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Quitting activity and tobacco brand Switching: findings from the ITC-4 Country Survey

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Abstract

Objective—Among Australian smokers, to examine associations between cigarette brand switching, quitting activity and possible causal directions by lagging the relationships in different directions.

Methods—Current smokers from nine waves (2002 to early 2012) of the ITC-4 Country Survey Australian dataset were surveyed. Measures were brand *switching*, both brand family and product type (roll-your-own versus factory-made cigarettes) reported in adjacent waves, *interest* in quitting, *recent quit attempt*s, and *one month sustained abstinence*.

Results—*Switching* at one interval was unrelated to concurrent *quit interest. Quit interest* predicted *switching* at the following interval, but the effect disappeared once subsequent quit attempts were controlled for. *Recent quit attempts* more strongly predicted *switching* at concurrent (OR 1.34, 95% CI=1.18–1.52, $p<0.001$) and subsequent intervals (OR 1.31, 95% CI= 1.12–1.53, $p=0.001$) than *switching* predicted quit attempts, with greater asymmetry when both types of switching were combined. *One month sustained abstinence* and *switching* were unrelated in the same interval; however after controlling for concurrent switching and excluding type switchers, sustained abstinence predicted lower chance of switching at the following interval (OR=0.66, 95% CI=0.47–0.93, $p=0.016$).

Conclusions—The asymmetry suggests brand switching does not affect subsequent quitting.

Implications—Brand switching does not appear to interfere with quitting.

Keywords

tobacco smoking; brand loyalty; smoking cessation; brand switching; quit attempts; intentions to quit

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Competing interests

None.

Ethics approval

The ITC Surveys were cleared for ethics by Research Ethics Boards or International Review Boards at the University of Waterloo (Canada), The Cancer Council Victoria (Australia) and Monash University (Australia).

Introduction

Australia is an unusual tobacco market for several reasons. The market is dominated by three tobacco companies,[1] however there are a wide variety of brands and compared to other countries such as the United States (US) each brand has a lower concentration of market share. A range of pack sizes are available from those containing up to 50 cigarettes to the smaller packs containing as few as 20 cigarettes more common elsewhere.[2]

By the year 2000 tobacco advertising had been banned in all settings except point of sale (POS), on packs themselves and - until 2006 - very limited exemptions for some forms of sponsorship. Marketing restrictions were increased in the different states between 2009 and 2011 with progressive restrictions on POS display size leading to banning of POS advertising,[3] and eventually a requirement for concealment of tobacco at POS by 2012,[4] thus reducing impulse purchasing.[5] In 2006 deceptive variant terms such as 'Light' and 'Mild' were banned and text only health warnings on packs were replaced with much larger graphic warnings (30% front and 90% back of pack), increasing smokers' health related responses to packs and consequently quitting.[6] In 2010, taxation increased 25% in addition to that of the regular Consumer Price Index. During the period covered by this study, smoking prevalence in those 14 years or older dropped from 19.4% in 2001 to 15.1% in 2010.[7]

Most academic research in the area of smokers switching brands and quitting has focussed on responses to price increases or switching variants (such as 'Light', 'Mild' and 'Menthol') in an attempt to minimise health concerns, rather than brand family switching (such as Winfield to Holiday). This paper examines the relationship between quitting behaviour and switching between tobacco brand families among Australian smokers over the period 2002 to early 2012.

In the data set used in this paper, which was collected as part of the Australian arm of the International Tobacco Control Policy Evaluation Project, 4 Country (ITC-4) study, we found some evidence of reduced brand stability in high income smokers after the 25% increase in the excise on cigarettes that occurred in April 2010.[8] However, across the nine waves of data, the highest income tertile were the most brand loyal (lowest brand shifting), and were least likely to report using price as a reason for brand choice. Other ITC-4 data shows that smokers can be price sensitive regardless of income, and that the availability of discounted cigarettes may mitigate the effect of price rises on quitting activity.[9]

Another study in one state, New South Wales, around the time of the April 2010 federal tax increase showed that 47.5% made smoking related changes (tried to quit or cut down) and that this proportion increased with time. By comparison, 11.4% smokers initially made product related changes (switching to cheaper brand, roll-your-own or bought in bulk). Though this proportion decreased with time, it suggests an opportunity for tobacco control policy to understand the link between product related changes and quitting behaviour (or lack thereof).[10]

The extent to which brand shifting occurs varies by study.[11–14] This could be due to country-specific effects or to prevailing economic conditions at the time. For example, one study in Taiwan found nearly as much brand switching (17.4%) as consumption reductions (18.8%),[15] whereas the above-mentioned NSW study found four times as much consumption reduction (47.5%)[10]. This highlights the importance of current market and policy context in assessing brand shifting and quitting behaviours.

