



A GENERALIZED LINEAR ANALYSIS OF SALES PRODUCTIVITY AND SALES CALL RELUCTANCE[®] IN THE MORTGAGE BANKING INDUSTRY

Industry: Mortgage Banking
Number of salespeople studied: 162
Year: 2002

EXECUTIVE OVERVIEW:

- 1) Sales Call Reluctance[®] Profile scores can distinguish between high and low sales producers.
- 2) The Prospecting Brake[™] score in particular can serve as a key indicator of sales performance.

TECHNICAL REPORT

Introduction

Sales call reluctance[®] refers to the emotional hesitation to initiate contact with prospective clients on a consistent basis. This condition limits opportunities to generate new business by limiting the prospecting activity of salespeople. Extensive research into call reluctance[®] began over thirty years by behavioral scientists Dudley & Goodson. Their research led to the discovery of twelve distinct types of call reluctance[®], which are assessed by the Sales Preference Questionnaire[™] (or SPQ*GOLD[®]). Studies using this diagnostic instrument have shown a statistical link between lower levels of call reluctance[®] and higher sales productivity (Dudley & Goodson , 1999)

Purpose

The purpose of this study is to determine if there is an association between sales performance and call reluctance[®] among sales personnel within a mortgage banking firm. Further analysis will examine whether any such association is relatively strong or weak. This study will be based upon a generalized linear model that is constructed from a fixed effect one-way analysis of variance. The explanatory (or fixed effect) variable will consist of three groups of salespeople who are classified according to sales productivity as performing above average, average, or below. The model will be used to estimate the degree of association between group classification and the variance in Prospecting Brake[™] scores, which are a comprehensive measure of sales call reluctance[®].

Method

Participants

This study consisted of 162 participants who work in sales for a mortgage company. Each individual completed SPQ*GOLD[®] and received a performance evaluation from the company. The sales productivity of study participants was evaluated in accordance to company performance standards. The evaluation process resulted in three performance level categories: top (n=63), average (n=28), and low (n=71) performers.

Procedure

Descriptive statistics on SPQ*GOLD[®] profile scores were computed for each level of the explanatory variable. An analysis of variance was conducted to test for differences between group means and to estimate the component of variance within and between groups. Additional statistics were calculated to determine if the properties of the data fit the test assumptions associated with analysis of variance.

The results of the study were evaluated on the basis of statistical significance. Due to the influence of sample size on significance testing, additional statistics were computed to estimate a general index of the degree of association between group classification and the Prospecting Brake[™] scale.

Results

The analysis of variance indicated a statistically significant difference in means between groups for each of the call reluctance types, with the exception of the Hyper-Pro SalesCR[™] and Oppositional Reflex SalesCR[™] scales as summarized in Table 1. According to the results, the effect of group classification was most significant on the Prospecting Brake[™] scale ($F=45.29$, $p<.001$). The relationship between Prospecting Brake[™] scores and sales performance was further analyzed as part of a linear model to assess the strength of the relationship.

Further analysis revealed that the distribution of Prospecting Brake[™] scores did not fully comply with the statistical requirement of homogeneity of variance between groups, as indicated by the Levene statistic (3.188, $p=.044$). This condition was influenced by the existence of outliers in the distribution of scores for the high and low performance groups (Figure 1). In accordance to statistical modeling procedures, these outliers were withheld from further analysis (Schumacker & Lomax, 1996), and the analysis of variance was recomputed as shown in Table 2.

According to the results, there is still a statistically significant difference in mean Prospecting Brake[™] scores between groups. However, the ratio of mean square variance between and within groups is much larger ($F=75.57$, $p<.001$), indicating a stronger relationship between the variables. In accordance to research guidelines (Stevens, 1999; Cohen 1977), a sample estimate of this relationship was found to be relatively large ($\eta^2=.50$). An adjusted estimate, used as a generalized population index (Hays, 1963), was also found to be relatively large ($\omega^2=.4936$). Based on the

magnitude of these effect sizes and the sample size ($n=153$), the statistical power associated with this study well exceeds the desired level of .80 (Cohen, 1975).

A summary of descriptive statistics for Prospecting Brake™ scores per group is shown in Table 3. A post hoc comparison (using Scheffe analysis) indicated that each sales performance group has a mean Prospecting Brake™ score that is statistically significant from the other groups. This post hoc comparison is also consistent with the results shown in Table 4 that indicate three statistically distinct homogenous subsets. A graphical depiction of these results is provided in Figure 2.

Conclusion

The results of this study are consistent with previous research that indicates a systematic link between lower sales call reluctance® and higher sales performance. In particular this study suggests that the relationship between Prospecting Brake™ scores and sales performance level is not due to sampling error ($F=75.57$, $p<.001$), but instead reflects a relatively strong relationship as estimated by the correlation-ratio ($\eta^2=.50$).

