Therapeutic Drug Prescription Behavior: Decision Process and Marketing Mix Effects

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Promotion of Prescription Drugs and its Impact on Physician's Choice Behavior: A Rejoinder

ABSTRACT

This paper provides an in-depth, qualitative analysis of the physician's prescription decision process. The research approach is designed to meet the full complexity and sensitive nature of the physician's choice behavior, which appears to be more hybrid and less rational in nature than is often assumed in quantitative, model-based analyses of prescription behavior. Several interesting findings emerge from the analysis: (i) non-compensatory decision rules seem to dominate the decision process, (ii) consideration sets are typically small and change-resistant, (iii) drug cost is not a major issue for most physicians, (iv) detailing remains one the most powerful pharmaceutical marketing instruments and is highly appreciated as a valuable and quick source of information, and (v) certain types of non-medical marketing incentives (such as free conference participation) may in some situations also influence drug choices.

BACKGROUND AND RESEARCH OBJECTIVES

Being of crucial importance from an economic as well as a social welfare perspective, the marketing of pharmaceuticals in general, and prescription drugs in particular, has been a topic of interest since long. Academic research in this domain is, nevertheless, quite sparse (see Gönül et al. 2001), and provides few insights into the mechanisms driving drug prescription behavior or the way it is affected by marketing mix efforts of pharmaceutical companies (Kahn et al. 1997).

Most of the previous studies on drug prescription behavior are mainly descriptive, and rely on large scale surveys among physicians to describe prescription outcomes within specific therapeutic classes. In addition, the impact of marketing instruments - like advertising, detailing and pricing – has been examined on the basis of factual data, collected by specialized syndicated sources such as IMS (see e.g., Machanda et al. 2000, Gönül et al. 2001, DeSarbo et al. 2002). While these behavioral data remain a valuable source of information, there are at least three reasons why recorded data on past prescription behavior may not be sufficiently informative and need to be supplemented with additional sources of information. First, the pharmaceutical market is a very dynamic market, implying that previously recorded phenomena cannot be readily extrapolated into the future. Second, the prescription of drugs takes place in a complex environment and involves a host of stakeholders whose impact may be difficult to unravel based on factual data alone. Third, even if one disregards system externalities and concentrates on the prescriber as such, one is confronted with a decision process that may be partly unconscious; based on heuristics rather than structured analysis of all relevant information, and partly based on socially less desirable motives. The traditional models used in conjunction with large scale quantitative data sets typically do not shed light upon these aspects of the decision process.

Based on the above, the recognition has grown that a complementary qualitative approach is called for, which does not suffer from the paradigms of classical decision theory (Svenson 1996), and offers insights into the processes underlying observed physician's prescription behavior. This recognition fits into a wider quest for making more and better use of supplementary qualitative data sources, as is illustrated by the following statement concerning repetitive choice modeling: (i) " … there may be several unobserved explanations for observed patterns of persistent choices", (ii) model misspecification entails a high potential for parameter bias, misleading conclusions about the nature of consumer decision processes and, therefore, inappropriate marketing strategies, and (iii) it is very hard to select the most appropriate model based on quantitative data alone, as correlations between measures of parameter bias and predictive validity are low (Abramson et al. 2000, p. 411). Qualitative information can, therefore, prove valuable not only to validate the outcomes and recommendations of quantitative models, but also to develop more appropriate model structures (Laurent 2001,Wedel et al. 2001).

The fundamental objectives of this paper are twofold. First, from a substantive viewpoint, we intend to shed more light on the decision process of physicians in prescribing therapeutic drugs. More specifically, this study aims to provide more in-depth insight into (i) the parties involved in, and the nature of, the decision process, (ii) the role and importance of different choice criteria - challenging the assumption made in many previous studies that prescription decisions are based on compensatory decision rules (see e.g. Gönül et al. 2001), and (iii) the impact of marketing mix efforts by pharmaceutical companies on prescription decisions. Second, from a methodological viewpoint, we present a qualitative approach to collect and analyze prescription information, and indicate how the insights from this approach complement those from traditional analysis of

information from syndicated sources. In the discussion, we rejoin the debate in a recent JM paper by Gönül et al. (2001). Although our study was conducted independently of the one by Gönül et al. (2001) (referred to as GCPS hereafter), it is instructive to confront our results with theirs. While our study confirms some of the findings from their quantitative data analysis, it disconfirms others, and yields additional propositions on prescribers' marketing mix response as well as on its underlying rationale. Like GCPS, we focused on prescription drugs from well-defined therapeutic classes[1], which are mainly prescribed by specialists, to patients treated for a prolonged period of time. The setting differs from that of GCPS in that all patients have an obligatory medical insurance, in which they have to pay for only a minor part of the drug costs themselves[2].

In the next section, we provide a detailed description of the qualitative research method used to analyze the physicians' prescription behavior. Section 3 presents the substantive findings, and compares them with the outcomes of the GCPS study. Conclusions and future research areas are given in section 4.

METHODOLOGY

In view of the discussion above, we opted for a qualitative research method (see Figure 1 for an overview) with philosophical roots in phenomenology and in interpretative interactionism (Hermeneutics, see e.g. Cronin 2001, Wiklund et al. 2002). Using individual[3], face-to-face, in-depth interviews and probing interview techniques based on the investigative approach method

(see e.g., Peplau 1999) we tried to obtain insight into prescription behavior *as experienced by* the interviewed physicians in their daily practice and environment. In view of the risk of rationalization and social desirability biases (see Wazana 2000), projection techniques were used for all interviews. Rather than describing their own prescription decisions, respondents were asked to express their expert opinion on the prescription behavior of their fellow physicians.

<insert Figure 1>

To enhance the validity of the results, three types of triangulation were applied (see Denzin and Lincoln 2000). First, to allow for conflicting reactions and rival explanations of prescription decisions, physicians as well as observers of physician's prescription behavior were included in the expert sample (data triangulation principle for transferability). Second, data were collected in two consecutive rounds, stage 1 results being tested and further refined in the second stage of the analysis (methodological triangulation). The first round interviews focused on a broad exploration of drug prescription behavior and its influencing factors. The second round interviews - conducted with a new sample of respondents - focused more on reflection and discovering of similarities and differences within that experience. Third, while the interviews were conducted by one of the researchers (second author), the results were evaluated independently by each of the four researchers, followed by a group discussion of the results, in order to enhance the objectivity of the conclusions[4] (investigator triangulation).

The sampling method was purposive (see Baker et al. 1992). Respondents were selected based on their expert knowledge concerning the topic under study and their willingness to participate freely without financial compensation[5]. Anonymity and confidentiality were guaranteed by precoding each interview and by not tape-recording the conversation. Data collection and analysis took place from July 2000 until April 2001.

Stage 1

In stage 1, respondents were added one by one to the sample until no new insights were obtained (saturation principle for sample size, see Miles and Huberman 1998). In total, 14 experts of different age, gender and specialization (quota sample, see Table la) were contacted over the telephone by the field-researcher and asked to participate (response rate 100%). The study and method of data collection (expert interviews) were presented like a Delphi approach, and an appointment for an in-depth interview was made. The interview guide used was based on a review of the related literature and a practitioner-based list[6] of key issues about drug prescribing and decision making. Each interview took at least one hour. Written key notes were taken by the interviewer, to register verbal and non-verbal cues. Immediately after each interview these field notes were completed, transcribed extensively and illustrated with examples given by the expert in his/her own words.

