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A Rose by Any Other Name? The Influence of Brand Name versus Chemical Differences in the Prescription of Antidepressants: The Role of Expertise.

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A Rose by Any Other Name? The Influence of Brand Name versus Chemical Differences in the Prescription of Antidepressants: The Role of Expertise.

Abstract

The effect that marketing has had on the prescription decisions of the medical profession is an area of great social and government concern and has been the subject of significant international debate. In this study the importance of brand name as a factor influencing the prescription habits of General Practitioners and Psychiatrists is examined. Using data of antidepressant prescriptions supplied by the Australian Government's Pharmaceutical Benefit Scheme and results derived from MANOVA and ANOVA analysis, it is suggested that the brand name as much as chemical differences influence the prescription of choice of antidepressants by both General Practitioners and Psychiatrists. The use of a well promoted brand name may be an important evaluation 'shortcut' by both groups regardless of detailed training resulting in medical practices which may undermine the social imperative of affordable medical care for all. The clinical appropriateness of prescriptions of antidepressants by brand name needs further investigation.

INTRODUCTION

The marketing of prescription pharmaceuticals has had the potential to impact the decisions of the medical profession resulting in a high level of social and government concern and significant international debate. On this issue, when referring to the United States, Wilkinson (2003, p. 328) poses a question, "is the U.S. health care system in crisis?" Health care is a critical factor in the quality of life of people of all nations and presents major problems for their governments. The spending worldwide of "health care-dollars" continues to grow and serious questions are being asked concerning the effectiveness of the expenditure (Commonwealth Department of Health and Aged Care 1999; Lee 2004; Mehrotra et al. 2003; Wagner and McCarthy 2004; Wilkerson 2003; World Health Organization 2004). The problems are multi-faceted and have many social, technological and economic dimensions. Predicaments of great interest to marketers emanate from the branding of prescription drugs, in particular antidepressants (e.g., Donoghue et al. 1996; Economist 2001, 2004; Oldani 2004; Olfson et al. 1998; Pecotich et al. 2002; Randolph and Viswanath 2004; Wagner and McCarthy 2004). Macromarketing issues related to the marketing of pharmaceutical drugs, like antidepressants, which do not cure an illness per se include concerns that the development of new drugs are that in some cases they may not yield substantive improvements in social benefits, such as improvements in affordable health because of the concern for private benefits, for example, profits (Lehmann 2006 and Cadeaux 2000). The consumers of antidepressants, the mentally ill, may also be considered as vulnerable consumers (Baker, Gentry and Rittenburg 2005 and Ringold 2005), therefore, will rely on the advice of suitable treatments based on the advice of medical specialists. There is, thus, a need for research at the macro marketing level to study the choices made by the medical profession in

prescriptions because of the impact of the quality of life of a society such as the provision of appropriate and affordable medical care for vulnerable consumers.

According to Antonuccio, Burns and Danton (2002) in 1999 three of the top selling selective serotonin reuptake inhibitors (SSRIs) antidepressant drugs, Prozac, Paxil and Zoloft accounted for revenues in the United States of $6.7 billion U.S. They cite evidence that as many as one in eight adult Americans had taken an antidepressant in the last 10 years and 3.5 million doses of SSRIs were consumed in 1999 alone. Coincidentally in Australia, there are similar concerns. According to figures supplied by the *Pharmaceutical Benefit Scheme* (PBS), in the eight years (1992-2000), approximately $A 754 million dollars was spent on antidepressants, with around 23 million prescriptions supplied (Department of Health and Ageing 2005). The number of prescriptions over this time grew by nearly 800% and in cost by 1500%. This expenditure was largely subsidised through the PBS' $A6 billion-dollar annual budget. Whilst these drugs have provided help to many patients, concerns have been expressed as to whether psychotropic drugs are appropriately prescribed, and whether the decisions of doctors and/or psychiatrists have been unduly influenced by the marketing efforts of drug companies (Benson 1983; Donoghue et al. 1996; Economist 2001, 2004; Holden 2000; Oldani 2004; Olfson et al. 1998; Wagner and McCarthy 2004). A Recent article in the *Australian Medical Journal* has noted, widespread marketing of free gifts to doctors from pharmaceutical companies starting whilst they are still students in medical school (Rodgers et al. 2004). Breen (2004) cites a number of studies that show widespread use of common marketing techniques by pharmaceutical companies to doctors, of which, conference sponsorships seem to be the most effective. The cost of pharmaceutical marketing in Australia is estimated to be between $A 1-1.5 billion a year (Rodgers et al. 2004) and Breen (2004) estimates that the industry in Australia spends around $A 21,000 per year per practising doctor on drug

promotion.

A recent report by the *UN International Narcotics Control Board*, also noted an increased worldwide use of psychotropic drugs, due in part, to these more aggressive marketing practices on the part of drug companies (Mallabone 2001). The report also noted these same drugs were being supplied, in some cases, without a diagnosis of "a real mental or physical disorder". The Board concluded that the prescribing preferences towards these types of drugs were sometimes a consequence of the quick solutions they offered. Commenting on the report, the Australian Medical Association (AMA) Federal vice-president reinforced this claim, citing the structure of the Medicare system, with its limited consultation times, as contributing to this over-prescription phenomenon (Mallabone 2001).

Marketing budgets for antidepressant drugs in the United States have been estimated at around $US 55 million dollars for each new product (Wilke 1997). General practitioners (GPs), who unlike psychiatrists (Ps) have limited patient time for diagnosis, and lack knowledge and training in mental health diagnosis, are the most likely to be influenced by such promotion. Yet these doctors are typically the first to treat the mentally ill and evidence suggests that depression is one of the highest illnesses encountered in practice (Holden 2000; Olfson et al. 1998). There is a clear need to identify to what extent marketing practices influence this important group. One way to gauge the effectiveness of marketing practices can be to compare the prescription patterns of GPs with those of more specialist Psychiatrists (Ps) in the area of mental health. To this end the objective of this study is to examine the prescribing behaviour amongst GPs and Ps and why they choose a particular type of anti-depressant drug, using brand name or chemical difference information.

LITERATURE REVIEW

A Tale of Two Health Systems Australia and the United States: A Macromarketing Perspective.

Public policy makers in charge of health systems around the world face the challenge of providing quality health care at affordable prices which can be accessed by a wide section of the population. Any discussion of the nature of access to medicines in the mental health area, particularly for antidepressants must take place in the context of the wider health system usually employed by government with the consent of the majority to meet the welfare of its citizens. Table 1 shows some important differences between health systems of the United States and that of Australia, the country of interest in this study. As can be seen in the United States the responsibility for health care rests mainly with individuals and employers. 44.7% of total health expenses are provided by the government and around a quarter (23.8%) of all out of pocket expenses (indicating the use of employer or health medical organisations, HMOs) are covered by the individuals.

INSERT TABLE 1 HERE

In Australia, even though the percentage of health expenditure of GDP is lower at 9.6% compared to 15.4% for the U.SA, the Australian government contributes to just over two thirds of total health expenditure (67.5%). Paradoxically, in Australia, unlike the USA there is a large percentage of out of pocket expenses paid for by individuals, (61.6%). The American health system seeks to provide affordable healthcare via competition, to those employed or in welfare need, while the Australian system is a more universal system of coverage provided by government, with the option of consumers contributing more for higher quality. As also shown in Table 1, expenditure in the Australian system is lower per

capita than in United States. The lower per capita expenditure in the Australian health system may also occur because of the way in which pharmaceutical costs are controlled by government. Prices for pharmaceuticals in Australia are subsidised by government, to the cost of the lowest competing drug in a therapeutic class. The government actively encourages consumers and doctors to consider generic drugs, which are safely manufactured in Australia. Direct advertising to consumers in the Australian system is not allowed. Despite this, as will be discussed, there are major differences in the prices of pharmaceuticals in Australia, and these may be due to marketing efforts to influence doctors to prescribe particular brands and/or medical specialists prescribing different brands of drugs because of different therapeutic outcomes. In the latter case patients are usually asked to make a co-payment towards the cost of the drugs (Department of Health and Aging 2005).

