

Smokers and ex-smokers reaction to anti-smoking advertising: a mixed methods approach

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Anti-smoking advertising is a central component of modern public health policy. Nevertheless, some smokers have reported that viewing anti-smoking advertising provokes intense nicotine craving. Anti-smoking advertising frequently features images of cigarettes and of individuals smoking. However, research indicates that images of tobacco paraphernalia may induce cravings in individuals addicted to nicotine. The effects of the presence of smoking cues in anti-smoking advertising were considered in the present study. Smokers and ex-smokers (N=63) were randomly assigned to view an anti-smoking advertisement or to complete a control task. Urge to smoke was measured pre- and post-test. Qualitative responses to anti-smoking advertising were also elicited from all participants in the intervention groups. According to both qualitative and quantitative data analyses viewing anti-smoking advertising, even with images of smoking related paraphernalia, led to decreases in craving amongst smokers. Ex-smokers experienced no change in quantitatively measured craving after viewing anti-smoking advertising. These findings are inconsistent with findings from studies using neutral or positive smoking cues. Qualitative data shows that no smokers or ex-smokers who viewed anti-smoking advertising reported an increase in tobacco craving as a result of viewing the campaign. Implications of these findings for future research and anti-smoking campaigns are discussed.

Keywords: Anti-smoking advertising, craving, tobacco

Introduction

The use of tobacco is one of the leading causes of preventable death in Australia (Begg et al., 2007), and as in many other countries, anti-smoking advertising is central to tobacco control strategies. A number of population based studies have supported the belief that such strategies are effective in prompting smoking cessation amongst established smokers. For example, according to the 2004 National Drug Strategy Household Survey 20.5% of Australian smokers who cut down or attempted to change their smoking behaviour in the 12 months preceding the study were motivated by anti-smoking campaigns (AIHW, 2005). Similarly, 27% of established Australian adolescent smokers surveyed in an evaluation of the National Tobacco Campaign, reported cutting down the number of cigarette they smoked after having seen the campaign (White et al., 2003). However, where prospective designs have been used to investigate reactions to anti-smoking advertising, results have been less promising. In a 4 year longitudinal study, for example, Sigel and Beiner found that exposure to anti-smoking advertising decreased the likelihood of progression to established smoking for younger adolescents (12-13 years), but had no effect on older adolescents (aged 14-15) (Siegel and Biener, 2000). Another study reported that amongst those who smoked at baseline, exposure to anti-smoking campaigns increased smoking cessation amongst girls but not boys (Hafstad et al., 1997).

It has been suggested that, in some cases, anti-smoking campaigns provoke defensive responses which negate the anti-smoking message, and result in a “boomerang effect” such that a message intended to decrease tobacco consumption actually increases it. In one early study, in a laboratory setting, the presence of a government warning label increased the desire to smoke amongst current smokers (Hyland and Birrell, 1979). Boomerang effects have also been found outside of the laboratory, with one study demonstrating that greater knowledge of cigarette warning labels was associated with an increase in tobacco consumption over a three-month period (Robinson and Killen, 1997). Consistent with such research, qualitative studies of both American and Australian university students have found that some students report that the presentation of anti-smoking messages resulted in increased craving and prompted them to have a cigarette (Gilbert, 2005, Wolburg, 2003).

In order to understand such responses to anti-smoking advertising it is important to consider the content and context of such messages. In particular it may be important to consider the use of representations of cigarettes and images of people smoking in anti-smoking advertising. Cue reactivity studies into individuals suffering from addiction have shown that presentation of paraphernalia related to the addiction produces craving (Carter and Tiffany, 1999). This effect is well documented in the case of smoking (Abrams et al., 1988, Bradley et al., 2003, Field and Duka, 2004, Waters et al., 2004) and has been demonstrated even when smokers were exposed to videotaped smoking cues (Upadhyaya et al., 2004).

It is important to note that such studies have only considered the effects of positive or neutral smoking cues, such as images of cigarettes and related paraphernalia, on craving amongst established smokers. This effect has not been studied in an anti-smoking context, where smoking cues are typically combined with information on the negative outcomes of tobacco consumption. Research into the effect of message framing on health behaviours suggest that both the context and content of information have the potential to influence the way in which health information is interpreted and acted upon (Kahneman and Tversky, 1984). To date, no studies have considered the effect that negatively positioned smoking cues, such as those that appear in anti-smoking advertising, have on craving.