<insert Table 1>

Intensive reading and rereading of the raw data led to the identification of meaning units, which generated 150 statements on physicians' drug-prescribing behavior and its influencing factors (for an example of how original expressions were grouped into meaning units and translated into statements, see Appendix 2). Extensive group discussions among the four researchers led to a refinement and regrouping of the original statements into a set of 30 statements, which were believed to be most representative for the prescription characteristics under study. Since those 30 statements would guide the conversation during the second data gathering stage, some adjustments in their formulation were necessary in order to evoke more profound reactions of the respondents, especially on sensitive issues. Therefore some of the statements underwent a slightly

more provocative reformulation (e.g. statement 21, see Appendix 1). This interview guide was pre-tested for face-validity and for informal content validity. No adjustments were necessary.

Stage 2

In stage two, the sample size was set at 30 respondents, mainly specialists. Sample characteristics are summarized in Table lb. In a similar fashion as for stage 1, the respondents were contacted and visited (response rate 75%) for an in-depth interview of approximately one hour. At the start of each interview respondents were told that the statements presented to them reflected the opinion of previously interviewed experts (thereby suggesting a Delphi approach), making supposedly sensitive topics more open for discussion. Respondents were then asked to express their expert opinion on the drug prescribing behavior of other physicians[7], rather than describing their own prescription habits (projection technique). Field notes were taken in a similar way as during the first stage interviews and transcribed extensively after each interview.

The data of the second stage interviews were evaluated independently by the four researchers, following pre-specified criteria formalized in a synopsis sheet (investigator and theoretical triangulation; See Appendix 2 for an example). Reactions of the second stage respondents were characterized and counted to identify majority and minority views per statement. In addition, data were compared across statements of related factors (for example, different information sources), to determine their relative importance and to identify differences and similarities in drug prescription effects. Next, the results of the individually performed evaluations were subjected to group discussions within the research team in order to obtain consensus and enhance the objectivity of the derived conclusions. The plausibility and consistency of the results – as

confirmed by the pharmaceutical company's managers - provides further support for their validity (Miles and Huberman, 1998).

FINDINGS

While we primarily report the opinion of the majority of respondents, details on differences in respondent reaction are also provided where needed. In addition, illustrative citations are incorporated to give the reader a more vivid idea of the raw data underlying the reported conclusions. Together with the detailed procedural account provided above, this should allow for a more accurate assessment of the validity of the results[8]. A summary of the findings, and comparison with GCPS' results, is given in Table 2.

<insert Table 2>

Decision making process

A content and comparative analysis of the responses to statements 12 to 14 and 17 to 21 reveals that the decision making process is typically complex and influenced by several sorts of factors, each in turn grouping multiple influences. This section summarizes the major findings concerning the impact of (i) the multiple-party-setting, (ii) the prescriber's multiple goals, (iii) the prescriber's multiple sources of information overload and (iv) the multiple diagnostic and therapeutic uncertainties.

The multiple-party setting. The present study clearly confirms earlier findings by GCPS, Hurwitz and Caves (1988), and Leffler (1981), that the physician rather than the patient is the *key* decision maker. This observation, however, needs to be put into perspective. First, based on the responses

to statement 9, we find that patients may still *influence* prescriptions, their impact being markedly stronger on prescription by general practitioners than on that by specialists. Secondly, in addition to the patient's requests, the physician's prescription decisions may be influenced by specific demands from relatives (e.g. for drugs with sedative effects, see statement number 25), formal and informal interactions with other physicians (e.g. in group practice, hospital context, or at medical conferences, statement number 3), and other medical staff (e.g. nurses, who provide feedback on the treatment results, and hospital pharmacists, who mainly influence prescriptions through composition of the hospital formulary; see statements 4 to 6).

Interestingly, the interview results reveal that physicians and in particular specialists - while subject to the inputs of multiple parties - often attempt to restrict their impact on the prescription decision, as is well illustrated by the following citation (in response to statement 6):

> *"Nurses never influence my drug order. They often discuss their patients' drug therapy with me, but **I** (as their unit physician) decide, control and change the drug order, never the nurse …The hospital pharmacist may comment on my drug prescription, but **I** know the patient, he does not…"*

Major reasons why physicians do not like patients to interfere are the complexity of the choice context and the physician's expert position. Their attitude in this respect is well expressed by Wilkes et al.'s (2000) statement that "*few consumers have the clinical and pharmacological background to properly understand and evaluate"* the drug information they receive through information sources such as direct-to-consumer advertising (see below). Based on these concerns, physicians indicate to only exceptionally - and often temporarily - follow a patient's prescription request for a different product (statement 9; see also Freudenheim, 1998, who indicates that only a small percentage of prescription requests for advertised drugs are followed by physicians). Major exceptions are situations where rejection of the request implies a high risk of harming the patient-physician relationship, or where different package types or delivery systems rather than

brands are demanded (these requests are more easily followed than alternative brand demands, because of the lower risk and complexity of the choice decision).

Multiple goals. The GCPS study implicitly suggests one predominant type of goal pursued by physicians, namely, to rationally and exclusively assume their medical responsibility. Although the present study does confirm the logical assumption that medical goals generally *dominate* prescription decisions (statement 14 and 21), other goals – such as the prescriber's personal financial and socio-psychological goals (like, for instance, being looked upon as competent and authoritative) - are also found to be of influence. This holds especially (i) when the prescription situation offers sufficient latitude to capture multiple goals and (ii) when other than strictly medical goals do no conflict with medical goals.

Multiple sources of information overload. Our study confirms GCPS' expectation that prescribers experience information overload. Based on a comparative analysis of responses to statements 12 and 13, we find that the information processing capacity of physicians is structurally insufficient. They cannot possibly process all the information reaching them, from many different scientific and/or commercial sources, and concerning many different aspects like pathologies, treatments, and pharmacological supply. The typical time pressure plaguing physicians - in combination with the high risk and uncertainty of the prescription decisions – worsens this structural problem. As will be discussed in more detail below, this has significant consequences for the types of information sources they prefer and use.

Multiple diagnostic and therapeutic uncertainties. As already suspected by GCPS and suggested by Kahn et al. (1997) and DeSarbo et al. (2002), a major element in the physician's decision making process is the difficulty of assessing the results of a treatment (statement 13). We encountered three groups of structural causes of uncertainty during the interviews:

(i) uncertainty concerning patients (caused by such eventualities like subjective, imperfect reporting by patients, numerous - often unknown - exogenous elements affecting the patient, and also the changing set of patients)

(ii) uncertainty concerning the pathology (caused by the fact that there might be multiple explanations for specific complaints, multiple complaints resulting from a single pathology, or multiple pathologies coinciding)

(iii) uncertainty concerning the effects of drugs (due to the limited opportunity for experimentation throughout a treatment, the possibly multiple effects of drugs and the possible carry-over effects of drugs).

Put together, these elements may stimulate the adoption of risk reducing prescription strategies, like following opinion leadership or remaining brand loyal.

Role and importance of different choice criteria.

In further typifying the decision process, and the role of different choice criteria therein, a distinction must be made between non-routine and routine situations.