It is recognised that in the American health system there is also an effort to encourage the use of generics by Health Medical Organisations (HMOs) and by government through policies on Medicaid (Koyanagi, Forquer and Alfano 2005). The marketing of pharmaceuticals in the U.S.A is also closely monitored by the FDA, which is not the case in Australia with the PBS. This may well represent a weakness in the Australian health system in terms of affordable care and cost containment. In order to ascertain this weakness of regulatory control, especially in the area of marketing to medical specialists a discussion therefore of the effectiveness of marketing of prescription drugs seems necessary.

The Marketing of Prescription Drugs

Drug companies market their products directly to doctors using an array of standard sales techniques (Bero 2003; Breen 2004; Economist 2001; Mehrotra et al. 2003; Randolph

and Viswanath 2004; Wagner and McCarthy 2004). These include sales promotions such as gifts and rewards to practitioners, the provision of free samples (in the USA around 150,000 free Zoloft samples were supplied at its launch), and heavy advertising in medical journals (in the USA, in 1999, antidepressants were the leading category of drug advertising in medical and professional journals). In addition, drug companies generously support medical conferences and research, to the extent that studies cited by O'Malley and O'Hanrahan (1982) have shown a high level of professional inter-connectedness between doctors and pharmaceutical companies in countries such as Canada and Finland, where 56% and 17% of doctors reported such a relationship respectively. Sometimes, the relationship between pharmaceutical companies and doctors can be controversial, with recent media reports of doctors being paid up to $1000 or more for speaking fees about research they are involved with on new drugs (Regalado 2003).

The relationship between medical specialists and sales representatives appears to be important since information from sales representatives is used and trusted by doctors.

Wright and Lundstrom (2003), argue that paradoxically, that the pressure of cost containment, aging population has curtailed the time available for most medical specialists to keep informed by medical journals, leading to a greater reliance of sources of information from salespeople. They cite a number of studies including Evans and Beltramini (1986) who found that Psychiatrists rated salespeople as their second most important source of pharmaceutical information, second only to pharmacists. Latter research by Andaleeb and Tallman (1996) also suggested that doctors see pharmaceutical sales representatives as an important source of information, even though they could have acquired this information without the representative's assistance.

Recent research using panel data of major health insurers in the United States (Gonul et al. 2001 and Donohue and Berndt 2004), found that the prescription choices of

GPs were also significantly influenced by marketing activities, such as free samples and personal selling. However, it is important to note that in Australia where the data for this study was collected it is currently illegal to market directly to consumers, and so marketing to medical specialists of activities as described previously is commonplace (Breen 2004). Other research by Richard and Van Horn (2003) found that the amount of detailing, or selling and sales promotion expenditure did have an influence on brand choice within a chemically equivalent therapeutic class (e.g SSRIs in antidepressants), although they note that the impact appears to be marginal. Although they also argue that a major factor in the prescription of a prescribed drug is what they term as "automatic renewals", which accounted for 93% of prescriptions in their dataset of SSRIs. This suggests that brand name and promotions of drugs may help encourage repeat purchasing or loyalty from the perspective of the medical specialist or consumer. It thus appears that brand name may be an important factor in influencing prescription decisions, especially for a set of therapeutic equivalent drugs, such as SSRIs.

The Role of Brand Name

It is not surprising that pharmaceutical companies strongly emphasize the brand names of their products in their marketing strategies, as it has long been recognized that the brand name is the dominant cue in decision making by many consumers. A brand provides identification and continuity in the marketplace and is the most visible extrinsic cue to the consumer (Keller, 1993 & 1998; Richardson and Dick 1994; Cobb-Walgren, Ruble, and Donthu, 1995). In a review of the price /quality literature Olson (1977) argued that the influence of brand name in determining product quality is clearly linked to its familiarity. That is, the more familiar the brand, the more positive the product evaluation. This he

suggests is due to "information chunking" or the use of brand as a summary construct. Therefore, as familiarity with the brand increases, consumers are less likely to use other factors, such as price and physical quality differences, since the information "chunked" or retrieved in the brand name becomes more useful (Audhesh, Kulkarni, and Gopal 2003; Brucks, Zeithaml, and Naylor 2000; Hong, Pecotich, and Schultz 2002; Jacoby, Johar, and Morrin 1998; Kotabe et al. 2005; Miyazaki, Grewal, and Goodstein 2005; Rao and Monroe 1989). Importantly, even in the presence of well known brand names and extrinsic cues, intrinsic quality differences were still found to influence consumer judgements particularly so when consumers have greater knowledge (Rao and Monroe 1989; Li, Miniard and Barone 2000; Maheswaran 1994 and Phau and Stunornnod 2006). As mentioned, research by Richard and Van Horn (2003), suggest that brand names may have some direct influence on prescription choices of medical specialists, even amongst drugs which are therapeutically and therefore chemically the same. Research by Gonul et al. (2001) and Donohue and Berndt (2004) also suggest that marketing activities and expenditure and, therefore, brand name, may also influence prescription choices. Other research by Druss, Marcus, Olfson and Pincus (2004) suggest that the introduction of cheaper, chemically equivalent generics, in this case generic SSRIs only marginally changed the market share, by less than 1% of all established branded products in this category such as Prozac. This indicates the importance of the brand name in repeat purchasing as discussed by Richard and Van Horn (2003). This is especially so for new or innovative pharmaceutical products where marketing expenditure, one could argue the extent of branding have been found to be the most important predictor for the success and uptake of new drugs by the medical profession (Van den Bulte and Lilien 2001).

Whether marketing influences will manifest themselves purely on brand name may be debatable as promotion may involve choices to use other types of drugs. For example,

there may be new drugs that are patented. It is also quite possible that medical specialists may make prescription decisions independent of marketers. Therefore, in terms of assessing the impact of marketing on health system the two following hypotheses were developed for testing:

H_1: For all medical specialists there will be a significant main effect due to the brand in terms of the number of scripts written and total costs.

H_2: For all medical specialists there will be a significant main effect due to differences in the physical nature of the drugs prescribed in terms of the number of scripts written and total costs.

The Role of Expertise

An important factor which would determine the importance of brand name in the prescription-decisions for antidepressants, or for other medical conditions may be the knowledge or expertise of the medical physician. For example, Kapmeyer, Meyer, Kochen and Himmel (2005, p73) noted when discussing the treatment choices of some GPs in Europe of patients with depression, "limited pharmacological knowledge and negative and positive attitudes towards different classes of mood–modifying medicines may lead to prescriptions that do not seem to be rational". Adding to this issue Kapmeyer et al (2005) cited a survey of depression management in Europe, where two-thirds of those suffering from depression did not receive antidepressant treatment and one fifth were given incorrect drugs which actually treated insomnia (Tylee, Gapster, Lepine and Mendelewicz 1999).

Furthermore, Kapmeyer et al (2005) argue there is evidence of common misuse of antidepressants in specific European countries. In Germany, for example a mild slow release antidepressant (neuroleptic) remains very popular with some doctors, even though there is little clinical evidence of the efficacy of such treatment regimes in the treatment of depression (Kappler, et al 1994 and Linden and Thiels 2001). The difficulty of determining if doctors or other medical specialists made these decisions out of ignorance or because of the marketing efforts of pharmaceutical companies and their influence of brand name, is revealed in other research. Freeman, Barnes, Summers and Szeinbach's (1993) research in the United States showed doctors reported a low degree of influence in the cost of drugs, marketing and promotion activities on prescription decisions and rated most highly aspects of side effects and efficacy considerations. Interestingly, the actual product attributes of the anti-depressants, were only ranked ahead of promotion and cost.