In order to understand the interplay between the anti-smoking message and the craving that may be elicited as a result of depictions of smoking and cigarettes in advertising, it is important to explore the reactions of both smokers and ex-smokers to anti-smoking advertising. It is particularly important to understand the way such messages are interpreted by adolescents and young adults given that those aged 20-29 are more likely to smoke than any other age group in the Australian population (AIHW, 2005). In light of this, the main aim of the present study was to investigate, using qualitative and quantitative measures, the impact of anti-smoking advertisements on smokers and ex-smokers in a young adult sample. With regard to qualitative methods, the aim was to explore the impact of an antismoking advertisement that includes images of smoking and cigarettes. The issue of the influence of anti-smoking advertising on both urge to smoke and more generalised reactions, such as thoughts, feelings, emotions, and attitudes, were investigated for the first time. With regard to quantitative data, it was hypothesised that anti-smoking advertising would have a differential effect on quantitative measures of tobacco craving depending on current smoking status. This is consistent with research into cue-reactivity, research conducted by Upadhyaya et. al. (2004) demonstrating that smokers experience an increase in self-reported craving after viewing videos containing smoking cues (Upadhyaya et al., 2004),

Method

Participants: The participants were 63 undergraduates enrolled in an introductory psychology course at an Australian University. All participants were recruited through an online management system for an experiment into 'smokers and ex-smokers reactions to advertising'. Class credit was awarded for participation. Participants were randomly assigned to experimental and control conditions in a 2x2 factorial design (see Table 1). Participants who identified themselves as smokers, and/or who reported that they had smoked a cigarette in the previous four weeks were classified as smokers for the purpose of this study.

Table 1. The experimental design with sample sizes

Control Ex-smokers (N= 17)	Experimental Ex-smokers (N= 17)
Control Smokers (N= 12)	Experimental Smokers (N= 16)

Ages ranged from 18-26, with a mean age of 19.47 (SD=1.709), 33% of the participants were male and 67% female. A total of 28 smokers and 35 ex-smokers were recruited.

Table 2 Smoking history and recent smoking behaviour of participants

Self Reported Smoking Behaviours	%
Number of Cigarettes Ever Smoked	
Between 1-100	54
100 or more	45
Smoked a cigarette in the last 12 months	
No	27
Yes	73
Smoked a cigarette in the last 4 weeks ^a	

No	40.4
Yes	59.6

^aOnly those who had smoked in the last year were instructed to answer this question.

Smokers in the study had smoked an average of 36.63 cigarettes in the week before testing (range 0-140, SD=37.549). With 62.5% of smokers reporting having attempted to quit smoking at least once. On average, smokers reported 2.13 past quit attempts (range = 0-10, SD=2.362), and an average longest quit attempt of 7 months (range=0-48, SD=11.03).

Demographics Questionnaire: All students answered questions regarding their age, gender, current smoking status, smoking history, and past attempts to quit smoking. Age, longest quit attempt, number of quit attempts, number of cigarettes smoked in the past seven days, and brand of cigarette most often smoked were assessed using open-ended questions and then classified into intervals for analysis where appropriate.

Questionnaire of Smoking Urges (QSU-Brief): The 10 item QSU-Brief (Cox et al., 2001) measures two factors; (1) the desire to smoke (e.g. *All I want right now is a cigarette*) and (2) urge to smoke (e.g. *I have an urge for a cigarette*). The desire to smoke is associated with the belief that smoking is rewarding, while the urge to smoke is associated with the belief that smoking will provide relief from negative affect. The total score on the two factors can be summed to provide a global measure of craving. Examination of the psychometric properties of the QSU-Brief, has indicated that the measure has adequate reliability and validity (Cox et al., 2001). For example, the internal consistency of the total craving score was assessed at Cronbach's alpha=0.97 in Cox et. al.'s (2001) analysis of the use of the measure in the laboratory setting. The measure has been used in a number of recent studies into tobacco craving in both adults and adolescents and both current and abstaining smokers (Shadel et al., 2001b, Shadel et al., 2001a, Upadhyaya et al., 2004, Upadhyaya et al., 2006, Waters et al., 2004).

