

Predictors of Student Non-compliance and Self-enforcement Efforts of a Total Tobacco  
Ban on a College Campus

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## **ABSTRACT**

This study examined the predictors of non-compliance, frequency of non-compliance, and enforcement efforts among college students within the context of a 100% tobacco-free campus policy. A total of 450 undergraduate college students (74% female) completed a researcher developed questionnaire about personal smoking behavior, compliance, enforcement efforts, and attitude towards the ban. Of the total sample, 19% of participants were smokers, and 49% of those smokers reported being non-compliant with the tobacco ban. Eighty-eight percent of the sample reported witnessing someone smoking on campus during the past 30 days, 26% of whom reported witnessing daily policy non-compliance on campus. The majority of students (90%) reported never making an attempt to enforce the policy and most students (58%) had a positive attitude towards the ban. Of the predictors examined through regression analyses (i.e., demographics, smoking-related variables, and policy-related variables) none were significant in predicting non-compliance, frequency of non-compliance, or enforcement effort.

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## CHAPTER I

### INTRODUCTION

Tobacco use remains a major public health concern in the U.S., as smoking remains to be the leading preventable cause of mortality and morbidity, and it imposes substantial health-related economic costs to society. Despite the well-known health consequences of smoking, many Americans still smoke. Specifically, smoking trends among young adults have been of particular concern as cigarette use and experimentation remains high among this age group.

Tobacco control legislation has been wide-spread across the U.S., prevalent at the federal, state, and municipal level, and many laws and policies have been enacted with the primary goal of decreasing smoking among minors and young adults. For instance, legislative efforts have focused on increasing prices, advertisement restrictions, and product regulation and accessibility, all of which have been shown to decrease smoking behaviors among young adults and minors. State and local governments, along with private institutions and organizations, have increased their efforts to further discourage smoking by young people by enacting smoke-free air policies.

With over 21 million young adults seeking higher education each year, universities and colleges represent an optimal setting for influencing young adult smoking behaviors through campus tobacco control policies (National Center for Educational Statistics [NCES], 2011). There has been a trend over the last decade for institutions, such as colleges and universities, to adopt stronger tobacco control policies. As of January 2014, there were over 1,000 colleges and universities that adopted a smoke-free campus policy, 811 of which are complete tobacco bans, prohibiting both

indoor and outdoor tobacco use on all campus property excluding privately owned vehicles (American Nonsmokers' Rights Foundation [ANRF], 2014). Research examining college campus tobacco ban effectiveness suggests that such bans have the potential to positively influence student smoking behaviors and perceptions of peer tobacco use prevalence. Other studies have concluded that overall student support, among smokers and non-smokers, is high for such tobacco control policies.

Although research supports the effectiveness of public and private smoke-free air policies, one common issue associated with these restrictions is promoting compliance among smokers and adopting appropriate enforcement strategies. With respect to college campus policies, fear of student opposition and lack of resources to enforce tobacco control policies appear to be common barriers reported by school administrators when deciding whether to adopt campus smoking restrictions.

The purpose of the current study is to measure and analyze college student self-reported compliance and enforcement efforts within the context of a 100% tobacco-free campus policy. Predictors of student non-compliance, frequency of non-compliance, and enforcement efforts will be examined in terms of demographics, smoking-related variables and policy-related variables. Student's personal smoking behavior, perceptions of student smoking prevalence and compliance will also be assessed.

### **Health Consequences of Tobacco Use and Second-hand Smoke (SHS) Exposure**

The health consequences of tobacco use are well-documented with tobacco use (e.g., cigarette smoking) identified as the leading preventable cause of cancer, disease, and death in the U.S. (American Cancer Society [ACS], 2012; Centers for Disease Control and Prevention [CDC], 2008). Tobacco use and exposure to tobacco smoke are

responsible for approximately 1 in 5 deaths in the U.S. (Mokdad, Marks, Stroup, & Gerberding, 2004), killing approximately 443,000 people each year (CDC, 2008).

