

The Dual Role of Company Prescribing Loyalty in New Drug Launches

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ABSTRACT. This study examined the 18-month postlaunch behavior of 3,646 US physicians to determine how prelaunch company prescribing loyalty affects subsequent prescribing levels—a new product’s prescribing volume and the incremental prescribing volume of other drugs from the company launching the new product. Prelaunch company prescribing loyalty is particularly important for understanding first-in-class drugs, less so for new drugs in existing drug categories. This loyalty is also associated with an increased prescribing volume for other drugs from the pharmaceutical company, regardless of a physician’s willingness to prescribe the newly launched drug from that company. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2004 by The Haworth Press, Inc. All rights reserved.]*

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INTRODUCTION

A review of the marketing literature produces numerous articles focusing on research establishing the relationship between the promotional efforts of pharmaceutical marketers and the resultant prescribing behavior of physicians. These promotional tactics include the integrated messaging delivered through the advertising in appropriate print media, as well as the sales representatives' personal contact with physicians. The advent of direct-to-consumer advertising has introduced a third element of influence upon the physician, patient demands (1-3).

One could classify these conventional tactics as exerting influence upon physicians from external sources and investigate the age old question, "What is the ideal combination of promotional tactics to employ to optimize the influence upon physician prescribing behavior?" This study addresses the effects of the physician's loyalty to a pharmaceutical company's brand and may be characterized as influencing the prescriber through a personal or internal motivating attribute. It is important for the marketer to understand the value of the internal motivational factor, as this study reveals dramatic results in differentiating the habits of physicians who are loyal prescribers versus physicians who are not.

In the hierarchy of effects model developed by R. J. Lavidge and G. A. Steiner, it is shown that the external influences created through integrated communications drive the buyer (physician) from gaining awareness to brand loyalty (4). The amount of time and the appropriate application of tactics vary greatly and may be different for individual physicians. While promotion response analytics has reached sophisticated levels, it is still apparent that we can only speculate on the return on investment related to promotion efforts.

Pharmaceutical marketers might find it important to investigate the factors referred to here as the internal motivators. What are the characteristics of a loyal prescriber and, of equal importance, the characteristics of a nonloyal prescriber? Clearly, this is not to advocate elimination of the use of external influencing tactics but rather to encourage the decision to apply those external messaging events that may cultivate the loyalists' characteristics as well as to determine what tactics are required to maintain the level of prescribing loyalty.

This study addresses the role of prelaunch prescribing behavior of physicians and their decision to adopt a new drug. Specifically, the study examines two ways that prescribing physicians' loyalty to the pharmaceutical company prior to the launch of the new brand affects the new product's prescribing volume and the incremental prescribing vol-

ume of other drugs from the company launching the new product. Prescribing data from physicians in the United States indicate that the prelaunch prescribing volume of drugs from the company marketing the new drug is especially important in understanding the physician's acceptance of first-in-class drugs launched by that pharmaceutical company. This prescribing physician loyalty to the company, however, plays a lesser role in the adoption of new, but similar, drugs in an existing class. In other words, physician loyalty to a pharmaceutical company is of greater importance when that company introduces the first drug in a new class of compounds than when the company is launching its brand ("me-too") into an existing class of drugs.

Equally noteworthy is the extent to which physician prescribing loyalty to a company manifests itself in the increased prescribing volume of other drugs from that pharmaceutical company, regardless of the physician's willingness to prescribe the company's newly launched drug. The marketing support behind a new drug launch appears to have a pronounced effect on the total prescribing volume of other existing products from the company launching the new drug.

STUDY DESIGN

The prescribing behavior of 3,646 physicians was examined in relation to the introduction of 32 new drugs on the market for the time period 1997-2000. The drugs were indicated for the outpatient treatments of asthma and allergic rhinitis, hypertension, osteoarthritis and rheumatoid arthritis, depression, pneumonia, hypercholesterolemia, and diabetes. Although hospital pharmacies are a major source of prescription fulfillment, it is frequently difficult to link an individual prescription to a particular physician within the institutional setting. By concentrating on outpatient indications, the comprehensiveness of the prescribing data for each particular physician appearing in the study was more certain.

