The Influence and Change in Smoking Ban Acceptance amongst University Employees

Bachelor Thesis

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Abstract

Background. Despite the decrease in smoking prevalence, diseases related to tobacco use are still leading causes of morbidity and death. A smoke-free campus is associated with a decrease in smoking rates and helps smokers quit which is evidenced by less favourable attitudes towards smoking amongst campus community members, such as employees. Stressing the importance of smoking ban acceptability amongst campus community members, this study examined the change in smoking acceptance among employees at the University of Twente over time. Moreover, the current level of smoking ban acceptability was assessed. To understand smoking ban acceptance better, predictors such as deterrence and habit were investigated. Furthermore, due to the importance of ban enforcement, the predictors were examined to enable policymaking for the University of Twente.

Method. This study includes a cross-sectional survey and a longitudinal observational study. The cross-sectional survey measured the acceptance of change over time, while the longitudinal observational study included more aims. At first, the study measured the current level of smoking ban acceptance amongst employees. Second, to assess smoking ban acceptance, this study included an explorative research with deterrence and habit as predictors of smoking ban acceptance. Next, to enable policymaking, different predictors of enforcement intention were tested, namely self-efficacy, outcome expectancies, responsibility, attitude, and habit.

Results and Discussion. The study found that although the overall level of employees' acceptance of the smoking ban did not change over the past two years, it was moderately high amongst the sample. However, due to COVID-19, employees were less exposed to the smoking ban, which could explain the lack of change over time. Nonetheless, it was argued that the smokers were underrepresented in the sample, making the measured level of acceptance invalid concerning the whole campus population. The explorative research showed that smoking ban acceptance is influence by a deterrent effect with the absence of smoking status as a moderator. Smoking status has shown a strong predictor of smoking ban acceptance due to its great influence on cognitions, which might exceed the effect of deterrence on smoking ban acceptance. Additionally, the study revealed that the presence of a high level of self-efficacy and a positive attitude greatly influenced the enforcement of the ban. It was, therefore, advised to create policies focusing on deterrence, self-efficacy, and positive attitudes.

Introduction

Despite the decreases in smoking behaviour, diseases that are related to tobacco use remain one of the leading causes of morbidity and mortality. Tobacco use has shown to be the greatest contributor to premature death (Statistics Canada, 2018; World Health Organization, 2017). Smoking does not only harm smokers but also brings health risks for non-smokers through second-hand smoking. In short, second-hand smoke is a combination of two types of smoke, namely exhaled smoke and sidestream smoke and it has shown to contain at least 250 chemicals that are considered either toxic or carcinogenic (National Toxicology Program, 2000; U.S. Department of Health and Human Services, 1986).

Because of this great impact of smoking, several interventions have been introduced to reduce smoking amongst populations. Those focused on a change of behaviour and pharmaceutical support and were delivered by specialists as well as through the internet and via telephone lines (Brown, Platt, & Amos, 2014). The World Health Organization introduced several measures as guidelines to decrease smoking behaviour. These measures include the monitoring of tobacco usage, policymaking to reduce tobacco usage, protecting non-smokers, offering cessation support, and warning for hazards (World Health Organization, 2013). The World Health Organisation (2013), therefore, supports the implementation of smoking bans since they regulate tobacco consumption. In line with these measures, smoke-free policies for campuses have been gaining attention for the past years due to their effectiveness in reducing smoking behaviour in the workplace. The central aim of smoke-free campus policies is to discourage tobacco use amongst employees, but also to protect non-smoking campus community members from second-hand smoking (Roditis, Wang, Glantz, & Fallin, 2015).

Overall, research by Berg et al. (2011) suggests the effectiveness of specifically a whole smoke-free campus policy. The reported benefits in this study focused on reduced smoking behaviour, protection of non-smokers, and a cleaner campus environment. Similarly, Lechner, Meier, Miller, Wiener, and Fils-Aime (2012) found that a campus smoking ban is effective in reducing smoking behaviour on campus. Furthermore, Farkas, Gilpin, Whyte, and Pierce (2000) found a significant reduction in the initiation to smoke amongst younger adults that are present on campus. An important aspect of this smoking prevention is that a targeted policy should be comprehensive and, therefore, easy to follow (Wolfson, McCoy, & Stufin, 2009). Moreover, research by Castellan et al. (2015) shows that tobacco control interventions should be implemented in the workplace since they have been shown to improve the decrease in second-hand smoke exposure. All in all, smoke-free policies are associated with a decrease in second-hand smoking, an increase in cessation attempts and a reduction in smoking rates (Hafez, Gonzalez, Kulik, Vijayaraghavan, & Glantz, 2019). A smoke-free campus, thus, has a positive effect on both smokers and non-smokers. Furthermore, smoke-free policies change the social acceptability of smoking, which eventually prevents smoking amongst others and helps smokers to quit (Chapman, Borland, Scollo, Brownson, Dominello, & Woodward, 1999; Fichtenberg & Glantz, 2002). Moreover, Fallin, Roditis, and Glantz (2015) reported that campus community members of smoke-free campuses reported less favourable attitudes towards smoking and fewer intentions to smoke. Research by Seo, Macy, Torabi, and Middlestadt (2011) adds to this that those campuses show a lower prevalence of smokers among the campus population.

While research (e.g., Lazuras, Rodafinos, Panagiotakos, Thyrian, John, & Polychronopoulos, 2009; Vardavas et al., 2011) shows evidence that employees are supportive of a smoke-free campus, Borland, Owen, Hill, and Chapman (1989) note that this support does not necessarily reflect the acceptance of a smoking ban. Moreover, smoking ban acceptance has shown to have a major influence on the respondents and their behaviour. The acceptance of smoking bans may affect the implementation as well as compliance with these bans, eventually decreasing the effectiveness of the smoking ban.