Reactions to the Anti-Smoking Advertisement: Both smokers and ex-smokers in the experimental condition were asked to comment on the anti-smoking advertisement they had been shown and their reaction to it (e.g. *As part of this experiment you were shown an anti-smoking advertisement, generally speaking how do you feel about this campaign?*). Open-ended responses were then analysed in order to identify common themes in responses.

Audio-Visual Packages: Participants were shown one of two audiovisual packages depending on condition. Participants in both conditions were shown five neutral television commercials. These advertisements were featured in prime time advertising at the time of the experiment, and were not related to health or wellbeing. Those in the experimental condition were also shown the anti-smoking commercial '45 Seconds' (QuitNow, 2007). The anti-smoking commercial '45 Seconds' is part of the National Tobacco Youth Campaign and features images of a woman smoking, alongside information about the negative health consequences of cigarette consumption (e.g. "When you smoke you inhale over 4,000 chemicals. It's a toxic, poisonous mix of substances, including: ammonia – the bleach in toilet cleaner; acetone, the chemical in nail polish remover; benzene, found in paint stripper; and hydrogen cyanide, used in rat poison").

Procedure: Two questionnaire booklets and an audio-visual presentation were administered to participants in groups of up to 20. At the beginning of each session, participants were given general verbal instructions and Part 1 of the questionnaire. Part 1 was made up of the demographic questionnaire and the QSU-Brief. After completing Part 1, participants were shown either the Control audiovisual package or Experimental audiovisual package. Participants were then instructed to complete Part 2 of the questionnaire which contained the second administration of the QSU-Brief and Reactions to the Anti-Smoking Advertisement (for experimental participants). All participants were debriefed following their participation in the study. The entire procedure lasted approximately 30 minutes. This study was approved by the University's Human Research Ethics Committee.

Quantitative results

Pre and post test craving scores were compared using Paired Sample t-tests to identify differences in total score, desire to smoke and urge to smoke (see Table 2). No within group differences were identified for either the ex-smoker experimental or the ex-smoker control groups.

Table 2. Paired Sample T-Test: Differences in pre- and post- test craving scores by group

	Time 1	Time 2	Mean difference	t	df	p
Ex-Smoker Experimental						
Total Score	11.28	11.33	.056	-.111	17	.913
Desire to smoke	5.83	5.83	.000	.000	17	1.000
Urge to smoke	5.44	5.50	.056	-.251	17	.805
Ex-Smoker Control						
Total Score	13.53	12.53	-1.000	.435	16	.670
Desire to smoke	6.59	6.53	-.059	.053	16	.958
Urge to smoke	6.94	6.00	-.941	.766	16	.455
Current Smoker Experimental						
Total Score	32.69	27.44	-5.250	3.701	15	.002
Desire to smoke	19.50	15.63	-3.875	3.893	15	.001
Urge to smoke	13.19	11.81	-1.375	2.052	15	.058
Current Smoker Control						
Total Score	26.58	30.00	3.417	-2.641	11	.023
Desire to smoke	15.67	18.08	2.417	-3.208	11	.008
Urge to smoke	10.92	11.92	1.000	-1.049	11	.317

For the experimental smoker group, both desire to smoke scores and total craving scores fell significantly between Time 1 and Time 2. In comparison, the total craving and desire to smoke scores rose significantly over the course of the experiment in the smoker control group. In both groups the change in urge to smoke was not significant.

One way ANOVA tests with planned contrasts were conducted to determine between-group differences in the change in craving pre- and post-test. Significant between group differences in the change in craving were identified for both the total craving score ($F_{3,59}=4.807$ $p=.005$) and the desire to smoke subscale ($F_{3,59}=8.577$ $p<.001$). No between group differences in urge to smoke were identified ($F_{3,59}=1.427$ $p=.244$). The results of planned contrasts for total craving score and desire to smoke are reported in Table 3.