The sample was originally designed to test the relationship between participation in a Phase III clinical trial and the effect this participation had on the subsequent prescribing of the study drug. The original analysis involved a comparison of physicians who had participated in a clinical trial with a matched set of physicians who had not participated in clinical trials of any sort in the previous five years. An analysis of the clinical trial physicians and the control physicians demonstrated that

clinical trial physicians were more likely to prescribe a study drug once it reached the market for a period of at least 18 months (5).

Approximately half of the physicians in this study had served as clinical investigators, and the other half were the matched control set. As with the general physician population in the United States, most clinical trial sites are office based and not usually conducted in a hospital setting. One particular type of hospital, a major academic medical center, may receive extensive press coverage for its work in clinical research. However, these centers constitute a decreasing minority of all Phase III clinical trial sites and perform a minority of all Phase III studies. Most clinical investigators see patients in their office-based practice and enroll patients for clinical studies from these practices (6). A comparative analysis (tests of statistical independence) between the two groups of physicians and other variables possibly affecting new drug prescribing behavior demonstrated that while physicians who had worked as clinical investigators were more likely to prescribe the study drug once it came to market, the relationship of the other demographic, practice, and prescribing variables in explaining new drug prescribing did not differ in any meaningful theoretical or statistical way between the clinical investigators and the other physicians. Hence, the decision was made to combine both sets of physicians into one data set, and, during subsequent analyses, statistically control for the impact of a physician's participation in at least one Phase III clinical trial for the new drug. In addition, the analysis always tested for the appearance of statistical interaction among the two sets of physicians, the independent variables, and the likelihood of being an early new drug adopter.

METHODS

Study Population

The physicians in the study came from the IMS Health Inc. (IMS) database of active prescribing US physicians (7) (Table 1). Compared to known parameters of US prescribing physicians, the study population is slightly older and more likely to be office based rather than hospital based (8). Physicians came from all 50 states and corresponded to the distribution of active physicians within the United States. A Spearman rank order test between the number of physicians in the study and the number of physicians active within each state (as indicated in the American Medical Association annual survey of practicing physicians main-

TABLE 1. Study Population and US Physician Demographics.

Practice Location	Study (%)
Office based	79
Hospital based and other	21
Five Largest States	
California	13
Florida	8
Texas	8
New York	5
Pennsylvania	4
Average Age	53

tained by IMS) was 0.932, indicating a strong rank order match between the two sets of data.

Dependent Variables

The study uses two dependent variables, the first being the total number of prescriptions written by each physician in the study for the new drug in the 18 months following product launch. Prescribing volume data were available for one new drug for each physician in the study. The second variable is the incremental number of prescriptions written by the physician for all other drugs besides the newly launched drug from the company marketing the new drug. Incremental is defined as the total number of company prescriptions for the first 18 months following product launch beyond the baseline prescribing figure. The baseline figure is the total number of prescriptions written by a physician for all drugs, other than the new drug, from the launch company for the three-month period prior to the relevant drug launch, multiplied by six to reflect the six quarters of prescriptions recorded from the date of the new product launch. The total number of prescriptions for the new drug, along with the 6-quarter baseline total company prescribing figure, is then subtracted from the total number of all drug prescriptions

written for the launch company during the 18-month postlaunch period, resulting in a net positive, neutral, or negative incremental prescribing number for each physician in the study.