It is also likely that research which uses behavioural data or actual prescriptions across different brand names for the same types of therapeutic drugs is likely to reveal the impact of marketing activities on the prescriptions decisions of medical specialists. As such, the impact of specialist training and therefore knowledge about antidepressant drugs may also be investigated by comparing prescription patterns across medical specialisations. Those with greater training in the treatment of depression would expect to be less likely to make decisions based on brand name. There is of course, support for this in the consumer behaviour literature where the use of brand name has also been shown to be influenced by the level of knowledge or expertise of the decision maker (Aaker and Maheswaran 1997; Choe and Cho 2000; Holbrook, Lehmann, and O'Shaughnessy 1986; Maheswaran 1994; Maheswaran and Sternthal 1990) with expert or more knowledgeable consumers relying less on brand name and extrinsic cues, and more on actual quality differences across products, than novices (Olsen 1977 and Rao and Monroe 1988). There is some support for

this in the consumer medical prescription literature with more knowledgeable consumers less likely to be influenced by direct advertising, and hence brand name effects (Vanjanapukka and Waryszak 2006). The effect of the knowledge and expertise of medical specialists in prescribing drugs in a behavioural context of actual prescriptions has rarely been studied.

Generally a convenient means of studying the effects of expertise on the use of brand name information is to examine differences between experts and novices. In this study GPs' and Psychiatrists' can be considered as novice versus expert medical specialists in the treatment of mental illness. Here the terms "novice" and "expert" are used for theoretical convenience, to illustrate the differing prescription behaviours between GPs and the more knowledgeable specialists (Psychiatrists) in the mental health area. It is recognised that even within the two groups there will be a variation of experience and knowledge in the treatment of mental illness (Benson 1983; Donoghue et al. 1996; Hadsall et al. 1982; Miller 1973; Oldani 2004; Olfson et al. 1998; Sleath and Shih 2003).

Novices and experts may be primarily differentiated on the basis of the knowledge they possess about brands and may, therefore, use different information processing strategies. Experts are more likely to detect quality differences, (have an appropriate knowledge of the pharmacological differences between drugs) and so may rely less on extrinsic cues (brand name and price) as a basis of their decision-making (Maheswaran 1994). Experts also know more about a domain, and are able to use such knowledge in a more applicable manner than novices (Allwood 1984).

There is some evidence of this in the prescription literature, with Beardsley et al. (1988) noting that psychiatrists were more likely to provide a mental health diagnosis as a reason for a drug prescription than GPs. Hadsall et al. (1982) found that GPs prescribed 45% of psychotropic drugs for non-emotional or mental health problems and that these

drugs were more likely to be prescribed by the less educated and experienced GPs. Further, Zelino (1982) noted an inverse relationship between the efficacy of advertising (i.e. brand name) and the experience and further training of GPs. This suggests that differences in training and experience in mental health between both groups may be crucial in explaining the differences in their respective prescribing behaviour of anti-depressant drugs. In terms of psychiatrists, Benson's (1983) research indicates that the prescription of drugs was positively associated with confidence in training, negatively with the degree of scepticism, of the pharmaceutical benefits of the drugs and with the extent of professional activism. Experts, as such, are expected to be more circumspect with regards to prescriptions that they should prescribe less of and at a lower cost per prescription.

Thus, the following hypothesis has been developed for testing:

H_3: Novices (GP's) will write more scripts then Experts (P's) and these scripts will cost more.

Novices, on the other hand, search the environment for simple, superficial differences, (such as brand name) since their knowledge is fragmentary and complex in its organisation. This makes its recall, use for generalisation and analysis of the object, difficult. They will tend to rely on brand name and thus be influenced more by promotions, suggesting that they will prescribe more and at a greater cost per prescription than experts. Pecotich et al. (2002) using the broad categories of "generic" and "patented" antidepressant brands found some preliminary evidence to support the notion that there exists differences in the prescription habits between general practitioners and specialist psychiatrists. Specifically, they found that GPs prescribed more antidepressants and more expensive patented drugs. Taking the issues discussed above in relation to brands, decision-making criteria used by experts versus novices and the marketing of

pharmaceuticals there appears to be evidence that GPs will rely on brand name.

Thus, the following hypotheses has been developed for testing::

H_4: There will exist a significant interaction between brand name and practitioner type (GPs, versus Psychiatrists) for all dependent variables (number of scripts written and total costs..

H_5: There will exist a significant interaction between differences in the physical nature of the drugs and practitioner type (GPs, versus Psychiatrists,) for all dependent variables (number of scripts written and total costs).

These theoretical differences in decision-making between experts (psychiatrists) and novices (general practitioners) are seen as the explanation of the prescribing pattern of branded pharmaceuticals versus any actual chemical differences that exist between these drugs. Note that the role of expertise is an important one to study at a macromarketing level. The effectiveness and affordability of medicines relies on their proper prescription by knowledgeable practitioners using appropriate drugs at the lowest possible prices. It is expected that this type of behaviour should occur more with medical specialists with specific training in one area psychiatry than those without this specialist training.

METHOD

The data for this study was derived from the 2001 Pharmaceutical Benefit Scheme (PBS), (Department of Health and Ageing 2005) prescription database of listed antidepressants, which is publicly available information and whose use is charged on a cost

recovery basis. This data is collected by the agency from the electronic uploads of every pharmacy in Australia and is organized by the postcode of the provider. The data consisted of 34, 966 grouped prescriptions and contained information on the type of antidepressant drug (as identified by an item number), chemical composition (used to examine physical differences amongst drugs), company manufacturing the drug, and the brand name (available, since every item number corresponds to a company's branded product). The dataset also contained information on the prescriber type (GP or Psychiatrist), the amount prescribed (as prescriber postcode), the incurred government cost (or subsidy) and the patient cost (both of which were summed to calculate the total cost). For privacy reasons individual level data was not available, instead data was provided on a group basis of a minimum of 4 prescribers per postcode. The mean number of prescribers per postcode was around 25, with a standard deviation of 14.15. The government subsidy was a constant proportion of the total cost to the patient so price was calculated by adding the government cost to the patient cost. For each postcode (line of record in the data) and the scripts written, the government and patient cost were divided by the number of practitioners in order to control for the size of medical practices and establishments. Each line of data thus represented total prescriptions and costs for a type of antidepressant drug and its accompanying brand name for one year, controlled for by size of medical practice. This dataset, unlike recent studies which use a sample of medical insurance information (Gonul et al. 2001 and Donohue and Berndt 2004) contained a complete list of all transactions of a national prescriptions market and so provided robust tests of all the hypotheses.

RESULTS

The dataset allowed the application of a 2 (specialty) X 23 (brand) X 20 (Drug chemical) factorial design with price, average scripts, and average total cost prescribed as the dependent variables (Neter et al. 1996). The results of the multivariate and univariate analyses are shown in Tables 2 and 3. As indicated in Tables 2 and 3 the results are statistically significant suggesting the existence of main effects for type of drug chemical ($F_{(19,32802)}$ = 88.17, p<.01, for price, $F_{(19,32802)}$ = 499.95 p<.01 for average scripts, and $F_{(19,32802)}$ = 587.30, p<.01 for average cost), brand name ($F_{(22,32802)}$ = 77.23, p<.01, for price, $F_{(19,32802)}$ = 234.16 p<.01 for average scripts, and $F_{(19,32802)}$ = 283.07, p<.01 for average cost) and specialty ($F_{(1,32802)}$ = 471.09, p<.01, for price, $F_{(1,32802)}$ = 417.80 p<.01 for average scripts, and $F_{(1,32802)}$ = 793.11, p<.01 for average cost) which supported H1 (brand name effect) and H2 (physical differences effect).