Non-routine decision making. In non-routine situations, involving new products and/or new patients with a complex pathological profile, prescribers typically go through a fairly extensive evaluation, and rely on multiple criteria (statement 18):

" *If patients have multiple health problems – which is often the case for elderly people – they usually take multiple drugs … So, as their physician, you have to think twice as long and twice as hard before you add an extra drug to his treatment list. Drug-drug interactions are always possible …and rocking a stable drug tree must be done very gently…".*

Our study distinctly confirmed the GCPS finding that medical criteria dominate the decision process (statements 14, 20, 21): if drugs differ in terms of main effects, these will largely be decisive. Yet, because pharmaceutical products within one drug category are often relatively similar in terms of main effects, side effects may in some cases also play a decisive role. The same – although to a lesser extent - goes for drug costs, physician-related-benefits and company image (see below). Even when the latter criteria rank low, and physicians will clearly take no risk at the expense of their patients, they may influence prescription decisions, especially in situations of medical equivalence.

In addition to the relative importance of the choice attributes, reactions to statements 14, 20 and 21 shed light on the nature of the decision rules adopted. Contrary to the GCPS study – which is based on the implicit assumption of compensatory decision making – we find that prescription decisions are usually based on hybrid models. A typical pattern is one in which (i) disjunctive or conjunctive rules - often based on main medical effects - reduce the number of alternatives, and (ii) the remaining options are eliminated in a lexicographic fashion, either on an aspect-by-aspect basis (e.g. side effects of drugs, physician-related-benefits) or on an alternative-by-alternative basis (product, product form, brand)[9]. Only after non-compensatory models have more or less strongly reduced the physician's evoked set[10] (statement 14),(iii) compensatory rules intervene to arrive at an actual choice. Thus, in non-routine situations the previous typical sequence of decision rules takes the prescriber from his awareness set, over a consideration set and a choice

set, to actual choices. Importantly, the ultimate thoroughness of the decision making process is situation dependent (e.g. multiplicity of the pathology) and may also be influenced by physician characteristics (statement 16).

Routine decision making. Depending on the repetitiveness of the situation, the physician will implicitly and/or explicitly go through a learning process. As will be discussed in more detail below, physicians apparently have a particularly strong need to remain in control of events, even under a high degree of uncertainty, and - as a result - predominantly acquire information through an active rather than a passive learning process (statements 2, 3, 9, 13):

> *"... Positive or negative experiences with a drug within my own patient population are often decisive in my final product choice, whatever statistics may say. The patients as I see them in my office seldom equal the inclusion criteria of a typical drug research patient. I am convinced that personal experience with a product (read: drug) is necessary to discover its real benefits…"*

A indicated below, this strong need of having to see with their own eyes before believing strongly weighs on the effect of different communication instruments.

Compared to early phases of the learning process, the routinized decision stage typically involves more narrow consideration sets and choice sets[11]. Our results reveal that many physicians have a high degree of inertia in the composition of their consideration set (statement 16):

> *" My personal internal drug memory (also called working memory) changes slowly over time and contains several relatively small sets of products. For each drug category, I have created my own set of products or brands which I use on a daily basis...Ongoing experience with those products has narrowed those sets, but also broadened my knowledge of the products I use …"*

This tendency to hold on to the same consideration set is typically stronger for more senior physicians and for certain specializations like pediatrics, where there is a lack of drug studies to rely on. The same holds for the choice set (the physician's working memory). Even though the majority of physicians appear to be switchers in their overall prescription behavior across patients (their choice sets containing multiple items; a similar finding was reported by GCPS), this seems primarily due to structural reasons (i.e. the multiplicity of diagnoses and patients described above). In line with GCPS' assumptions, we find that the majority of physicians tend to repeatedly prescribe the same drug to a given patient. Noteworthy exceptions in our study (based on statement 26) are non-responders, who typically are the first ones for new drugs to be administered to. The same goes for completely new patients.

Impact of pharmaceutical companies' marketing mix instruments.

Numerous causes may disrupt established routines, resulting in a sequence of non-routine and routine situations and associated prescription behavior that is highly idiosyncratic to the product category and the individual physician. The following statement is illustrative of this reality:

> *"For many drug categories I have two options A and B to choose from in 80% of my prescriptions. The new drug C or perhaps even D I will use somewhat experimentally. If C and/or D prove to score well they will ultimately become substitutes of A and B in my choice set/work memory".*

Pharmaceutical companies' marketing mix instruments may both affect non-routine decisions and reinforce or disrupt established routines. In this section, we concentrate on how price, advertising, detailing, samples and gifts may affect prescription rates of the company's drug products.

Price. Similar to the findings of GCPS, the results of the present study (statements 19 to 21) indicate a very low price sensitivity of physicians for prescription drugs (similar findings were

reported by Hurwitz and Caves 1988). Especially in inpatients' settings, physicians show a lack of knowledge of and/or interest in the price of the products they prescribe[12], as illustrated by the following typical statement by one interviewee:

> "*It's much more important that drugs are effective and have no serious side effects … Whether they're easy to apply may also play a role, especially for pediatrics and geriatrics, but prices really are of minor importance. Physicians will never prescribe drugs with more side effects, just because they're cheaper."*

While most physicians indicated to disregard drug prices in general, some of them explicitly referred to a patient's difficult financial situation as an important exception to occasionally take drug costs into account, especially in outpatients' settings. This finding is in line with GCPS' observation that price sensitivity may be higher for physicians who mainly treat patients with low-refund health insurance types. Interestingly, additional findings suggest that general practitioners – as a result of a higher risk of patients discontinuing costly drug treatments - focus more on the price of drug therapy than specialists do. The same goes for younger physicians, who are better trained to focus on cost-benefit issues.

According to GCPS' empirical results, the relationship between price and prescription rate would even be positive in many cases, a finding they explain as a result of price being used as a quality indicator. Our in-depth interviews reveal, though, that prices are hardly known or taken up in the decision process. Yet, physicians appear to perceive a clear positive association between a company's R&D investments (which often translate into higher prices) and its perceived drug quality. This quality perception was found to be particularly important for the difference in prescription rate between patented and generic products (statement 22). Although generics do contain the same basic ingredients as the original drugs, they are perceived to be of inferior quality (a finding which is completely in line with Hurwitz and Caves's (1988) results) and this -

as explicitly stated by several physicians - not because of their price advantage, but because of the absence of a strong research reputation and lack of transparency in the production process. This is well illustrated by the following typical interviewee reaction:

> *"Most physicians still prefer traditional brands … That these products are more expensive is more than reasonable, the pharmaceutical companies that develop them also invest more money in research and production control … and in this way provide higher guarantees of product safety and effectiveness … Besides, the price difference with generics isn't even that large in many cases, especially not for hospital packages. So why prescribe a copy if you can have the original for a slightly higher price?"*

Advertising. Traditionally, pharmaceutical companies' promotional efforts almost exclusively concentrated on detailing and free product samples directed to physicians (GCPS). Recent sector information, however, points to a strategy shift, pharmaceutical companies now allocating a larger share of their promotion budgets to advertising, and extending their target groups with 'end-consumers' (see e.g. Freudenheim 1998, Leffler 1981, Wilkes et al. 2000)[13]. Our study sheds more light on the physicians' attitude towards, and perceived effect of, pharmaceutical advertising directed to (i) the physician and (ii) the consumer (Direct-To-Consumer or DTC advertising[14]).

