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## **Retail tobacco outlets: Variation by usage segment**

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### **Abstract**

Despite a variety of long-standing anti-smoking measures in most countries, smoking remains a source of considerable economic and health costs. Off line retail outlets account for the overwhelming majority of tobacco supply in developed countries, yet the effect of different retail outlets on tobacco consumption is relatively under-researched. In particular, there has been almost no empirical research on whether different types of retail outlet have different effects on tobacco consumption by different types of smokers. This paper reports on two large studies examining the purchase behaviour of independent samples of smokers. The results show important differences in tobacco purchase size across different retailers, and varying purchase patterns by different smoker types. Implications for public health and tobacco control are discussed.

Keywords: Smoking, tobacco retailing, consumer behaviour

## **Retail tobacco outlets: Variation by usage segment**

### **Introduction and Literature Review**

Tobacco smoking is said to be the largest single preventable cause of premature mortality and disease (Lopez *et al.*, 2006). Estimates by the Australian Institute of Health and Welfare suggest that in 2003 tobacco consumption accounted for 7.8 % of the entire health loss in Australia—a larger proportion than all other analysed health risks (Begg, 2008). Worldwide, tobacco use is estimated to kill about 5 million people annually, and this figure is forecast to increase to 10 million by 2030 (Jha *et al.*, 2006). Smoking prevalence in Australia, as in most developed countries, has fallen sharply. However 16.6% of Australians aged 14 years and above were still smoking on a daily basis in 2007 (AIHW, 2008). As a result, measures aimed at decreasing smoking rates remain an important health priority.

Tighter regulation of the retail distribution of tobacco is one possible action with the potential to decrease smoking and its associated health costs. Despite the growth of online retailing, tobacco distribution is still dominated by physical stores; one study of cigarette purchase patterns in the US, UK, Australia and Canada found that physical stores accounted for a very large majority of consumers' tobacco purchases in all the countries studied (Hyland *et al.*, 2006). That study also found that non-traditional retail sources (such as the internet, and purchases from low-tax and tax-free sources) accounted for small percentages of tobacco supply in all four countries, and an even lower percentage in Australia. Thus traditional retail outlets appear to dominate tobacco supply in developed countries, and any assessment of retail effects should consequently be focused on those outlets.

Despite the importance of the retail environment for tobacco supply (and hence, potentially, for tobacco control), little is known about the effect of retail tobacco distribution patterns on the level of smoking in the community. While there is strong evidence from other product categories that consumers tend to share their purchases between different retail outlets (Keng & Ehrenberg, 1984), there is almost no data on whether different smoker segments vary in their use of different retail outlets, and thus whether particular retail outlets contribute disproportionately to the level of smoking. For example a study by Hanewinkel *et al.* (2007) examined outlet usage by German smokers, but did not explicitly analyse the relationship between retail outlet patronage and consumers' smoking patterns.

There are at least three theoretical reasons why particular retail outlets may vary in their contribution to smoking by different types of smokers. Firstly, there is evidence that tobacco sales are price elastic (Chaloupka *et al.*, 2002), with heavier smokers most likely to be price sensitive (Cavin & Pierce, 1996). Although all tobacco products are taxed at fairly high rates in Australia, there is evidence that prices differ significantly between different outlet types: for example, Scollo, Owen & Boulter (2000) found that tobacconists were the cheapest outlets, followed by supermarkets. Tobacconists and supermarkets also dominate retail tobacco sales in Australia, accounting for 19% and 51% of market share respectively (PricewaterhouseCoopers, 2005). There are thus grounds to believe that the presence of such lower priced outlets may contribute to higher levels of smoking in the Australian community, particularly amongst price-sensitive heavier smokers.

