"Health Education Journal" (in Press, 2011)

Title: Preventing Smoking in Open Public Places in University Campus Settings: A Situational Crime Prevention Approach

Jing Sun[1], Tim Prenzler[2] Nicholas Buys[3], Marilyn Mcmeniman[4]

[1]School of Public Health, Griffith University, Brisbane, Australia
[2]School of Criminology and Criminal Justice, Griffith University, Australia
[3]Health Group, Griffith University, Australia
[4] Deputy Vice Chancellor and Provost, Griffith University, Australia

Word counts: 4100

Key words: smoking prevention, situational crime prevention, place management

Authors:
Dr Jing Sun (**corresponding author**)
School of Public Health, Griffith University
Logan Campus, University Drive, Meadowbrook, QLD 4131, Australia
Phone: 617 338 21198
Fax: 617 338 21034
j.sun@griffith.edu.au

Professor Tim Prenzler
School of Criminology and Criminal Justice, Griffith University, Australia
Mt Gravatt campus, Griffith University, 176 Messines Ridge Road, Mt Gravatt, QLD, 4122, Australia
Phone: 617 373 55613
Fax: 617 373 55608
Email: t.prenzler@griffith.edu.au

Professor Nicholas Buys
Health Group, Griffith University, Australia
Gold Coast campus, Griffith University, Parklands Drive, Southport, QLD 4215 Australia
Phone: 617 55529280
Fax: 617 55529025
n.buys@griffith.edu.au

Professor Marilyn McMeniman
Deputy Vice Chancellor and Provost, Griffith University
Postal Address: Deputy Vice Chancellor and Provost, Nathan campus, Nathan, Griffith University, QLD 4111, Australia
Email: m.mcmeniman@griffith.edu.au

Abstract

Purpose: The primary aim for the project was to reduce both the annoyance and health impacts of passive smoking in an Australian university campus. An associated aim was to help community members to quit smoking.

Design/methodology/approach: Prospective intervention study design was used for the study during July 2009 to December 2009. Evaluation tools were designed to measure the impact of the campaign generally and to attempt to measure the effects of different strategies. The pre-implementation survey was conducted between 15 July and 30 July and the post-intervention was conducted between 15 November till 30 November 2010. The effectiveness of situational measures were measured by asking the following questions: effect on general environment and behaviour change, effectiveness of Situational method, information sharing and communication. The intervention strategies entailed voluntary compliance with a 'Smoke-less Campaign', which asked staff, students and visitors to smoke only in nominated smoking areas. The campaign was supported by strategies consistent with a number of techniques of situational crime prevention, including 'facilitating compliance' through the availability of smoking areas, 'setting rules' and 'posting instructions', and 'extending guardianship' through the use of campaign ambassadors.

Findings: At the end of the three month trial in 2009 the campaign was considered to have had a positive impact. After the intervention at the intervention campus there was a significant increase of 14.4% in the proportion of people who did not feel bothered by second-hand smoke – from 52.7% to 67.1%. In addition, six percent of survey respondents who smoked reported quitting, while 17% of smokers indicated the campaign had helped them to quit or cut down. Observational data showed that 98% of smokers complied with directions to smoke in nominated smoking areas

Research limitations/Implications: The success of the pilot study led to the university-wide adoption of an enforceable policy that restricted smoking to designated areas. Overall, the outcomes are instructive for security managers and other 'place managers' responsible for implementing changes to smoking regulations in open public places.

Practical implications: The most likely foreseeable trend globally is for greater controls on smoking. This presents a challenge for security managers and place managers delegated the task of ensuring compliance while avoiding heavy handed law enforcement and alienating persons (such as employees, customers or visitors) who have a smoking habit. The present study suggests that the use of situational techniques can be beneficial in pursuing this goal.

Originality/value: This study identifies important intervention strategies that impact on smoking behaviour among university students. The results provide evidence that supports the situational crime prevention approach that 'facilitating compliance' through the availability of smoking areas, 'setting rules' and 'posting instructions', and 'extending guardianship' through the use of campaign ambassadors, are important intervention strategies to lead people to decrease the likelihood of smoking.

INTRODUCTION

Aspects of the supply of tobacco products have been criminalised in many locations, especially in relation to supply to minors. Other aspects have been regulated, primarily through workplace health and safety laws that typically prohibit smoking indoors, wherever food and drink are served, outside the entrances to buildings, and around children. There is also a trend towards banning smoking completely on large public use areas such as stadiums, fun parks, hospitals, college campuses and open air malls (Schmidt, 2007). To assist with compliance, in practice these smoking bans often include a capacity for smoking in restricted 'designated smoking areas', such as 'smoking huts'.