In line with triangulation principles, the impact of *advertising directed to the physician* is assessed by considering drug information published in different media (medical journals, official publications) and originating from different sources (pharmaceutical companies versus government and professional organisations) (statements 1-4, 9, 13). In addition, we confront the effect of published information with that from personal sources (medical conferences, discussion groups, word-of-mouth communication). Some interesting findings emerge from these analyses. First, most physicians clearly prefer verbal over written information, a major reason being that

this type of information takes less of their valuable time (see discussion on information overload above). Only a small minority of respondents prefers searching for the needed drug information in printed or electronic information sources, rather than listening to a sales representative or presentation at a medical conference. Second, information effectiveness depends to a great extent on the perceived objectivity and expertise of the source on the one hand, and the specificity (direct applicability) of the information on the other hand. This view is shared by all physicians, independent of their preference for verbal or written information. Third, while the general attitude towards advertising is negative, ad effectiveness varies with the type of ad and setting. As indicated by Leffler (1981), informative ads work better in drug markets with (i) a high rate of new product introduction, (ii) high costs of ineffective drug treatment, and (iii) repetitive drug use for treatment of chronic diseases. Conversely, repetitive, persuasive ads are more suited for established, low-risk, acute therapeutic classes, where prescribers are often general practitioners. This point of view is confirmed by the specialists in our sample, who indicate that advertising (with perceived low information content) usually has a stronger effect on the prescription behavior of general practitioners compared to specialists (statement 9).

With respect to DTC advertising, GCPS suggest that synergetic effects could be achieved by "*capitalizing on interactions between patients and physicians through a concerted marketing effort targeted at them simultaneously through different promotional channels*". Two conditions must be met for this to occur (Gönül et al. 2000). First, DTC advertising should lead patients to ask their physicians for (information on) advertised drugs, a phenomenon that has been reported by Freudenheim (1998), and is confirmed in our interviews:

"While I was working as a general practitioner I already noticed that patients became more and more demanding about the drug prescription they wanted from me…They read something about product X and asked for it …or they wanted brand name Y because their neighbour felt so much better with it …".

Second, the physician should not be predisposed against DTC advertising, and willing to involve patients in prescription decisions. In line with the results of Gönül et al. (2000), we find that the physicians' attitude toward DTC advertising is essentially negative, implying that the second condition may not be met in the majority of cases. Rather than valuing increased patient involvement, physicians may feel threatened in their expert position, become annoyed with the patient's interference – especially in risky choice situations - or simply attach little value to his/her opinion on which drug to prescribe (in view of the patient's limited pharmacological knowledge, see Freudenheim 1998). Wilkes et al. (2000) and Freudenheim (1998) also point to the physicians' concern that DTC ads contain inaccuracies (side effects are, for instance, often not clearly mentioned) or encourage demand for unnecessary or inappropriate treatment. As a result, physicians would have to spend more time in 're-educating' the patient, losing valuable time for discussing important treatment issues. Patient prescription requests are for these reasons often not followed (see Freudenheim 1998 for some recent research results), and may even cause an adverse effect (Galewitz 1999) as is fully confirmed by our interviews:

"Drug advertising influences the drug knowledge and preference of the patient, but not my prescribing behavior ….. and if it does, never in the positive way, rather the opposite would be true…"

According to the interviewed specialists, the situation may be different for general practitioners, who mainly treat acute diseases with lower drug prescription risks, making it easier to comply with advertising induced prescription requests. For obvious reasons, general practitioners are also believed to value long-term relationships with their patients more strongly, and thus attach greater importance to patient involvement:

"…as a specialist, it is so much easier to say no to the patients' drug requests …"

Detailing. In the highly complex and rapidly evolving drug market, sales representatives have an important information function, both for new and existing products. Personal selling is also believed to have strong persuasive effects (see e.g. Zuger 1999). GCPS therefore expect that more intensive pharmaceutical detailing will increase drug prescription rates, and find empirical support for this hypothesis. At the same time, returns to scale appear to be decreasing, suggesting that a high frequency of sales visits may become counterproductive.

Our interviews fully confirm these results, and provide additional insights into the underlying mechanisms (statements 10 and 13, see also Appendix 2). Most physicians indicate to appreciate sales representative visits as a valuable and quick source of information. Given their tight time constraints and the high risk and complexity of drug choice decisions, reliable and efficient information sources are deemed to be of crucial and even growing importance (see Zuger 1999). The present study strongly indicates the general preference of physicians for types of information acquisition they themselves can determine and keep under control in terms of selection of topics, choice of specific issues, and amount of time spent (comparative analysis of responses to statements 1-4, 9, and 13). Combined with the sales representatives' perceived expertise[15], this also explains why physicians have a clear preference for detailing over advertising. At the same time, physicians clearly do not want to spend more time on sales visits than what is strictly needed to update their pharmacological knowledge. In support of GCPS's tentative explanation of the inverted U-relationship between detailing and prescription rates, high time constraints and opportunity costs appear to be the major reason for this negative attitude towards too frequent or long-lasting sales calls.

GCPS expect, though, that the persuasive effect of detailing on prescriptions will be short lived. In support of this proposition, most interviewed physicians acknowledge to regularly increase drug prescription rates after a sales representative's visit, but to do so only temporarily. Cross-validation of this finding with information obtained from other medical staff confirmed this fact, nurses and hospital pharmacists observing clear undulations in the physicians' prescription behavior following pharmaceutical sales calls. This is well illustrated by the following citation:

> *"Visits of medical representatives can cause small temporary fluctuations in the drug prescribing behavior of physicians ... until a steady state (choice set) is reached again ... especially if new products or non-responders are involved"*

At the same time, clear indications are obtained that this does not imply, though, that detailing has no long term effects at all. Especially for new or less known products, detailing can persuade physicians to try out products and – in case of positive experiences – include them into their consideration set, thereby increasing the prescription probability in the long term. Wazana's (2000) finding that sales calls from pharmaceutical representatives sometimes lead physicians to request that a drug be added to the hospital formulary, points in the same direction.

In addition to these short-term, direct effects, GCPS expect that detailing can have an indirect long-term effect on prescription behavior through the increase in the physicians' product knowledge, which in turn is hypothesized to affect their (long-term) price sensitivity. They find price sensitivity to increase with detailing, pointing to a 'price information' effect. Our research results, in contrast, point to weak or non-existent price information effects. In spite of the fact that the interviewed physicians regularly receive sales calls from pharmaceutical representatives, the large majority acknowledges to have very limited price knowledge. Furthermore, although most respondents indicate to appreciate sales visits for the information they provide, none of them

mentions price as an important information component. All agree that they are primarily interested in receiving pharmacological product information. Again, this must be linked to the prevailing health insurance system (see price section). The fact that the need for product information varies strongly across drug markets (see advertising section), may provide a further explanation why detailing increases price sensitivity in some cases (as found by GCPS), while it does not affect (our study) or even decreases price sensitivity in other situations (see e.g. Wysong, 1998).

Samples. Like for detailing, GCPS expect that samples will have a positive effect on drug prescription rates, because they facilitate new product trial and encourage brand loyalty. Samples are, for instance, thought to create commitment towards sales representatives and their company, and to serve as a reminder of the sales representatives' visit once they have left.

Although they appreciate receiving samples, most physicians in the present study clearly indicate not to feel more strongly committed towards sales representatives (or companies) who provide them with free drug samples (statement 11). The high frequency of sample distribution appears to be a major reason for this. As indicated by Van Zandt (1993, p.92) "*physicians virtually expect samples will be available upon new product introduction*". The fact that high levels of sample distribution diminish their effectiveness is completely in line with the wearout effects reported in the sales promotion literature (see e.g. Blattberg et al. 1995). When probed after the reasons why they nevertheless appreciate receiving product samples, new product trial turned out to be one of the most highly valued advantages, other reasons being that samples can be used to improve the relationship with patients, solve emergency situations, and help low-income patients:

"Free drug samples are useful gifts. They give me the opportunity to see the (new) drug in the package and form the patient buys it… I can use them in emergency situations, and, yes, a sample can trigger my memory, but it depends on the quality of the product and on the cases (patients) you get in the office whether you will or can use it …"

In all, the results of this study suggest that – although samples may be indispensable for successful new product introduction – they are unlikely to lead to a significant increase in prescription rate of existing products in the long run.