What limited evidence there is suggests that brand switching might be used as an alternative to quitting. In one US study, those who used more price minimising strategies were less likely to attempt to quit or to cut back on cigarettes.[16] Similarly in the first couple of waves of data collection of this dataset (2002 to 2003), those who engaged in price minimisation strategies were less likely to quit.[9] In contrast in one earlier US study, brand switching was more common in those who made one or more quit attempts in last 5 years compared to those who did not.[17] It is not clear, however, if such findings represent a relationship between switching and quitting activity, or merely to alternative strategies smokers use to deal with the impact of price increases. Considering switching and desire to quit, one study found higher motivation in switchers, but no differences in quit attempts or success.[18] Tindle and associates found that those who had ever switched to a ‘light’ cigarette for more than 6 months, were more likely to make quit attempts, but less likely to succeed,[19] possibly suggesting switching might be a strategy for those finding quitting particularly difficult[20] supported, if not instigated, by the industry as a way of avoiding losing customers.[2118]

The introduction of plain packaging in Australia in December 2012 may interfere with brand identity and thus increase brand switching. There is currently no clear assessment of the likely effects - on the positive side, standardised packaging may disrupt the smokers relationship with their brand and provide at least a short-term boost to quitting. However, if switching is a displacement strategy used to avoid quitting or having to reduce consumption, plain packaging may make switching psychologically easier, making it an easier although plausibly a less potent, alternative to quitting. As there is a plausible mechanism by which switching could affect quitting, it is important to find out if this is supported by evidence. As far as we have been able to discover, this is the first empirical study to explore the relationship between brand switching and quitting activity using longitudinal data in ways designed to shed light on possible causal relationships.

We assessed the possible causal relationship between brand switching and quitting activity by exploring how the strength of associations between the two varied when lagged in different directions. A causal link of switching facilitating quitting activity is plausible if the relationship of brand switching is stronger with subsequent rather than with prior quitting activity, while if no correlation were seen or where quitting activity was more closely associated with subsequent brand shifting, such a causal relationship would be effectively ruled out. The latter case would be evidence for quitting failures leading to increased brand switching.

Methods

Participants

This sample contains data from the first nine waves of the Australian arm of the ITC-4 Country Project collected between 2002 to 2012. The larger ITC-4 Project is a longitudinal survey of current (at least monthly) smokers of factory made or roll-your-own cigarettes in the United Kingdom, Canada, United States and Australia. Ex-smokers are retained in the cohort and their data is included in analyses where possible. Data is collected by computer assisted telephone interviewing and more recently partly online. Sample sizes were maintained using the same sampling frame to replenish those participants lost through attrition. See Fong et al.[22] and Thompson et al.[23] for further description of methods.

The number of individual participants and the number of observations per participant differed between analyses and can be seen in Tables 1 and 2. The number of observations varied for reasons such as how many waves of the survey individuals participated in and whether they had quit attempts spanning survey waves.

The average age of the cohort has increased across the waves from 38.9 (SD=13.6) to 50.2 years (SD=12.8) as a result of ageing of the cohort and a higher dropout rate among younger smokers and this not being corrected since we have replenished from the same sampling frame at all waves.

In addition, we explored the demographic characteristics of the smokers in our sample who were lost to attrition after one wave. Compared to the youngest age bracket (18–24 years), older participants were much less likely to be lost to attrition across all age brackets (25–39 years: OR=0.72, 95% CI=0.63–0.82; 40–54 years: OR=0.42, 95% CI=0.37–0.78; and 55 and over: OR=0.40, 95% CI=0.34–0.46, all $p<0.001$). After controlling for age, male participants were more likely to be lost (OR=1.11, 95% CI=1.02–1.20, $p=0.012$, and participants in the higher income bracket were more likely to be retained in the sample than those from the lowest income group (OR=0.89, 95% CI=0.80–0.99, $p=0.035$). All our analyses were adjusted for age, sex, and income.

Measures

Brand switching—At each wave of the survey current smokers were asked what brand they were currently smoking. From this, a brand switching measure was derived by comparing brand family (ignoring variants such as ‘Light’, ‘Mild’, ‘Menthol’) at adjacent survey waves. In addition, we also assessed change between roll-your-own (RYO) and factory-made (FM) cigarettes as a type shift. If participants were quit at any wave they could not have a current brand, and were therefore excluded on the shift measure for related intervals.

