A Cluster Analysis of Physician's Values, Prescribing Behaviour and Attitudes towards Firms' Marketing Communications

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ABSTRACT

In this paper we present an exploratory research on the associations between physicians' personal values with physicians' prescribing criteria and preferred marketing communications. The research involved extant marketing research and primary data collection. The resulting quantitative research instrument was then administered to a sample of 69 physicians, yielding a 69% response rate. All, but the demographic measures were tapped by 5-point scales. A series of factor and reliability analyses assessed unidimentionality and reliability of research constructs. Standard cluster analysis generated three clusters of physicians, which inspired us to name as 'brand loyals,' 'moodies' and 'bohemians'. A series of ANOVAs and Tukey tests depicted the meaningful differences among the three clusters. The implication is that physicians' personal values may be a meaningful basis of segmentation for the pharmaceutical market. The findings may be useful for both marketing strategy planners and researchers examining physicians' prescription behavior and attitudes towards firms' marketing communication efforts, in the hybrid pharmaceutical market, which lies in between industrial and consumer categories.

Key words: Physicians' values, physician clusters, prescription criteria, marketing communications, detailing, sales promotion.

INTRODUCTION

Contemporary marketing scholars show an ever-growing interest in studying physician perceptions on various pharmaceutical companies' communication efforts, i.e., direct-to-consumer communication, company-physician communication and detailer-physician communication, among others (Mukherji, 2004; Wieringa et al., 2004). The primary reason is that the global market of pharmaceutics is large, growing, and competitive. Indeed, the IMS World Review tracks global pharmaceutical sales of approximately $773.1 billion in 2008. The same report estimates that the global pharmaceutical market will grow 6% in 2009, a pace similar to 2008, with sales surpassing $820.0 billion (www.encyclopedia.com /doc/1G1-150901578.html).

Specifically in Greece, pharmaceutical sales of prescribed medicines (Prescribed Only Medicines-POMs) rose to €7.5 billion, in 2008, depicting an annual growth rate of 10% which is the highest when compared to the rest European countries (http://www.bpi.de/userfiles/file/download/pharmadaten_2009_en.pdf). This amount accounts for 16.3% of total health care expenditure, which is quite close to the E.U. countries' respective average of 17.3%.

At the same time, given the rising competition and deregulation of pharmaceutical market worldwide, there has been explosive growth in pharmaceutical marketing costs. In Greece only, during 2008, advertisement expenditure of OTC (Over The Counter) pharmaceutical products reached €52.5 million, accounting for .7% of total pharmaceutical sales. This is quite high, compared to the pharmaceutical Direct-to-Consumer (DTC) expenditures worldwide, which covers both OTC and POM medicines, accounting for 1.5% of pharmaceutical sales for 2008. Although that advertisement is allowed only for OTC medicines, however it may act as an indicator of increasing marketing expenditures for both OTC and POM medicines, in order to cope with enhanced competition, mainly due to the escalating growth of generic products. Indeed, the market for OTC healthcare in Greece increased at a compound annual growth rate of 8.7% between 2003 and 2008, which is approximately similar to the 10% average annual growth of the market as a whole (http://www.researchandmarkets.com/reports/1195165/).

Given the above, there is an increasing pressure, both in Greece and worldwide, for justifying marketing expenditures and measuring marketing efforts in the pharmaceutical industry. The marketing strategies employed in the pharmaceutical industry sharply contrast with those typically adopted in other markets. One of the primary reasons for this difference is that in the prescription medicine market there is a distinct breach in the traditional buying decision process: The decision maker is the physician, who chooses among an array of medicine alternatives, but the buyer is the patient who takes the medicine and ends up paying (i.e., either out of pocket, or through health insurance coverage) for the choices made by the physician. In this vein, the marketing of prescriptive medicines calls for variation from the traditional marketing practices studied so far. The marketing literature is replete with examples in which the chooser is not the user. Organizational buying, toy purchasing, and textbook buying provide examples of situations in which the decision maker is necessarily different from the user (Kotler, 2000). However, the major deviations from the aforementioned examples are that prescriptive medicine market is highly regulated (i.e. top prices and shopping outlets are approved by the government) and traditional advertisement is not legally permitted. The implication is that marketing

communication efforts lean primarily towards interpersonal communication, which is served by the companies' representatives, i.e. the detailers and secondarily to customer-group communication, which is accomplished through medical conferences. The detailers also use sampling as sales leads for the promoted medicines (Gonul et al., 2001).

Academics have had a long- standing interest in understanding the effectiveness of marketing activities. A big part of marketing literature focuses on the influence of advertising costs on price elasticity and diffusion of new medicines, the impact of detailing (i.e. personal selling) and promotion efforts on physicians' prescription behaviour, the role of marketing mix interactions on pharmaceutical expenditures, the relationship of consumer characteristics with prescription medicine advertising, just to mention few of them (Gonul et al., 2000; Mehta & Purvis, 2003; Liu 1995; Narayanan et al., 2004).

Despite the substantial published research that has been reported to indentify performance of various marketing efforts, little research has investigated the association between physicians' values and their prescription behaviour, thus mitigating the marketing communication performance. Indeed, values are an essential element explaining a person's attitudes and behaviour (Sousa et al., 2010). Thus, for example, it should be worthwhile to examine whether a physician's need for security (i.e., a value dimension) is related with enhanced preference on prescribing branded medicine, instead of generics, ceteris paribus (i.e., similar efficacy, side effects, or contraindications). Or, whether there is a relationship between the value dimension of warm relationships with others with the physicians' preference on detailing and publicity (i.e., marketing communication means).