Gifts. In addition to samples, many pharmaceutical companies also offer various gifts (sponsoring of conference participation, travel and lodging, medical education, meals, honoraria, promotional material and other small gifts such as pens; see Wazana 2000 for an overview), which mainly aim to enhance the long-term relationship between the company and physicians (DeSarbo et al.2000). Most respondents believe that the effect of these gifts - the non-medical-oriented ones in particular - has sharply diminished under the current market conditions (statement 11). Like for samples, the fact that giving gifts has more or less become common practice may be responsible for their diminished effectiveness (Jhon 2001), but may also imply that not giving these advantages may elicit negative reactions. This may especially hold for the sponsoring of medical conference participation which, in contrast to most other gifts, appears to be highly valued by most physicians (a similar finding is reported by Wazana 2000):

" Conferences give physicians the opportunity to talk with peers, opinion leaders and drug experts within their own field of expertise…They can discuss the drug treatment of particular cases in an informal way….Such word-of-mouth exchange of drug information can change your perception of certain drugs, and inherently your drug choice…"

While most respondents indicate that conference financing usually has no strong direct effect on their prescription behavior (unless the promoted products are medically equivalent to currently

prescribed drugs), it is believed to strengthen the physician's commitment to the financing company (possibly as a result of the company's increased legitimate power), thus increasing brand loyalty in the long term. Moreover, conference sponsoring may have a synergetic effect with detailing when the company's sales representatives attend the conference: several respondents indicated to consult these representatives for further information on issues discussed during the conference presentations (statement 3, 15). The fact that physicians can take the initiative and ask for very specific information (see earlier) is bound to increase the effectiveness of these sales talks. Finally, these franchise-building promotions are not only offered to practitioners but also to medical students, on which they are believed to have a relatively stronger impact (see also Wazana 2000, and Jhon 2001).

CONCLUSIONS AND FUTURE RESEARCH

In this paper, we presented a qualitative research approach to analyze drug prescription decisions of physicians, and uncover the role and impact of marketing mix activities of pharmaceutical companies in this decision process.

From a methodological viewpoint, analyzing drug prescription decisions represents a particularly interesting case. First, as indicated by Kahn et al. (1997), the process is likely to be quite complex. This calls into question whether traditional, quantitative models, which are typically quite streamlined and mostly based on compensatory rules, are adequate representations of the decision process. Moreover, even if researchers were willing to adjust their model structures to mimic the real life complexity, the question remains whether purely behavioral data, on which

these models are often based, would reveal the true underlying story[16]. Second, the sensitivity of certain drug prescription issues (such as the possible - yet socially less acceptable - influence of non-medical - read: commercial - factors), coupled with the fact that physicians are highly educated and alert respondents, places high demands on the qualitative data collection procedure.

The approach proposed in this paper is designed to meet these challenges. It consists of a carefully set up combination and sequence of data collection and analysis procedures. The open-ended approach - subjects reacting freely to cues provided to them - should allow to gauge the full complexity of the decision process. To safeguard the validity of the findings, three types of triangulation are used in conjunction (data, investigator and methodological triangulation). Moreover, response bias on sensitive issues is reduced through the use of projection techniques, framed and combined within the suggestion of a Delphi setting. The method generates new insights into the physician's pharmaceutical decision process and provides plausible - yet not obvious – outcomes, also for the more sensitive issues (such as the negative reactions of physicians to direct-to-consumer advertising). In all, the findings seem to picture our approach as a valuable research tool. While, of course, the exact content of each research stage is dictated by the context at hand (medical prescription behavior), the framework and its underlying tools can be translated to other decision contexts, and prove especially suitable in settings with highly complex, sensitive decision making by highly educated persons.

At the substantive level, the qualitative research approach provides interesting new insights into prescription behavior and its antecedents. Instead of re-iterating these findings – which are extensively discussed in the previous section, and summarized in Table 2 - we point out how they can be put to proper use in subsequent large scale, model-based analyses of prescription behavior.

First, we find prescription decisions to be hybrid in nature, comprising a mixture of disjunctive (or conjunctive) rules, lexicographic decision making and compensatory rules. Moreover, when facing a prescription situation, physicians will not consider the complete set of product alternatives available, but rather consider only a limited set of alternatives and operate within even more narrow choice sets. These findings may have important implications for the way prescription behavior is modelled. To capture the true prescription process and avoid parameter biases (see e.g. Swait 2001, Abramson et al. 2000), drug choice models should allow for non-compensatory decision rules, and model product selection along a number of decision stages, with consideration/choice sets that are typically small, and change with time and patient (see, e.g, Siddarth et al. 1995 for a possible modelling approach).

Second, while there is no evidence of clearly delineated prescriber segments, our findings point to some differences in behavior between (i) general practitioners and specialists, (ii) age categories, (iii) physicians with more or less time pressure, and (iv) type of practice (hospital vs private setting). At the same time, prescriptions are bound to systematically vary with idiosyncracies of the prescription context. While these may be very hard and costly to measure, one way to account for them in choice models is by allowing for heterogeneity across occasions rather than only across prescribers per se. Moreover, as prescriber and context differences may affect not only expected outcomes but also decision variance, researchers should allow for scale factor (error variance) differences in the drug choice model (DeShazo and Fermo 2001).

Third, quantitative analysis to date points to the presence of *dynamics*, which is confirmed by our findings. Our results further suggest that these dynamics comprise both inertia (habit persistence:

impact of previous prescription *tendencies* on future choices) on the part of the prescriber, and feedback effects (structural state dependence, or impact of previous choices *actually made*) (see, e.g., Roy et al. 1996). While inertia is primarily found at the level of the choice (consideration) set, feedback effects are especially valid *within* patients - product switching occurring either for new patients, or for non-responders. This points to a need for collecting individual level data that allow to identify not only the prescriber, but also the patient for whom the prescription is formulated. Unless such information is present, patient-differences are likely to constitute an important source of latent heterogeneity between prescription occasions. Also, not having patient-specific data may mask much of the dynamics at work in the prescribers' decision process.

Besides highlighting the general decision process, this research generates insights into the role of marketing mix instruments, which also constitute relevant prior information for model building. They may suggest in which stage a marketing instrument may intervene (e.g. consideration set formation, versus ultimate choice) and whether it acts in a compensatory or a non-compensatory way. Selective indications are also obtained on the shape of the effects, the dynamics involved, and potentially important interactions with other instruments.

The outcomes of our study suggest that *price* – though positively linked with perceived drug quality - is generally unimportant. However, price may be salient in brand selection for very expensive products, or products prescribed for patients on a very tight budget. Also, general practitioners and younger physicians seem somewhat more alert to price, and increased government pressure is bound to increase price attention in years to come. From a modelling perspective, these findings imply that (i) not accounting for product quality or company reputation may seriously bias price effects, (ii) a very high price is likely to act as a disjunctive

criterion, excluding the product from the choice set, (iii) price sensitivity may vary across prescribers/occasions, and (iv) price effects may be time varying.