Secondly, consumption of alcohol has been shown to be associated with higher levels of smoking (Shiffman *et al.*, 2002), and bars, pubs and clubs have been identified as a common venue for relapse by attempting quitters (Cancer Council NSW, 2008), possibly due to the

effect of alcohol consumption and/or due to the presence of other smokers (Piasecki *et al.*, 2008). Thirdly, retail tobacco displays (such as behind the counter tobacco displays) have been reported to result in an urge to buy cigarettes (Wakefield, Germain, & Henriksen, 2008) so retail outlets commonly visited by consumers may contribute to smoking by exposing the consumer to the sight of tobacco products. Lighter smokers and/or attempting quitters, who will presumably be less regular in their smoking behaviour, may be particularly vulnerable to any effect of such point of purchase displays.

While there are thus reasons to suggest that retail distribution may have an important role in contributing to the level of smoking, and that particular retail outlets may have effects on different types of smokers, there has been almost no research into differential use of retail outlets by different types of smokers. Understanding the factors which contribute to tobacco smoking is important in order to develop effective and efficient policy and health promotion initiatives to decrease the harm from smoking. As a result, the current study was designed to investigate any differences in usage of tobacco retailers by different smoker types.

### **Methodology**

Data was collected by two independent surveys sent to: a) a sample of 20,000 NSW residents chosen to be representative of the population by gender and age (the ‘population study’) and b) 2,287 smokers actively trying to quit, defined as people who requested a “Quit Kit” from a government health service (the ‘Quitline study’). 3,735 responses and 288 responses were obtained respectively, for a response rate of 19.4% and 12.6%. Since there is no commercially available data base of smokers, the population survey was sent to a sample chosen to be representative of the population (and thus containing a majority of non-smokers). As a result, for the population study 2,623 surveys (70%) were received from non-smokers (defined as those who had never smoked, or smokers who had quit more than 12 months previously) and were excluded from data analysis. This resulted in a final sample of 1,112 smoker respondents in the population study.

To measure tobacco acquisition and consumption behaviour, survey recipients were asked to fill in a diary style survey over a four day period, recording a number of measures for each four hour period that they were awake: purchase or borrowing of cigarettes (no/yes) and, if applicable, purchase location (i.e. retail outlet type), number of cigarettes acquired and cigarette smoking (yes/no). In addition, demographic information was collected (age, postcode of residence, highest level of education etc.) and Fagerström measures of addiction (number smoked per day, how soon after waking was first cigarette consumed) and smoking status (whether quit smoking within last month or week, quit more than one month ago or smoking daily or occasionally). Results from the full study have been reported separately, but the following analysis reports on responses by individuals who answered that they were daily or occasional smokers at the time of the survey, resulting in two separate samples: 998 self-reported smokers from the population study and 131 smokers from the Quitline study (representing 89.7% and 45.5% of each respective sample).

### **Results**

A very large proportion of self-reported smokers in each study smoked at some stage during the four day survey period: 95% for the population study and 97% for the Quitline study. 81% of the smokers in the population sample *purchased* tobacco at some stage during the four day

period, and 82.4% of the smokers in the Quitline sample. Alternative sources of supply were having stock-on-hand and being given cigarettes by others.

A comparison of the average purchase size at different retail outlets is shown in Table 1 for the two samples. In the population sample, an overall ANOVA ( $p < 0.001$ ) and follow up Fisher pairwise comparisons ( $p < 0.05$ ) showed that purchases at tobacconists and supermarkets were significantly larger than purchases at all other outlets. For the Quitline sample, there was no significant difference in purchase size between the different outlets ( $p > 0.1$ ). However the data showed some (non-significant) evidence of higher purchases at supermarkets and tobacconists, with an average purchase size at these outlets approximately 50% higher than at other outlet types, as shown in column 4 of Table 1.