Quitting activity—Quitting interest was computed from reported intentions to quit, combining those who intended to quit in the next month and those intending to do so in the next six months into the group showing an interest in quitting, compared with those who might try beyond six months and those with no current interest.

Quit attempts were based on reports of any quit attempts since the previous survey or in the last year for new recruits (*recent quit attempts*). We also assessed outcomes among those whose longest time without smoking cigarettes was shorter than those who had stopped smoking for than one month *(one month sustained abstinence)*. It should be noted that for analyses where quitting activity was related to switching, we could not estimate switching for those smokers who were successfully quit at one wave, as they necessarily did not have a current brand from which to derive brand switching. Quitting activity was evaluated in several ways with yes/ no answers; except where quit attempts were assessed in the wave following switching, the attempts were necessarily unsuccessful or else brand shifting could not have been assessed.

Analysis—We conducted three sets of analyses for all relationships tested: both including and excluding type shifts from the brand shifting measure, and finally comparing type shifts against all others. *Quit interest* at a given wave refers to the following period, while the determination of quit attempts and switching at that wave refers to the previous period. Where switching and quit attempts occur in the same interwave period, it was not possible to sequence switching and quit attempts, so lagged analyses used the previous or subsequent periods. The relationships between brand switching and quitting activity were evaluated using Generalised Estimating Equations (GEE) modelling collapsed across the survey period. All GEE models controlled for interwave interval (continuous, in days) and sociodemographics (age, sex and income). Exploratory analyses controlling for HSI made little difference to the direction or significance of any changes so were not included in the final results. In additional analyses, to control for the relationship between switching at one wave and switching at another, *switching* at the wave where the relevant quit activity occurred was used as a control. Similarly, *recent quit attempt* and *one month sustained abstinence* at the wave where the switching occurred were used as controls in the relevant analyses.

For prospective analyses, switching in one period related to quit attempts in the next period, those still quit at that wave can be included, unlike in the other analyses, where only failed attempts can be used (as those quit did not have a brand with which to determine switching). In these cases, we conducted the analyses including and excluding those still quit to see if it made a difference.

Results

Switching occurred in 18.6% of wave to wave observations. Of these 13.6% only switched brand, while a further 4.9% made a “type” switch from FM to RYO cigarettes or vice versa, regardless of whether they switched brands. We focus our main reporting on the analyses where we excluded the type switchers, and report any results where including type switchers resulted in a different outcome, and in these cases explore impacts of type switching as well.

In 32.9% of cases smokers reported an interest in quitting, and in 45.3% reported making a quit attempt between waves (or in the last year). When controlling for demographics and sample characteristics, both of these and brand switching were all autocorrelated: switching between one wave pair was greater if it was observed in the previous period (OR=4.57; 95%

CI=3.78–5.54, $p<0.001$), similarly for quit interest across waves (OR=7.82; 95% CI=6.83<8.95, $p<0.001$) and for quit attempts (OR=6.78; 95% CI=6.05–7.61, $p<0.001$).

Odds ratios and *p* values for the various measures of quit interest and switching can be seen in Table 1. Switching tobacco brand in one period was not associated with quit interest at the end of that period. In contrast, quit interest at one wave was significantly associated with switching in the next period (i.e. in the following inter-wave interval). The effect persisted even when controlling for switching in the previous period (OR=1.25, 95% CI=1.05–1.50, $p=0.013$). However, after adding (unsuccessful) quit attempts in the following period (i.e. the period referred to by the quit intentions) to the model, the association became non-significant (OR=1.09, 95% CI= 0.93–1.29, $p=0.28$).

We now turn to the relationship between switching and quit attempts (see Table 2). There was a positive association between switching and failed quit attempts within the same interwave interval (top row of Table 2), regardless of which one was used as the predictor variable.

Turning now to the asymmetric analyses, a failed quit attempt in one interwave period predicted switching more strongly in the next period than switching predicted a subsequent quit attempt. This was true both when including or excluding the successful attempts for switching predicting quit attempts (Table 2, bottom rows). NB. This is the only analysis where we could include successful recent quitters as people who are currently quit do not have a contemporaneous brand with which to assess if they have switched. Controlling for quit attempts in the predictor period or for switching in the outcome period made no marked difference to the effect size. For example, the effect of switching between waves on quit attempts at the next wave changed little (OR=1.20, 95% CI=1.02–1.41, $p=0.025$) as did the effect of quit attempts at the previous interval on switching at the next, controlling for switching in the predictor period (OR 1.32, 95% CI=1.12–1.55, p=0.01).