Therefore, it is important to make sure that employees do accept the smoking ban to make sure the smoking ban is effective (Borland et al., 1989). Accordingly, it can be argued that the acceptance can be measured within different groups of employees on campus. These groups together constitute the campus community and, therefore, contribute to the compliance and enforcement of the smoking ban. Mostly, the distinction between smokers and non-smokers is made. According to the literature by Borland et al. (1989), a high level of acceptance might indicate a high level of ban compliance which is most important amongst smokers since they are the ones that need to comply with the ban. Specifying on the importance amongst non-smokers, this group includes ex-smokers who could identify with smokers best or, moreover, start smoking again. Lastly, non-smokers are being protected by the ban and their acceptance consequently signals the smokers, thus, legitimizing the smoking ban. Therefore, measuring acceptance amongst non-smokers is of importance.

Deterrence. A determinant that might influence employees' acceptance of the smoking ban, is deterrence. To explain deterrence, both the situational action theory (SAT) (Wikström & Treiber, 2007) and deterrence theory (Grosvenor, Toomey, & Wagenaar, 1999) should be considered. The SAT focuses on the determinants that explain breaking moral rules. Wikström (2006) defines morality as the individually dependent rules about what is right and what not in certain situations. When someone's moral beliefs accord with the moral rules of a situation, they are more likely to comply with the rules. Additionally, the SAT emphasizes that the choice to break a moral rule is dependent on the available action alternatives. In the end, one's moral beliefs will influence the choice for a certain action alternative (Wikström & Treiber, 2007). When deliberating over different action alternatives, deterrence is considered an effective hindrance for the deviant action alternative (Wikström, 2006). Deterrence can be defined as 'the felt worry about or fear of consequences when considering breaching a moral rule or committing an act of crime' (Wikström, Tseloni, & Karlis, 2011, p. 403). A high degree of deterrence, thus, stops a person from breaking a moral rule when in doubt. Concerning the current study, employees might experience morality with regard to the smoking ban, such as the feeling of being an example for students. Accordingly, if they worry a lot about the consequences of not following the smoking ban on campus, they are more likely to accept and comply with the ban. Furthermore, based on the deterrence theory (Grosvenor et al., 1999) three elements that can be distinguished as components of deterrence, are the likelihood of getting caught, the severity of the consequences and the certainty of consequences. First, the likelihood of getting caught is considered. Harbaugh, Mocan, and Visser (2013) found that when the likelihood of getting caught increased, the intention to violate a certain ban decreased. This would mean that when it is likely to get caught smoking on campus, more people would comply with the ban or at least intend to, implying that proper ban enforcement is needed. Second, Harbaugh et al. (2013) suggest this effect gets bigger when the expected severity of punishment gets larger. Gibbs (1977) already noted the influence of the perceived severity of sanctions on behaviour. However, there is evidence that the perceived severity of sanctions will only influence behaviour when the certainty of getting caught is sufficiently high (Grasmick & Bryjack, 1980; Paternoster, Saltzman, Chiricos, &

Waldo, 1983). In addition to this, Tittle (1980) found that of the three aspects of deterrence, perceived certainty of punishment is most effective in influencing behaviour. Accordingly, Nagin (2013) found that the certainty of punishment is more convincing and consistent than the severity of punishment and, thus, has a greater deterrent effect.

Enforcement. An element that seems important regarding this certainty of punishment is enforcement. Moreover, this variable seems interesting for the whole employee population on campus, both smokers and non-smokers since both can contribute to ban enforcement. Research by Schreuders, Nuyts, van den Putte, and Kunst (2017) mentions that inconsistent and not so strict enforcement of the smoking ban leaves opportunities for smokers to smoke. In addition, it may increase the feeling of unfairness amongst smokers since inconsistent enforcement creates different sanctions for different people. This eventually leads to a decrease in deterrence amongst employees. Research by Chiou, Cheng, and Huang (2011) noted that a higher level of perceived deterrence increases the intention to comply and improves attitudes towards a ban. Accordingly, Hong, McConnell, Liu, Urman, and Barrington-Trimis (2019) found a decrease in acceptance amongst employees due to lower levels of enforcement of the smoking ban. In general, strict and consistent enforcement has shown to improve the effectiveness of the smoking ban (Linnansaari, Schreuders, Kunst, Rimpelä, & Lindfors, 2019). Moreover, strong and comprehensive ban enforcement are of importance to achieve acceptance and compliance (Mons et al., 2012). In addition, the Centers for Disease Control and Prevention (2014) addresses the importance of campuses evaluating the policy enforcement by analysing several predictors among which attitudes (such as attitude towards the ban and responsibility), beliefs (such as outcome expectancies and self-efficacy) and behaviours (such as ban compliance).

Habit. Another determinant influencing one's smoking behaviour and acceptance of the smoking ban is habit. Since 1712 smoking has been known as an unhealthy habit including its addiction (Ekiken, 1712). Smoking is a habit that leads to both physical and psychological dependence (Juranić, Mikšić, Rakošec, & Vuletić, 2018). A habit can be defined as a cognitive process in which circumstances trigger a reaction. Furthermore, a habit is formed as a learned behavioural response that is frequently repeated and highly automated (Gardner, 2015; Lally, van Jaarsveld, Potts, & Wardle, 2010; Orbell & Verplanken, 2010). Concerning the smoking ban acceptance and, thus compliance, it has been suggested that violation of such rules stem from a deliberate decision or a habit (Wikström & Treiber, 2007). This shows that violating the smoking ban is either a deliberate act, showing non-acceptance, or a habit, showing the impact of habit on complying with the smoking ban. Accordingly, as the habitual nature of smoking is acknowledged by earlier research (e.g. Ekiken, 1712; Juranić, Mikšić, Rakošec, & Vuletić, 2018), one can rule out the deliberate act of noncompliance with the smoking ban.