The regulation and criminalisation of smoking is premised on a harm philosophy driven by scientific research (Ransley & Prenzler, 2007). Democratically elected authorities take on the burden of restricting people's freedom to smoke because of (a) the harm done to innocent non-smokers through passive smoking, (b) the costs to public health services of anti-cancer and palliative care and (c) an obligation to protect smokers from themselves – as is the case with prohibitions on illicit drugs or dangerous sports for example. From the early-1950s medical research increasingly linked smoking to lung cancer and other serious and life threatening illnesses, including cancers of the upper respiratory and digestive tracts, ischemic heart disease, stroke and peptic ulcer (Giskes, Van Lenthe, Turrell, Brug, and Mackenbach, 2006; Turrell and Mathers, 2001). Consideration of the harm from tobacco can be illustrated by comparing it to illicit drugs and alcohol, which are heavily criminalised. Research in Australia examining health data for the year 2004/5 estimated that smoking was responsible for the deaths of 19,459 people, compared to 4,135 alcohol-related deaths and 1,204 deaths from illicit drugs. Tobacco was also estimated to cost society AU$31.5 billion, compared to AU$15.3 billion for alcohol and AU$8.2 billion for illicit drugs (Collins and Lapsley, 2008). The World Health Organisation (2008) has estimated that smoking will kill approximately one billion people in the 21st century, and the WHO has attributed primary responsibility for the smoking-related diseases epidemic to the failure of authorities to protect citizens.

‘Second hand smoke’ or ‘passive smoking’ has also been the subject of medical research. In the 1980s several major international reports concluded that exposure to second-hand smoke was a cause of illness and death in non-smokers, from infancy through to adulthood (e.g., (National Health and Medical Research Council, 1987). Subsequent reviews published by expert agencies have since strengthened and extended these findings (US Department of Health and Human Services, 2006). The awareness that second-hand smoke is dangerous makes smoking a safety issue both indoors and outdoors in workplaces, entertainment venues, hotels and restaurants, sporting venues, and even beaches and parks (US Department of Health and Human Services, 2006).

These concerns have led to a fundamental shift in policy in many locations away from tolerance of smoking anywhere except in designated areas (such as indoors and near doorways) to prohibitions on smoking everywhere except in designated areas. Total bans on smoking in workplaces and entertainment venues have been shown to be successful in stopping smoking, reducing people’s exposure to second hand smoke, and even contributing to smokers quitting or cutting down (Pickett et al., 2006). Bans attract very high levels of public support and even support from smokers (Mele and Compagni, 2010). Public support would appear to be a fact in compliance, but monetary fines are also usually part of the mix of compliance methods. The legal authority to evict persons violating rules of entry or employment would also appear to be a factor, especially in relation to building interiors or entrances which are easily kept under surveillance. However, it is not clear how effective bans are in more open spaces, such as parks, beaches or the campuses of educational institutions. There appears to be a dearth of research on this topic. The shift to banning smoking everywhere except in designated locations significantly enlarges the challenge of enforcement for security managers and other ‘place managers’ responsible for compliance with rules (Eck, Clarke and Guerette, 2007), especially in locations with open space between buildings. Despite successes reported in many studies, a policy against smoking anywhere except in designated locations is likely to alienate many people who are used to the more liberal policy and who may attempt to defy the new rules by acting out what they see as their right to smoke.

Clarke (1997) offers a variety of techniques for developing compliance which have been shown to work in relation to crime in settings relevant to the issue of smoking bans in public places such as footpaths (Beauregard and Leclerc, 2010; Matthews, 1997), market places (Levy and Tartaro, 2010; Poyner and Webb, 1997) and town centres (Brown, 1997). Some techniques appear more likely than others to contribute to compliance with bans or restrictions on smoking. 'Assist compliance' can be achieved through the provision of smoking areas. 'Rule setting' would be considered essential, and signage can be used to 'post instructions' and 'alert conscience'. 'Strengthening formal surveillance' and 'extend guardianship' can be achieved through mobilising staff and security officers to engage with smokers about locations where smoking is prohibited and permitted.

The aim of the study was to evaluate the effectiveness of interventions using situational crime prevention approaches to reduce the smoking rate in outdoor areas of a university campus.

METHODS

Research site and sample

A prospective intervention method was used to compare differences in smoking behaviour between the "intervention university" campus and comparison campuses. The intervention was conducted on Mt Gravatt campus, a campus of Griffith University, with approximately 4000 staff and students. Two other campuses of the University were selected as control groups. Logan campus was chosen because it was most comparable to Mt Gravatt in size (with approximately 3000 staff and students); and the Gold Coast campus because it provided a contrast, being the largest campus with approximately 9000 staff and students.

A survey was used to help design the interventions and also measure people's smoking practices and experiences of smoking. A post-implementation survey was conducted in November 2009, with additional questions for the intervention campus members. Incentives were offered to complete both surveys. These consisted of a Woolworths shopping voucher for the first survey, and given the

possibility of survey fatigue, a $100 prize for the second survey. Although there was a decrease in responses between the first and second surveys, in that the pre-intervention the response rate was 25.91% of 3413 students and the post-intervention response rates were 18.54% for the intervention campus and 9.4% for the comparison campus, the numbers were sufficiently large for meaningful analyses within groups and between groups. Table 1 shows that the demographic characteristics of the sample.