A better understanding of the relationship between a physician's personal values with her/his prescription choice criteria and her/his preferred marketing communications means, would improve the pharmaceutical companies' ability to better allocate marketing expenditures, depending on whether their medicine is an established brand, or a generic product and make marketing efforts more cost efficient and effective. With this exploratory study we made an attempt to start filling this void.

Specifically, the purposes of this study were:
a) To select appropriate marketing scales for tracing physicians' personal values.
b) To develop appropriate constructs for measuring physicians' prescription criteria (i.e. buying criteria) and physicians' preferred marketing communications.
c) To examine the relationships among the aforementioned constructs.
d) To examine the taxonomy abilities of physicians' personal values, i.e., whether we may use them as a basis for physicians' market segmentation.

The paper flows as follows. First we provide the theoretical groundwork. The next section deals with methodological issues. In the following section we present the findings. In the last sections we discuss the implications and limitations of the study and provide some directions for future research.

THEORETICAL BACKGROUND

Physicians' prescribing behavior: a hybrid buying situation

Physician's decision making on prescribing medicines seems to lie in between the industrial and consumer buying situation, which we may define as hybrid. Specifically, Liu (1995) characterises the prescription of medicines (POMs) as

organizational (or industrial) buying and the selling of over-the-counter (OTC) medicines as consumer buying. Mudambi (2002), synopsizing prior knowledge on the differences between industrial and consumer markets, postulates that a market may be categorized as industrial if it involves: a) emphasis on tangible product and augmented services in the purchase decision, b) customized products, c) personal relationships between buyer and salesperson, d) highly complex products, e) sophisticated buyers, f) reliance on personal selling, f) branding at a corporate level, and, g) more customer emphasis on risk-reduction; less customer emphasis on self-expressive benefits of brands. It may be easily derived that the prescription medicine market satisfies all the aforementioned criteria. Moreover, a few more researchers attribute additional characteristics to industrial marketing: a) pricing may be negotiated) the demand is derived and c) the buying center is multi-member organizational (Fill & Fill, 2005).

As evident, we do not meet the above characteristics in a physician's prescribing situation (i.e., in conjunction to the buying situation). For example, a physician: a) may not negotiate the price of the medicine on behalf of his/her patient, b) the patient is scarcely aware of the alternative therapies, so as to create a demand for it (i.e., derived demand), and c) the therapist comprises one-member buying center (i.e., with the exception of hospital treatments, where a team of physicians decide on the appropriate medicine).

Taking the above characteristics into account, we may conjecture that physician's decision making on prescribing medicines has elements of both industrial and consumer type, thus we may define it as hybrid buying situation. Thus, although that the decision on which medicine to prescribe should primarily depend upon scientific criteria, however, personal and social values may play a role, especially when it is about diseases that may be treated by a few alternative medicines with negligible differences.

Physicians' Prescription Criteria

A medicine is a tangible product and as such, it may be x-rayed into its 'core', 'real' and 'augmented' constituents (Kotler, 2000). The core product reflects the medicine's efficacy, use, side effects and contraindications. Likewise, the medicine's brand name reflects the real product, whereas the augmented constituent comprises a vast array of add-value services, i.e., the firm's support with scientific evidence from clinical studies, the interaction and service from the firm's detailer, in terms of information, and sampling, the firm's publications and on-line information on the Web, the firm's conferences and other secondary add-value benefits (Smith et al., 2002; Peters & Yeats, 2000).

In order to prescribe a medicine, a physician may take into account a number of factors. From a point of view, one should hypothesize that product efficacy should play the first role in prescribing a medicine. However, there are instances that this is not the case. A physicians' price sensitivity, or a patient's psychological reaction to the efficacy of the medicine may be such cases. Thus, physician's price sensitivity may vary significantly, depending on the patient income class or type of disease and may affect the physician's prescribing decision. Likewise, a patient's psychological reaction to the product use or efficacy may also mediate the physician's prescribing behavior. For example, in chronic diseases, where there is often no immediately obvious curing effect, placebo effects are common (Gonul et al., 2001). Anecdotal evidence suggests that, in such cases, physicians may keep prescribing the same

medicine for refills, if the medicine has been reported to working by the patient, so that the placebo effects of the original brand remain undisrupted. Thus, the patient' compliance to taking the medicine properly, may play a role in the prescription medicine choice. Alternatively, the physicians may consider cost efficiencies among medicines of similar efficacy for a given medical treatment, thus acting as agents for low-income patients.

Consequently, whether a physician's prescribing decision leans towards the medicine's actual effects (i.e., the core product), or towards the brand name (i.e., the real product) and to what extent, remains largely unknown.

In this study, we select certain prescription choice criteria, expressing the physician's concern on the product's core and real constituents. Specifically, we examine the constructs 'brand image', 'information search' and 'patient's compliance'. With the *brand image* construct we operationalized physician's tacit preference on branded products, over generic alternatives, reflecting the power of the product's real constituent. With the *information search* construct, we operationalized physician's sensitivity to select information from scientific journals and online sources about the product efficacy and side effects and about prices of alternative products, in order to document her/his prescription decision. Finally, with the *patient's compliance* construct we operationalized physician's sensitivity on the ease with which patients may take the medicine, as a criterion for prescribing a medicine. Both *information search* and *patient's compliance* reflect the gravity of the product's core constituent in the physician's decision making.