Cigarette smoking is the single largest cause of cancer; responsible for more than 30% of all cancer deaths and 80% of lung cancer deaths (CDC, 2008). In addition to lung cancer, smoking has shown a causal relationship to more than 15 other types of cancer (International Agency for Research on Cancer [IARC], 2009a). Tobacco use is a major cause of various other diseases such as cardiovascular disease, cerebrovascular disease, chronic obstructive pulmonary disease, peptic ulcer disease, gum disease, cataracts, and stroke (U.S. Department of Health and Human Services [USDHHS], 2004); USDHHS, 2010). Smoking is also a major cause of various health conditions including chronic bronchitis, asthma, hip fractures, emphysema, cataracts, and reduced fertility (USDHHS, 2004; USDHHS, 2010). In 2000 the CDC (2003) estimated approximately 8.6 million Americans suffered from smoking related health problems such as emphysema, chronic bronchitis, and cardiovascular disease. In addition to specific diseases and conditions, smoking harms almost every organ in the human body, and smokers are generally less healthy than non-smokers (USDHHS, 2010).

In addition to the negative health effects of smoking on the tobacco user, involuntary exposure to tobacco smoke (e.g., secondhand smoke [SHS], or environmental tobacco smoke) has serious health consequences for the non-smoker (USDHHS, 2010). Between 2007-2008 the CDC (2010) estimated 88 million non-smoking adults and children were exposed to SHS, which is known to contain over 250 identified harmful chemicals and numerous human carcinogens (USDHHS, 2010). According to the Surgeon General, there is no safe level of exposure to SHS, and it increases the risk of

cancer and cardiovascular disease in adults (USDHHS, 2006). Exposure to tobacco smoke by non-smokers is said to be responsible for 800 infant deaths and approximately 50,000 cases of lung cancer and heart disease in adults each year (CDC, 2008). Smoking and exposure to SHS while pregnant can also increase the risk of low birth weight, premature birth, and sudden infant death syndrome (USDHHS, 2010). Other adverse health effects of SHS on children and adults include middle ear disease and infection, severe asthma attacks, lower respiratory illness and infection, impaired lung functioning and other respiratory symptoms like wheezing and nasal irritation (USDHHS, 2010).

### **Negative Economic Effects of Tobacco Use and SHS Exposure**

Tobacco use and exposure to tobacco smoke result in substantial health-related costs for both the smoker and society. Between 2000 and 2004, tobacco use and exposure to tobacco smoke resulted in an estimated 443,000 premature deaths, or 5.1 million years of potential life lost each year (CDC, 2008). During this five year span the annual average cost of smoking-attributed productivity losses was \$97 billion, and an additional \$96 billion was spent each year on direct healthcare-related costs due to tobacco use (CDC, 2008). These and other costs place a tremendous financial burden on the U.S. healthcare system.

### **Cigarette Use among Adults**

Despite the well-known health consequences of tobacco use, nearly 45.3 million American adults are regular cigarette smokers (CDC, 2011c). In 2010, the CDC (2011c) estimated that one in five U.S. adults were current cigarette smokers (defined by individuals who currently reported smoking on every day or some days and had smoked  $\geq 100$  cigarettes during their lifetime). Estimates were provided by the CDC (2011c);

determined through analyzing two corresponding, nationally representative, and federally funded surveys: the Behavioral Risk Factor Surveillance System and National Health Interview Survey (NHIS).

Adult cigarette smoking prevalence varies based on several demographic factors, such as gender, racial/ethnic background, level of education, and socioeconomic status (CDC, 2011c). Prevalence data suggests more men (21.5%) than women (17.3%) smoke; however, disparities between genders range from 3.0% among whites to 10.4% among Asians when analyzing racial/ethnic populations individually (CDC, 2011c). Smoking prevalence is highest among American Indians/Alaska Natives (31.4%) and adults reporting multiple races (25.9%), followed by whites (21.0%) and blacks (20.6%), and is lowest among Hispanics (12.5%) and Asians (9.2%) (CDC, 2011c). Adults living below the poverty level, compared to above, are much more likely to be smokers (28.9% vs. 18.3%), and smoking prevalence generally decreases with increasing education (CDC, 2011c). For example, 45.2% of Americans with a GED, 23.8% of individuals with high school diploma, and 23.2% of individuals with some college education were defined as smokers, compared to only 9.9% of individuals with an undergraduate degree or 6.3% of individuals with a post-graduate degree (CDC, 2011c).