Drugs are designated by their Uniform System of Classification (USC) code. The USC was created in 1975 by IMS and pharmaceutical manufacturers. The system uses five digits to standardize and categorize all US pharmaceuticals based on product type. USCs are used in the United States and Canada. In Europe, the equivalent classification is referred to as ACT. USCs have four levels of hierarchy. USC2 is the broadest category, and USC5 is the most detailed category, allowing for more specificity within a category. This study uses the USC5 level of specificity. For example:

USC2	Respiratory Therapy
USC3	Bronchodilators General
USC4	Beta Agonists
USC5	Beta Agonists Aerosol

Independent Variables

The IMS prescribing database provides the information for the prescribing variables used as independent variables: Total Pre-Product Launch Prescribing Volume, Total Pre-Product Launch Drug Class Prescribing, and Pre-Product Launch Company Prescribing Loyalty. A drug was classified as either “first in class” or “follow-on” according to its respective order of appearance in the USC coding scheme.

The total prescribing volume for all drugs from the company marketing the new drug was also accessible for each physician in this study. Prescribing data were not available for each of the other specific drugs from the marketing company. Finally, for new drugs in existing drug classes, prescribing volume data for all drugs within that drug class were included in the analysis. Prescribing data for individual drugs within the existing drug classes were not available for this study.

IMS also provided the rank order of spending data used for the variable Pharmaceutical Marketing Support. Although not a physician demographic or practice characteristic, we included this variable in a control function. Some of the relevant literature accents the importance of drug detailing in the decision to prescribe a new drug (9). The various drugs in our analysis come from companies in the largest revenue cate-

gory to those with sales under \$1 billion. The use of the Pharmaceutical Marketing Support variable helps to control for the role of differential marketing expenditures in understanding new drug adoption and to isolate the explanatory importance of physician demographic and practice characteristics.

Information on a physician's participation in a drug's Phase III clinical trials came from a pharmaceutical industry database of clinical trials and the FDA database of 1572 forms filed as part of new drug clinical trial activity (Table 2) (10). Missing data never exceeded 0.1% of any variable.

Ordinary Least Squares Regression Analysis

The analysis in this research used two ordinary least squares (OLS) regression models for first-in-class drugs and for follow-on drugs. Table 3 presents mean prescribing levels. The table indicates statistically significant differences in the means based on one-way analyses of variance. These tabular results are confirmed by two additional OLS regression models.

TABLE 2. Independent and Control Variables.

Variable Description	Variable Name
Did the physician participate as a clinical trial investigator for the study drug or not?	Clinical Investigator Experience
Physician's total pre-product launch (3-month) prescribing volume in the absolute number of prescriptions	Total Pre-Product Launch Prescribing Volume
Investigator's total pre-product launch (3-month) prescribing USC share in the drug class of the clinical study drug	Total Pre-Product Launch Drug Class Prescribing
Physician's total pre-product launch (3-month) prescribing USC share of all the respective company's products as a percentage of all the prescriptions written by the physician	Pre-Product Launch Company Prescribing Loyalty
The rank order of the total pharmaceutical company spending on the study drug during the prelaunch and first six months postlaunch of the study drug	Pharmaceutical Marketing Support
Physicians who prescribed the new drug within the first 6 months of product launch and continued to prescribe the drug throughout the next 12 months of prescription tracking are classified as new drug adopters. All others are termed nonadopters.	New Drug Adoption

TABLE 3. Mean Number of Prescriptions by New Product Adoption and Pre-Product Launch Company Prescribing Loyalty for the 18 Months Following the New Product Launch.

	Total New Product Prescriptions	Total Incremental Prescriptions Written for Other Drugs, Besides the New Drug, from the Company Launching the New Product
Not an Adopter		
Lowest Loyalty	1	7***
Medium Loyalty	2	45***
Highest Loyalty	2	277***
New Drug Adopter		
Lowest Loyalty	76***	13***
Medium Loyalty	115***	112***
Highest Loyalty	171***	299***

***.0001 level of significance

RESULTS

First-In-Class Drugs

The most important explanatory variable in understanding total new drug prescribing volume is Pre-Product Launch Company Prescribing Loyalty. As the percentage of all drugs written by a physician for the launch company increases, so too does the number of prescriptions written by that physician for the newly introduced first-in-class drug from that company. It would appear that physician trust in the company behind the new drug plays an important role in the decision to prescribe the new drug. With the launch of a first-in-class drug, only a limited amount of information about clinical efficacy and safety can be known, and the information is primarily derived from clinical and preclinical study results. For many physicians, reluctance to try the new drug may be offset by a high level of trust and familiarity with the company and sales representatives launching the new drug.