Insert Table 1

Measures

Evaluation tools were designed to measure the impact of the campaign generally and to attempt to measure the effects of different strategies. The pre-implementation survey was conducted between 15 July and 30 July 2010 and the post-intervention was conducted between 15 November and 30 November of the same year. The effectiveness of situational measures were measured by asking the questions in the following areas:

1. Effect on general environment and behaviour change: Four questions were asked to evaluate the effectiveness of situational measures on the environment and smoking behavioural change. These questions were asked to evaluate whether the new smoking policy has created a healthy physical, work and study environment and has changed smokers' smoking behaviour. These four questions have an internal consistency with a Cronbach Alpha of 0.89.
2. Effectiveness of Situational method: This was assessed by the following aspects: (a) Rule setting by setting up new smoking policy, for example, "To what extent would you agree that implementation of a Smoke-free Campus policy which allows for certain Nominated areas is effective in tobacco control?"; (b) Signage provision by providing post instruction and alert conscience: This area included questions about the attitude of respondents regarding placement of clear signage in Nominated Smoking Areas, and placement of No Smoking area signs in No

Smoking Areas. Questions were also asked which evaluated the effectiveness of placement of butt bins in smoking areas and removal of butt bins in non-smoking areas; (c) Strengthening formal surveillance and extend guardianship: Questions covered the effectiveness of facilitation of the new policy by roaming Smoke-less campaign Ambassadors. These seven questions have a high level of internal consistency with a Cronbach Alpha of 0.92.

3. Information sharing and communication: Questions were asked to evaluate the effectiveness of education session, similar/workshops, quit sessions on quitting smoking in smokers. These seven questions have a high level of internal consistency with a Cronbach Alpha of 0.92.

The other measures were used to gauge compliance. The smoke-less ambassadors were engaged in observations of 134 smokers before and after the intervention. They also recorded responses from smokers asked to move to smoking areas.

Intervention methods

Griffith University, with a population of 38,000 staff and students, is spread across five campuses located between the southern part of Brisbane and the Gold Coast in the state of Queensland, Australia. The University has gradually extended no smoking areas in response to changes in state and federal government legislation. By 2009 University regulations banned smoking in buildings, 'where food and drink are provided', 'within five metres of air intakes, external doors, windows and ventilation louvers', and at other designated locations (such as around gas tanks) (Griffith University Council, 2004). One effect of the five metre rule was to displace smoking onto pathways and outdoor seating areas. Over several years members of the University's Mt Gravatt campus made their concerns about passive smoking known to the campus health and safety committee. The committee was also concerned about the problem of tobacco litter defacing the campus environment and the fire risk posed by smoking in the bushland setting. In 2007 the supply of cigarettes on campus had been stopped when the student union shop was closed due to government cut backs. However, this had little apparent impact on smoking levels. In response to mounting concern over

these problems, and as part of its general commitment to the health and safety of staff and students, in 2009 the university administration decided to conduct a pilot project to extend smoking prohibitions to all outdoor areas on the Mt Gravatt campus.

A Project Management Committee and Advisory Committee were formed, and an initial survey was conducted to gauge the views of the campus community about smoking and different options for restricting or banning smoking. A key issue concerned whether or not to ban smoking completely or restrict it to nominated areas. While a total ban was considered optimal, committee members were concerned that this would alienate too many community members and create too many difficulties for compliance. Consequently the survey included questions about community acceptance of different options. An invitation was sent via e-mail to members of three campuses – Mt Gravatt, Logan and Gold Coast – inviting them to take part in an online survey. The results showed that 60% of all respondents believed smoking should only be allowed in certain places, 31% believed that smoking should never be allowed in a university setting, and 9% thought smoking should not be restricted. The survey also found that 18.8% of members were smokers, and 60% of smokers supported restricting smoking to nominated smoking areas.

The situational crime prevention approach was used to guide the development of intervention strategies for the current study based on the principles that "situations can present cues which *prompt* the individual to perform criminal [smoking] behavior, they can exert social *pressure* on an individual to offend, they can induce disinhibition and *permit* potential offenders [smokers] to commit normally proscribed illegal acts, and they can produce emotional arousal which *provokes* a criminal response" (Wortley 1997, p. 174). Situational crime prevention has been criticised as having little relevance to 'non-rational' behaviours such as dangerous driving or illicit drug consumption by addicts. However, Farrell (2010) has shown that situational techniques can be highly effective in addressing these types of problems. For example, 'traffic calming' measures have reduced speeding and accidents, and the harms associated with illicit drug use have been reduced by the availability of safe injecting rooms and clean needles. Situational Crime Prevention