There are several other well-established, nationally representative surveys that collect annual data on tobacco use in addition to the one published by the CDC; however reported results vary due to survey methodology and approach to measuring smoking behaviors. For example, the National Survey on Drug Use and Health (NSDUH), sponsored by the USDHHS, assesses the prevalence of cigarette use defined by smoking part or all of any cigarette in the past month. In 2011 the NSDUH found that

approximately 23% of Americans reported smoking part or some of a cigarette in the past month, and prevalence rates were highest among adults between the ages of 21 to 25 years (34.7%), followed by 26 to 29 year olds (33.7%) and those aged 18 to 20 (31.6%) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012). Past month cigarette use prevalence was higher among males (24.3%) than females (19.9%), and varied by other demographic factors similar to smoking status prevalence rates (CDC, 2011c; SAMHSA, 2012). Past month cigarette use was more prevalent among unemployed adults (40.7%) than adults who were working full- or part-time (23.3% and 22.9%, respectively), in addition to prevalence decreasing with amount of years of education obtained (SAMHSA, 2012). Similar to smoking status prevalence rates reported by the CDC, cigarette use was highest among individuals who did not complete high school (33.7%) or high school graduates with no college education (28.3%), and was lower among college graduates (11.7%) and individuals who attended college (25.9%) (SAMHSA, 2012). For adults aged 18-22 years old, cigarette use was much lower among individuals who were enrolled in college full-time (23.8%), compared to those who were not (39.2%) (SAMHSA, 2012). Overall, based on the results of the NSDUH, sponsored by the USDHHS, and CDC, approximately 20-23% adults are smokers (CDC, 2011c; SAMSHA, 2012).

### **Tobacco Use among Young Adult College Students**

Cigarette smoking by young adults poses a serious public health concern in the U.S., as cigarette use and experimentation among adults aged 18-25 remains much higher than among the general population (SAMSHA, 2012; USDHHS, 2012). One subgroup highly represented by young adults, or individuals aged 18-25, are those seeking higher

education. More than 21 million Americans seek higher education at a university or college each year, and more than half (56%) are between the ages of 18 to 24 (NCES, 2011). Smoking prevalence estimates among this group range from 14.3%-25.8%. Results from the National College Health Assessment-II, sponsored by the American College Health Association (ACHA, 2012), reported approximately 14.3% (17.5% males, 12.5% females) of college students were current smokers (defined by past month cigarette use). However, higher prevalence rates have been reported by other nationally representative, federally sponsored surveys and independent studies, ranging from 15%-25.8% (Johnston, O'Malley, Bachman, & Schulenberg, 2012; SAMSHA, 2012; Sutfin, Reboussin, McCoy, & Wolfson, 2009). Nevertheless, initial and continued experimentation with cigarette smoking is very common during college years. An estimated one in four students report smoking at least once in the past year (Johnston et al., 2012).

Several factors address why it is important to monitor and prevent smoking experimentation and progression to regular smoking among college students. An estimated 11.4%-36.0% of non-smoking students start smoking during their college years (Staten et al., 2007; Thompson et al., 2007; Wetter et al., 2004), and nearly all smokers (99%) report smoking their first cigarette by age 25 (USDHHS, 2012). Additionally, the national average age for non-regular smokers to initiate daily smoking behaviors is 20.7 years of age (SAMSHA, 2010). This is a concern for young adult college students experimenting with social or occasional smoking because research suggests they are within the most vulnerable age group for social smoking behaviors to progress to daily or regular smoking (SAMSHA, 2010; USDHHS, 2012).