The total amount of prelaunch prescriptions, Total Pre-Product Launch Prescribing Volume, is an important predictor of total new

product (first-in-class) prescribing amounts. Physicians with larger patient numbers are probably more apt to prescribe a higher volume of a new drug, if for no other reason than the size of their patient population and number of patients who might benefit from a new type of drug.

The relative amount spent by a company to launch the new product, Pharmaceutical Marketing Support, is a critical variable in explaining new drug prescribing levels. Companies that spend relatively more on a new product launch are more likely to see more prescriptions of that drug over the first 18 months of that product's life.

Clinical Investigator Experience is a noteworthy variable, as physicians who have worked with the drug in Phase III trials and have had the chance to become familiar with the drug in their specific clinical setting write a greater number of prescriptions for the study drug once it has reached the marketplace. Clinical Investigator Experience does not appear in a statistically significant interaction term with any of the other variables in the model, as we expected from the earlier tests of independence used to combine the clinical investigator and noninvestigator physician groups. Clinical investigators may be more likely to prescribe the new drug. However, the independent variables explaining first-in-class prescribing among these physicians are no different than those for the other physicians in the study (Model 1).

Follow-On Drugs

For follow-on drugs, Pre-Product Launch Company Prescribing Loyalty does not appear as a statistically important variable in the model. How-

MODEL 1. First-In-Class Drugs.

	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	40.115	9.557		4.198	.000
Total Pre-Product Launch Prescribing Volume	8.961E-02	.007	.322	13.771	.000
Pharmaceutical Marketing Experience	8.770	.966	.209	-9.075	.000
Clinical Trial Experience	28.058	8.467	.077	3.314	.001
Pre-Product Launch Company Prescribing Loyalty	37.447	2.070	.423	18.087	.000

R = .616, model significance = .0001

ever, higher prescribers in the drug's class (Total Pre-Product Launch Drug Class Prescribing) are more likely to prescribe the new drug. They understand the mechanism of action and may be looking for other drugs in that class to meet the medical needs of patients for whom current drugs in that class were not suitable. If physicians do not prescribe many other drugs in this existing drug class, physicians may not feel the drug class meets the needs of their other patients.

Pharmaceutical Marketing Support is an important explanatory variable. Increased detailing and advertising results in more prescriptions written by the physicians in the study. Clinical Investigator Experience is also associated with greater new drug prescribing volume (Model 2).

Other Drugs from the Company

Pre-Product Launch Company Prescribing Loyalty helps explain the number of prescriptions written by a physician for a first-in-class drug during the 18 months following product launch, but not for a follow-on drug in an already established drug class. However, the importance of the company prescribing loyalty variable goes beyond new drug prescriptions. Pre-Product Launch Company Prescribing Loyalty is a major predictor of incremental prescriptions of other drugs from that company during the same 18-month period used to track new drug prescriptions.

Table 3 displays the 18-month mean prescribing volume for the new product (both first-in-class and follow-on drugs) by Pre-Product Launch Company Prescribing Loyalty and New Product Adoption. Al-

MODEL 2. Follow-On Drugs.

	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	31.738	4.010		7.914	.000
Total Pre-Product Drug Class Prescribing	.262	.025	.226	10.290	.000
Total Pre-Product Launch Prescribing Volume	1.142E-02	.002	.111	5.441	.000
Pharmaceutical Marketing Support	3.410	.364	.176	9.359	.000
Clinical Trial Experience	13.311	2.949	.085	4.513	.000

R = .356, model significance = .0001

though Pre-Product Launch Company Prescribing Loyalty is a metric variable based on USC share, this variable is displayed in Table 2 as a categorical variable to illustrate the impact of this company prescribing loyalty on incremental prescriptions for other drugs from that company. Physicians who have not written any prescriptions for products from the pharmaceutical company launching the new product in the three months prior to product launch are considered lowest in loyalty. Of the physicians who wrote prescriptions for drugs from that company, the half writing the most prescriptions are categorized as highest in loyalty, with all others classified as medium in loyalty.