Physicians' Attitudes on Firms' Marketing Communications

A marketing communications strategy aims at conveying integrated messages about the brand's core, real and augmented constituents and the producing firm. Thus, a primary objective of marketing communications is to communicate the brand's core and augmented benefits to its communication audience. In this study, we make a first attempt to trace physicians' attitudes (i.e., relative preference) towards publicity, detailing and sales promotion, which are major marketing communication mix elements in pharmaceutical marketing (Smith et al., 2002; Peters & Yeats, 2000).

Detailers provide a vast array of services to the physician, together with free samples for testing the medicine. Among the alternative tools of a pharmaceutical firm's communication mix, personal selling seems to be the most powerful in many marketing studies (Narayanan et al., 2004; Pitt & Nel, 1988). However, for the physician there is a trade-off between the benefits acquired through time spent with sales representatives and the opportunity cost of that time, which can be spent otherwise (i.e., seeing more patients, reading professional materials, conferring with colleagues, or simply enjoying leisure time). At the same time, information about new medicines and their applications and side effects is largely available from other sources physicians have access to: medical symposia and conferences, research articles, and medical journals, to name a few. Furthermore, there is anecdotal evidence that inertia and loyalty to specific medicines play some role in the choice of a medicine prescribed by a physician. All these factors can render the influence of detailing and samples much less important (Gonul et al., 2001). A physician's positive attitude towards the detailing service indicates her/his interest on both the core and the augmented constituents of the medicine. Indeed, the detailer serves both the core product, by providing detailed information and free samples of the product and customized service according to physician's specific enquires.

As far as publicity is concerned, Williams & Hensel (1991) reported that the source of information about pharmaceuticals considered to be important by physicians, has changed in rank order, from direct mail, journal advertising and detailing, to colleagues, conventions, meetings, and conferences. Especially in the pharmaceutical market of Prescribing Only Medicines (POMs), that advertising to the media is legally forbidden, publicity in the form of corporate and scientific conferences seems to be an effective outlet of pursuing promotion goals (brand awareness, favourable attitudes, brand loyalty, etc.). Information published on the Web, scientific announcements on clinical studies and on-line, real-time information support are complementary publicity outlets of a firm's communication effort (Smith et al., 2002). Especially in this study, publicity reflects the physician's interest for self-education through retrieving information from press and on-line means (i.e., customer-to-company communication enquiry). Thus, it may associate with the physician's interest on the core and real components of the medicine (i.e., the actual efficacy of the brand).

Sales promotion is another communication mix element, which, however, is not easily reported in the pharmaceutical industry, as it may misleadingly be considered as unethical behaviour, since a physician's behaviour should be triggered solely and exclusively by the patient's best interest. Notwithstanding, Conlan (1991) reported that pharmaceutical companies in the USA spent more than US$165 million on gifts, trips and cash awards to physicians when promoting brand name medicines. For private practitioners, Baker (1992) suggested that more selective office-practice items, such as prescription pads and patient record forms, would be more effective not only because they provided a service to physicians and their staff, but also offered an added benefit of being perceived as less promotional.

On the other hand, the extent to which a physician chooses a medicine due to its add-value benefits, reflecting the product's augmented constituent, is interweaved with the firm's sales promotion effectiveness. For example, a doctor's financial support for participation in an international conference mirrors an aspect of the product's augmented component and a firm's sales promotion tool, at the same time. Thereinafter, the gravity of the medicine's augmented component upon the physician's decision making rests heavily upon the firm's sales promotion success. In other terms, a physician's positive attitude towards a firm's sales promotion may indicate that her/his decision making leans favourably towards the augmented component of the medicine, ceteris paribus (i.e., given that there are a lot of good alternative branded and generic medicines with similar efficacy and side effects).

Physicians' personal values as a basis of segmentation

Values are viewed as enduring beliefs that a specific end state of existence or specific mode of conduct is preferred to an opposite, or converse end state or mode of conduct of existence (Herche, 1994). They are relatively stable criteria that people use to evaluate their own and others' behaviour across various situations (Schwartz, 1992). Furthermore, they serve to guide actions, attitudes, judgments, and comparisons across specific objects and situations.

The relationship of personal values with buying behavior is well documented in the marketing literature (Schwartz, 1992, 1994; Puohiniemi, 1995; Herche, 1994). For example, Sousa et al., (2010) postulates that values are an essential element explaining a person's attitudes and behavior. In consumer markets, homogeneous segments have been defined on the basis of consumer characteristics such as

personality type and psychographics to explain differences in buying behavior (Raaij et al., 1994).

Much of the research on values in marketing is based on the work of Rokeach (1968, 1973) and Herche (1994). However, personal values of physicians have not been much studied, although that they have been considered as crucial to health care practice, and have come under scrutiny during recent years, especially regarding priorities in health care (Neittaanmaki et al., 1999). With this study we make an attempt to investigate whether physicians' values may be associated with their prescription criteria and their attitudes towards complementary marketing communications means (i.e., both indicating relative gravity of the core, real and the augmented component of the medicine).

Measures of values reflect one of two types (Dawis, 1991). The first type of values, reflecting general or global values, appraises the construct generally across the spectrum of human experience (Rokeach, 1973; Herche, 1994). The second type of values measure (i.e., Work Values Inventory, or the Minnesta Importance Questionnaire) assesses values relative to a specific domain, or context, typically the work, or occupational setting (Super, 1983, Weiss et al., 1981; Hartung et al., 2005).