Promoting cessation among young adult smokers is also a priority when considering that quitting before age 30 almost eliminates a person's risk of smoking-related premature death (Doll, Peto, Boreham, & Sutherland, 2004). Although college student smoking prevalence rates have declined over the past decade, NHIS data from 2001-2010 suggest there was no increase in young adult quit attempts (CDC, 2011a). Approximately two in three smokers aged 18-24 (i.e., 67%) report an interest in quitting (CDC, 2011a); however, promoting and researching college student cessation proves to be difficult (Berg et al., 2010; Thompson et al., 2007).

A major barrier involves college student resistance to self-identify as a "smoker," and therefore, they do not generally believe they need to quit (Berg et al., 2010; Brown, Carpenter, & Sutfin, 2011; Levinson et al., 2007, Thompson et al., 2007). Moran, Wechsler, and Rigotti (2004) found that the majority (65%) of student tobacco users are occasional smokers, and college student cigarette use can be largely described as situational or context specific, such as only smoking while drinking, attending a party, or in the presence of smoking peers (Brown et al., 2011; Moran et al., 2004; Sutfin et al., 2009). Importantly, college student smokers are generally confident that they will eventually quit, more specifically when motivated by extrinsic events or milestones (i.e., graduation, marriage, children) (Brown et al., 2011; Sutfin et al., 2009); but longitudinal trajectories among occasional smokers in college estimate only 15-50% successfully quit smoking, while 35-50% maintain occasional smoking patterns, and 15-25% eventually progress to long-term daily smoking (Kenford et al., 2005; Wetter et al., 2004; White, Bray, Fleming, & Catalano, 2009).

College campuses provide an optimal opportunity to educate smokers, promote cessation, and increase accessibility to cessation support and programs, as young adult smoking habits are perceived to be more changeable (ACHA, 2011; American Lung Association [ALA], 2008). College students represent maturing young adults in a transitional phase of their life; seeking independence, developing their autonomy, and are known to be sensitive to the social and environmental influences that surround them (ALA, 2008; Ling & Glantz, 2002; Rigotti, Regan, Moran, & Wechsler, 2003). Additionally, experimentation with new behaviors like drinking and smoking is very common during the college years (ALA, 2008; Sutfin et al., 2009; USDHHS, 2012). College communities provide identifiable and effective mediums that can be used to influence a large young adult population (ALA, 2008; Ling & Glantz, 2002). The tobacco industry's effort to strategically market to young adults attending college is well-documented (ALA, 2008; Ling & Glantz, 2002; USDHHS, 2012). College students define a robust age group for the tobacco industry to market its products, and also represent an optimal target population for anti-tobacco campaigns (ALA, 2008; Ling & Glantz, 2002).

### **Tobacco Control**

Tobacco use in the U.S. poses a serious public health problem, and several health organizations and government agencies have made strong efforts to deter young adult smoking and increase overall tobacco control nation-wide (ALA, 2008; CDC, 2007; Institute of Medicine [IOM], 2007; USDHHS, 2012). These organizations have made a strong effort to reduce cigarette use and exposure to SHS population-wide by lobbying for stronger tobacco control legislation at the municipal, state, and federal level (ALA,

2008; CDC, 2007; USDHHS, 2012). Decades of legislation and settlements resulting from class-action lawsuits against the tobacco industry have resulted in increases in advertisement and marketing restrictions, product and sales regulation, cigarette prices, and smoking restrictions indoors and outdoors (ALA, 2008; Sung, Hu, Ong, Keeler, & Sheu, 2005; USDHHS, 2012).