The adjusted estimate ($\omega^2=.4936$) is very similar, indicating that approximately 50% of the variance in Prospecting Brake™ scores is explained by (or attributed to) sales performance level. In other words, sales productivity significantly explains the differences in Brake scores as measured by SPQ*GOLD®. Therefore, in the context of the generalized linear model, this study suggests that there is a *predictive* relationship between sales call reluctance® and sales productivity (Hays, 1963; Tatsuoka, 1975).

ANOVA Table		
	F	p
PROSPECTING BRAKE™	45.287	.000
DOOMSAYER SalesCR™	24.490	.000
OVER-PREPARER SalesCR™	3.389	.036
HYPER-PRO SalesCR™	1.148	.320
STAGE FRIGHT SalesCR™	11.377	.000
ROLE REJECTION SaleCR™	20.633	.000
YIELDER SalesCR™	12.384	.000
SOCIAL SELF-CONS SalesCR™	6.321	.002
SEPARATIONIST SalesCR™	18.225	.000
EMOT. UNEMANANCIPATED SaleSCR™	6.927	.001
REFERRAL AVERSION SalesCR™	14.223	.000
TELEPHOBIA SalesCR™	3.273	.040
OPPOSITIONAL REFLEX SalesCR™	.125	.883

Table 1. Summary of Analysis of Variance

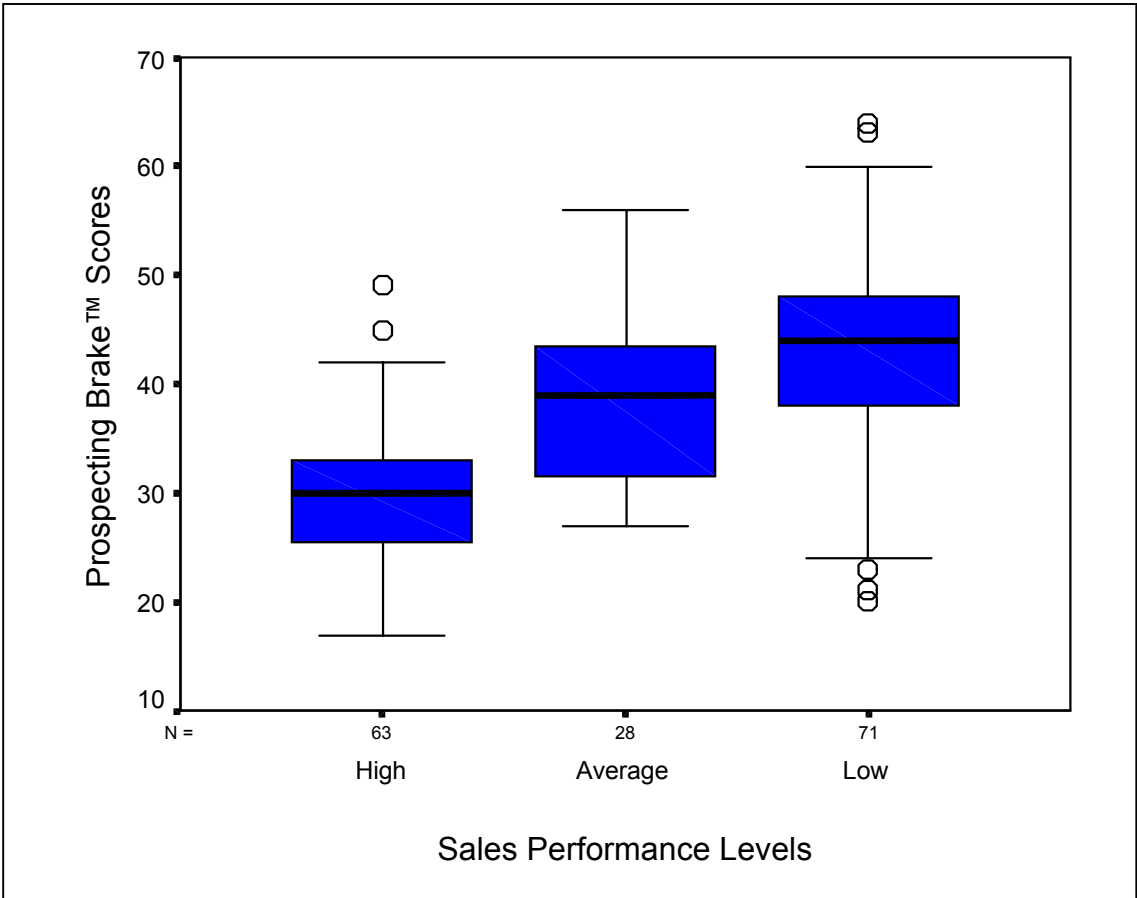


Figure 1. Outliers in Brake score distribution (9 cases represented by circles)

