number of Clients	11.45	2.399	78	78.000

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Annual Sales [000 dollars]	.216	136.023	2	75	.000
Number of Clients	.672	18.338	2	75	.000

The mean sales levels for each sales performance classification were \$934,800 (Good), \$590,900 (Average), and \$450,000 (Poor). The minimum level of sales for the Good bracket was \$762,850. The minimum sales level for the Average bracket was \$520,450.

Covariance Matrices

Performance Class		Annual Sales [000 dollars]	Number of Clients
Good	Annual Sales [000 dollars]	91.262	2.338
	Number of Clients	2.338	2.862
Average	Annual Sales [000 dollars]	86.273	12.324
	Number of Clients	12.324	5.235
Poor	Annual Sales [000 dollars]	132.696	14.870
	Number of Clients	14.870	3.172

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	3.627 ^a	100.0	100.0	.885

a. First 1 canonical discriminant functions were used in the analysis.

Table 15: Discriminant Analysis

Functions at Group Centroids

Performance Class	Function
	1
Good	2.920
Average	-.488
Poor	-1.884

Unstandardized canonical discriminant functions evaluated at group means

Group covariances of canonical discriminant functions

Performance Class	Function	1
Good	1	.896
Average	1	.847
Poor	1	1.303

The pooled within-groups covariance matrix of the canonical discriminant functions is an identity matrix by definition.

Classification Function Coefficients

	Performance Class		
	Good	Average	Poor
Annual Sales [000 dollars]	.918	.580	.442
(Constant)	-43.998	-18.242	-11.041

Fisher's linear discriminant functions

As the discriminant values for the variables were different, it was feasible to classify sales force performance into three groups based on the available data. The discriminant analysis provided cut-off points and mean group values for each of the three classifications in relation to annual sales and number of customers. This information will be useful in training and development activities for the company's sales force because the information provides guidelines for the type of effort that must be made by sales personnel to perform at specific levels, as

well as indicating the level of organizational support that will be required to facilitate such performance.

Cluster analysis was applied to determine the extent to which good performers were homogeneous in relation to psychological characteristics. Cluster analysis was applied to determine whether it was possible to include all good performers in the same cluster in relation to the Extraversion, Neuroticism, and Psychoticism superfactors. The results of the cluster analysis (which are presented in Tables 16 and 17) demonstrated that a high level of homogeneity exists among good performers in relation to the psychological measures.

Table 16

Initial Cluster Centers

	Cluster	
	1	2
EPI Extraversion Scale	20	18
EPI Emotional Scale	36	20
EPI Adventure Scale	31	17

Table 17

Iteration History

Iteration	Change in Cluster Centers	
	1	2
1	8.617	9.121
2	.871	.758
3	.644	.598
4	.000	.000

a. Convergence achieved due to no or small distance change. The maximum distance by which any center has changed is .000. The current iteration is 4. The minimum distance between initial centers is 21.3

Final Cluster Centers

	Cluster	
	1	2
EPI Extraversion Scale	19	16
EPI Emotional Scale	35	29
EPI Adventure Scale	22	20

Distances between Final Cluster Centers

Cluster	1	2
1		7.093
2	7.093	

ANOVA

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
EPI Extraversion Scale	41.026	1	6.406	25	6.404	.018
EPI Emotional Scale	272.415	1	8.369	25	32.552	.000
EPI Adventure Scale	25.646	1	16.559	25	1.549	.225

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

The findings presented above and on preceding pages in this sub-section of the study are relevant to Hypotheses 5 and 6. These hypotheses held that (a) Good performance compatible with Eysenck scores equated to annual sales of \$762,850 and higher (Hypothesis 5) and (b) Average performance compatible with Eysenck scores equated to annual sales in the \$520,450-to-\$762,849 range. The results presented above and on preceding pages in this sub-section supported the hypotheses, which were accepted by inference.

Recommendations

The purpose of this study was to analyze and assess factors that may relate to sales force effectiveness with the end objective of identifying characteristics that provide valid and reliable predictions of sales force effectiveness. The study findings demonstrated the reliability and validity of applying personality tests as a means of predicting levels of sales force performance.

Based on the results and findings of this study, several recommendations for the participating company were formulated. These recommendations were as follows:

1. The industrial goods manufacturer should develop and implement a program to recruit and train women to be sales representatives for industrial goods.
2. The industrial goods manufacturer should investigate the work environment within the sales and marketing function of the company with a view toward (a) identifying the underlying reasons for the unusually higher scores among the industrial goods sales representatives on the Neuroticism Super Factor of the Eysenck Personality Profiles and (b) implementing corrective action to bring the scores down to acceptable levels.
3. The Industrial goods manufacturer should apply the findings presented in this study to rate all industrial goods sales representatives in relation to the "Good", "Average", and "Poor" classification system. These ratings should serve as bases for decisions related to (a) additional training for sales representatives and (b) termination of sales representatives.

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