Advertisement restrictions implemented by the federal government have limited how, where, and to whom tobacco products are marketed; for example banning television, radio, or billboard cigarette advertisements (Berlyne, 2011; Grob, 2011). Policies and laws have specifically focused on restricting minors' exposure to tobacco product advertisement, such as banning advertisements in printed materials like magazines and newspapers that have a large audience under the age of 18 (Food and Drug Administration [FDA], 2012; Grob, 2011). Product mascots (e.g., Marlboro Man and Joe Camel) are now banned, along with certain graphics, colors, and patterns used in advertisements and packaging (ALA, 2008; Grob, 2011). The tobacco industry is no longer allowed to distribute any free tobacco products or samples, including non-tobacco promotional items with product's name-brand (FDA, 2012). Tobacco companies are also prohibited from sponsoring any athletic, musical, social or cultural events under a product's name-brand (FDA, 2012), which has historically been an important and well-funded marketing strategy used by the tobacco industry (ALA, 2008; USDHHS, 2012).

Increases in marketing and advertisement restrictions have been accompanied by stricter product regulation and health warning requirements over the years (ALA, 2008; Grob, 2011). The Surgeon General's Warning, required on all cigarette products packaging, has grown in length, font size, and content over the years. Furthermore, the

2010 U.S. Supreme Court upheld the decision to prohibit the use of “reduced harm” claims, or misleading product descriptions such as “low tar,” “mild,” or “light” cigarettes (FDA, 2012; Grob, 2011). Federal legislation has also aimed to limit the availability and legality of manufacturing tobacco products that appeal to younger generations such as banning cigarettes with any characterizing flavors or banning the sale of cigarette packages with less than 20 cigarettes (ALA, 2008; FDA, 2012). Municipal and state legislatures have also increased penalties for providing, purchasing, or selling tobacco products to minors, prompting state and municipal legislatures to implement stronger identification, or proof of age, requirements for the sale of any tobacco product, regardless of a customer’s age (ALA, 2008; USDHHS, 2012).

Cigarette product regulation, advertisement, required warning labels, and other limitations were either introduced or reinforced by the federal legislation, the Family Smoking Prevention and Tobacco Control Act (2009), which granted the FDA authority to regulate tobacco (FDA, 2012; USDHHS, 2012). Prior to this legislation, tobacco products were said to be the most dangerous “over-the-counter” product in the U.S. that was not federally regulated (USDHHS, 2012).

Cigarette price manipulation, primarily accomplished through increasing state and federal government excise tax, has been another key strategy to deter experimental smoking, and promote cessation and prevention (ALA, 2008; CDC, 2007; USDHHS, 2012). The federal excise tax has remained over \$1.00 per pack of cigarettes since 2009 (Grob, 2011), while the mean state excise tax was up to \$1.46 per pack as of 2011, ranging from \$.017 in Missouri to \$4.35 in the state of New York (CDC, 2012). The tobacco industry has also raised product prices; primarily to pay for legal expenses

related to several class action lawsuits resulting in record-high monetary settlements (Grob, 2011; Sung et al., 2005). For example, the 1999 Master Agreement Settlement requiring the tobacco industry to pay over 250 billion to states in tobacco-related medical costs (USDHHS, 2012), was accompanied by average increase of \$1.19 per pack of cigarettes between 1998-2001 (ALA, 2008; Pierce & Gilpin, 2004). Raising cigarette prices per pack has been shown to reduce overall cigarette consumption and prevalence of tobacco use among the general population (Cebula, Foley, & Houmes, 2011; Sung et al., 2005), and Taurus (2003) found that increasing cigarette prices increased number of young adults who quit smoking. Major tobacco companies have therefore focused their resources on counteracting price increases in recent years by distributing coupons and discounts through solicitation and by mail (ALA, 2008; USDHHS, 2012).

### **Smoke-free Air Laws and Smoking Restrictions**

Research indicates smoking restrictions and smoke-free laws lower cigarette consumption and assist quitting attempts among smokers, and reduces smoking in public places (IARC, 2009b; USDHHS, 2006). As evidence has revealed the negative health effects associated with SHS, state and local governments have responded by increasing their efforts to further discourage smoking at a population level through the use of smoke-free air policies and legislation (USDHHS, 2006; CDC, 2011b). As of October 2012, there were 29 states that have laws in effect requiring restaurants and bars to be 100% smoke-free; twenty-three of which have additional requirements for both private and public workplaces to be smoke-free (ANRF, 2012a). Within the workplace, Brownson, Eriksen, Davis, and Warner (1997) found that smoke-free policies were effective in promoting cessation and reducing employees' daily cigarette consumption.