In this study we choose the global values approach, as proven useful for values clarification, initial occupational decision making and consumption decision making (Zytowski, 1994; Puohiniemi, 1995; Herche, 1994). Specifically, the Herche's (1994) MILOV (multi-item measures of list of values) approach which is a refined operationalization of the LOV (list of values) developed by Kahle (1983) and Rokeach (1973). The MILOV measures those values that are central to people in living their lives, particularly the values of life's major roles (i.e., marriage, parenting, work, leisure and daily consumptions). This values' scale is most closely tied to social adaptation theory and many studies suggest that it is related to and/or predictive of consumer behaviour and related activities (Homer & Kahle, 1988). Thus, we use this scale in our effort to associate physicians' values with their prescription behaviour (i.e., in conjunction to buying behaviour).

The MILOV falls into nine dimensions, i.e., security, self-respect, being well-respected, self-fulfilment, sense of belonging, excitement, fun and enjoyment, warm-relationships and a sense of accomplishment. Specifically, the MILOV typology draws a distinction between external and internal values, and it notes the importance of interpersonal relations and socially oriented (i.e., sense of belonging, warm relationships with others, being well-respected), life-goal view of values (i.e., sense of accomplishment), as well as personal factors (i.e., self-respect, self-fulfilment) and apersonal factors (i.e., fun, security and excitement) in value fulfilment. As there is scarcity on primary research upon the subject matter, we make a first attempt to scan the relationship of the aforementioned value dimensions with the physician's prescription (i.e., choice) criteria and their compatibility with the firm's various communications means, in terms of publicity, detailing and sales promotion. Thus, for example, we may hypothesise that a physician with enhanced sensitivity for security may prefer a branded medicine, over a generic alternative, in order to mitigate the accompanying risk of a me-too product. Likewise, we may hypothesise that a physician that values high the excitement, fun and enjoyment in life, will more likely favour a firm's sales promotion offers that may partly satisfy these ambitions (i.e., receiving financial support for participation in international scientific conferences).

However, due to the sensitivity of the product, per se, we are completely in the shade, regarding the extent to which subjective factors, i.e., psychographic traits, may affect the physician's decision upon prescribing for a patient's treatment.

METHODOLOGY

Research Sample[i]

A random sample of 100 general practitioners and specialists was drawn from the physicians' registrar of the city of Patras, due to distance proximity to our research institution. All the selected subjects were first contacted by phone. Those giving consent to participate, were personally interviewed. Finally, a sample of 69 physicians responded, 38 general practitioners and 31 specialists, yielding a response rate of 69%. The sample of specialists comprised cardiologists, gynecologists and neurologists/ psychiatrists. It was decided that a face-to-face questionnaire-based survey would best serve the purposes of this small-scale exploratory study.

For the purposes of our research, we asked our participants to have in mind that their answers should be related to medicines of chronic diseases (i.e., hypertension, diabetics, osteoporosis, etc.), or curable diseases (i.e., common cold, etc.) and not for severe, incurable cases. Details of the research demographics are depicted on Table 1.

Table 1 about here

Measures

All but the physicians' values scales were not available for the variables described in the study, thus, measures were developed following the guidelines suggested by Churchill (1999).

All the measures were multi-item and scored on 5-point scales. Especially the constructs used for the physician's prescribing criteria and preferred marketing communications were scored on Likert-scales, anchored by "strongly disagree" and "strongly agree".

In order to operationalize the constructs of physicians' prescription criteria and physicians' preferred marketing communications, we conducted preliminary research. To this end, firstly, we delved into literature on marketing communications, pharmaceutical marketing, consumer behaviour and business-to-business buying behaviour. As a next step, we performed in-depth personal interviews with five physicians, selectively, in order to identify important aspects of prescribing behaviour and physicians' interest on various marketing communications means. Furthermore, we interviewed five detailers, in order to consider common ground of reference, i.e., opinion congruency between the physicians and the detailers.

The results of the aforementioned preliminary research led as to the formation of the research instrument. Below, we discuss the pertinent item-constructs.

Physicians' prescription criteria

The measurement was tapped by three constructs: (1) a four-item scale for the brand image, (2) a three-item scale for the information search and, (3) a two-item scale for the patients' compliance.

Two constructs have coefficient alphas that range between 0.60 and 0.65, indicating acceptable levels of reliability (Nunnally, 1978). The construct patient's compliance produced a low coefficient alpha of .55, indicating a marginal fit of items

to the latent dimension, which however was retained in the subsequent analyses, amid the exploratory character of our study.

Physicians' preference on marketing communications

The pertinent measures were tapped by: (1) a four-item scale for publicity, (2) a four-item scale for detailing and sales leads and (3) a three-item scale for sales promotion. All three constructs have coefficient alphas that range between 0.62 and 0.74, indicating acceptable levels of reliability.

A detailed list of physician's prescription criteria and preferred marketing communications, together with some descriptive statistics and coefficient alphas are depicted on Appendix I.

Physicians' values

For the physicians' value scales, we used the multi-item measures of Herche's (1994) list of values (MILOV). All, but one construct, produced coefficient alphas that ranged between .71 and .88, thus indicating acceptable levels of reliability (Nunnally, 1978). Only the construct self-fulfilment yielded a low coefficient alpha of .56, indicating a marginal fit of items to the latent dimension, which however compares favourably to the MILOV's initial scales, showing similar rates (Herche, 1994). Thus, we retained this variable in the subsequent analyses.

Four items from the scales of 'excitement' and 'fun and enjoyment' dimensions were omitted, as incongruent with the spirit of the study. For example, we felt uncomfortable to ask the physicians to express importance on such issues, as, "I consider myself a thrill seeker", or "I thrive on parties". Thus, the two aforementioned value dimensions were treated as one, the construct 'excitement, fun and enjoyment', comprising two items from each one aforementioned dimension, respectively. The coefficient alpha of this compound value variable was .76, which permit us to treat it as a unidimensional scale.