*Table 1: Average purchase size (number of cigarettes) by retail outlet*

<b>Retail category</b>	<b>Population study</b>	<b>Std</b>	<b>Quitline study</b>	<b>Std</b>
Tobacconist	65.0	72.0	45.7	47.0
Supermarket	50.8	66.7	46.6	60.9
Convenience store/ mixed business	36.4	29.0	31.3	30.4
Newsagents	34.2	24.9	29.0	9.4
Liquor stores	30.2	12.3	27.9	10.3
Petrol station	29.7	13.5	27.9	8.8
Bars/ pubs/ clubs	26.5	10.1	24.2	4.9
ANOVA	$F = 12.56, p < 0.001$		$F = 1.35, p > 0.1$	

Further analysis compared the proportion of purchases at different retail outlet types by light (less than 10 per day) and heavy (more than 21 per day) smokers. Following the preceding discussion concerning the potential theoretical differences between different outlet types, the percentage of purchases was compared for: 1) cheaper outlets (i.e. supermarkets and tobacconists); 2) outlets where impulse smoking has been shown to be higher (i.e. bars/pubs and clubs) and 3) convenient outlets where visibility of tobacco products may contribute to impulse purchases (convenience stores). Differences in the proportion of purchases at each outlet by light and heavy smokers were assessed using Fisher's exact test (a pairwise test of proportions which does not rely on a normal distribution). Results for both studies are shown in Table 2 and Table 3.

*Table 2: Percentage of purchases at outlets for different smoker types, Population study*

<b>Retail category</b>	<b>&lt;10 per day (%)</b>	<b>&gt; 21 per day (%)</b>	<b><i>p</i></b>
Supermarket	44.2	48.9	$p = 0.162$
Tobacconist	12.9	17.8	$p = \mathbf{0.038}$
Convenience store/ mixed business	15.2	10.0	$p = \mathbf{0.026}$
Bars/ pubs/ clubs	6.5	2.7	$p = \mathbf{0.012}$

*Table 3: Percentage of purchases at outlets for different smoker types, Quitline study*

<b>Retail category</b>	<b>&lt;10 per day (%)</b>	<b>&gt; 21 per day (%)</b>	<b><i>p</i></b>
Supermarket	40.9	43.2	$p = 0.803$
Tobacconist	9.1	19.8	$p = 0.085$
Convenience store/	22.7	4.9	$p = \mathbf{0.009}$

mixed business			
Bars/ pubs/ clubs	6.8	0.0	$p = 0.042$

### Discussion

The results show significant differences in the usage of different retail tobacco outlets, both in average purchase size, and in frequency of purchase by different smoker types. Average purchase sizes at tobacconists and supermarkets were larger (though not significantly larger for the Quitline study) than at all other outlets. This finding may be explained by previous research which has shown that in Australia, tobacconists and supermarkets sell tobacco products at lower prices, on average, than other retail outlets (Scollo *et al.*, 2000). Research in other product categories has shown that lower prices are likely to result in larger purchase sizes, which for some product categories, are likely to be followed by higher levels of product consumption (Ailawadi & Neslin, 1998). Those findings would suggest that the lower prices charged by tobacconists and supermarkets are likely to result in larger average purchase sizes, and thus potentially in higher levels of tobacco consumption.

The results also show important differences in the usage of different retail outlets by different smoker types. In both samples, convenience stores and bars, pubs and clubs were used significantly more for purchases by light smokers than by heavy smokers, suggesting that these retail outlets may contribute to impulse smoking by lighter smokers. This is consistent with other research which found that around one-third of recent quitters reported an urge to make an impulse purchase of cigarettes as a result of seeing retail cigarette displays (Wakefield *et al.*, 2008). In contrast, heavy smokers were more likely to buy at tobacconists, one of the cheapest Australian sources for tobacco (though the result was only significant at the trend level for smokers in the Quitline study). Perhaps surprisingly, supermarkets, identified by Scollo *et al.* (2000) as the second cheapest tobacco retailer in Australia, were not significantly more likely to be used more by heavy smokers, although heavy smokers in both studies were more likely to buy from supermarkets, though the difference was not significant. The high usage of supermarkets by both heavy and light smokers suggests that supermarkets, which are presumably a convenient outlet for many consumers, may be attractive as a source of cigarettes both for their lower prices (an attraction to price sensitive consumers) and also for their ease of access for consumers who are not price sensitive.