Also in Table 2, when we included the type switchers in analyses of quit attempts (controlled for demographics only), the asymmetry was even stronger - the effect of switching on subsequent quit attempts was no longer significant, whereas the effect of quit attempts on switching was marginally higher.

Finally we explored whether switching was related to the length of subsequent quit attempts. In comparison to those who managed to quit for less than 1 month, those who abstained for a month or more were no more likely to switch during the same inter-wave interval as the quit attempt (OR=1.09% CI=0.88–1.35, $p=0.44$). However, both asymmetric relationships showed that longer quit attempts were associated with less switching. The brand smoked soon after a short quit attempt was less likely to be retained than the one used soon after a long quit attempt (OR=0.71; 95% CI=0.53–0.94, $p=0.016$), and this effect was - if anything - stronger when controlling for switching in the predictor period (OR=0.66, 0.47–0.93, $p=0.016$). When switching was related to subsequent length of quit attempts, longer attempts were similarly less likely, but only significantly so when controlling for switching concurrent with the quit attempt (OR=0.71, 95% CI=0.53–0.97, $p=0.029$).

The negative relationships were not significant when we included the type switchers for quit attempt to switch (OR=0.90, 95% CI=0.68–1.19, *p*=0.47) or switch to longer quit attempt (OR=0.78, 95% CI=0.60–1.02, *p*=0.067).

Discussion

The findings clearly show that quitting activity and brand shifting tend to occur together. Having an interest in quitting is more associated with later brand switching than the converse. Further, failed quit attempts are also more strongly associated with subsequent switching than the converse, and when failed attempts are controlled for, the relationship between quit interest and subsequent switching is attenuated. These findings are consistent with a model of switching being a response to the difficulty of quitting, and does not support theories that smokers switch brands as an alternative to quitting – that would predict switching leading to less quitting activity, something we did not find.

We also found asymmetry of the association between length of a quit attempt and switching, with no concurrent association, but evidence of both longer attempts being associated with less subsequent switching, and switching in the previous wave predicting less likelihood of a quit attempt lasting a month. The two asymmetric relationships plausibly have different effects. Longer quits are associated with less subsequent switching, suggest that the brand used after a long quit tends to be persisted with, while the switching to quit length association suggests that those who switch may be those with a reduced capacity to quit, consistent with the above analysis.

Given that we failed to find a clear positive association between switching and subsequent quitting success, we think it likely that switching is one ineffective strategy that smokers adopt in response to the challenges of actually quitting, and thus need be of no real concern. If it has any importance, it may be as another indicator of smokers who are finding quitting very difficult. This explanation is consistent with the finding that when controlling for switching in the same period, those making longer quit attempts were less likely to switch in next period (i.e. a year or so).

More switching goes on in the same period as a quit attempt, but with our study we cannot determine which comes first. It is plausible that those attempting to quit may be more likely to switch following the failed attempt as in some cases the relapse cigarettes will be from other smokers' packs (further ITC work is awaited on this) and thus may not be their previous brand, and this might be expected to stimulate some switching. It is also plausible that switching might occur just before a quit attempt as a means of disrupting the person's smoking habit. We have no way of telling whether either or both are responsible for the observed association.

The finding that brand-switching is associated with quitting (interest and attempts) and that all three tend to be more common in some smokers than others, is consistent with the idea of a group of smokers who are regularly trying to quit and also switching brands - presumably because they are failing to quit - but remaining motivated to do something about their smoking. Other studies using this data set have shown that smokers with a history of

frequent unsuccessful attempts are less likely to succeed in the future.[24] This should be seen as an opportunity to find ways to more effectively help such smokers by both using switching as a sign of a need to offer more help, and perhaps as an opportunity to point out the lack of utility of switching as a strategy.

The findings on type switching generally suggest that this form of switching plays a similar role to pure brand shifting; however, after longer quit attempts there is no inhibition of type switching. Presumably after a long quit smokers tend to stick with the brand they resume with, but may still be open to larger changes, such as a change in type of cigarette. Given the marginal significance of the differential impact of type and brand shifting, we should not over-interpret this finding.

Little else is known about what influences brand shifting. Using the same dataset, it has previously been shown that public health interventions such as the substantial tax increase in 2010 were not associated in any overall change in brand switching.[8] Indeed, as there were only one substantial tax increase in Australia during the survey period in addition to Consumer Price Index increases, most brand switching and quitting activity cannot be attributed to price rises.