Details on the MILOV's scale items used in the study, together with some descriptive statistics and coefficient alphas are depicted on Appendix II.

Analyses

As reliability analysis statistics showed that our constructs were reliable and unidimensional, we summated the item scores of each one construct, in order to use them in the statistical analyses, hereafter.

The analyses involved a series of correlations and a cluster analysis of the aforementioned survey data. Table 2 presents the correlation analysis among the constructs which gave us a first idea of the relationships of physicians' values with the prescription criteria and the preferred marketing communications, thus inducing us to proceed to further statistical analysis.

Table 2 about here

As a next step, we proceed to grouping physicians on the basis of prescription criteria, preferred marketing communications and values constructs, using cluster

analysis. K-means (nonhierarchical) is a commonly used clustering technique and we employed it in the study (Johnson & Wichern, 2002; Punj & Stewart, 1983).

The cluster analysis resulted in an interpretable solution, producing three clusters, all of which could be defined uniquely and meaningfully on the basis of the 12, out of the total 14 variables included in the analysis. The mean cluster center values for the three physician clusters are presented on Table 3, together with the ANOVAs of the cluster means and significance levels, which provide support for the discriminant validity of the cluster solution. Each of the three groups identified during the clustering process exhibited differentiated characteristics with respect to physician's prescription criteria, preferred marketing communications and physician's values. We named the clusters on the basis of their distinctive measures, as 'Brand Loyals', 'Bohemians' and 'Moodies' and interpret them in the next section.

Table 3 about here

Only two variables, the physician's prescription criterion of patient's compliance and the physician's self-fulfillment dimension showed no significant differences between clusters. For all the remaining, the ANOVA results were significant, and we conducted further pairwise comparison Tukey tests to determine which cluster differences were responsible for the overall significant ANOVA results. This allowed for a more detailed characterization of the clusters. Table 4 presents only the significant Tukey test results for these multiple comparisons.

As presented on Table 4, the greatest distances between final cluster centers were between Cluster 1 (Brand Loyals) and Cluster 2 (Moodies). Moderate distances were found between Cluster 1 (Brand Loyals) and Cluster 3 (Bohemians), and between Cluster 2 (Moodies) and Cluster 3 (Bohemians).

Table 4 about here

A series of crosstabs analyses between the physician clusters and the study's demographics, in regard to gender, age, education, number of patients, specialization and type of employer, showed no meaningful differences, thus indicating that the clusters were demographically heterogeneous.

FINDINGS

Table 2 presents the inter-correlations of prescription criteria, preferred marketing communications and physicians' values.

Firstly, the prescription criterion of brand image was related to publicity and detailing, indicating that physicians who would rather prescribe a branded medicine, than an alternative generic, they would also rely on public and personal means, in order to retrieve credible information. Likewise, patient's compliance was related to sales promotion, which implies that a physician would accept the sales promotion benefits only if this would not be at the expense of their patients quality of treatment.

Furthermore, there were a few significant correlations between the values importance ratings and either the prescription criteria, or/and the physicians' relative preference on marketing communications means. Specifically, self-respect and warm relationships with others were correlated with both the prescription criteria of brand image and information search.

The value dimensions sense of belonging, warm relationships with others and sense of accomplishment were related to publicity. Being well respected, sense of belonging and warm relationships with others, were correlated with detailing. Finally, being well-respected and excitement, fun and enjoyment were correlated with sales promotion.

Thus, physicians' enhanced need for self-respect and warm relationships with others are susceptive to prescribing branded medicines and to enquiring about the products they prescribe. Additionally, the physicians with enhanced sense of the social oriented values of warm relationships with others, sense of belonging and being well respected are inclined to interact with firms' detailers. Apart from the social oriented values of warm relationships with others and sense of belonging, physicians with the enhanced life-goal view value of sense of accomplishment would also prefer the firm's communication means of publicity, expressing physicians' inclination to self-education and retrieving information from the firms' sources. Finally, physicians with enhanced sense for the social oriented value of being well-respected, together with the apersonal value of excitement, fun and enjoyment would rather rely on the firm's communication means of sales promotion.

Cluster 1: The Brand Loyals

As depicted on Tables 3 and 4, Cluster 1, the 'Brand Loyals' was the smallest of all three groups, with seventeen physicians, comprising 24.6% of the sample.

Among all three physician clusters, the Brand Loyals place the highest emphasis on the prescribing criterion of information search, whereas they expose a significantly higher mean than the Moodies, in respect to prescribing branded medicines.

Furthermore, the Brand Loyals have a higher mean difference than the Moodies for the variables publicity and detailing.

In regard to the personal values, the Brand Loyals cite the highest means among all three clusters, in respect to self-respect, sense of belonging, warm-relationships with others and sense of accomplishment. Also, they scored higher than the Moodies, in respect to the value dimensions of security and being well respected. Finally, they scored significantly lower in respect to excitement, fun and enjoyment, in comparison to the Bohemians.

In corollary, the Brand Loyals have the greatest possibility among all three clusters to prescribe a branded medicine, than a generic alternative. They depend heavily on the information they retrieve either through self-inspection (i.e., through scientific journals and Web publications), or through their interaction with the firms' representatives (i.e., the detailers).

Additionally, they are more receptive to participating to a firm's event or a scientific conference, than their counterparts.