Table 3. Summary of Planned Contrasts for Changes in Self-Reported Craving Between Groups

	Contrast estimate	Std. Error	t	df	p
Total Score					
Experimental condition main effect	.89	3.130	.284	59	.777
Smoking status main effect	-7.61	3.130	-2.432	59	.018
Condition x smoking status interaction	9.72	3.130	3.106	59	.003
Smoker Experimental vs. Smoker control	5.31	2.108	2.517	59	.015
Desire to smoke					
Experimental condition main effect	1.40	1.718	.814	59	.419
Smoking status main effect	-6.23	1.718	-3.627	59	.001
Condition x smoking status interaction	6.35	1.718	3.695	59	.001
Smoker Experimental vs. Smoker control	3.88	1.158	3.348	59	.001

As shown, for both measures of craving there was a main effect of smoking status but not experimental status on change in craving scores. In that, on average smokers experienced a greater change in craving than non-smokers between Time 1 and Time 2. While, on average whether or not an individual viewed the anti-smoking advertisement did not influence their change in craving over the course of the experiment. However, a significant interaction between smoking status and experimental condition was observed, in that the effect of viewing, or not viewing, the anti-smoking advertisement was influenced by whether on not an individual was a current or ex-smoker.

Finally, smokers who viewed anti-smoking advertising experienced a decrease in both total craving score and desire to smoke between Time 1 and Time 2, as compared to an increase in craving scores reported by the smokers in the control group. This effect was significant.

Qualitative results

Qualitative framework analysis (Ritchie and Spencer, 1994) was used to analyse open-ended responses to the questions relating to individual's "Reactions to the Anti-Smoking Advertisement" in this study. A number of themes emerged from analysis of smokers' and ex-smokers' responses to the anti-smoking advertisement they were shown.

Theme 1 - Emotional responses to anti-smoking advertising: In seeking to understand the influence the anti-smoking advertisement had on desire to smoke it is important to consider the emotional experiences of the smokers and ex-smokers who were shown the advertisement. Two main emotions were reported in response to viewing the campaign, disgust and worry. Smokers and ex-smokers both reported that the confronting nature of the campaign led them to experience feelings of disgust:

"The 'upfront' nature of the campaign hits hard on the individual"
"The ad is very confronting"
"I think the ads are working – they are disgusting"

However, only smokers reported significant feelings of worry as a result of viewing the campaign:

"It worries me, very effective as a quitting campaign"

Theme 2 - Adaptive and maladaptive responses to anti-smoking advertising: Smokers and ex-smokers reported a range of changes in behaviour and cognitions as a result of viewing anti-smoking advertising. A number of smokers reported that the advertisement did have an effect on their smoking behaviour and had led in a decrease in desire to smoke.

"The imagery is, for me, a strong deterrent"
"The ads really make me want to quit smoking! I don't want to die"

Others reported that although they found anti-smoking advertising generally effective the advertisement did not decrease their desire to smoke:

"The ad might remind you of what smoking does but it won't make me feel like quitting."
"I feel this advertising campaign is fairly harsh yet effective. I must admit it turns me off smoking, however would not make me quit."

Research into the use of fear in public health messages suggest that when health messages contain threatening information, they may provoke defensive responses in those who view them (Witte and Allen, 2000). These maladaptive responses, which include wishful thinking, denial and avoidance are negatively correlated with danger control behaviours such as behavioural change and risk minimization (Witte and Allen, 2000). There is some evidence to suggest that such maladaptive reactions may have been experienced by both smokers and ex-smokers in the current sample for example, disbelief was frequently expressed.

"...some of the particular diseases the advertisement displays might be a bit farfetched. Gangrene for example."

Another maladaptive behaviour was that of unrealistic optimism (Weinstein, 1987), with some participants feeling that such illnesses were unlikely to affect them or their peers.

"I think, like a lot of others my age that we are a long way from these things happening to us."
"...being young and generally healthy I don't think the pictures shown (e.g. mouth cancer, gangrene) really relate to me that much. Or perhaps won't affect me in the near future."

This view is consistent with research that suggests that young people often underestimate their personal level of risk (Arnett, 2000, Boney-McCoy et al., 1992). While a number of smokers and ex-smokers reported having friends who engaged in behaviours that might have been considered maladaptive, no participants reported engaging in such behaviours themselves:

"The packaging designs with diseases on them seem to be made a joke of by some who attempt to collect/buy the "less serious" of the diseases."
"Some smokers I know can't stand the pictures on cigarette packs, they cover it."

It is important to note that this may be a result of desirability bias and that such reports may have been regarding participants' own behaviours. Unlike smokers in previous studies, no smoker or ex-smoker in this sample reported that viewing anti-smoking advertising led to an increase in their level of craving or greater cigarette consumption.