Among both new drug adopters and nonadopters, the incremental prescribing volume of other drugs from the pharmaceutical company launching the new drug increases markedly with the level of product loyalty, that is, Pre-Product Launch Company Prescribing Loyalty. The data show that the higher the prelaunch loyalty of an individual physician, the greater the number of incremental prescriptions written by that doctor for other drugs from the launch company. For physicians who did not adopt the newly marketed drug, the number of incremental prescriptions for other drugs increases substantially as the level of company prescribing loyalty grows. The nonadopters may not prescribe the new drug, but the marketing effort behind the launch shows other prescribing results.

The incremental prescribing growth is equally pronounced for new drug adopter physicians. The number of other drug prescriptions from the launch company jumps as the level of Pre-Product Launch Company Prescribing Loyalty increases among these adopter physicians.

The OLS Models 3 and 4 demonstrate that the strength of relationship between incremental prescribing for other drugs and company prescribing loyalty persists as additional variables are introduced. Pre-Product Launch Company Prescribing Loyalty continues to account in a meaningful way for the incremental prescribing behavior of both new drug adopters and nonadopters. The data show that for new drug adopters, the higher the total prelaunch prescribing volume, the greater the number of prescriptions written for other drugs from the launch company. Physicians who write more prescriptions for the new launch drug are also more likely to write more incremental prescriptions for other launch company drugs, especially if the drug is the first in its respective class. Pharmaceutical Marketing Support is a significant variable in Model 3.

Only two parameters are significant in the nonadopter model: Pre-Product Launch Company Prescribing Loyalty and Total Pre-Product Launch Prescribing Volume.

LIMITATIONS

The study design has several limitations. First, the data are restricted to drugs in ten outpatient indications. The dynamics may be different for inpatient or other outpatient indications. Second, while the study population covers a broad range of physicians, it is not statistically projectable to the entire US physician population. Finally, the study

MODEL 3. Prescribing of Other Drugs from the Launch Company for the 18 Months Following the Launch of the New Drug—New Adopters.

	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	-60.497	9.887		-6.119	.000
18-Month New Product Prescribing Volume	9.172E-02	.024	.065	3.848	.000
Pre-Product Launch Company Prescribing Loyalty	38.569	.953	.667	40.459	.000
Total Pre-Product Launch Prescribing Volume	8.538E-02	.005	.267	16.678	.000
Pharmaceutical Marketing Support	2.231	.994	.038	2.244	.025

R = .814, model significance = .0001

MODEL 4. Prescribing of Other Drugs from the Launch Company for the 18 Months Following the Launch of the New Drug—Nonadopters.

	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	-26.906	11.712		-2.297	.022
Pre-Product Launch Company Prescribing Loyalty	19.872	.786	.489	25.295	.000
Total Pre-Product Launch Prescribing Volume	9.045E-02	.007	.251	12.898	.000

R = .742, model significance = .0001

deals with US data only. Given the restrictive use of physician-specific data outside the United States, it is probably difficult, at present, to replicate this study globally.

SUMMARY

The correlation of physician loyalty and prescribing behavior should be of serious concern to the pharmaceutical marketer from three aspects within the marketing strategy: the segmentation process, the integration of promotional tactics directed at company-loyal and class-loyal physician segments, and an understanding of the “halo effect” of new product launches upon the incremental increase in the number of prescriptions written.