While chemical properties of the antidepressant appear to influence the decision making of both groups (psychiatrists and general practitioners) for all the dependent variables brand name was found to be just as an important consideration in prescription writing by all Psychiatrists. The effect sizes for brand name (eta-squared, or variance explained) were 1.4% for price, 4.1% for average scripts, and 4.9% for average cost per physician. For drug chemicals these were .8% for price, 4.4% for average scripts and 5.1% for average cost. The effect sizes due to medical specialty were small, and represented 1.4% for price, 1.3% for average scripts and 2.4% for average costs. With respect to the significance / effect size controversy, the effects although small, exist, and even small effects of these may have major social implications for the sustainability of publicly funded medicine.

Analysis of the plot of means in Figure 1 show a large variation in the total average cost per physician of the different drugs prescribed for depression. This ranged from the cheapest antidepressant drug, Nortriptyline Hydrochloride marketed under the brand

Allegron in Australia, which had an average cost of $13.44 per physician (GPs and Psychiatrists) to Paroxetine Hydrochloride, marketed under a number of different brand names of which Aropaw, seems the most well known and which had an average cost per prescribing physician of $2796.21. Thus the choice of antidepressant drug has a major cost impact on the affordability of public health in Australia. A similar pattern emerges with the plot of the mean of the average cost of the brand name. The most expensive brands of antidepressants were Aurorix (Moclobemide) at an average cost per physician of $2771.83, followed by Cipramil (Citalopram Hydrobromide) at $2358.01 and Zoloft, (Sertraline Hydrochloride) $2112.46. One of the most costly antidepressant brand names had competing generic or other brand name drugs. For Aurorix, this included 15 competing brands and for there were eight competing brand names. Only with Zoloft and Cipramil as patent brands were there no competing brand names. Figure 2-4 shows that Aurorix, Cipramil and Zoloft not only were the highest priced brand (see figure 3) antidepressants but were prescribed more on average than other competing brands (see figure 4). It would, thus, appear that Psychiatrists in Australia prescribe on the basis of brand name for a major chemical type, Aurorix, for the drug of Moclobemide. This not only supports the concerns of some macromarketing scholars that products may be produced which have no social benefit, e.g offer some unique product benefits, since they may be merely different brands of the same generic product (Cadeaux 2000 and Lehmann 2006).

In terms of the specialist groups Psychiatrists were found to prescribe more antidepressants at generally higher prices and at greater costs than GPs. The differences between both groups are presented in Table 4. These results did not support H3 (GPs prescribing more and more expensive drugs than Psychiatrists). An explanation for this can be found in the specialist drug and brand interaction and these are described next.

The results showed a significant interaction effect between brand name and specialty (H4) for all dependent variables. As shown in Figures 5-7 this significant interaction between the specialty and brand suggest that the brand name may enhance the prescription writing by specialists particularly with strong brands such as Cipramil. The significant interaction for drug chemical and specialty follows a similar pattern, with Citalopram Hydrobromide being prescribed as the more expensive antidepressants by Psychiatrists than GPs. One wonders if this reflects the efficacy of treatment of only one particular drug amongst a suite of antidepressants by Psychiatrists to treat the seriously mentally ill, or that as medical specialists, they have been specifically targeted to use this new patented drug ahead of competing formulations (Van den Bulte and Lilien 2001).

CONCLUSION

This study found major differences in the prescription habits amongst general practitioners (GPs) and psychiatrists (Ps). Psychiatrists prescribed on average more antidepressants, at higher prices and average costs than GPs. The result is surprising given that P's would have had greater training in the area of mental health and hence would be expected to base their prescription decisions more on pharmaceutical differences between antidepressant drugs rather than brand name. The use of a well promoted brand name may be an important evaluation shortcut used by all groups regardless of detailed training. It is these brand names, as much as any pharmaceutical differences and similarities that medical specialists may use as a basis of prescription. This may well explain the concern about the recent rise of marketing activity that has been documented in the Australian Medical Journal, (Breen 2004 and Rodgers et al. 2004).

These findings here may mirror those in the wider consumer psychology literature

where there is experimental evidence indicating that expertise may be developed through training, and the enhancement of knowledge and information processing ability. In this domain, work by Anderson (1996), Newell and Simon (1972) and Shanteau (1992) is consistent with the expected results of this study. However, outside the laboratory there are people (even when experts) who simplify, exercise choice in the cues they use, and may be subject to biases due to the nature of the configuration of cues (frames) and the context involved (Alba and Hutchinson 1987; Gigerenzer, Todd, and the ABC Research Group 1999; Kahneman, Slovic, and Tversky 1982; Loken 2006; Maheswaran 1994; Maheswaran and Meyers-Levy 1990). It would seem that results from this study support some of these findings that even medical experts, such as psychiatrists in a field situation may be influenced by brand name and other cues and be subject to other biases in much the same way as would be expected with novices. The results are also surprising given recent research has suggested that greater consumer knowledge, let alone that of a medical specialist, decreases promotional influences (Vanjanapukka and Waryszak 2006) but unlike this study it dealt with consumer attitudes and intent and not actual behavior.

These findings are of concern for vulnerable consumers, as Lexchin and Mintzes (2002, p.199) note,

> "If Psychiatrists who are more knowledgeable about drugs and have greater access to objective sources of information are negatively influenced by promotion, how realistic is it to believe that consumers will be positively affected"?

There is thus a major concern that the marketing practices of pharmaceutical companies may not provide the best treatment outcomes for vulnerable consumers, in this case the mentally ill (Baker, et al. 2005 and Ringold 2005), since it appears that Psychiatrists irrespective of knowledge and expertise are influenced by brand name as they

are by chemical differences in antidepressant drugs.

These results may also reflect a greater emphasis of direct marketing to the medical profession (sampling, conference promotions and sales visits or detailing), which may also explain the effects of brand name in prescription decisions of the medical profession. Clearly there is also a need to investigate these findings further, but this study is unique as it used actual market data which mapped the behavior of medical specialists in a country.

The nature of the Australian medical health system may also explain these results. GPs currently are only able to spend a limited time with patients while Psychiatrists on the other hand, face more severe and frequent cases of mental illness referred to them by GPs. This relationship probably occurs in other areas of practice and is clearly of concern to the Australian government, who in 2002 has trialed a "doctor bonus" which rewards the relevant professional groups when their members prescribe more generic drugs. The savings from the scheme is to be invested for further training of doctors. It could be argued, given the results of this study, that such a scheme should also be extended to other specialist groups such as psychiatrists. This would seem to be a pressing issue for government policy given the wide variation in cost of the antidepressant drugs currently used. It is also important for government policy makers in particular the PBS in Australia to closely monitor marketing activities of pharmaceutical companies marketing activities much like the FDA does in the USA. A failure to do so could expose a fundamental weakness of cost containment in the Australian system.

Another explanation of the results may lie in the effect of the antidepressant drugs themselves. There is conflicting evidence that antidepressants do not improve a patient's condition any better than a placebo (see Antonuccio et al. 2002, who cite a number of studies on this area). A major problem in investigating this claim further is that many studies on antidepressants are funded by pharmaceutical companies, and that non-

significant results are not published, creating a publication bias (Antonuccio et al. 2002). Therefore medical specialists' prescription habits may reflect not actual treatment outcomes, but those advocated and advertised claims of the pharmaceutical companies. In other words, differences in the prescribing of different antidepressant drug chemicals may reflect another type of brand effect. Another possibility is that both specialist groups (GPs and Ps) may be prescribing drugs not on the basis of cure but on the basis of side-effects. There are, for example several studies (i.e., Freeman et al. 1993 and Kapmeyer et al. 2005) which show that side effects rank highly in the prescription decisions of general practitioners. Although, again the data of these side effects may come from studies which are in the main supported by pharmaceutical companies and so may be in another form of branding of anti-depressants.