Discussion

The aim of the present study was to investigate the impact of depictions of smoking and cigarettes in anti-smoking advertising, on smokers and ex-smokers. In particular the potential for such images to result in cue-elicited craving in those addicted to nicotine was considered using both qualitative and quantitative measures.

It was hypothesized that the presentation of anti-smoking advertising would have a differential effect on self-reported craving depending on current smoking status. The findings of this study support this hypothesis, in that an interaction between smoking status and experimental condition was observed. However, the results are not consistent with cue-reactivity research that suggests that the presence of smoking paraphernalia in anti-smoking advertising would increase self-reported craving (Upadhyaya et al., 2004, Upadhyaya et al., 2006). These findings are also inconsistent with responses from qualitative research conducted by Gilbert (2005) and Wolburg (2003) where some respondents indicated that anti-smoking advertisements caused cigarette cravings. Rather, in this study smokers who viewed anti-smoking advertising experienced a decrease in craving and no participants exposed to anti-smoking advertising reported an increase in craving when qualitative responses to the campaign were elicited.

One possible explanation for this finding is the craving measure used in this study. Self-report measures such as the QSU-Brief do not provide a complete understanding of an individual's level of craving, and may not fully capture all salient features of craving as it has been conceptualized in cue reactivity research. Also, importantly self-report measures of craving may be open to demand characteristics that may bias results. However, many cue-reactivity studies, in particular the study conducted by Upadhyaya et al (2004), that provide significant support for increases in craving after presentation of smoking cues have used the QSU-Brief as the primary measure of craving. Therefore, while it may be prudent to recommend the use of a number of measures and protocols to more fully measure craving in future research, it seems unlikely that issues of measurement alone can explain these findings. A second explanation for these results may be related to the use of a relatively small sample of individuals in this study. However, whilst the size of the present sample was limited, this is consistent with other research conducted in this field (Upadhyaya et al., 2004, Upadhyaya et al., 2006).

Finally, subtle differences between the demographic characteristics and smoking history of participants in the present study and those in studies where increased cue-elicited craving has been observed may serve to explain the pattern of results in the present study. However, it is important to note that cue-elicited craving has been observed across a number of populations and under a range of experimental paradigms. As such, the authors of the present study would argue that the difference in the cue material in the present study presents a more likely explanation of the results than differences between the present sample and that of previous studies.

Instead, it seems more likely that the context of the smoking cues in the present study may have influenced the way that they were interpreted by participants. Most research conducted into cue elicited tobacco craving has used neutral or positively positioned cues (Abrams et al., 1988, Bradley et al., 2003, Field and Duka, 2004, Waters et al., 2004). In contrast, qualitative data collected as part of this study suggest that most smokers and non-smokers experience disgust and/or concern when viewing this anti-smoking advertisement. Together the qualitative and quantitative data from this study suggest that the negative positioning of the smoking related cues in anti-smoking advertising may have mediated the way in which the cues were interpreted. To further explore this possibility, future researchers may wish to consider the role of emotional responses to smoking cues in cue-elicited craving.

This data is consistent with a number of theoretical accounts of health related decision making including the Health Belief Model (Becker, 1976) and Protection Motivation Theory (Rogers, 1975) which both posit that health behaviour is influenced by an individuals' perception of threat associated with a given behaviour. It is important to note that the PMT suggests that caution must be exercised when using negative cues in health campaigns. Studies using this theory suggest that there is a risk of provoking maladaptive responses to fear inducing cues when an individual believes that they may be unable to take action to avoid negative consequences of behaviour (Rippetoe and Rogers, 1987). Data suggests that

although some maladaptive responses may arise from viewing anti-smoking advertising, in particular wishful thinking or denial, few smokers and ex-smokers engage in actual maladaptive behaviour in response to such advertisements.

Ultimately, these findings have implications for future interventions and more research is needed to explore this issue further. Both quantitative and qualitative data from this study suggest that anti-smoking advertising is effective in leading to immediate decreases in desire to smoke. However, further research is needed to determine the extent to which this reflects the role of negative framing of smoking paraphernalia in anti-smoking advertising, and whether campaigns of this kind would be more or less effective if smoking cues were completely absent from campaign materials.

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