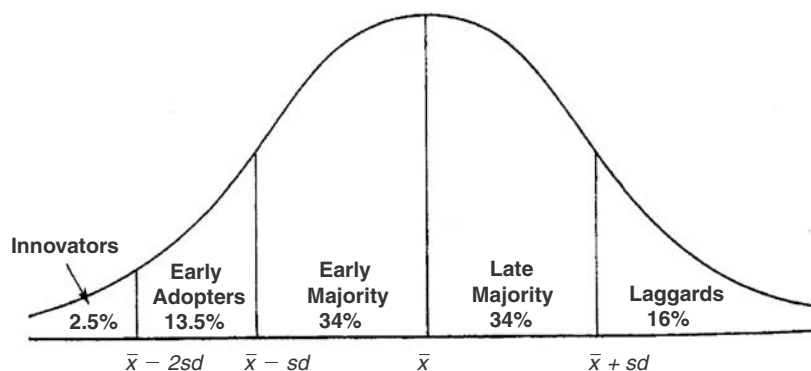
Segmentation Process

The traditional methods for segmenting physicians, generally relating to the quantity of prescriptions written and classifying by deciles, has served the industry well. However, the competition focusing its promotional tactics on the top three deciles has increased to unmanageable proportions. Another time-tested method when introducing new products to market involves Roger’s Adoption of Innovations (11). In the pharmaceutical industry, the process involves promoting to the physicians described as the innovators (2.5%), then to the early adopters (13.5%), the early majority (34%), the late majority (34%), and finally to the laggards (16%). However, further investigation reveals that the innovators are generally not loyal, nor do they occupy the highest deciles of prescription writing (Figure 1).

The key findings in this study suggest alternative approaches to the segmentation process. The high degree of correlation between company-loyal prescribers and the adoption of the newly launched brand as well as the increase in incremental prescriptions of other company brands has far-reaching implications in challenging conventional pharmaceutical marketing wisdom. Contrary to the current segmentation by deciles and the focus on the innovator segments, pharmaceutical marketers should consider focusing on establishing a loyalty segmentation process.

Loyalty segmentation is of greater importance when a company is preparing to launch a new drug that is either first-in-class or a follow-on added to a current class. Study findings indicate that a first-in-class brand tends to generate greater adoption by company-loyal prescribers,

FIGURE 1. Adopter Categorization on the Basis of Innovation.



while the launch of a new drug classified as follow-on shows greater adoption by physicians loyal to the category.

A recommended approach to segmenting the physician population could incorporate the "loyalist" approach. This would involve classifying the physicians into "loyal leaders," the "loosely loyal," the "lesser loyal," and the "nonloyal." This classification for physician segments would relate to the prescriptions written for the company's brands and those physicians who write for the class in general (Matrix 1).

Integration of Promotional Factors

This study confirms that the greater the marketing support spending, on promotional tactics, the higher the volume of prescriptions written. These findings tend to coincide with results published in the marketing literature. However, marketers may generate a greater return on the promotional investment when focusing these tactics on the loyalist prescribing population.

The "Halo Effect"

For each new product launched, the launching company experienced an incremental increase in the total number of prescriptions written by loyal physicians independent of whether or not they chose to adopt the new brand. This can be attributed to the "halo effect" that

MATRIX 1. Company/Class Loyalty Matrix.

		Company Loyal ¹	
		Yes	No
Class Loyal ²	Yes	<p>LOYAL LEADERS</p> <p>(high level of prescribing of "follow-on drugs" and "1st in class")</p>	<p>LOOSELY LOYAL</p> <p>(high level of prescribing of "follow-on drugs")</p>
	No	<p>LESSER LOYAL</p> <p>(high level of prescribing of "1st in class")</p>	<p>NONLOYAL</p> <p>(lowest level of prescribing for either "1st in class" or "follow-on drugs")</p>

¹Study variable: Pre-Product Launch Company Prescribing Loyalty

²Study variable: Total Pre-Product Drug Class Prescribing

occurs whenever a company launches a new product. Again, the marketer is provided an opportunity to increase the total number of prescriptions for all of the launching company's brands as well as to further improve upon the degree of loyalty of the prescribing population.

While further investigation to support this model for segmentation is warranted, the authors, encouraged by the results of this analysis, are convinced that physician loyalty can be cultivated by including physicians in clinical trials whose characteristics mirror those described as loyal prescribers in the study.

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