However, both the advantages and disadvantages of implementing a smoking ban should be considered. Nishiura, Narai, Ohguri, Funahashi, Yarita, and Hashimito (2009) found that smoking has negative influences in the workplace such as affecting one's productivity and contributing to being more

absent during the day (Gerson, Allard, & Towva, 2005). Furthermore, Halpern, Shikiar, Rentz, and Khan (2001) hypothesized that employees productivity decreases due to time lost by absenteeism. Accordingly, the World Health Organization (2019) mentions that a smoking ban will increase the focus on work since staff will take fewer smoke breaks which eventually improves productivity. Generally speaking, Watson, Glover, McCool, Bullen, Adams, and Min (2011) found that employees are likely to leave the campus to smoke when whole campus bans are implemented, and are thus, accepting and complying with a smoking ban. However, a smoking ban at the workplace may bring risks. Previous studies have emphasized how complying with a smoking ban at work might be challenging for employees (Jancey, Bowser, Burns, Crawford, Portsmouth, & Smith, 2014; Pires, Block, Belance, & Marteache, 2016; Schultz, Finegan, Nykiforuk, & Kvern, 2011). Since smoking is addictive, smokers may isolate themselves to smoke somewhere within the restricted area. This can cause feelings of guilt or develop stigmas (Burns et al., 2013). Therefore, it is of importance to investigate the overall acceptance of employees on the smoke-free bans since they comprise the campus as a workforce (Braverman, Hoogesteger, & Johnson, 2015).

University of Twente, Smoke-free campus

In the year 2020, the University of Twente decided to make the university campus smoke-free from the 30th of March onwards. Hereby, they aimed to follow the Tobacco and Smoking Products Act, which states that smoking is forbidden on educational grounds from January 1st, 2020 and will be enforced from August 1st onwards (University of Twente, n.d.). Therefore, the University of Twente decided to make the whole campus smoke free, this means that students and employees are not allowed to smoke on campus with the exclusion of living areas. At first, the University of Twente had a smoking ban within 25 meters of University building entrances. However, a whole smoke-free area is more interesting since partial smoke-free policies have shown to be less effective in reducing smoking behaviour (Bauer, Hyland, Li, Steger, & Cummings, 2005; Berg et al., 2011; Farrelly, Evans & Sfekas, 1999). Besides making the campus smoke-free, the University of Twente offers cessation help. Sponsored cessation programs have shown to be effective as well since they increase quitting rates (Halpern, Dirani, & Schmier, 2007). In the current situation, students and employees, thus, only have the ability to smoke outside campus or in the living areas, increasing the effort that should be put into finding a place where smoking is allowed. Hopefully, decreasing their smoking behaviour as well.

At the beginning of 2019, a survey was conducted among campus community members by Ditzel, Postel, and Pieterse (2019). This survey assessed their smoking status and accordingly their smoking behaviour. The part about smoking behaviour included items about smoking products, smoking frequency, smoking locations, cessation attempts, compliance to the former smoking ban (as mentioned above) (Ditzel et al., 2019). Additionally, the survey considered (namely) the variable attitude of the Theory of Planned Behaviour (TPB) which states that attitude together with the subjective norm and perceived behavioural control influence the intention of a certain behaviour (Ajzen, 1991).

The survey included several items about the participants' attitudes toward the potential smoking ban (Ditzel et al., 2019). They found that the new smoking ban would be highly accepted as shown by 70% of their sample agreeing that the ban in 2019 could be stricter.

Since two years has passed and the new ban has been implemented, it is interesting to assess the smoking ban acceptance again. This can show whether smoking ban implementation influences smoking ban acceptance over time. However, due to the COVID-19 situation, it seems as though hardly anything has changed since employees were hardly going to campus while working at home and, therefore, did not notice that this policy has been implemented. It is, thus, not clear whether employees are going to accept the ban whenever they are installed at campus again. Accordingly, the sample by Ditzel et al. (2019) will be contacted again for a follow-up study. In addition, other campus community members will get an invitation to participate in the general post-ban study.

Current research

This research has several goals. To begin with, it aims to assess the current level of smoking ban acceptance and whether this acceptance has changed due to ban implementation. Furthermore, this study aims to understand smoking ban acceptance and will examine which variables predict smoking ban acceptance. Lastly, the study intends to advise the University of Twente on policymaking. Therefore, the variables influencing ban enforcement will be assessed.

Longitudinal study. First, the change in acceptance among employees between pre- and post-ban implementation is assessed. Therefore, the first research question will be *"To what extent has the acceptance towards the smoke-free campus of smoking and non-smoking employees changed after implementing a whole campus smoking ban?"*. Acceptance can increase over time since research by Borland, Owen, and Hocking (1991) have shown that acceptance amongst employees increased after the implementation of a smoking ban. However, it is hypothesized that little to nothing has changed in the meantime due to the lack of exposure to the ban caused by the COVID-19 situation. To test this hypothesis, the data of Ditzel et al. (2019) will be used as a pre-ban cohort sample and compared to the results of this research (post-ban cohort sample).

Cross-sectional study. The second research question includes *"To what extent is the smoking ban accepted by employees, both smoking and non-smoking?"* and examines the current level of acceptance amongst employees. Hypothesis two is that the smoking ban is highly accepted with differences between the smoking and non-smoking employees. Smoking employees may be less accepting of the smoking ban since they are the ones that will potentially suffer from the ban. On the other hand, non-smoking employees are protected by the ban and will, therefore, score higher on smoking ban acceptance than smoking employees, with on average a highly accepting attitude based on the high support shown by Ditzel et al. (2019).

Explorative study. Besides, this research will examine the different variables that might have a significant influence on the general acceptance and compliance with a smoking ban. The (exploratory)

third research question will, thus, be *"What is the influence of deterrence and habit on employees' acceptance towards a smoking ban?"*. Fourthly, to ensure better enforcement of the smoking ban on campus, the exploratory fourth question arose, *"What is the influence of habit, attitude, responsibility, outcome expectancies and self-efficacy on employees' ban enforcement intention?"*. Furthermore, with the answered research questions this research aims to enable new policymaking to promote the smoking ban.