The results may also suggest the importance of targeting professional medical groups such as Ps, who may also be important opinion leaders and early adopters of new antidepressant drugs by pharmaceutical companies. Pharmaceutical companies also often provide many incentives to prescribe a brand of drugs. This may include support of educational seminars, conferences and trips, use of free samples and extensive sales promotion. Both these approaches are used with Ps and GPs, but it seems with the former group that there has been a greater degree of success, partially because most antidepressant scripts, are written by GPs given their number in Australia. A measure of drug companies' marketing to GPs and Ps may be the cost blow-out of the PBS which rose to $A700 million last year and has been increasing at a rate of 13.6% every year for the past decade. One wonders, despite the efforts of the Australian Federal government how long such a process can continue. Even in a regulated market like Australia where pharmaceutical companies cannot advertise directly to consumers, it seems that further marketing to GPs and P's may

eventually lead to greater consumer costs and a rationing of medicines on the basis of affordability rather than need. The impact of the quality of life of such marketing practices therefore needs further investigation at the micro and especially the macro level (Malhotra 2006). There is also a danger that marketing practices may undermine the social benefits of affordable medical care for all.

TABLE 1: A TALE OF TWO HEALTH SYSTEMS (2004 WORLD HEALTH ORGANISATION FIGURES)

	U.SA Health System	Australian Health System
Health Expenditure as a percentage of GDP	15.4%	9.6%
General government expenditure as a percentage of health expenditure	44.7%	67.5%
Out of pocket expenses as a percentage of private expenditure on heath	23.8%	61.6%
Per capita Expenditure at international dollar rate	3123	2724.7
Drug approval process	All prescription drugs must be approved by a government body, FDA.	All prescription drugs must be approved by a government body, Pharmaceutical Benefit Scheme (PBS).
Advertising of drugs	Direct to Consumer Advertising and promotion to Psychiatrists	Only promotion to Psychiatrists allowed.
Pricing and Costs of drugs	Cost containment by HMO's some drugs available under Medicaid and Blue Shield, otherwise set by the market.	Prices of drugs subsidised by government, consumers pay up to $30.70 for most prescriptions. Brand premiums exist, by the Govt subsidises each brand to the same amount up to the cost of the lowest brand.
Generic drugs	Generics are manufactured locally but not as widely available in Australia due to patent laws. Cheaper generics can be purchased by consumers in neighbouring countries such as Mexico. Therefore concern about the quality of generics.	Wide public acceptance of generics that are chemically equivalent to patent drugs. These drugs are usually manufactured in Australia under government approval

TABLE 2: MANOVA RESULTS

Variable	d.f	Wilks Lambda	Pillai Trace	Hotelling – Lawley
Drug Chemical (D)	98403[a]	.93**	.07**	.07**
Brand (B)	131208	.92**	.08**	.08**
Specialist (S)	32799	.96**	.04**	.04**
Drug Chemical X Brand	32800	1.00	.00	.00
Drug Chemical X Specialist	65600	.98**	.02**	.02**
Brand X Specialist	131208	.99**	.02**	.13**
Drug Chemical X Brand X Specialist	32800	1.00	.00	.00

*p< .05, **p<.01.

NOTE: Degrees of freedom varied but are not included so as to avoid clutter.

TABLE 3: ANOVA RESULTS

Source	d.f	Price F value	Ave. Scripts F value	Ave. Cost F value
Main Effects				
Drug Chemical	19	88.17**	499.95**	587.30**
Brand	22	77.23**	234.16**	283.07**
Specialist	1	471.09**	417.80**	793.11**
2 Way Interactions				
Drug Chemical X Brand	22	.00	.00	.00
Drug Chemical X Specialist	1	85.82**	29.32**	115.42**
Brand X Specialist	1	13.45**	13.65**	42.72**
3 Way Interactions				
Drug Chemical X Brand X Specialist	1	.00	.00	.00

*p< .05, **p<.01.

TABLE 4:
DESCRIPTIVE STATISTICS OF MEDICAL SPECIALIST TYPES

		Mean	Std Deviation
GP	Price	$48.52	$34.04
	Average Scripts	7.5	11.5
	Average Cost	$439.26	$836.50
PSYCHA	Price	$56.95	$40.60
	Average Scripts	10.2	17.4
	Average Cost	$836.41	$1,701.31