was defined for the current project as an approach: to develop measures directed at smoking that involve setting policy and rules; to modify the immediate environment to provide situational cues to smokers; and to manage the situation by surveillance, administration and education, so as to reduce the opportunities for smoking, increase its risks and reduce the rewards as perceived by smokers. With this approach in mind the management and the advisory committees elected to adopt a policy against smoking in all parts of the campus except nominated smoking areas. The slogan adopted was 'Smoke-less Campaign'. The double meaning was used to indicate no smoking was preferred but that smoking was still permitted on a restricted basis. The slogan also supported the component of the campaign aimed at helping smokers to quit or cut down. An additional major consideration was that the campaign was based on an official preferred option but that compliance was voluntary. At that stage the university was not willing to change the official policy which could be enforced through rules governing staff employment, student enrolments and conditions of entry for visitorAs indicated in the literature review, many of the strategies developed for the current study were consistent with the techniques of situational crime prevention. Table 2 provides a modified version of Cornish and Clarke's (2002) typology of 25 techniques of situational crime prevention. The examples have been deleted and replaced with relevant strategies adopted in the Smoke-less Campaign. As noted, the strategies considered most likely to be effective related to setting policy and rules, designing environmental cues by placing signs, posting instructions and alerting conscience, strengthening formal surveillance and extending guardianship, and assisting compliance by providing information sharing, education and communication through gym activities.

The following interventions were developed, and were implemented beginning in Week seven of the 14 week semester (the week beginning Monday 15 July).

1. Set policy and rules : A new policy was approved by the Vice-Chancellor against smoking at Mt Gravatt campus in all locations except nominated smoking areas.

2. Design the immediate environment for smokers to reduce opportunities for smoking : Facilities Management staff identified suitable smoking areas that were situated away from building entrances, public places, paths, passageways and ventilation equipment. Several smokers were consulted about the convenience of these locations. Five smoking areas were established, with seating and butt bins. One was an already existing smoking hut. The others included part of an undercroft area and three areas adjacent to buildings, including the student residence. Cleaning services were provided to the nominated smoking areas on a daily basis to enhance their amenity. Brochures were printed explaining the new policy, with a campus map showing the locations of smoking areas.

3. Strengthen formal surveillance and extend guardianship: Three students from the School of Public Health were employed as 'Smoke-less Ambassadors' on a part-time basis. The ambassadors, wore T-shirts and caps with campaign logos, ran a stall at the main pedestrian path for a week and roamed the campus handing out brochures. Ambassadors also targeted smokers with smoking-related health messages, brochures and directions to smoking areas. Ambassadors were trained in knowledge of health effect of smoking, and to be polite and avoid conflict with smokers. Ambassadors implemented these activities on campus on a daily basis for 10 weeks time in July to November in 2009. Security guards were also encouraged to communicate with smokers about the new policy and provide brochures and directions to smoking areas.

4. Provide environmental cues: All butt bins were removed from non-smoking areas in order to remove environmental cues encouraging smoking or communicating legitimacy for smoking. These bins were then installed in the nominated smoking areas to help keep the areas clean.

5. Post instruction and alert conscience: Messages about the new policy were provided through a variety of media. These included e-mails to all campus members, start-up messages on common use computers, and a large banner on the sole vehicle entrance to the campus. "No Smoking" signs were erected around the campus, particularly in areas that had been popular for smoking. "Smoking

Area" signs were put up in multiple languages in nominated smoking areas. Posters were also put up around the campus and inside buildings. The Smoke-Less Campaign was launched with an e-mail notice sent to all staff and students to the effect that: "From 7 September 2009, Mt Gravatt campus has become a smoke free campus. All students, staff and visitors are asked to only smoke in nominated smoking areas". The Smoke-less Campaign message was also delivered through free stress balls, posters and pamphlets, and information in the project website.

6. Encourage compliance: A variety of health promotion activities were conducted. The campaign stall provided health information in the form of brochures, booklets and posters. The Project Management Committee worked with Griffith Sport and Activities to promote physical and educational activities and free gym sessions were made available. Free QUIT sessions which were delivered by clinical psychologists using Cognitive Behavioural Therapy were made available to assist smokers to quit or cut down.

Insert Table 2 here

Data Analysis

SPSS Statistical program version 18.00 was used to analyse data. People who smoked and people who felt bother by smoking in pre-intervention phase and post-intervention phase and in intervention and control campus were analysed by using percentage. The difference between pre and post intervention in the proportion of people in both intervention and control campus who smoked and felt bothered was analysed by Chi-Square test, and P value was set at 0.05 level. The effect of Situational Crime Prevention measure on smoking in university was presented using percentage of people who agreed in the creation of health environment and effectiveness of the utilisation of Situational Crime Prevention Measures.

RESULTS

The findings overall indicated that the Smoke-less Campaign was effective in reducing smoking in targeted areas and that it had an impact in assisting smokers to quit or cut down. As noted, the campaign was also designed to contribute to the health of university members by encouraging and assisting smokers to quit or cut down. Table 3 shows the overall prevalence of smoking amongst members (regardless of where they smoked) as reported in the self-administered surveys at both the intervention and control campuses in the pre- and post-intervention phases of the campaign.