Methods

Design

This research used three different study designs. Since it focuses on four different research questions, different variables are presented. The first research question will be analysed amongst the cohort sample. To test whether acceptance has changed, a longitudinal study has been done with the results that Ditzel et al. (2019) gathered in July 2019, as the pre-ban cohort sample and the cohort results of this study as the post-ban cohort sample. The variables that would be considered are the acceptance at both points in time with smoking status as a between-subjects variable. Acceptance will be measured through attitude (as described above) due to the cognitive nature of this research. The cross-sectional study and second research question examined the independent variable smoking status and dependent variable acceptance within the post-ban group. The third research question is exploratory and will, therefore, focus on several determinants while being assessed in the post-ban sample. The influence of the independent variables deterrence and habit on the dependent variable smoking ban acceptance will be examined. Lastly, the fourth research question will assess the independent variables habit, attitude, responsibility, outcome expectancies, and self-efficacy on the dependent variable ban enforcement.

Participants

The post-ban survey was filled in by 190 participants. The participants were divided into two categories with regard to smoking status. Overall, 13% of the post-ban sample were smokers, whereas the other 87% were non-smokers or ex-smokers. With regard to the occupation amongst employees, 80 (42.1%) were academic staff in research and/or education. 15 (7.9%) participants were categorized as management (which included executive functions). 32 (16.8%) participants worked in services (such as IT, HR, PR, and health and safety services) and 63 (33.2%) were employed as supportive staff (which includes management assistants, technicians, maintenance of facilities). The participants were gathered by two methods. 46 participants responded to the personal email based on the email address they left in the survey of Ditzel et al. (2019) completed in 2019. These participants belong to the cohort sample and their data will be compared to their pre-ban data of 2019. 144 participants replied to the survey that was published on the weekly news feed of the University of Twente. Data of both participants groups (post-ban sample) was used to investigate the influence of deterrence and habit on the acceptance of a smoking ban and level of acceptance in general and the several influences on ban enforcement.

Materials

For this research, the data of Ditzel et al. (2019) and a similar survey were used. The survey consisted of 30 items, all with different constructs and was based on the existing survey of Ditzel et al. (2019), enabling comparisons. The items had a forced response to ensure complete responses of the participants. Moreover, some constructs requested non-smokers to imagine being a smoker, this would ensure a high response rate for analyses. The non-smokers group also consisted of ex-smokers who could imagine being a smoker properly. At first, the survey consisted of demographic questions, asking about their living situation and occupation (e.g., "What is your primary occupation at the UT?"). Next, the smoking status was assessed, which used several checkbox questions, open-ended questions, dichotomous questions, multiple-choice questions, and Likert scale questions. These were recoded in a way that smokers would score lower than non-smokers indicating a higher acceptance of the smoking ban. The questions were put into Qualtrics, an online environment for publishing a questionnaire. The following constructs were formed to measure the variables.

Smoking ban acceptance. The following construct, attitude, was used from the initial survey. The initial survey of Ditzel et al. (2019) used 14 items, both positive and negative formulated. In this study, an additional item was added, namely "A smoke-free campus contributes to a healthy lifestyle.", therefore coming to fifteen items in total. All fifteen statements were assessed by using matrix questions ("Please indicate your agreement with these statements."). The first nine (in the 2019 survey there were eight) items were positive and, therefore, were recoded in order to make sure that a higher score meant a more positive attitude towards the smoking ban. For the post-ban sample, the subscale for the variable attitude towards smoking ban showed high reliability with $\alpha = 0.95$. In the cohort sample, the subscale for attitude had high reliability as well, with $\alpha = 0.91$. It is important to mention that for comparing the acceptance over time within the cohort sample, the added item was deleted from the post-ban cohort sample data.

Smoking habit. The habit construct included items that focused on the habitual nature of smoking, thus, how likely one is to smoke on campus due to habit. It was added in the revised survey and was measured by six matrix questions ("How likely do you think that this [response of the smoker] may happen?"). Since the habit of smoking is merely known for smokers, the items asked for non-smokers to imagine being a smoker, which would ensure enough responses on the habit construct. The scale showed high reliability with $\alpha = 0.81$. All six items were recoded so a higher score meant a higher likeliness of smoking within the smoke-free area due to habitual patterns.

Deterrence. Furthermore, the construct deterrence was added using three Likert scale questions with the recoded response options ranging from 1 = very unlikely to 5 = very likely, 1 = very pleasant to 5 = very unpleasant, 1 = completely unfair to 5 = completely fair, and 1 = no, never to 5 = yes, always ("When violating the campus smoking ban by smoking within a smoke-free area, getting caught by others is… very unpleasant – very pleasant"). On this scale, the non-smoker was asked to imagine being

a smoker, in order to measure the perceived deterrence from smokers' perspective. The items were recoded, which resulted in a higher score meaning a more deterring feeling. The scale showed somewhat moderate reliability of $\alpha = 0.52$, which is acceptable for a construct of four items.

Outcome expectancies. Next, the outcomes expectancies included items focusing on the expected reactions of smokers when addressing them on their behaviour (ban enforcement). The construct was measured by seven matrix questions ("Please indicate what you expect would happen in the following situation… The smoker will think twice."), some items needed to be recoded so that a higher score meant more positive outcome expectancies. This scale showed an adequate Cronbach's alpha of $\alpha = 0.77$.

Self-efficacy. The added self-efficacy construct focused on the self-efficacy towards ban enforcement and was measured by six items and all were recoded with a higher score meaning a high level of self-efficacy. The construct used matrix questions ("Calling on to someone who smokes within the smoke-free area on campus, is easy or difficult for me when… I know the smoker.") and showed high reliability of $\alpha = 0.83$.

Procedure

The participants were invited to participate either by a personalized email or the weekly news feed. To participate they had to follow the link that was presented. At first, they were asked to give informed consent to participate in the research. Then, demographic questions were asked. After that, they were presented with several items, which asked for their personal information/opinion and did not include any right or wrong answers. When finished with the items, the participants were asked whether they were willing to participate in a follow-up survey by leaving their email addresses.

Analysis

Longitudinal study. To explore the cohort study data, a descriptive analysis was done for smoking ban acceptance for both the pre-ban cohort sample and the post-ban cohort sample. This analysis only included cases that responded to both surveys. The survey demanded a full response on all items ensuring complete data, therefore, all items were used to calculate constructs. To test the change in acceptance over time, a repeated measure ANOVA was conducted between the survey results of 2019 and 2021 for the cohort sample. Furthermore, a between-subject factor of smoking status was added, measuring the difference in change amongst smokers and non-smokers. In addition, the specific scores on the separate items were calculated to examine the change of attitudes on different concepts in time (such as health, or campus reputation).