Modelling and interpreting observed *advertising* effects calls for a distinction between informative versus persuasive, and direct-to-physician versus direct-to-consumer ads. While informative advertising directed towards specialists may promote products into the awareness set and maybe the choice set, it is expected to be less effective than detailing. Non-informative ads may even trigger negative responses. The negative attitude towards advertising is even more pronounced for DTC ads, which in some cases may even lead to lower prescription rates of the advertised drug.

Like previous researchers, we find *detailing* to have a positive immediate effect on prescription choices, with decreasing returns to scale. Interestingly, unlike GCPS' findings, our results suggest that besides producing immediate upswings (and subsequent dips) in prescriptions, detailing may also affect prescription rates over a longer period of time, by bringing products into the physician's consideration or choice set. Concerning interactions, we find, unlike GCPS, that detailing does not seem to increase price sensitivity, but can positively interact with samples and the sponsoring of conference participation.

Clearly, our study exhibits a number of limitations. From a substantive viewpoint, our insights are obtained for one country, and with emphasis on one group of specialists and on the drug categories typically relevant in their specialization. While they appear plausible and consistent with insights available from elsewhere, future research should check their validity in other countries and prescription settings. From a methodological viewpoint, there is a need for further

validation of our suggested approach. While we tested the insights generated by our approach against those obtained from previous descriptive and behavioral research, our results pertain to only one application. Finally, our methodology is clearly qualitative in nature, and the insights obtained should thus be viewed as preliminary statements that are not necessarily fully generalizable. We do believe, however, that they may provide valuable guidance and focus in future quantitative analyses of prescriptions and their antecedents, an area that continues to generate substantial academic and managerial interest.

TABLES AND FIGURES

Table 1

Sample characteristics

1a : Sample characteristics stage 1 (n=14)

Age : between 30 and 80 years
Gender : 12 males and 2 females.
Specialization : 6 physicians (4 specialists, 2 generalists)
8 observers of drug prescription behavior (2 private pharmacists, 1 hospital pharmacist, 2 head nurses, 1 sociologist and 2 medical representatives).

1b : Sample characteristics stage 2 (n=30)

Age : 21 respondents aged between 40 and 55 years; 4 were younger and 5 were older.
Gender : 23 males and 7 females.
Education : 20 subjects were trained at one university, the others studied at several universities. 5 subjects got their training also at foreign universities.
Specialization : 25 specialists (area of (sub)specialization known to the authors), 3 generalists and 2 hospital-pharmacists.
Experience : 1 subject was practicing medicine less than five years, 12 subjects were active in their field between 6 and 15 years, 11 subjects practiced their job between 16 and 25 years and 6 subjects were working more than 25 years in their field of interest.
Treatment facility : 27 different treatment facilities were involved (14 specialized hospitals, 5 specialized units in general hospitals, 2 specialized units in university hospitals, 3 health care centers and 3 private practices). 22 subjects were not only hospital-based but had a private practice too. 4 candidates were only active in a hospital and 4 others were only working in a private setting.

Table 2

Comparison of outcomes with GCPS hypotheses and results.

Hypotheses (H), Empirical Questions (Q) and Assumptions (A) of the GCPS Study	Findings of the GCPS Study	Interview results confirming the GCPS findings / assumptions	Interview results disconfirming the GCPS findings / assumptions	Complementary interview results
A1: Prescription decision process				
(a) multi-party setting, in which the physician plays an intermediary, service-providing role	(a) Not tested.	(a) the product user and buyer (patient) ≠ the decision maker (physician)	(a) physicians see themselves as experts, rather than service providers	(a) potential impact of other involved parties (family, nurses, hospital pharmacist)
(b) complex choice context, use of choice heuristics	(b) Not tested.	(b) drug choice is complicated by the fast introduction rate of new products, deficiencies in the physicians' pharmacological education and difficulties in assessing drug treatment results	(b) to simplify drug choices, company image will more easily be used as a quality indicator than price.	(b) for routine decisions, physicians prefer to rely on their own experience and operational knowledge of a limited number of products.
(c) use of compensatory decision rules	(c) Not tested.	(c) medical criteria (main and side effects) dominate drug choice decisions	(c) use of hybrid non-compensatory rather than compensatory decision process	(c) non-medical criteria may enter the decision process in case of medical equivalence
(d) between, but not 'within patient' brand switching	(d) Switching in prescription behavior over time.	(d)Physicians usually select a brand from a limited set of well-known products. Although they switch brands across patients, they are reluctant to change drug prescriptions in the course of a patient's treatment.		(d) Although not completely brand loyal, physicians display a high degree of inertia to a *set* of regularly prescribed brands; new drugs are more easily prescribed to new patients and non-responders;
(e) physician heterogeneity	(e) Three latent classes with divergent intrinsic preferences and price sensitivity	e) Physicians have different brand preferences; only a minority reports to take drug prices into account for most prescription decisions.		(e) the willingness to try out new drugs is also related to the physician's general innovativeness, his age/experience and specialisation.
Q1&2: Price effects:				
(a) Do higher prices lead to lower/higher prescription rates	(a) In two segments, price is positively related to prescription rate.	(a) physicians have a clear preference for (more expensive) national brands over generics.	(a) a positive price/quality relationship is not the major reason for the higher prescription rate of expensive drugs (see A1).	
(b) Do detailing and samples increase physician's price sensitivity as a result of increased awareness of	(b) Detailing and samples increase the physician's		(b) Most physicians regularly receive sales visits and samples, but attach very little importance to drug prices	

competitors' prices, or decrease it as a result of enhanced perception of product differentiation?	price sensitivity, because of increased price knowledge.		and have very limited price knowledge.	
H1: Insurance effects:				
The type of health insurance will have a moderating effect on the prescription probability of a drug, increasing physicians' price sensitivity when patients have Medicare coverage than when they have private or HMO insurance.	Not confirmed.	Less relevant (similar type of health insurance for most patients).		Physicians are more sensitive to price when treating low-income patients, and in ambulant compared to hospital settings (confirming GCPS' assumption that the *share* of drug cost carried by the patient, may affect the physicians' price sensitivity)
H2: Detailing and samples				
(a):Detailing and samples have a positive (main) effect on the prescription probability of a drug.	Confirmed: higher levels of detailing and samples lead to higher prescription rates, but only in the short term.	Sales visits from pharmaceutical representatives often lead to temporary increases in drug prescription rates.	Pharmaceutical sales representatives are a valued source of pharmacological information, and may in this way also have a longer-lasting effect on drug prescription behavior. Because samples are heavily used in the analysed market, they normally do not directly increase prescription rates (except for new products).	Most physicians have a clear preference for oral pharmacological information over written information. They also attach great importance to the direct applicability of the information and the objectivity/expertise of the source.
(b):Detailing and samples will have diminishing marginal effects on the prescription probability of a drug.	Confirmed.	Although they value the information provided by pharmaceutical sales representatives, most physicians express a clear aversion against too frequent sales calls due to high time constraints.	Samples do not have a substantial direct effect on drug prescription rates (see H2(a)).	In contrast to most other gifts, conference subsidization is still a much appreciated 'relationship' gift. Regular sales visits – as well as a minimum number of freely distributed drug samples – may be needed to *maintain* products in the physician's consideration set, and to update knowledge on new or less known products.
A2: DTC advertising:				
DTC advertising - in combination with detailing - may produce synergetic effects.	Not tested.		Most physicians have a negative attitude towards DTC advertising, to the extent that it may even have a negative impact on drug prescription rates.	The probability that increased patient involvement - created by DTC advertising - will have a positive effect on drug prescription rates, is higher for family doctors than for specialists. Synergetic effects may occur for other combinations of marketing mix instruments, such as conference subsidization and detailing.