Insert Table 3 here

Results from the post-intervention survey show a reduction in smoking by members of both groups. However, there was a greater reduction in the overall prevalence of smoking in the intervention group, with a 6.3% reduction compared with a 2.7% reduction in the control groups. On the intervention campus most of the reported reduction in smoking at statistically significant levels was accounted for by female undergraduate students (7.3%), male undergraduate students (14.2%), and postgraduate female students (8.4%). Table 4 shows that 17.2% of smokers at the intervention campus said the new policy had helped them to quit or cut down. In terms of the question of inconvenience, 38.3% said that the policy had created some difficulties for them, while 44.4% reported that they had not been affected adversely by the policy.

Insert Table 4 here

Further evidence for a reduction in smoking on the intervention campus outside nominated areas and compliance behaviour is provided. Of survey respondents who smoked, 76.8% said they used the nominated smoking areas at least some of the time (this includes: 39.7% of them used the nominated area every time when they needed to use it, 17.9% of them used it in most of the time, 19.2% of them used it some of the time, and 23.1% of them never used them). In total, approximately 40% said they used the smoking areas every time they smoked on campus.

Observation data recorded by ambassadors related to approaches to 134 smokers on average per day over 13 weeks. The observation data indicated that 77.6% (n=104) of smokers encountered outside nominated areas used the designated smoking areas when requested by ambassadors; 20.1%

(n=27) of smokers were not aware of the smoking areas but complied with the policy when they were asked by student ambassadors; and 2.2% (n=3) of them needed further explanation or refused to use the smoking areas. The results of the observation study were also supported by the results in Table 5 reporting findings from the pre- and post-intervention surveys about people's experiences and perceptions of smoking on campus. In the pre-intervention phase approximately 53% of respondents were bothered by second-hand smoke at both the intervention and control campuses. After the intervention there was a significant increase of 14.4% in the proportion of people who did not feel bothered by second-hand smoke from 52.7% to 67.1% at the intervention campus (Mt Gravatt). At the same time, there was an increase of 3.8% – from 53.0%to 56.8% – on the control campuses in the proportion of people who felt bothered by the second-hand smoke after the campaign on the intervention campus was completed.***Insert Table 5 here***

Survey respondents were also asked about their views on the effectiveness of the campaign and of specific strategies in reducing smoking. The majority of respondents (82.8%) thought the campaign was effective to some degree. Strong support was given to situational crime prevention measures. Table 6 indicates that between 64.1% and 79.1% support was expressed for all the situational measures, with the strongest support given (80.8 to 85.9%) to creating healthy physical, study and work environment.

Insert Table 6 here

Table 7 shows that the second highest level of support (79.1%) was for no smoking signage and the third highest level of support (78.7%) for signage identifying nominated smoking areas. The availability of smoking areas was supported by 76.6%. Lower levels of support were given to measures that were more supportive or educational in nature, and the lowest levels of support were given to measures that were related to behavioural change. Nonetheless, support was generally solid here as well: 61.0% agreed support groups were effective, 59.1% supported smoking awareness health promotion activities, 57.8% supported How to Quit information and 52.3% supported rule

setting helped with smoking behavioural change. These views were in fact at odds with data on the take up of offers of support.

Insert Table 7 here

DISCUSSION

The results of this study support the view that the Smoke-less Campaign was generally successful in reducing smoking in open public places on the intervention campus and creating a healthier study and work environment. The reduction in smoking was most marked amongst male and female undergraduates on the intervention campus. This was the largest group on campus and the group most exposed to campaign activities in the form of contact with ambassadors as students moved between classes and the use of common computing facilities with campaign messages. Conversely, staff and postgraduate students were more likely to be older, with longer smoking histories and possibly more addicted to smoking.

The high level of agreement in the post intervention survey with the strategies of the situational crime prevention approach indicates the effectiveness of implementing this approach to reduce the prevalence of smoking, and to create a healthy physical, social, and study environment on a university campus. In terms of situational crime prevention theory the strategies designed for the current study were effectively applied and implemented with sufficient administration and authority support in the university. These strategies are most closely related to the technique of 'post instructions' under the heading 'remove excuses'. Signage also related to 'assist natural surveillance' in making non-compliance conspicuous.

Strong support was also given to the availability of Nominated Smoking Areas, which relates to 'target hardening', 'assist compliance' and 'reduce frustration and stress' strategies described in previous research, (Farrall, 2010; Clarke and Homel, 1997). For example, setting up designated smoking areas is the part of the creating a healthy environment initiative. Going to designated smoking areas to smoke was inconvenient for smokers, this discouraged them from smoking and

consequently made them quit smoking. The smoking areas allowed smokers to satisfy cravings while complying with the policy and without bothering non-smokers. The availability of the smoking areas was also useful in 'removing excuses' and 'deflecting offenders' – if the latter does not stretch this concept too far – in pre-empting arguments against non-compliance and providing a controlled environment for an anti-social behaviour. These findings were also consistent with findings from other research showing that younger smokers who are 'socially cued' to smoke in places such as bars are more likely to give up smoking when bans are introduced (Trotter, Wakefield and Borland, 2002).