Cross-sectional study. Research question two focuses on the current level of acceptance amongst the post-ban sample. One cognitive variable was considered to measure this, namely the participants' attitude towards the smoking ban. To calculate the smoking ban acceptance for this research question, a descriptive analysis was done including the mean scores with standard deviations.

Means scores on the attitude scale were computed and to test a significant difference between smokers and non-smokers, an independent t-test was executed. Next, the constructs were checked on normality for further analyses. Furthermore, as this study aims to provide advice with regard to ban enforcement, an understanding of employees' attitudes on different subjects is required. To ensure that it is visible which statements employees agree or disagree with, it is critical to compute the independent scores on all items.

Explorative study. For the exploratory third research question, correlation analyses of the independent variables deterrence and habit were done with the dependent variable smoking ban acceptance for the post-ban sample. Next, a multiple regression analysis was conducted with the independent variables habit and deterrence, and the dependent variable smoking ban acceptance. The variables that showed significant results were used to test whether a moderation effect of smoking status was present assessing whether being a smoker or not influences the effect of deterrence/habit on smoking ban acceptance. This was done through a moderation analysis with the PROCESS tool of Preacher and Hayes (Hayes, 2012). Finally, a correlational analysis and a multiple regression with the predictors: smoking ban acceptance, habit, outcome expectancies, responsibility, and self-efficacy was done. The significantly correlated and significantly influencing variables were examined further by an item level correlation analysis with enforcement intention.

Results

Longitudinal study. The descriptive analysis of the pre-ban cohort sample showed a pro-ban attitude with a mean of 3.89 (SD = 0.79, N = 46). The attitude among the smoking employees had a somewhat low mean score of 2.29 (SD = 1.31, N = 3), while non-smokers scored high with a mean of 4.00 (SD = 0.67, N = 43). The post-ban cohort sample scored high on attitude with a mean of 3.86 (SD = 0.87, N = 46). The smokers scored on average a low $\bar{x}$ = 2.00 (SD=0.47, N = 3), while non-smokers showed a high mean of 3.99 (SD = 0.73, N = 43). The repeated measure ANOVA between the two measurements within the cohort sample showed a nonsignificant difference over time ($F(1, 44) = .722$, $p = .400$, $\eta p^2 = .016$). The results of the repeated-measures ANOVA with the interaction effect of time*smoking status on smoking ban acceptance showed $F(1, 44) = 0.64$, $p = .427$, $\eta p^2 = 0.014$) which is also nonsignificant. The pairwise comparison using the Bonferri correction showed an increase in acceptance, but this was nonsignificant ($p = .400$). Furthermore, the main effect of smoking status on smoking ban acceptance was $F(1,44) = 24.17$, $p < .001$, $\eta p^2 = 0.355$). The item level scores can be found in Table 1.

Table 1.

Item level scores for the attitude scale cohort study.

Items/smoking status	Smoker				Non-smoker				Total			
	Pre-ban		Post-ban		Pre-ban		Post-ban		Pre-ban		Post-ban	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
It protects non-smokers.	2.00	1.4	2.67	1.2	4.32	1.0	4.33	1.0	4.22	1.1	4.22	1.1
It is better for the health of non-smokers.	2.00	1.4	2.67	1.5	4.20	1.1	4.30	1.0	4.11	1.2	4.20	1.1
A smoke-free campus contributes to a healthy lifestyle.	2.00	1.4	1.67	1.2	4.02	1.0	4.28	1.1	3.93	1.0	4.11	1.2
It helps ex-smokers to maintain quitting.	1.00	0.0	1.33	0.6	3.36	1.2	3.21	1.3	3.26	1.3	3.09	1.3
Smokers will be more likely to quit smoking.	1.00	0.7	4.00	1.0	4.41	1.1	4.63	0.7	4.28	1.2	4.59	0.7
It reduces odour nuisance.	1.50	0.7	4.00	1.0	4.41	1.1	4.63	0.7	4.28	1.2	4.59	0.7
It reduces trash on the streets.	2.50	0.7	3.33	1.2	4.41	1.1	4.33	1.2	4.33	1.1	4.26	1.2
It is a good example for the younger generations.	1.50	0.7	3.00	2.0	4.43	0.9	4.47	0.9	4.30	1.1	4.37	1.0
It is good for the image of the UT.	1.50	0.7	1.33	0.6	4.30	0.9	4.19	1.1	4.17	1.0	4.00	1.3
It is discriminating to smokers.	1.00	0.0	1.33	0.6	3.30	1.2	3.65	1.3	3.20	1.3	3.41	1.4
It is annoying to smokers that they have no longer a place to smoke on campus.	3.00	2.8	1.33	0.6	3.09	1.3	3.02	1.5	3.09	1.3	2.91	1.5
Smoking is an addiction and this is forgotten by the smoking ban.	2.50	2.1	1.33	0.6	3.66	1.3	3.37	1.2	3.61	1.3	3.24	1.2
It is patronizing for smokers; they have to be able to decide for themselves.	3.00	2.8	1.00	0.0	3.89	1.2	3.84	1.2	3.85	1.3	3.65	1.3
It does not bother anybody if people smoke on campus.	2.50	2.1	2.00	1.7	4.41	0.6	4.53	0.7	4.33	0.9	4.37	1.0
The former smoking ban on campus (indicated with the green lines near the buildings) was fine, the current complete ban is too much.	3.00	2.8	1.00	0.0	3.80	1.1	3.84	1.0	3.76	1.2	3.65	1.2

Cross-sectional study. The post-ban sample showed a mean of 3.77 (SD = 0.94, N = 190) showing an accepting attitude amongst employees. The t-test compared the mean scores of the smokers and non-smokers which are significantly different with $t(188) = -10.88$, $p < .001$. The smoking employees were found to have a mean score of 2.27 (SD = 0.65, N = 25) on smoking ban acceptance, showing a somewhat negative attitude towards the smoking ban. On the other hand, non-smoking employees had a highly positive attitude towards the ban with $\bar{x} = 4.00$ (SD = 0.75, N = 165) and were, therefore, more accepting of the smoking ban than non-smokers. The item level scores, as presented in Table 2, showed that smokers agreed more with items that represented a more negative attitude towards the smoking ban, whereas there was little to no difference amongst non-smokers. Furthermore, the

biggest difference appeared between smokers and non-smokers on the item about the patronage of smokers since non-smokers did not agree with the ban as patronizing whereas the smokers totally agreed. Additionally, attitudes differed greatly on whether the new ban is too much or not. Smokers totally agreed whereas non-smoker totally disagreed.