Cluster 2: The Moodies

In Cluster 2, twenty three physicians were listed, comprising 33.3% of the total sample. This cluster exposed the lowest means of all three clusters, thus we named them as 'Moodies', emphasizing their modest, or low-scored value character.

To these physicians, prescribing branded medicines and information search about medicines and prices seem to be less important, compared to the Brand Loyals. In regard to the preferred marketing communication elements, they scored the lowest means on the variables publicity and detailing, among all three clusters. Similarly,

they scored a lower mean for sales promotion, compared to the Bohemians. The Moodies expose lower scores in comparison to the Brand Loyals, for all, but the excitement, fun and enjoyment, values dimensions. They also have lower means than the Bohemians, for the values dimensions of security, being well respected, excitement, fun and excitement and warm relationships with others. Thus, they seem to be the most modest of all three physician clusters, and simultaneously they show inertia on both their prescribing behavior and their attitudes on firms' communications.

In corollary, the Moodies are the most probable among the physicians to prescribe non-branded, i.e., generic medicines. Regarding the information research, they differ only with the Brand Loyals, as being less interested to the later. Furthermore, they are the least interested of all three physician clusters in respect to all three communications means, i.e., publicity, detailing and sales promotion.

Cluster 3: The Bohemians

In this cluster, twenty four physicians were listed, comprising 34.8% of the total sample and reflecting characteristics that inspired us to name as 'Bohemians'.

The Bohemians scored significantly lower rates for information search, compared to the Brand Loyals. Inversely, they scored higher means than the Moodies, for detailing and sales promotion.

In respect to physician values, the Bohemians rated the highest scores of all three physician clusters in respect to excitement, fun and enjoyment. Furthermore, they scored higher than the Moodies, for the values of security, being well respected and warm relationships with others, whereas they scored lower than the Brand Loyals, for the values self respect, sense of belonging, warm relationships with others and sense of accomplishment.

In corollary, the Bohemians seem not to discriminate between branded and generics medicines. They tend to avoid information search as they rest heavily upon the detailers for covering their information needs. At the same time, they are the most likely of all, to appraise firms' sales promotion efforts (i.e., in terms of receiving grants for participation in international conferences and other value-added benefits). As we might intuitively expect, excitement, fun and enjoyment scored the highest rates in this cluster.

IMPLICATIONS

The research findings suggest that pharmaceutical companies should consider both consumer and industrial buying behavior aspects when designing marketing and communication plans for the physicians' communication target audience.

Thus, for example, a pharmaceutical company with well-established branded medicines should primarily target to the Brand Loyals and the Bohemians.

When approaching the Brand Loyals, a communication strategy based on rich information sources that a physician would retrieve by him/herself (i.e., extant publications in scientific journals and Websites) would be appropriate. The communication messages should fit to persons with extremely high perceptions on almost all their values dimensions, except for the values excitement, fun and enjoyment and self fulfillment. However, detailers should avoid overselling their

firm's sales promotion offerings, as sales promotion appears to be less important to this segment.

Inversely, when targeting to the Bohemians, sales promotion through financial incentives and add-value benefits would be more appropriate, without excluding detailing and publicity, which however appear to be less important to this physician cluster. The communication messages that praise excitement, fun and enjoyment would fit perfectly to this physician cluster.

As far as the Moodies segment is concerned, this would be a more appropriate target group for the firms dealing with generic products. As this market segment depicts average scores on all the values dimensions, physicians pertaining to this segment wouldn't be thrilled by communication messages driven by psychographic, social, or emotional appeals.

Additionally, the Moodies are the least interested among the physicians to receive information from public and interactive, on-line means, or through their interaction with a firm's detailer. It is only for the communication means of sales promotion that the Moodies showed no difference compared to the Brand Loyals. However their sales promotion scores were significantly lower, when compared to the Bohemians. This finding implies that a communication strategy based on sales promotion would be the only appropriate communication outlet for a pharmaceutical marketer.

Overall, our research provided evidence that social and personal values may play a role in physicians' prescribing behavior and response to marketing communication means.

Thus, physicians that place great importance on social-oriented values, such as warm relationships with others, as well as on personal values of self respect tend to prescribe established brands rather, than generic medicines. Likewise, physicians with high scores on the social-oriented values tend to appreciate communication with detailers and firm' publications on scientific and on-line means. Inversely, physicians that place great importance on excitement and enjoyment of life would more likely be responsive to an intensive sales promotion strategy, no matter if it is about a well-established brand, or a generic medicine.

Finally, for the pharmaceutical companies that market generic medicines, physicians with average values scores seem to be the best suited target group and they should appeal to them with intensive sales promotions, as this proved to be the most appropriate communication strategy to them.

In corollary, the cluster analysis revealed that the physicians' personal values may be a meaningful basis of segmentation for the pharmaceutical market. Marketing planners need to match their marketing plans with the physicians' target groups. Thus, for example, a detailer at the beginning of the business relationship with the physician may try to trace the physician's psychographic traits, in order to adapt his/her communication efforts to the physician's typology. Planning and pricing of differentiated brands for each target group should also be considered.
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LIMITATIONS AND FUTURE RESEARCH

This is an exploratory study and we should not generalize too far. Further research is needed considering a larger sample frame from allover Greece. As cross-cultural differences may influence consumer (i.e., physician) behavior, the aforementioned research should also be performed in a number of European countries, or elsewhere, in order to assess generalizability of the research results. A more extant list of research construct items may also be in order.

Table 1.