Additionally, the campaign measures were implemented within a framework of a revised official policy that 'set rules'. Although the 'prohibition' on smoking in public places was not an enforceable university rule, the fact it became an official policy preference appeared to have been important in providing at least some authority to the campaign. The current study differs from a recent study in a university setting conducted by Ballie and colleagues (2011) in the following points . First, our interventions were consistent with a situational crime prevention approach – including the use of explicit strategies to regulate and reinforce smoking rules. In the Ballie et al. study, administrative support and publicity measures were not provided to ensure compliance with such rules . Second, the Ballie et al study did not appear to include the flexible monitoring and surveillance activities used in our study which encouraged acceptance and compliance by smokers of the new policy. The adoption of a situational crime prevention approach therefore appears to have been a key aspect of the relative success of our project. The reduction in the number of persons who smoked (regardless of where they smoked) is also indicative of the idea in situational crime prevention of a 'diffusion of benefits' (Clarke, 1997). This can occur as an inverse of crime displacement. Interventions aimed at reducing crime in a particular location may help reduce crime in other locations as a result of various factors, such as discouragement of potential offenders. In this smoking case study it appears that interventions employed on a university campus had some effect on the behaviour of campus members when they were off campus. It is possible that the 'alert

conscience' messages in relation to the harmful effects of smoking had the most effect here. It is also notable that the proportion of persons on the control campuses bothered by smoke increased between the pre- and post-intervention surveys. The most likely explanation for this is that awareness of the Smoke-less Campaign on the intervention campus stimulated them to think more about their experience of second hand smoke.

While the reductions in smoking were significant, they were fairly modest. In the post-intervention period one third of people on the intervention campus were still bothered by smoke (down from 47.3%). However, the results of the trial were sufficiently robust to provide support for the university administration's decision, in May 2010, to change the smoking policy across the university to officially prohibit smoking in all locations except designated smoking areas (Griffith University Council, 2010). This is likely to greatly enhance compliance given the experience when bans in public areas have the weight of law (Mele and Compagni, 2010). The university also made a commitment to constructing purpose-built smoking huts on all campuses to facilitate compliance.

Conclusion

This study of a campaign to reduce smoking in outdoor areas of a university campus showed that relatively high rates of compliance can be achieved even when there is no legal basis for enforcement. In particular, the study showed that many techniques associated with situational crime prevention can be utilised successfully in the somewhat novel area of compliance with new smoking restrictions in outdoor public spaces. The most likely foreseeable trend globally is for greater controls on smoking. This presents a challenge for security and other managers delegated the task of ensuring compliance while avoiding heavy handed law enforcement and alienating persons (such as employees, customers or visitors) who have a smoking habit. In practice, it is more effective if clear non-smoking signs in the non-smoking areas and designated smoking areas are placed on university campuses, supported by a clear smoking policy and strong monitoring and surveillance of smoking behaviour. The present study suggests that the use of situational techniques can be beneficial in pursuing this goal.

References

Baillie, L., D. Callaghan, D and M. L. Smith. 2011. "Canadian campus smoking policies: investigating the gap between intent and outcome from a student perspective." *Journal of American College Health*, Vol. 59 No.4, pp. 260 -265.

Beauregard, E., and M. B. Leclerc. 2010. "An application of the rational choice approach to the offending process of sex offenders: A closer look at the decision-making." *Sex Abuse* Vol. 19, pp. 115-33.

Brown, B. 1997. "CCTV in Three Town Centers in England." in *Situational Crime Prevention: Successful Case Studies (2nd ed.)*, edited by R. V. Clarke. Guilderland, N.Y.: Harrow and Heston.

Clarke, R. V. 1997. *Situational Crime Prevention: Successful Case Studies*. Guilderland, NY: Harrow and Heston.

Clarke, R.V. and Homel. R. 1997. "A revised classification of situational crime prevention techniques." pp. 17-27 in *Crime prevention at the crossroads.edited by* S.P. Lab, Cincinnati, OH: Anderson.

Cornish, D. B. , and Clarke. R. V. 2002. "Analyzing organized crimes." pp. 41-62 in *Rational Choice and Criminal Behavior: Recent Research and Future Challenges*. edited by A. R. Piquero and S. G. Tibbetts, NY: Routledge.

Collins, D., and H Lapsley. 2008. "The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05, .". Canberra: Department of Health and Ageing.

Cornish, D., and C. Clarke. 2003. "Opportunities, precipitators and criminal decisions: a reply to ortley's critique of situational crime prevention." pp. 41-96 in *Theory for Situational Crime Prevention. Crime Prevention Studies*, edited by D Cornish. Monsey, NY: Criminal Justice Press.