Table 2.

Item scores on the attitude scale for the whole sample.

Items/smoking status	Smoker		Non-smoker		Total	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
It protects non-smokers.	2.48	1.3	4.36	1.0	4.11	1.2
It is better for the health of non-smokers.	2.40	1.3	4.33	1.0	4.07	1.2
A smoke-free campus contributes to a healthy lifestyle.	2.64	1.2	4.44	0.9	4.20	1.1
It helps ex-smokers to maintain quitting.	2.44	1.3	4.13	1.0	3.91	1.2
Smokers will be more likely to quit smoking.	1.88	0.9	3.27	1.2	3.08	1.2
It reduces odour nuisance.	2.92	1.2	4.55	0.8	4.33	1.0
It reduces trash on the streets.	3.12	1.3	4.28	1.0	4.13	1.1
It is a good example for the younger generations.	3.08	1.3	4.51	0.9	4.32	1.1
It is good for the image of the UT.	2.48	1.2	4.27	1.0	4.04	1.2
It is discriminating to smokers.	1.68	0.7	3.56	1.3	3.31	1.4
It is annoying to smokers that they have no longer a place to smoke on campus.	1.20	0.5	2.99	1.4	2.76	1.5
Smoking is an addiction and this is forgotten by the smoking ban.	1.96	1.1	3.25	1.2	3.08	1.2
It is patronizing for smokers; they have to be able to decide for themselves.	1.44	0.7	3.88	1.2	3.56	1.4
It does not bother anybody if people smoke on campus.	2.72	1.1	4.40	1.0	4.18	1.1
The former smoking ban on campus (indicated with the green lines near the buildings) was fine, the current complete ban is too much.	1.60	1.0	3.79	1.2	3.50	1.4

Explorative research. The correlational analysis between habit and smoking ban acceptance resulted in $r(188) = -0.08$, $p = .294$. Secondly, deterrence and smoking ban acceptance showed a significant correlation of $r(188) = 0.49$, $p < .001$. Next, the multiple regression found a significant regression equation ($F(2, 187) = 29.23$, $p < .001$), with an R^2 of .24. Only the deterrence variable showed a significant effect with $b = 0.66$, $SE = .09$, $p < .001$. To test whether the smoking status has a moderation effect in this equation, a moderation analysis was conducted using the PROCESS tool of Preacher and Hayes (Hayes, 2012) which showed a nonsignificant interaction effect ($b = 0.09$, $SE = 0.23$, $p = 0.699$). The effect of deterrence on acceptance was positive and nonsignificant ($b = 0.29$, $SE = .43$, $p = .502$) and the effect of smoking status as a moderator was positive and significant ($b = 1.49$, $SE = .22$, $p < .001$), showing higher acceptance amongst non-smokers.

Lastly, the effects of multiple predictors on enforcement intention of the smoking ban were assessed. The correlation between smoking ban acceptance and enforcement intention showed $r(188) = 0.506$, $p < .001$. Habit and enforcement intention were nonsignificantly correlated by $r(188) = 0.065$, $p = .375$. Furthermore, outcome expectancies and enforcement intention showed a correlation of $r(188) = 0.097$, $p = .183$. Responsibility was significantly correlated with enforcement intention ($r(188) =$

0.309, $p < .001$). And lastly, the correlation between self-efficacy and enforcement intention showed $r(188) = 0.424$, $p < .001$. The multiple regression predicted a significant proportion of variance with $R^2 = .45$ ($F(5, 184) = 30.13$, $p < .001$). Self-efficacy was the strongest significant effect on enforcement intention ($b = 0.62$, $t(184) = 6.97$, $p < .001$). Next, smoking ban acceptance strongly positively and significantly predicted enforcement intention by $b = 0.54$, $t(184) = 8.02$, $p < .001$. Furthermore, responsibility showed a low significant effect with $b = 0.14$, $t(184) = 2.69$, $p = .008$. However, habit showed a nonsignificant effect with $b=0.02$, $t(184) = 0.31$, $p = .754$ and outcome expectancies was also nonsignificant ($b = -0.03$, $t(184) = -0.28$, $p = .779$). The item level correlations between the items of smoking ban acceptance and enforcement intention are shown in Table 3. Most items were low positive correlated and two items were moderately positive correlated to enforcement intention. Six items scored $r > .400$. It is noticeable that three of them seem to be negative attitudes, namely negative consequences, such as the ban is patronizing, and the current ban going too far, and protecting smokers as smoking does not bother. The other two are positive including the benefits for ex-smokers and the university's reputation. Additionally, in Table 4, the item level correlation between self-efficacy and enforcement intention are presented showing all low positive correlation. Only addressing when a non-smoking sign is in sight showed the highest correlation with $r=.496$.

Table 3.

Correlation between Attitude Items and the Intention to Enforce.

	Intention to enforce	
Attitude Items	*r*	*p*
It protects non-smokers.	.359	.000
It is better for the health of non-smokers.	.389	.000
A smoke-free campus contributes to a healthy lifestyle.	.399	.000
It helps ex-smokers to maintain quitting.	.404	.000
Smokers will be more likely to quit smoking.	.300	.000
It reduces odour nuisance.	.359	.000
It reduces trash on the streets.	.280	.000
It is a good example for the younger generations.	.375	.000
It is good for the image of the UT.	.436	.000
It is discriminating to smokers.	.317	.000
It is annoying to smokers that they have no longer a place to smoke on campus.	.379	.000
Smoking is an addiction and this is forgotten by the smoking ban.	.282	.000
It is patronizing for smokers; they have to be able to decide for themselves.	.536	.000
It does not bother anybody if people smoke on campus.	.456	.000
The former smoking ban on campus (indicated with the green lines near the buildings) was fine, the current complete ban is too much.	.524	.000

Table 4.