FIGURE 1:
NATIONAL MEAN AVERAGE COST OF ANTIDEPRESSANT DRUGS FOR 2001

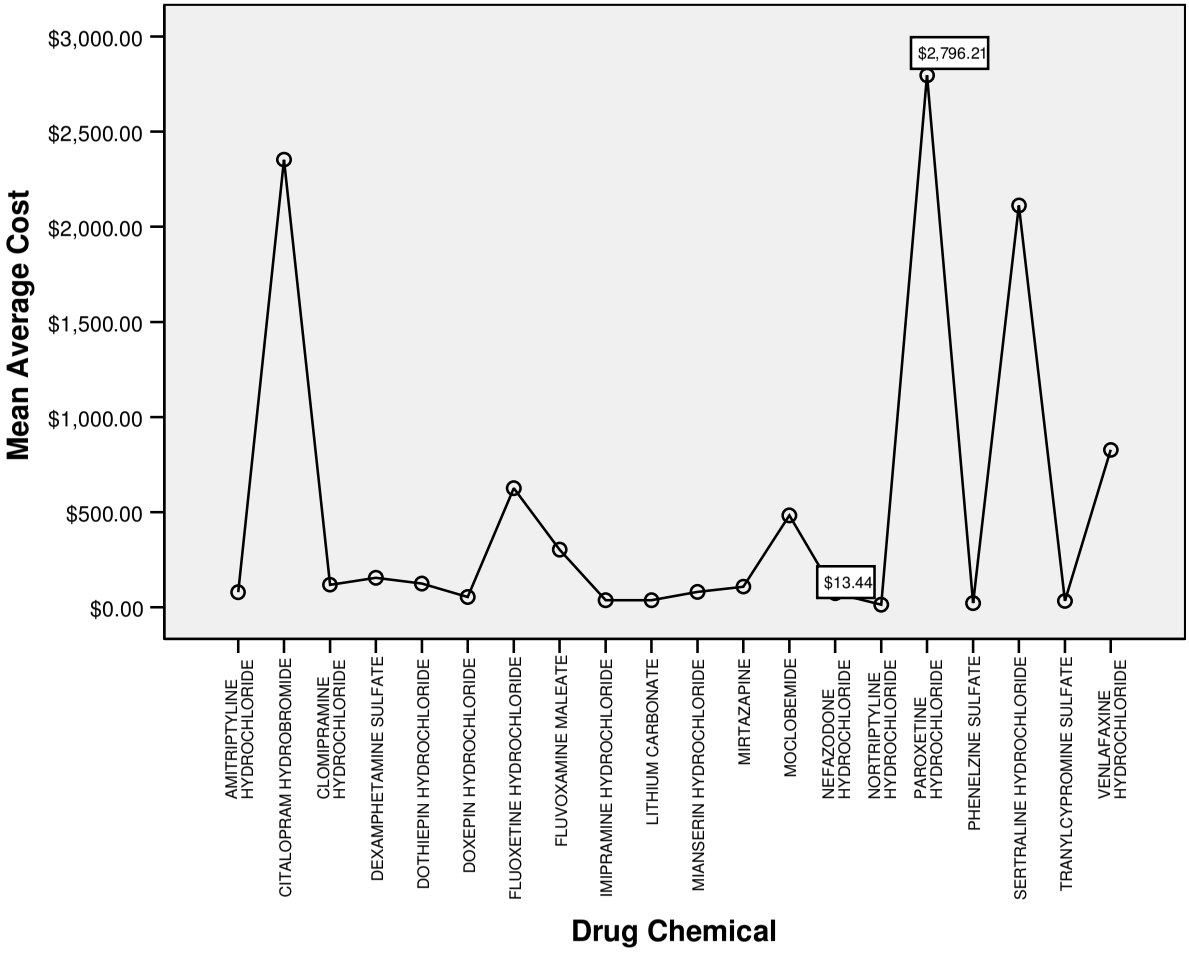


FIGURE 2:
NATIONAL MEAN COSTS OF BRANDED ANTIDEPRESSANT DRUGS OVER 12 MONTHS FOR 2001

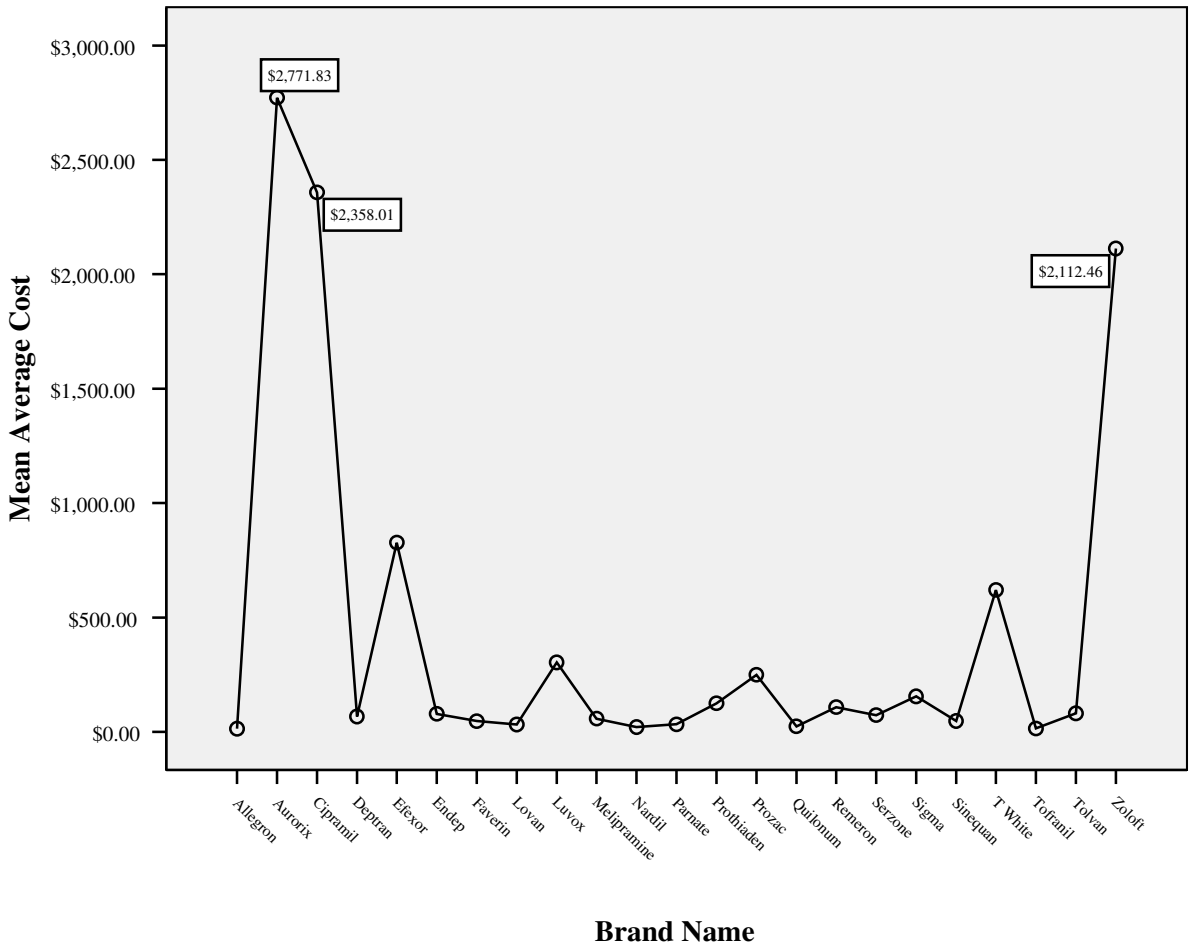


FIGURE 3:
PRICES OF ANTIDEPRESSANT BRANDS