Sample Demographics						
Gender	**Freq.**	**Perc.**		**Specialization**	**Freq.**	**Perc.**
Male	38	55,1		Pathologist	38	55,1
Female	31	44,9		Kardiologist	8	11,6
	69	100,0		Gynaecologist	11	15,9
				Neurologist/psychiatist	12	17,4
					69	100,0
Age	**Freq.**	**Perc.**				
Under 40 years	28	41,2		**Employer**	**Freq.**	**Perc.**
40-50	30	44,1				
51 and more	11	14,7		Social security	19	27,5
	69	100,0		Public hospital	28	40,6
				Private health care employer	22	31,9
					69	100,0
No of patients per day	**Freq.**	**Perc.**				
Under 10	14	20,3				
10 - 15	23	33,3				
16 and more	32	46,4				
	69	100,0				

Table 2.

Descriptives, Coefficient alphas and Correlations of constructs

							Correlations							
Constructs	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 f1_brand image	1,00													
2 f1_information research	0,16	1,00												
3 f1_patient's compliance	0,10	0,18	1,00											
4 f2_publicity	,334**	0,15	0,12	1,00										
5 f2_detailing and sales leads	,239*	0,10	0,21	,368**	1,00									
6 f2_sales promotion	0,01	0,01	,311**	0,14	,409**	1,00								
7 f3_security	0,20	0,03	-0,02	0,15	0,08	0,19	1,00							
8 f3_self respect	,395**	,454**	0,01	0,18	0,18	-0,11	,316**	1,00						
9 f3_being well respected	0,23	0,04	0,13	0,07	,405**	,263*	,356**	0,19	1,00					
10 f3_self fulfillment	0,04	-0,08	0,01	0,03	0,12	0,15	0,20	0,06	0,20	1,00				
11 f3_sense of belonging	0,19	0,17	0,10	,372**	,263*	0,02	0,10	0,20	0,22	0,02	1,00			
12 f3_excitement, fun & enjoyment	-0,16	-0,02	0,22	-0,09	0,16	,310*	-0,01	-0,10	0,11	0,21	0,09	1,00		
13 f3_warm relationships with others	,344**	,426**	0,16	,332**	,245*	-0,03	,288*	,526**	,345**	0,03	,527**	0,19	1,00	
14 f3_sense of accomplishment	0,17	0,17	0,17	,289*	-0,06	-0,02	0,21	0,23	0,21	0,22	,531**	0,14	,535**	1,00
Number of items in scale	4	3	2	4	4	3	4	7	4	2	4	4	4	5
Mean	15,0	10,6	6,6	16,7	14,3	9,7	13,9	27,8	13,4	6,2	16,5	14,5	16,1	19,7
Standard Deviation	2,7	2,2	1,5	2,4	2,6	2,7	2,7	4,8	2,8	1,6	2,2	2,5	2,3	2,7
Coefficient Alfa	,65	,60	,55	,74	,62	,71	,71	,88	,81	,56	,74	,76	,81	,78

Table 3.

Final Cluster Centers, Cluster Membership & ANOVA Statistics					
	Cluster				
	(1) **Brand Loyals**	**(2)** **Moodies**	**(3)** **Bohemians**	**F**	**Sig.**
No of cases in each cluster*	17	23	24		
Physician's prescription criteria					
f1_brand image	16,1	13,9	15,1	3,5	0,04
f1_information research	12,1	10,1	9,8	7,2	0,00
f1_patient's compliance	6,6	6,6	6,8	0,1	0,88
Physician's preferred marketing communications					
f2_publicity	17,8	15,3	17,1	6,9	0,00
f2_detailing and sales leads	15,5	12,6	15,6	14,0	0,00
f3_sales promotion	9,6	8,6	11,2	7,4	0,00
Physician's values					
f3_security	15,2	12,4	14,7	8,4	0,00
f3_self respect	38,8	28,9	29,8	59,1	0,00
f3_being well respected	14,6	11,7	14,5	10,8	0,00
f3_self fulfillment	6,5	6,0	6,4	0,5	0,61
f3_sense of belonging	17,8	15,5	16,4	6,7	0,00
f3_excitement, fun & enjoyment	13,8	13,4	15,8	7,7	0,00
f3_warm relationships with others	17,9	14,6	16,3	13,7	0,00
f3_sense of accomplishment	21,4	18,6	19,7	5,9	0,00
* 5 cases unclassified					

Table 4.

Tukey Test Results for Multiple Comparisons of Cluster Means					
Variable	**Cluster (I)**	**Cluster (J)**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
Physician's prescription criteria					
f1_brand image	1	2	2,25	0,86	0,031
f1_information research	1	2	2,03	0,64	0,007
	1	3	2,28	0,64	0,002
Physician's preferred marketing communications					
f2_publicity	1	2	2,56	0,73	0,003
	2	3	-1,86	0,67	0,019
f2_detailing and sales leads	1	2	2,91	0,69	0,000
	2	3	-3,06	0,65	0,000
f2_sales promotion	2	3	-2,64	0,69	0,001
Physician's values					
f3_security	1	2	2,78	0,75	0,001
	2	3	-2,28	0,68	0,004
f3_self respect	1	2	9,89	0,98	0,000
	1	3	8,93	0,97	0,000
f3_being well respected	1	2	2,95	0,76	0,001
	2	3	-2,80	0,69	0,000
f3_sense of belonging	1	2	2,30	0,63	0,002
	1	3	1,44	0,62	0,060
f3_excitement, fun & enjoyment	1	3	-2,03	0,71	0,015
	2	3	-2,40	0,65	0,001
f3_warm relationships with others	1	2	3,32	0,63	0,000
	1	3	1,59	0,63	0,038
	2	3	-1,73	0,58	0,012
f3_sense of accomplishment	1	2	2,74	0,80	0,003
	1	3	1,69	0,79	0,093

Appendix I.