Correlation between Self-efficacy Items and Enforcement Intention.

	Intention to enforce	
	r	*p*
Addressing the smoker when I know them.	.207	.004
Addressing the smoker when I do not know them.	.291	.000
Addressing the smoker when I am in the company of others.	.350	.000
Addressing the smoker when they are in the company of others.	.227	.002
Addressing the smoker when there is a non-smoking sign in sight.	.496	.000
Addressing the smoker when more people are exposed to the smoke.	.330	.000

Discussion

Since smoking has shown to have negative influences on the work environment, this study was done aiming to assess the smoking ban acceptance amongst employees. Therefore, this study computed the level of acceptance toward the smoking ban amongst employees before and after the whole smoke-free campus ban was implemented while comparing the scores between the smokers and non-smokers group. Accordingly, it was examined which variables explain smoking ban acceptance and improve the enforcement of the smoking ban. Results showed that the acceptance amongst employees did not significantly change over time. Hence, the ban is mostly accepted, with a lower acceptance amongst smokers. As a conclusion, hypothesis one is rejected and two is accepted. Furthermore, deterrence was found to significantly influence smoking ban acceptance but smoking status seems to exceed the effect. Furthermore, self-efficacy, attitude and responsibility were variables that contributed to the intention to enforce.

Answering research question one, it is interesting to measure the difference in smoking ban acceptance over time. The results of the repeated measure ANOVA showed no significant difference in attitude over time, meaning that the implementation of the smoking ban did not influence the acceptance. This does not align with earlier research, which showed that smoking ban implementation increased overall acceptance and compliance (Borland et al., 2006; Heloma & Jaakkola, 2003; Hyland et al., 2009; Lykke, Helbech, & Glümer, 2014). However, due to the COVID-19 situation, employees were less exposed to the smoking ban, which could have influenced the research. The ban was implemented on March 30th, 2020 (University of Twente, n.d.), whereas the lockdown in the Netherlands started two weeks earlier. Due to multiple lockdowns, employees hardly worked at the campus since. Due to this lack of exposure, it could be argued that no change in acceptance could have taken been found. In addition, the University of Twente did not actively campaign to communicate the new policy. Accordingly, employees could have missed the new ban which explains the lack of change in acceptance since some might have been unaware of any change in policy. In addition, this study only used the data of participants that participated in both the first and this study. However, the sample Ditzel

et al. (2019) initially had was bigger than the amount of employees that replied to the follow-up study. Therefore, it might be interesting to do a drop-out analysis, to understand who decided not to participate this time.

Next, as addressed by research question two, this study found that employees have a pro-ban attitude. More specifically, non-smokers were found to have a more positive attitude towards the smoking ban than smokers. While non-smokers scored high, smokers scored medium, thus, still showing a moderate amount of support towards the smoking ban. This overall moderate level of acceptance shows a positive outlook to the compliance of the ban since Borland et al. (1989) mentioned that a high acceptance leads to an increase in compliance, meaning that few employees will be smoking on campus and will, thus, be complying to the ban. This shows that the smoking ban is an effective method to reduce smoking at campus amongst employees. However, it could be the case that the smokers were underrepresented (only 13% of the sample). The Netherlands Expertise Centre for Tobacco Control (2018) found that less than a quarter (23,1%) of the adult population were smokers in 2017. In our sample, this percentage is smaller, thus, showing underrepresentation. Therefore, their score will have less impact on the general score which is dependent on the actual percentage of smokers amongst the full campus population. The overall acceptance of the smoking ban can, thus, be overestimated.

Furthermore, this study examined different predictors of smoking ban acceptance which has shown importance as mentioned earlier. The exploratory analysis showed a significant effect of deterrence on smoking ban acceptance. Moreover, the moderation analysis was nonsignificant but showed that smoking status as a predictor was significant. Smoking status, thus, does not have any influence on deterrence as a predictor of smoking ban acceptance but does have a strong direct influence on smoking ban acceptance. Therefore, smoking status is an independent predictor of smoking ban acceptance. Additionally, deterrence showed a nonsignificant effect on smoking ban acceptance in the moderation analysis. However, smoking status was not included in the correlation analysis and multiple regression where deterrence was significantly correlated with smoking ban acceptance and showed a significant effect in the multiple regression. Accordingly, it can be argued that smoking status has such a great influence that the influence of deterrence on smoking ban acceptance is exceeded. This may be explained by the influence of smoking status on cognitions. Being a smoker or not might influence a lot of human cognitions, thus, could be considered a distal determinant influencing human cognitions (the proximal determinant) eventually influencing smoking ban acceptance. If smoking status is such a great influence, it could be argued that examining predictors of smoking ban acceptance is not valid due to the differences in cognitions between smokers and non-smokers. Analyses for the separate groups (smokers and non-smokers) might, thus, be more insightful.

Additionally, it is interesting to see what influences enforcement intention which gives informative insights for policymaking. This is of importance since it has been suggested that smoking ban enforcement ensures a decrease in smoke exposure (Ruokolainen, Ollila, Patja, Borodulin,

Laatikainen, & Korhonen, 2018; Tobacco Statistics 2013, 2014). The multiple regression on enforcement showed that a positive attitude and self-efficacy amongst employees strongly predicted a high level of enforcement intention. However, the feeling of responsibility showed a low significant effect. Furthermore, it is of importance that the employees show a high level of self-efficacy in order to address smokers and enforce the smoking ban. With regard to self-efficacy, the study found that using non-smoking signs makes it easier for employees to address smokers. Moreover, the multiple regression showed that outcome expectancies nonsignificantly influenced enforcement intention, therefore, it can be argued that expected outcomes do not withhold employees from intending to addressing smokers or not. Nonetheless, this study assessed the intention to enforce which differs from performing enforcement behaviour. Once employees install at campus again, performing enforcement behaviour might still result in negative experiences (e.g., a lack of self-efficacy or negative outcomes) although not expected. These negative experiences may cause a barrier to enforcement of the smoking ban. Subsequently, it can be argued that enforcement intention does not represent proper enforcement behaviour.