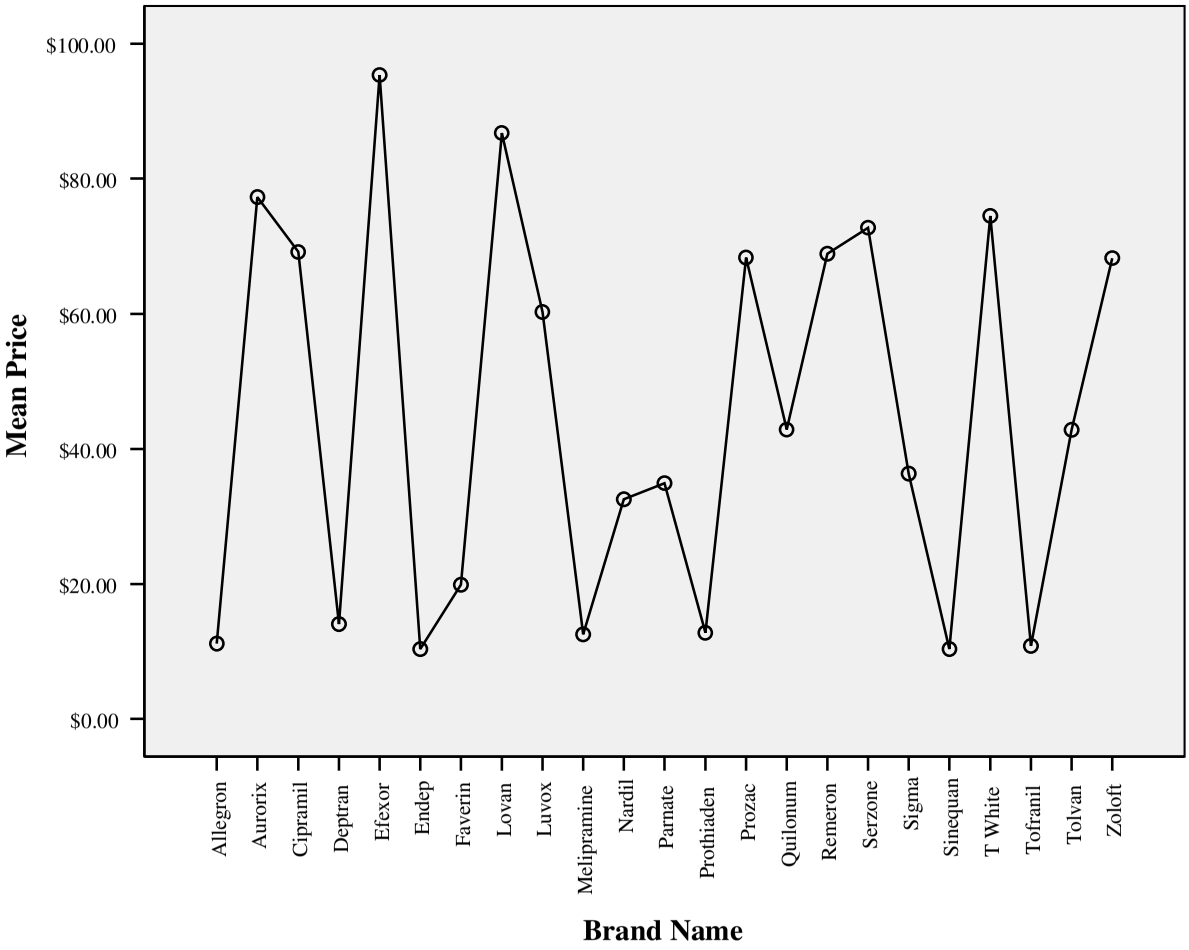


FIGURE 4:
NATIONAL AVERAGE SCRIPTS FOR ANTIDEPRESSANT BRANDS OVER 12 MONTHS FOR 2001

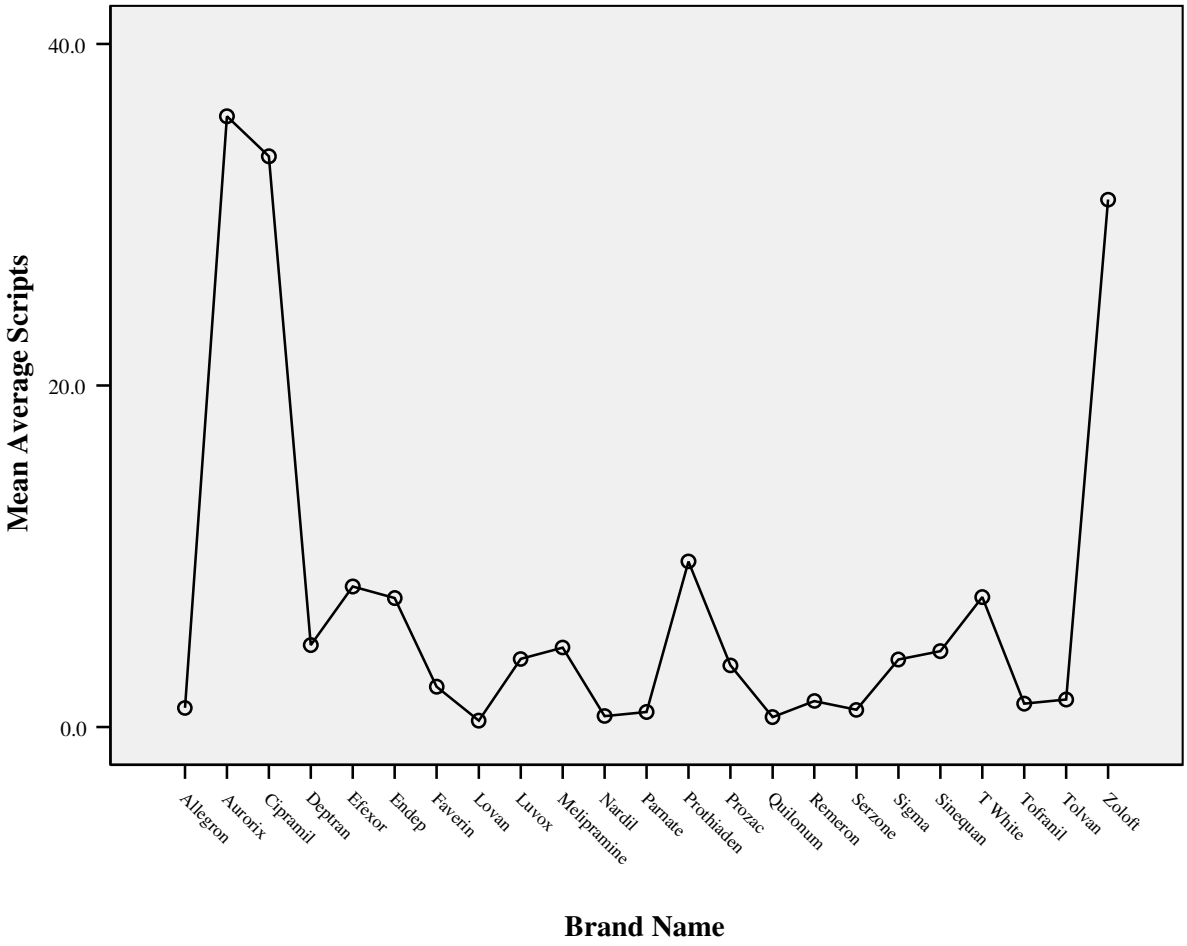


FIGURE 5:
INTERACTION BETWEEN BRAND AND SPECIALTY FOR PRICE

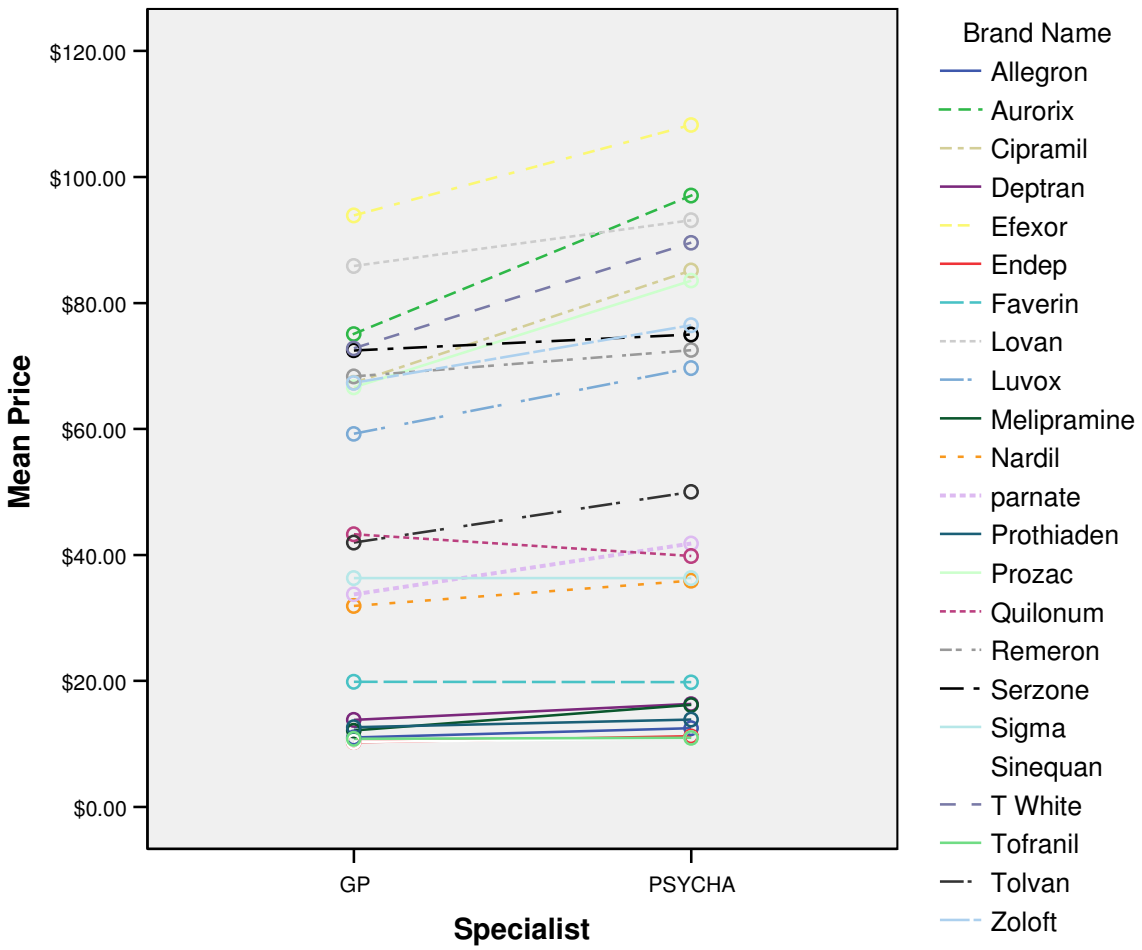