Figure 1

Overview of the Data Collection and Analysis Procedure

STAGE 1: GENERATION OF PRESCRIPTION BEHAVIOR STATEMENTS

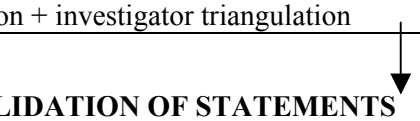
Sampling
Purposive, medical and non-medical informants
Saturation principle for sample size (n=14)

Instruments
One field researcher + literature-based and practice-based interview guide

Data Collection
Semi-structured, individual in-depth interviews, using projection techniques

Data analysis
Identification of meaning units and generation of 150 statements
Data reduction by 4 researchers through transformation of meaning units into 30 statements

Validity
Data triangulation + investigator triangulation



STAGE 2: VALIDATION OF STATEMENTS

Sampling
Purposive, mainly specialists
Fixed sample size (n=30)

Instruments
Same field researcher + 30 statements (stage 1) as interview guide

Data Collection
Semi-structured, individual in-depth interviews, using projection techniques

Data analysis
Content and comparative analysis guided by pre-specified theoretical criteria
Independent evaluation of data by 4 researchers
Intensive group discussions among those 4 researchers

Validity
Data triangulation, investigator triangulation, methodological triangulation

Appendix 1: Research instrument stage 2

Table A.1.

Statements

Statement[a]
1. The medical and pharmacological education physicians receive, has a pervasive and long-lasting impact on their prescription behavior.
2. Although medical journals have a wide reach and often contain articles providing valuable pharmacological information, their impact on prescription decisions is usually quite small. Compared to these articles, information published in the Folia Pharmacotherapeutica[b] is much more authoritative and influential.
3. Medical conference participation often leads to increased prescription rates of products, brands or preparation forms that received positive comments on the conference. Publications in medical journals (scientific articles, research notes, advertisements) providing similar pharmacological information are far less influential.
4. With the exception of hospital pharmacists, pharmacists have little influence on the physicians' prescription decisions, and affect neither the choice of product category, nor the selection of brand or preparation form.
5. Restrictions imposed by the hospital formulary often result in substantial discrepancies in prescription behavior between hospital and private practices, i.e., physicians often prescribe different products, brands or preparation forms during hospital and private practice consultations, but usually stay with the same product category.
6. Nurses play an important role in adjusting drug treatments to individual patient needs. Their experience and close observation of treatment results is not only of crucial importance for the choice of preparation form, it can also influence the physician's choice of product category, type and brand.
7. Family doctors usually follow the specialist's prescription decisions, but not vice versa. On the contrary, specialists may even have a tendency to change drug treatments previously prescribed by family doctors.
8. Pharmaceutical company image is no longer of any importance for a physician's prescription choices.
9. Drug advertisements published in mass media (television, newspapers, magazines) may influence the patient's drug requests, and directly or indirectly, the physician's prescription decisions. This is equally true for the choice of product category, type, brand and preparation form.
10. Sales visits of pharmaceutical representatives produce clear upswings (and downs) in the prescription rates of promoted products.
11. Gifts of pharmaceutical companies - such as free product samples and restaurant visits – are no longer effective in influencing the physicians' prescription behavior. Sponsoring of medical conference participation, on the contrary, can ultimately make the difference in the choice between two or more acceptable products.
12. For the choice of frequently prescribed drugs, most physicians essentially rely on their experience with and operational knowledge of a small set of familiar choice alternatives.
13. As a result of the fast introduction rate of new drugs, and deficiencies in the physician's pharmacological education, pharmaceutical sales representatives are an indispensable source of information for updating the physicians' drug knowledge.
14. In selecting a product from a given drug category, physicians first decide on the pharmaceutical company, next, select one or more products that provide the desired main effects, and finally, make a choice in function of undesirable side effects.
15. At medical conferences, pharmaceutical representatives direct their sales efforts not only to practicing physicians, but also to medical students, and in this way, secure a place in the working memory of these future prescribers.
16. Young, inexperienced physicians try out new drugs too easily. Older, more experienced physicians - on the contrary - are more hesitant in changing their habitual prescription behavior, and usually prefer to

rely on their operational knowledge of familiar drugs to select a product, brand and preparation form.

17. Drugs that do not comply with a number of crucial minimum criteria (of medical or non-medical nature) are simply not considered for prescription.
18. Multiple pathology patients impose very difficult drug choices on the physician. In case of doubt between two or more non-routinely prescribed products, the physician will carefully evaluate the products, and choose the product that provides the best combination of main and side effects.
19. In selecting a prescription drug, treatment efficiency, as well as ease of use and dosage, are of much greater importance than drug costs. Price will only enter the decision process when patients (are thought to) experience serious financial difficulties, in which case physicians may even decide to prescribe a product or brand with lower cost, yet more (serious) side effects.
20. Drug costs will seldom be a decisive factor for the choice between medically equivalent products, but promotional gifts of pharmaceutical companies can be. This is equally true for products that are equivalent only in terms of main effects as for products with similar main and side effects .
21. The same holds for the choice between drugs with different main and/or side effects, which will also rather be influenced by promotional gifts of pharmaceutical companies than by differences in drug costs.
22. In spite of government efforts to promote the prescription of cheaper generic products, most physicians (with the exception of course of the generic firms' shareholders) still prefer to prescribe the original, branded products.
23. Drug prescriptions can help to improve the patient-physician relationship, but can in some cases also be a source of conflict, when the patient or his/her relatives have divergent opinions on the product to prescribe.
24. The medication a patient is currently taking, as well as his/her objective and subjective experiences with the product(s), are an important determinant for future prescription choices of product, brand and preparation form.
25. Sedative side effects are in some cases not only tolerated, but may – in the context of some psychiatric treatments – even increase acceptance of drug choices by relatives and/or other persons who are taking care of the patient.
26. New drugs will in many cases rather be prescribed to new patients and non-responders, than to patients who are being treated with older products (as long as those older products have acceptable side effects).

[a] Of the 30 statements that were used for the second stage interviews, 4 are omitted from the table, because they relate to the impact of local (country-specific) medical organizations and government regulations.

[b] The Folia Pharmacotherapeutica is an official publication providing pharmacological information on new and existing drug products.