Implications

This research aimed to enable policymaking for the University of Twente. Accordingly, this research found a significant effect of deterrence on smoking ban acceptance. Therefore, the University of Twente can develop a policy that ensures employees feel deterred. This can be done through for example integrating punishments or encouraging enforcement and addressing of smokers. According to the deterrence theory (Grosvenor et al., 1999), deterrence is composed of three components, namely the likelihood of getting caught, the severity of the consequences and the certainty of certain consequences. This study did not get into the effects of the separate components, therefore, further research on this deterrent effect is needed. Future research with a similar survey (but more specific items on the separate components of deterrence) could improve the understanding of deterrence enabling new insights. Subsequently, smoking ban policies should focus on these specific components and their effects to improve smoking ban acceptance and compliance by specifically tackling problems within policies. These new insights and the significant effect of deterrence may not only apply to campuses. In this research, the campus is mainly considered as a workplace. Since the differences with other workplaces could be minimal, the results could perhaps be applied to other work environments with smoking bans as well. Moreover, this significant deterrent effect may be present in other smoking ban places, therefore, this effect can be convincing for future research in other smoking ban places, such as public places.

Furthermore, as mentioned by earlier research it is important to improve ban enforcement (Ruokolainen et al., 2018; Tobacco Statistics 2013, 2014) to ensure a deterrent effect of a new policy, the University of Twente should improve ban enforcement. Therefore, the University of Twente should encourage campus faculty members to enforce the ban and address smokers on their behaviour.

Variables that have shown to strongly influence enforcement are attitude, self-efficacy, and responsibility, meaning that the University of Twente should ensure high levels of self-efficacy, positive attitude, and feelings of responsibility amongst employees. Regarding self-efficacy, employees should feel able to address smokers on noncompliance. The moderate correlation between the intention to enforce and the item about non-smoking signs implies that employees find addressing easier when a non-smoking sign is in sight. The University of Twente should, thus, place more non-smoking signs to increase enforcement amongst employees.

Additionally, specifying on the correlations between items of the attitude scale and the intention to enforce, six items stood out. At first, "It is patronizing for smokers, they have to be able to decide for themselves." shows the importance of focussing on decreasing the feeling of patronage amongst employees. Employees that did not think of the ban as patronizing, were more likely to intend to enforce the smoking ban, subsequently, decreasing the feeling of patronage will increase smoking ban enforcement amongst employees. Second, disagreement with "The former smoking ban on campus (indicated with the green lines near the buildings) was fine, the current complete ban is too much." showed a higher acceptance amongst employees, meaning that employees that think the new smoking is not too much were more likely to enforce. Accordingly, this item might show the general attitude on the smoking ban. Third, disagreeing with "It does not bother anybody if people smoke on campus." showed higher levels of enforcement intention, implying that it might be helpful to ensure that smokers know the smoking does bother others which increases smoking ban enforcement and compliance amongst smoking employees. Fourth, the moderate correlation between "It is good for the image of the UT." and enforcement intention suggest that by promoting the smoking ban and consequently its influence on the image of the University of Twente, smoking ban enforcement on campus could be increased. Lastly, "It helps ex-smokers to maintain quitting." shows another positive outcome of the smoking ban that increases employees' smoking ban enforcement. Accordingly, promoting the positive influence of the smoking ban on ex-smokers maintenance may improve smoking ban enforcement.

Limitations

Several limitations could be discussed evaluating this study. At first, the study took place during the COVID-19 pandemic, causing most employees to work from home. This means that they have not been exposed properly to the smoking ban on campus. Therefore, the increase of smoking ban acceptance amongst employees overtime that was found by earlier research (e.g. Borland et al., 2006; Heloma & Jaakkola, 2003; Hyland et al., 2009; Lykke et al., 2014) could not have been achieved by the current study. Perhaps, the study had shown different outcomes when conducted at a different moment in time. Hence, it should be acknowledged that the level of acceptance did not decrease, which might show that the sample did not experience the smoking ban yet, therefore, being just as accepting as before. Furthermore, it might be doubtful whether attitude was a good enough measure of smoking ban acceptance. In line with the study and its relevant literature, it seemed like the best option. Nonetheless,

more variables might be included. Additionally, the questionnaire measured the level of smoking ban compliance as well. However, due to a technical issue, not all smokers responded to the associated items, causing a response rate of approximately 50%. Therefore, it was decided to exclude this variable from the analyses but it could have affected the acceptance and enforcement of the smoking ban. Furthermore, in the items for the habit and deterrence, non-smokers were asked to imagine being a smoker to answer the question and provide enough responses on these constructs. Accordingly, it could be argued that these items were invalid in measuring habit and deterrence. The explained variance of the multiple regression model showed a low variance (24%), meaning that the items could not be that valid. However, smoking status did not show any significant effect in the moderation analyses, so one can argue for general validity.

Conclusion

In short, the study found moderately high levels of employees' smoking ban acceptance without any change over the past two years. However, due to the lack of smoke exposure on campus (COVID-19 situation), one could doubt whether this change would have been absent if a normal working situation had continued. Moreover, the sample might not have been representative of the campus population. The results showed that deterrence significantly influences one's acceptance of the smoking ban, which enlightens the importance of including a deterrent effect in policymaking. Additionally, to ensure compliance and acceptance, one should ensure ban enforcement. The study found that self-efficacy and a positive attitude positively influenced ban enforcement, enabling the University of Twente to focus on these specific variables in policymaking. In general, it is also doubtful whether attitude alone was a good enough measure for smoking ban acceptance. Therefore, future research might focus on the specific variables that can measure smoking ban acceptance.

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