ANOVA					
BRAKE					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6890.394	2	3445.197	75.571	.000
Within Groups	6838.325	150	45.589		
Total	13728.719	152			

Table 2. Analysis of Variance Table (outliers withheld)

Descriptives						
BRAKE						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Top	61	28.98	5.72	.73	27.52	30.45
Average	28	38.57	7.27	1.37	35.75	41.39
Low	64	43.73	7.40	.92	41.89	45.58
Total	153	36.91	9.50	.77	35.39	38.43

Table 3. Descriptive Statistics for each Sales Performance Level

BRAKE					
	Sales Level	N	Subset for alpha = .05		
			1	2	3
Scheffe Analysis	1: High	61	28.98		
	2: Average	28		38.57	
	3: Low	64			43.73
	Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Table 4. Homogenous Subsets

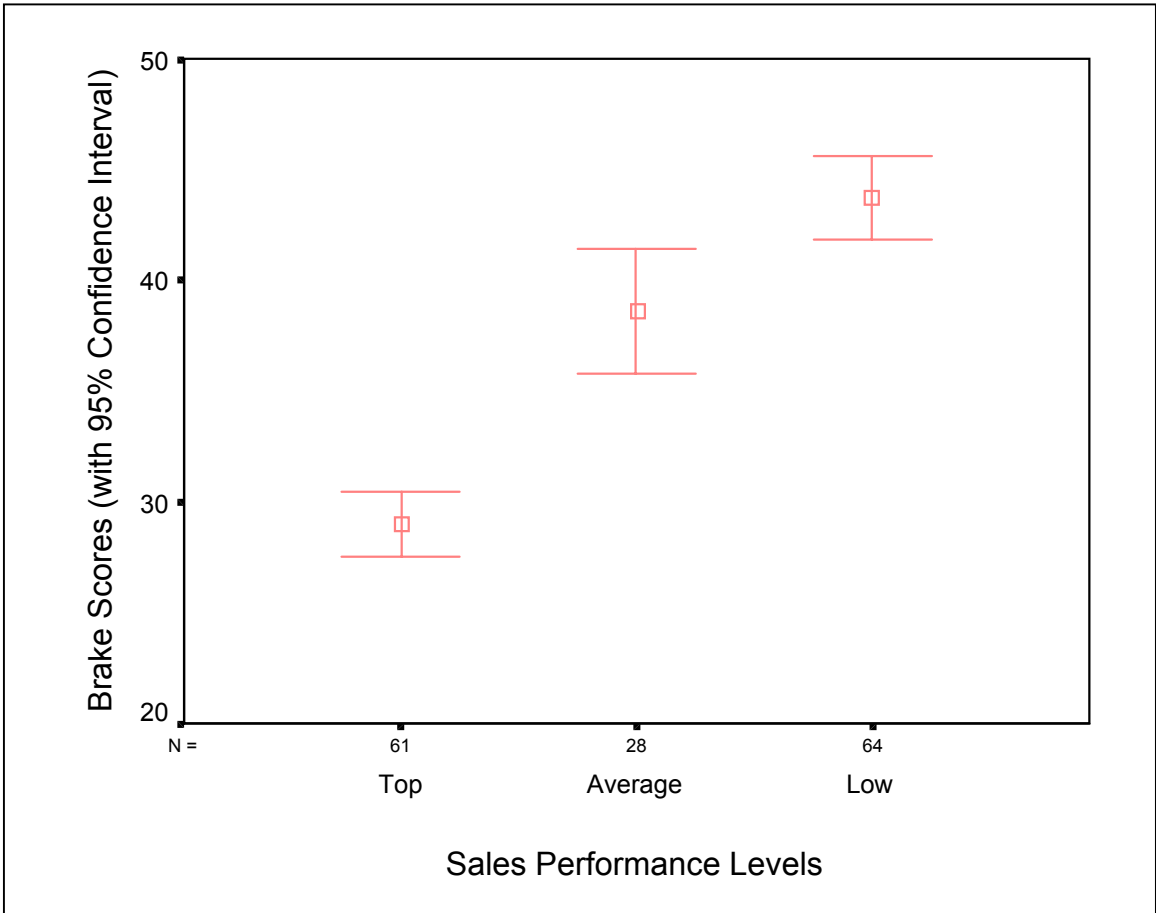


Figure 2. Range of Brake Scores per Group