The results suggest that different tobacco retailers contribute to smoking in different ways: firstly, some outlets (tobacconists and supermarkets) are associated with larger purchase sizes. As previously discussed, there is evidence from other product categories that larger purchase sizes may result in higher levels of consumption (Ailawadi & Neslin, 1998). Thus, larger purchases at tobacconists and supermarkets may result in higher levels of smoking. Secondly, heavy smokers were more likely to purchase at tobacconists, which Scollo *et al.* (2000) found were the cheapest tobacco outlets, on average, in Australia. This higher usage of tobacconists by heavy smokers is consistent with U.S. data which found that heavier smokers are more likely to be price sensitive (Cavin & Pierce, 1996). So tobacconists (and also supermarkets, though they were not *significantly* more likely to be used by heavier smokers) may be more attractive to heavier smokers (because of their lower prices) and may also encourage larger purchase sizes, and may thus contribute to higher levels of smoking by heavy smokers.

In contrast, the effect of bars, pubs and clubs and convenience stores on smoking appears to be very different. Purchases at these outlets tended to be smaller, on average, but these outlets

were used significantly more by light smokers, suggesting that such outlets may be particularly likely to trigger impulse smoking by lighter smokers. Other research has suggested that bars, pubs and clubs may contribute to impulse smoking: one study found that the probability of smoking nearly doubled when subjects were consuming alcohol (Shiffman *et al.*, 2002). Lighter smokers may be more likely to be cued to smoke by alcohol consumption or by the presence of other smokers, thus explaining their higher rate of purchase at bars, pubs and clubs. The explanation for the higher rate of purchase at convenience stores by light smokers is less clear, but is consistent with other studies where subjects reported an increased urge to smoke after seeing retail displays of tobacco. Heavy smokers (with their higher level of purchases at tobacconists, an outlet type associated with larger purchase sizes) may be more likely to have an existing stock of cigarettes, and would then be less likely to respond to retail tobacco displays with purchases of tobacco. In contrast, lighter smokers may be less likely to have a stock of cigarettes, so might be more likely to be influenced to purchase after seeing tobacco displays in convenience stores.

### **Conclusion**

The two studies suggest that different retail outlets contribute to smoking in different ways: by offering lower prices for tobacco, it appears that supermarkets and tobacconists encourage larger purchase sizes, and are thus likely to contribute to higher levels of smoking among price sensitive smokers. In contrast, other venues (bars, pubs and clubs and convenience stores) appear to be disproportionately used for purchases by lighter smokers, suggesting that these venues encourage impulse smoking by lighter smokers, possibly after consuming alcohol, and/or after seeing other people smoke (for bars, pubs and clubs), and/or by triggering an urge to smoke after the sight of tobacco displays (for example at convenience stores). With increased restrictions on smoking in public places in Australia, bars, pubs and clubs are now the only venues where people can see other people smoke (e.g. in designated outdoor and/or smoking areas), can smoke themselves, and can purchase tobacco. Coupled with the reported increase in smoking caused by consumption of alcohol, this suggests that such venues are likely to play an important role in triggering smoking by lighter and/or occasional smokers and/or by attempting quitters. As with any research conducted in one location, it is uncertain if the results can be generalised to other countries is uncertain , and replication of the study in other countries would be valuable.

The results suggest several potential directions for public health policy aimed at decreasing the level of smoking; firstly, consistent with evidence on the price elasticity of cigarette consumption, any action which increases tobacco prices (for example by increased taxation) is likely to decrease smoking. Secondly, any measure which reduces the convenient supply of tobacco (for example by restricting the number of tobacco outlets, the hours in which they can sell tobacco, and/or imposing restrictions on purchase size) is likely to decrease smoking. Thirdly, measures to decrease impulse purchases (for example by legislation which prohibits retail tobacco displays) are likely to decrease impulse purchases, particularly by lighter/occasional smokers and/or attempting quitters, who are less likely to have a stock of cigarettes on hand, and who may thus be most susceptible to point of purchase cues to smoke. Finally, any measure to eliminate tobacco sales at venues where smoking is permitted, and in particular, to limit tobacco sales where alcohol is sold, is likely to decrease the apparent role of alcohol in increasing tobacco purchases.

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