Appendix 2: Illustration of qualitative research approach

The contents of the first stage interviews were carefully examined and grouped into meaning units. For instance, comments on the role of medical sales representatives and drug education were first grouped as follows:

(a) The pharmaceutical training of a physician is focused on the product category, not on the product

(b) Today most medical representatives are highly educated product specialists

(c) For a regular up-date of a physician's drug knowledge the pharmaceutical sales representatives are a good and fast resource of product information, especially when new drugs are released on the market

(d) The product information you get from representatives has a high quality

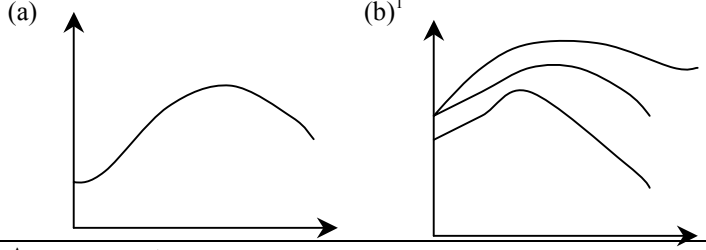
Next, these (related) meaning units were summarized into one statement:

"As a result of the fast introduction rate of new drugs (c), and deficiencies in the physician's pharmacological education (a), pharmaceutical sales representatives are an indispensable source of information for updating the physicians' drug knowledge (b, c, d)"

Experts of the second stage sample were asked to reflect on this and the other statements. Recorded reactions were content-analyzed, and compared to responses to statements 2, 3, 4, 6 and 9, by each of the four researchers. The independently derived conclusions were summarized in a synopsis sheet, containing a number of predetermined evaluation criteria (see column 1 of Table A.2). The individual evaluations were later compared, and thoroughly discussed in group sessions among the four researchers, to arrive at a generally accepted interpretation of the results, an illustration of which can be found in Table A.2 for statement 13.

Table A.2.

Synopsis of second stage interview results

STATEMENT 13: IMPACT OF PHARMACEUTICAL SALES REPRESENTATIVES	
Magnitude/importance of the effect	Quite important
Nature of the effect	Choice of product category, product type, brand and delivery system
Relative importance compared to related factors	Less effective than other non-commercial personal information sources More effective than other commercial impersonal information sources
Functional relationship (a) between factor and prescription rates (b) impact over time	(a) (b)[1] 
Effect in terms of evoked set classification	Awareness set Consideration set Choice set
Effect in terms of sources of power	Expert power Legitimate power Reward power
Differences between segments	No indications of segment differences in attitude/effectiveness
Interaction with other factors	Samples Conference participation Product life cycle
Unanimity of respondents	Great unanimity in opinions
Respondent knowledge of/experience with the factor	Adequate
Sensitivity of the topic	Somewhat sensitive (acknowledgment of being susceptible to commercial influences)

[1] The top line represents the evolution in prescription rates of new drugs which generated positive results, the middle line that of existing drugs, and the bottom line that of new drugs with negative results.

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ENDNOTES

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[1] To preserve confidentiality, the product categories cannot be identified.

[2] While this may affect the way the price element enters the prescribers' decision process, we need to emphasize that such an insurance does not take out price effects a priori, as patients get reimbursed for part of their expenses only, and still cover a portion of drug expenses themselves. In this sense, the health insurance system is highly similar to the HMO and private insurance systems studied by Gönül et al. (2001), covering 57% of the analyzed patients.

[3] The individual approach was preferred for two reasons: (1) to avoid the pitfalls of undesirable group dynamics in a setting where experts have a high self-esteem and autonomy, and (ii) because of the (expected) sensitive nature of some of the issues to be discussed (for instance, acceptance of non-medical based gifts as restaurant visits).

[4] As indicated by Miles and Huberman (1998), the fact that many qualitative studies are carried out by one and the same person – from data collection to analysis and reporting – implies a high risk of subjective conclusions. By dividing the evaluation tasks over different persons – in combination with group discussions of the independently derived interpretations of the raw data – we tried to avoid this bias and to enhance the objectivity of the conclusions.

[5] The in this way selected respondents comply with the characteristics of `good informants', as described by Cutcliffe (2000, p.1477): *a good informant is one that has the knowledge and experience the researcher requires, has the ability to reflect, is articulate, has the time to be interviewed and is willing to participate in the study.*

[6] Discussion with managers from the pharmaceutical company.

[7] Several of the respondents spontaneously switched to description of their own drug prescription behavior (even for the more sensitive issues), although they could only talk about their fellow physicians' behavior if they wanted.

[8] In this way, we aim to circumvent one of the major disadvantages of qualitative research, described by Miles and Huberman (1998, p.262) as : " .... *when we read the reports, they are often heavy on the "what" (the findings, the description) and rather thin on the "how" (how you got to the "what"). We rarely see data displays – only the conclusions. In most cases, we do not see a procedural account of the analysis, explaining just how the researcher got from 500 pages of field notes to the main conclusions drawn"*.

[9] This finding is completely in line with Kahn et al.'s (1997, p.363) proposition that high involvement decisions – combined with limited information processing capacity – may encourage the use of heuristic cues and the elimination of choice alternatives based on the value of one attribute.

[10] The 'evoked set concept' was introduced by John Howard as early as 1963, referring to the 'brands a buyer considers as acceptable for his next purchase'(or prescription) (Howard and Sheth 1969, p. 98). The fact that the notion of acceptability is not the sole criterion to reduce the number of alternatives throughout the decision process has presumably led other scholars to distinguish between several evoked set concepts. To our knowledge the most representative and popular typology was introduced by Philip Kotler and made available in several of his publications. We interpret the multiple evoked set classification of Kotler (1991 p. 183) as follows. The 'awareness set' refers to the alternatives (out of the total set) which the prescriber knows. The 'consideration set' refers to the alternatives that meet the minimum standards of the prescriber (corresponding with the original evoked set definition of Howard). The 'inept set' would encompass the alternatives that are not acceptable. The alternatives out of the consideration set that are compared more closely as they prove to be 'the strong choices' make up the 'choice set'. The alternatives out of the consideration set that are not compared more closely with others make up the 'inert set'. Ultimately the sequence of sets lead to a decision, which we interpret as a decision set since prescribers need not limit themselves to one brand option. During the interviews some physicians sometimes referred to their 'working memory', indicating the alternatives they know best and prescribe quite regularly. We feel that the 'choice set' resembles this idea most closely.

[11] Also, other phenomena typical of a routine decision stage will occur like: a favorable attitude towards prescribed brands, perceptual defense against new brands or against dissonant information.

[12] Note that, although this viewpoint can be considered socially less acceptable - and therefore be subject to interviewer bias- it was open-heartedly defended by all respondents. This can probably be explained by the fact that (for the analysed country) a large share of the drug costs is reimbursed by the National Health Insurance, and that the cheaper generic products are generally perceived to be of lower quality.

[13] As indicated by Galewitz (1999): "*Pharmaceutical companies spent $1.35 billion on direct-to-consumer advertising in 1998, a 24 percent increase over 1997 and three times the 1995 amount according to market research firm IMS Health.* In addition to drug regulation changes, these shifts appear to confirm the observed growing

involvement of patients in (some) treatment decisions, and the stronger competition from generic products (Freudenheim 1998, Wilkes et al. 2000).

[14] For this application, DTC advertising takes the form of publicity, as consumer-directed advertising of prescription drugs is legally prohibited. The interview results demonstrate though, that the physicians' attitude towards patient requests stimulated by publicity, is essentially the same as their response to advertising based requests (as described by Wilkes et al. 2000, and Gönül et al. 2000).

[15] Our observations fully confirm Zuger's (1999) statements with regard to the role and expertise of pharmaceutical sales representatives: "*the sales force performs a vital educational role in the industry ... unlike the salesmen of past years, many now have a strong background in science and health care ... For some doctors, keeping an open door for the sales representatives is an educational imperative made more essential through the glut of new products"*

[16] Or, as Abramson et al. (2000) put it : " … it may not be possible for choice models to identify correctly the underlying cause of persistence in choices, which may result in spurious habit, state dependence, preference heterogeneity or choice set effects". The authors conclude that model selection driven by behavioral, quantitative data is often not easy, and may greatly benefit from prior insights generated by a qualitative research approach.