Eck, J. E., R. V. Clarke, and R. T. Guerette. 2007. "Risky facilities: Crime concentration in homogeneous sets of establishments and facilities." pp. 225-64 in *Imagination for Crime Prevention. Crime Prevention Studies*, edited by F. Graham, K. J. Bowers, S. D. Johnson, and M. Townsley. Monsey, NY: Criminal Justice Press.

Farrell, G. 2010. "Situational crime prevention and its discontents: rational choice and harm reduction versus 'Cultural Criminology'." *Social Policy & Administration*, Vol. 44 No.1. pp. 40–66.

Giskes, K., F. J. Van Lenthe, G. Turrell, J. Brug, and J. P. Mackenbach. 2006. "Smokers living in deprived areas are less likely to quit: A longitudinal follow-up." *Tobacco Control*, Vol. 15 No.6, pp. 485-88.

Levy, M. P., and C. Tartaro. 2010. "Repeat Victimization: A study of auto theft in Atlantic city ssing the WALLS variables to measure environmental indicators." *Criminal Justice Policy Review*, Vol. 21 No. 3, pp. 296-318.

Matthews, R. 1997. "Developing more effective strategies for curbing prostitution." pp. 74-82 in *Situational crime prevention: Successful case studies*, edited by R. V. Clarke. Guilderland, NY: Harrow and Heston.

Mele, V., and A. Compagni. 2010. "Explaining the unexpected success of the smoking ban in Italy: Political strategy and transition to practice, 2000-2005." *Public Administration*, Vol 88 No. 3, pp. 819-35.

National Health and Medical Research Council. 1987. "Effects of passive smoking on health." Canberra: National Health and Medical Research Council Working party.

Pickett, M. S., S. E. Schober, D. J. Brody, L. R. Curtin, and G. A. Giovino. 2006. "Smoke-free laws and second hand smoke exposure in US non-smoking adults, 1999-2002." *Tobacco Control*, Vol 15, No. 4, pp. 302-07.

Poyner, B., and B. Webb. 1997. "Reducing theft from shopping bags in city centre markets." pp. 83-89 in *Situational Crime Prevention: Successful Case Studies*, edited by R. V. Clarke. Guilderland, N.Y.: Harrow and Heston.

Ransley, J., and T. Prenzler. 2007. "Defining crime." pp. 17-32 in *An introduction to crime*, edited by H. Hayes and T. Prenzler. Sydney: Pearson.

Schmidt, C.. 2007. "Public support for smoking bans diffusing to developing countries." *Journal of the National Cancer Institute*, Vol. 99 No. 8, pp. 585-86.

Trotter, L., M. Wakefield, and R. Borland. 2002. "Socially cued smoking in bars, nightclubs, and gaming venues: A case for introducing smoke-free policies." *Tobacco Control*, Vol 11No. 4, pp. 300-304.

Turrell, G., and C. Mathers. 2001. "Socioeconomic inequalities in all-cause and specific-cause mortality in Australia: 1985-1987 and 1995-1997." *International Journal of Epidemiology* Vol. 32 No. 2, pp. 231-39.

US Department of Health and Human Services. 2006. "The health consequences of involuntary exposure to tobacco smoke: A report of the Surgeon General : .". Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

World Health Organization. 2008. "WHO Report of the Global Tobacco Epidemic." Geneva: WHO.

Table 1 Demographics characteristics of participants

	Pre intervention		Post intervention		χ^2
	Intervention (n=2194) n(%)	Control (n=1334) n(%)	Intervention (n=1345) n(%)	Control (n=684) n(%)	
Smoking status					
Smoker	313 (20.7%)	456 (18.1%)	112 (14.4%)	234 (15.4%)	4.36*
Non-smoker	1197 (79.3)	2069 (81.9%)	668 (85.6%)	1285 (84.6%)	
Gender					
Female	1169 (76.8%)	1833 (72.4%)	583 (74.6%)	1163 (75.9%)	0.45
Male	353 (23.2%)	700 (27.6%)	198 (25.4%)	369 (24/1%)	
Age					
< 21	332 (24.7%)	174 (25.4%)	592 (27.0%)	280 (21.0%)	4.35
21-30	524 (39.0%)	288 (42.1%)	1027 (46.8%)	571 (42.8%)	
31-40	233 (17.3%)	96 (14.0%)	255 (11.6%)	219 (16.4%)	
41-50	160 (11.9%)	78 (11.4%)	211 (9.6%)	171 (12.8%)	
>50	96 (7.1%)	48 (7.0%)	109 (5.0%)	93 (7.0%)	