Tobacco plain packaging was mandated in Australia in December 2012 and although it is a world first and occurred after the period covered by this study, we have previously shown in this dataset that other tobacco control policy changes have had little impact on brand loyalty[8]. It is possible that plain packaging will alter the relationship between quitting and brand switching, given that brands now look more similar. Further work is underway on the impact of the plain packaging laws using subsequent waves of this survey.

Though based on correlational data, our findings are consistent with the model outlined above and use of asymmetrical relationships between variables adds weight to arguments about causality. Our findings are limited in that we did not assess the sequencing of brand switching and quit activity within the same interwave interval, and did not explore either multiple brand shifts or quit attempts in the same survey intervals. We also did not look for changes in preferred pack size. Some brands have several different pack sizes and shifts between them may be motivated by price changes, and smaller packs may be chosen to cut back on consumption, which can be a precursor to quit attempts. Variant switching was also not examined, which may mask some of the switching relationship with quitting activity, especially if quit-related switching was more likely to be towards variants of lower perceived strength. The main reason for not assessing variant switching was that most of these variants were renamed in 2006 after the banning of misleading descriptors (such as ‘Light’ and ‘Mild’), and we have not yet been able to map all variants across this change.

The study also underrepresents longer quit attempts, because any quit attempt spanning waves of the survey (on average longer) results in missing data on brand smoked and precludes computation of interwave brand switching.

In conclusion, this paper contributes to the sparse academic literature using longitudinal data on the relationship between tobacco brand switching and quitting, and suggests there is no important causal relationship between the two. Brand switching may be more an indicator of

greater difficulty in quitting; however, these findings should not be generalised to variant switching which may be motivated by different factors.

Implications

Those in tobacco control should not be concerned about brand switching, as it does not appear to either inhibit or facilitate quitting, but may be an indicator of more-than-average difficulty in quitting.

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Table 1

Odds ratios of *quit interest* and *switching* of smokers, showing direction of predictor to outcome

Analysis[a]	*N* (Obs/ groups)[c]	% achieving outcome[d]	*OR*	*95% CI*	*p*
Switching (Wx → Wx+1) → Quit interest (Wx+1)[b]	8549/ 3296	31.7	1.09	0.96–1.24	0.17
Quit Interest (Wx) → Switching (Wx → Wx+1)	5497/ 2128	14.1	1.22	1.03–1.43	0.019*

NB. Wx = reference wave; Wx +1 = next wave;

[a] Controlled for age, sex, income & interwave interval.

[b] Switching predicting quit interest uses data from the same survey waves because interest is logically in the future while switching refers to the previous year/inter-wave interval.

[c] GEE allows for multiple observations from the same individual over time, so we provide the sample sizes for both the number of observations ("Obs") and the number of individuals ("groups" of observations from the same individual).

[d] Percentages refer to observations, not groups.

* $p<0.05$

Table 2

Odds ratios of *recent quit attempts* and *switching* of smokers, showing direction of predictor to outcome[a]

	Switching → recent quit attempt				Recent quit attempt → switching			
Outcome in relation to key predictor	***N* (obs/ grps)[b]**	**%[c]**	***OR***	***95% CI***	***N* (obs/ grps)[b]**	**%[c]**	***OR***	***95%CI***
Outcome in same interwave interval								
failed attempts only	8671/ 3314	33.8	1.27	1.12–1.43***	5179/ 1995	13.7	1.34	1.18–1.52***
Outcome lagged one interwave interval:								
all attempts	6138/ 2365	42.1	1.21	1.05–1.38**	NA	NA	NA	NA
failed attempts only	5180/ 1996	33.8	1.21	1.03–1.42*	5536/ 2128	14.3	1.31	1.12–1.53**
TS: all attempts	6455/ 2426	42.2	1.12	0.98–1.27	NA	NA	NA	NA
TS: failed attempts only	5623/ 2119	34.2	1.12	0.97–1.29	5824/ 2187	18.6	1.34	1.17–1.54***

NA = not applicable, TS = type switchers included

[a] Analyses controlled for age, sex, income & interwave interval.

[b] GEE allows for multiple observations from the same individual over time, so we provide the sample sizes for both the number of observations (“obs”) and the number of individuals (“groups” of observations from the same individual, “grps”).

[c] Percentages achieving outcome: percentages refer to observations, not groups.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.