Physician's prescription criteria and preferred marketing communications items, means, st. dev. and coefficient alphas

Measurement Items	Mean	St. Dev.
Physician's prescription criteria		
Please check the appropriate box in order to cite the degree to which you agree or dissagree with the following statements, regarding your prescription criteria		
Brand image (alpha=.65)		
I choose a medicine primarily for its efficacy.	4,41	,73
I prescribe a well known brand more easily, than an anknown brand with similar efficacy.	3,72	1,01
I prescribe a well known brand more often, than an anknown brand with similar efficacy.	3,46	1,08
In order to prescribe a medicine for a first time, I listen to the opinion of award colleagues (professors etc.).	3,36	1,04
Information Research (alpha =.60)		
In order to prescribe a new medicine I pursue information from award scientific journals.	3,90	,83
I take the product price very seriously into account.	3,17	1,19
I would preclude an absolutely effective medicine which, however, I would suspect that it might have increased possibilities of side effects, at the same time.	3,55	1,01
Patients' compliance (alpha =.55)		
I'd prefer a medicine needing application once per day, than another one, with better efficacy, though needing application three times per day.	2,97	1,10
I would prescribe a medicine taken through the mouth more easily, than another one with similar efficacy, or similar side effects, which, however, would need intramuscular injection.	3,65	,90
Physician's preferred marketing communications		
Please cite the degree to which you agree, or dissagree with the following statements, regarding their importance on deciding the prescription of a medicine ….		
Publicity (alpha =.74)		
Provision of scientific evidence from clinical studies about the medicine.	4,14	,93
The physician's on-line, real-time support with information provided by the firm.	3,99	,85
The information published on Web sites, regarding the disease's characteristics and critics on the qualities and effects of the medicine.	4,20	,70
The constant information from award scientific journals and scientific publications.	4,35	,76
Detailing and Sales Leads (alpha=.62)		
The detailer's scientific knowledge on the medicine.	4,00	,89
The physician-detailer interpersonal relationship.	3,42	,86
The hand-out broshure with details about the medicine.	3,91	,80
The free samples of the medicine.	2,97	1,16
Sales Promotion (alpha=.71)		
The firm's interest to educate the physicians on new medicines, through financing their participation to international scientific conferences.	3,96	,95
Financial incentives, given that there are similar competitive alternative medicines.	2,94	1,21
Add-value incentives, i.e., office-practice items, patient record forms, etc., given that there are similar competitive alternative medicines.	2,75	1,22

Appendix II.

Descriptive statistics of physicians' values items & coefficient alphas of values dimensions

	Mean	Std. Dev.
Security dimension (alpha = .71)		
I am often concerned about my physical safety	2,84	,99
Knowing that I am physically safe is important to me	3,54	1,01
My security is a high priority to me	3,58	,81
Financial security is very important to me	3,93	,77
Self-respect dimension (alpha=.88)		
I try to act in such a way as to be able to face myself in the mirror the next morning	4,16	,85
If one loses one's self-respect, nothing can compensate for the loss.	3,83	1,01
My self-respect is worth more than gold.	3,94	,95
Even though others may disagree, I will not do anything to threaten my self-respect.	3,87	,86
More that anything else, I must be able to respect who I am.	4,10	,86
I will do what I know to be right, even when I stand to lose money.	4,04	,85
Knowing that I am doing the right thing in a given situation is worth any price.	4,09	,84
I will not compromise on issues that could cause me to lose my self-respect.	3,99	,85
Being well-respected dimension (alpha = .81)		
I strive to retain a high status among my friends.	3,41	,77
I am easily hurt by what others say about me.	3,23	1,00
The opinions of others are important to me.	3,35	,87
I care what others think of me.	3,43	,79
Self-fulfillment dimension (alpha = .56)		
I treat myself well.	3,62	,69
I deserve the best, and often give myself what I deserve.	3,43	,65
I like to buy the best of everything when I go shopping.	3,20	,96
The finer things in life are for me.	3,04	,98
Meeting my desires is a full-time job for me.	3,80	,81
Sense of belonging dimension (alpha = .74)		
I play an important role in my family.	4,10	,71
I need to feel there is a place that I can call 'home'.	4,25	,68
I feel appreciated and needed by my closest relatives and friends	4,06	,73
Being a part of the lives of those with whom I am close is a high priority for me.	4,10	,71
Excitement, fun & enjoyment dimension (alpha = .76)		
I enjoy doing things out of the ordinary	3,83	,82
I strive to fill my life with exciting activities.	3,58	,86
Having fun is important to me.	3,23	,84
Recreation is a necessity for me.	3,83	,71
Warm relationships with others dimension (alpha = .81)		
I oftern commend others on their efforts, even when they fail.	3,93	,72
I make a point of reassuring others that their presence is welcomed and appreciated.	3,81	,78
I try to be as open and genuine as possible with others.	4,13	,57
Without my close friends, my life would be much less meaningful.	3,87	,77
I value warm relationships with my family and friends highly.	4,24	,74
When those who are close to me are in pain, I hurt too.	3,97	,86
Sense of accomplishment dimension (alpha = .78)		
I need to feel a sense of accomlishment from my job.	4,12	,68
I am disappointed when I am unable to see a project through to the end.	3,62	,86
"Getting things done" is always high on my "to-do" list.	4,00	,79
Feedback on my job performance is very important.	3,93	,68
I tend to set and strive to reach my goals.	4,04	,72

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