* $P < 0.05$

Table 2: Smoke-less Campaign and Situational Crime Prevention Techniques

Increase the effort	Increase the risks	Reduce the rewards	Reduce provocations	Remove the excuses
1. Harden Targets N/A	**6. Extend guardianship** ▪ Student ambassadors	**11. Conceal targets** N/A	**16. Reduce frustration and stress** ▪ Accessible Nominated Smoking Areas ▪ Access to QUIT assistance programs	**21. Set rules** ▪ Authorise new policy
2. Control access to facilities ▪ Remove butt bins	**7. Assist natural surveillance** ▪ Advertising campaign to all community members ▪ "No smoking" signs	**12. Remove targets** ▪ Remove butt bins	**17. Avoid disputes** ▪ Ambassadors trained to avoid conflict ▪ Brochures left with smokers	**22. Post instructions** ▪ "Smokeless Campaign", "No Smoking" and "Smoking Area" signs
3. Screen exits N/A	**8. Reduce anonymity** ▪ Personal contact by ambassadors and security officers	**13. Identify property** ▪ Griffith University logo on signage	**18. Reduce emotional arousal** ▪ Absence of smokers in public places ▪ Remove cigarette litter and butt bins that provide environmental cues	**23. Alert conscience** ▪ Ambassadors and brochures provide warnings and information on health and nuisance impacts of smoking and passive smoking
4. Deflect offenders ▪ Ambassadors, security officers and brochures provide locations of smoking areas	**9. Utilise place managers** ▪ Project Management Committee and Advisory Committee included campus facilities management staff	**14. Disrupt markets** ▪ Continuation of ban on tobacco products by campus shops	**19. Neutralise peer pressure** ▪ Absence of smokers in public places	**24. Assist compliance** ▪ Accessible Nominated Smoking Areas ▪ Access to QUIT assistance programs
5. Control tools/weapons ▪ Removal of butt bins	**10. Strengthen formal surveillance** ▪ Security officers involved in campaign	**15. Deny benefits** ▪ Health messages help neutralise smoking pleasures and rationales	**20. Discourage imitation** ▪ Absence of smokers in public places	**25. Control drugs/alcohol** ▪ Continuation of ban on tobacco products by campus shops

(Adapted from Cornish & Clarke, 2003)

Table 3: Overall prevalence of smoking in pre and post intervention phase of the campaign

Campus	Smoking Status	Pre-intervention	Post-intervention	% difference	$\chi 2$
Control Campuses	Non Smoker	2069 (81.9%)	1285 (84.6%)		p=0.03
	Smoker	456 (18.1%)	234 (15.4)	-2.7	
Intervention Campus	Non Smoker	1197 (79.3%)	668 (85.6%)		p=0.001
	Smoker	313 (20.7%)	112 (14.4%)	-6.3	

Table 4: The new smoke free policy helped smokers to cut down or quit

	Intervention Campus
Helped you quit smoking	4 (4.9%)
Helped you cut down	10 (12.3%)
Created difficulties for you	31 (38.3%)
Not affected you at all	36 (44.4%)

Table 5: University members bothered by second-hand smoke

Group	Bothered by smoking	Pre-intervention	Post-intervention	$\chi 2$
Control Group	Yes	1315 (53.0%)	849 (56.8%)	p=0.03
	No	1164 (47.0%)	647 (43.2%)	
Intervention Group	Yes	695 (47.3%)	251 (32.9%)	p=0.001
	No	775 (52.7%)	511 (67.1%)	

$\chi 2$ test was used to test the difference between Pre-intervention and post-intervention phase in relation to the feeling of being bothered by smoking in the intervention and control groups.

Table 6. Rule setting and healthy environment and health behaviour change

	Yes N(%)	No N(%)
Create healthy physical environment	**268(85.9%)**	44(14.1%)
Create healthy study environment	**249(80.8%)**	59(19.2%)
Create healthy work environment	**256(84.5%)**	47(15.5%)
Change health behaviour	**156(52.3%)**	142(47.7%)

Table 7
Effectiveness of situational crime prevention measures

		Strongly Disagree	Neutral	Strongly Agree
Strengthening formal surveillance and extend guardianship and, Signage post instruction and alert conscience	Smoke free policy	49 (11.0%)	57 (12.8%)	**440 (76.3%)**
	Roaming Ambassadors on campus	72 (16.1%)	91 (20.4%)	**283(63.5%)**
	Removal of butt bins	77 (17.2%)	79 (17.7%)	**291(65.1%)**
	Placement of butt bins in smoking areas	32 (7.2%)	63 (14.1%)	**351(78.7%)**
	Signage at Nominated Smoking Areas	34 (7.8%)	64 (14.6%)	**339(77.6%)**
	Signage at no smoking areas	48 (10.8%)	57 (12.9%)	**338(76.3%)**
Information sharing and education	Awareness of smoking effect health promotion week	56(12.5%)	122 (27.2%)	**271(60.4%)**
	Seminars/workshops	45(10.1%)	133 (29.8%)	**269(60.2%)**
	Quit information sessions	45(10.1%)	133 (29.8%)	**269(60.2%)**
	Support groups	39(8.7%)	132 (29.6%)	**277(61.7%)**
	Sport activity (Gym)	46(10.2%)	137 (30.5%)	**266(59.2%)**