FIGURE 6:
INTERACTION BETWEEN BRAND AND SPECIALTY FOR AVERAGE SCRIPTS

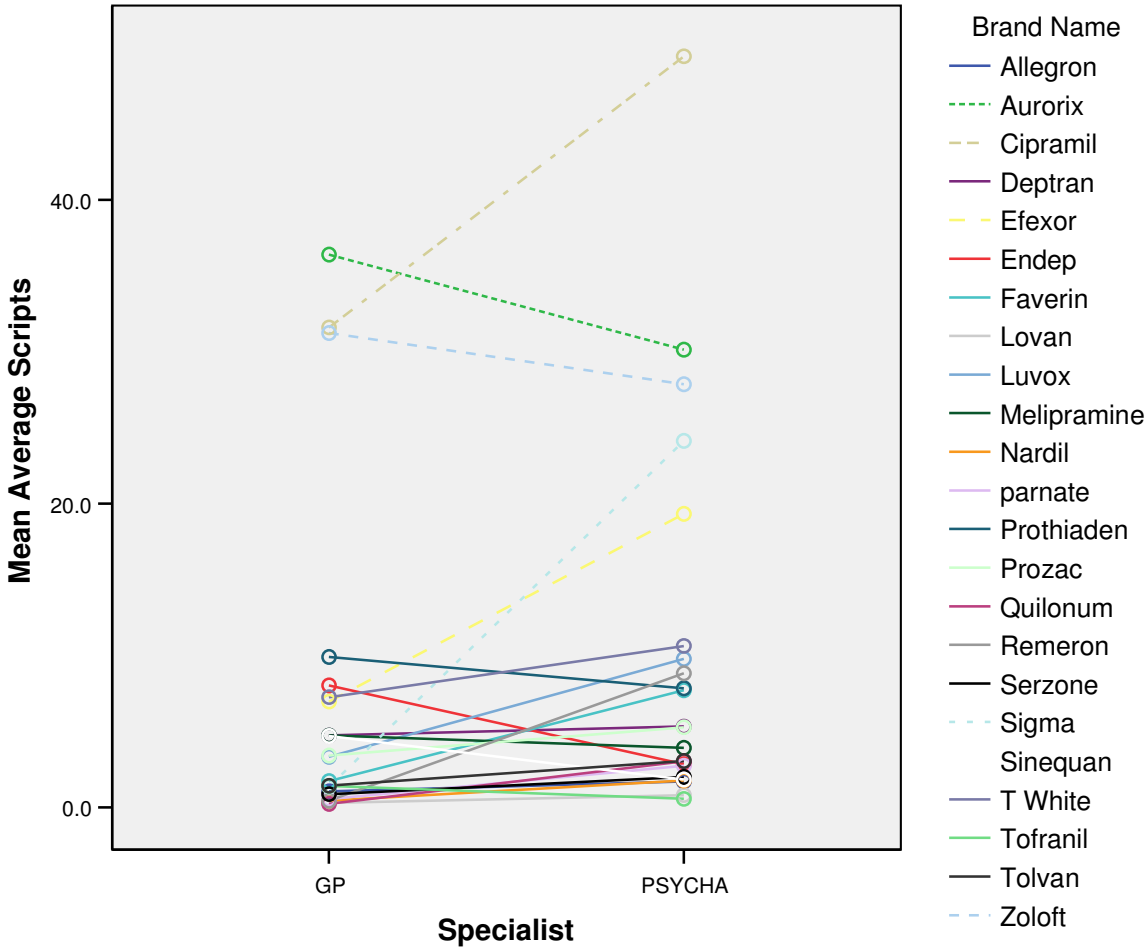
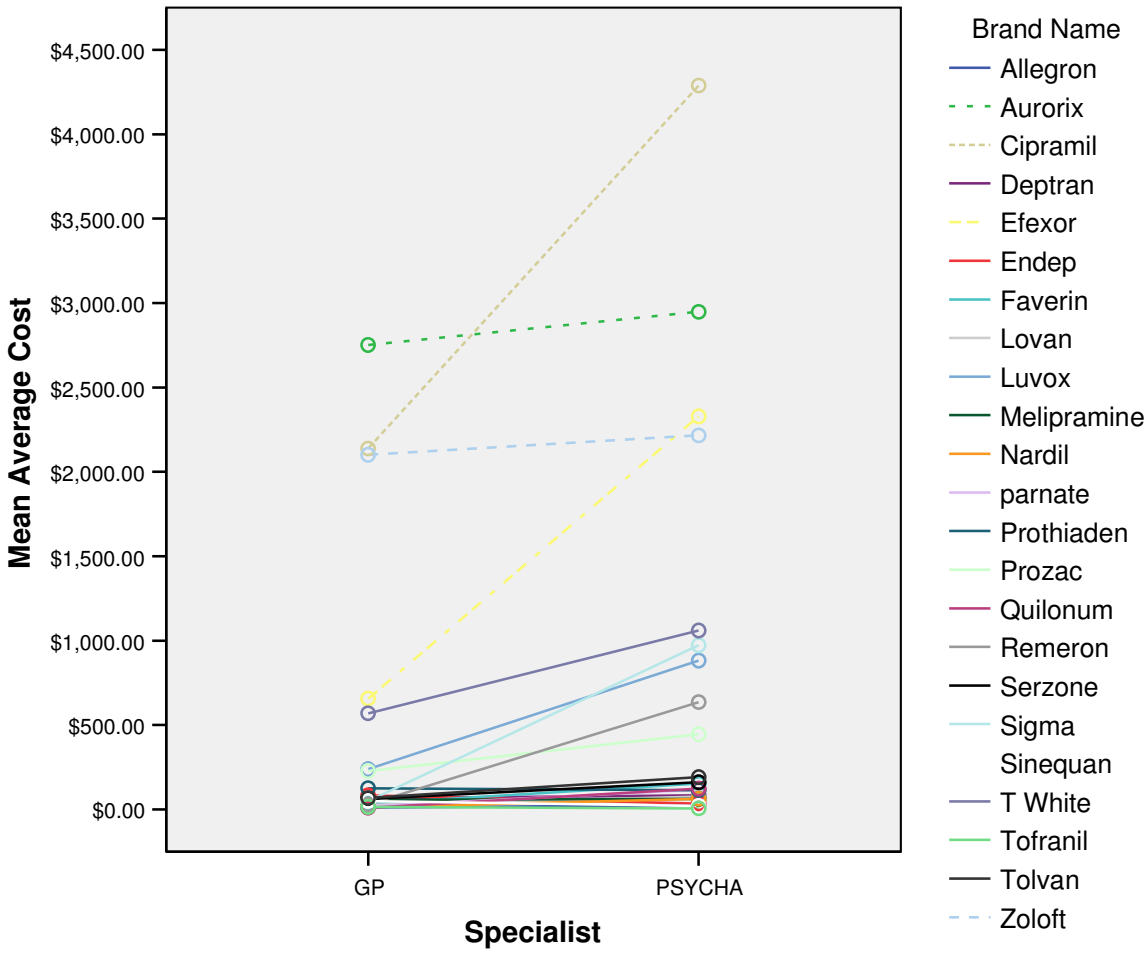


FIGURE 7:
INTERACTION BETWEEN BRAND AND SPECIALTY FOR AVERAGE COSTS



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