Outdoor smoking restrictions have also been widely implemented, as a total of 2,311 states, commonwealths, territories, cities, and counties had implemented one or more outdoor restrictions as of October, 2012 (ANRF, 2012a). Over 1,600 of these outdoor restrictions apply to public places such as parks and beaches, and another 1,000 or more restrict smoking near building entrances or ventilation systems. Smoking restrictions have also been widely implemented at public outdoor venues, including more than 280 laws that prohibit any smoking, and additional 390 laws restricting smoking to designated areas, in outdoor sport and entertainment venues (ANRF, 2012a).

The use, prevalence, and type of smoking restrictions has dramatically evolved over the past decade; becoming more common in a variety of public settings, as smoking and exposure to SHS continues to be a major public health concern in the U.S. (IARC, 2009b, USDHHS, 2006). Public and private institutions have also adopted combined indoor and outdoor smoke-free policies, such as 100% smoking bans on hospital and nursing home grounds, correctional facilities, public schools, and transportation services (e.g., airports, subways, or buses). Private institutions of higher education have demonstrated a wide-implementation of smoking restrictions on college campuses; for example more than 800 colleges and universities have adopted a 100% smoke-free campus policy as of January 2014 (ANRF, 2014).

### **Tobacco Control Efforts and Smoking Restrictions Used on College Campuses**

Tobacco control efforts have increased among the college population, and smoke-free air policies and tobacco use restrictions have been implemented by many colleges and universities. Increases in the prevalence of tobacco control policies on college campuses has been accompanied by a transformation in type of policies implemented.

For example, in the past, smoking policies specified which indoor areas allowed smoking, such as offices and break-rooms; however current smoking bans generally prohibit all indoor smoking and generally specify outdoor areas in which smoking is allowed. Today, most universities prohibit tobacco sales or marketing on school property, and implement indoor smoking bans that apply to classrooms, faculty offices, break rooms, and restrooms (Grob, 2011; Halperin & Rigotti, 2003).

It was not until recently that indoor campus smoking bans started regularly applying to student residential housing (ANRF, 2012b). Several studies suggest smoking restrictions in student housing decreases student smokers' cigarette consumption and decreases the likelihood of non-smokers initiating smoking (Patterson, Lerman, Kaufmann, Neuner, & Audrain-McGovern, 2004; Wechsler, Lee, & Rigotti, 2001). Wechsler, Lee, et al. (2001) found current smoking prevalence was significantly lower for students living in smoke-free housing compared to those in unrestricted housing. However, there was no significant difference in smoking rates for students who were regular smokers before reaching the age 19, or in the number of cigarettes smoked per day (CPD) among smokers based on housing restrictions (Wechsler, Lee, et al., 2001). While it is now common for colleges and universities to have 100% smoke-free student housing, earlier in the decade Halperin and Rigotti (2003) reported only half of the U.S. colleges and universities had 100% smoke-free housing, which was still double the 27% prevalence rates reported in 2001 (Wechsler, Kelley, Seibring, Kuo, & Rigotti, 2001).

In addition to indoor bans, within the last decade there has been a clear increase in the number of colleges and universities that have implemented outdoor smoking restrictions and smoke-free air policies (ALA, 2008). In 2003, Halperin and Rigotti

(2003) reported approximately 50% of colleges had outdoor smoking bans prohibiting smoking within a certain distance from building entrances, doorways, or air intake vents. However, research has suggested that stricter and more comprehensive outdoor bans are being implemented across the country (ALA, 2008). For example, some universities have used smoking-bans on all of campus property, except in designated areas. More recently, there has been an increase in the number universities implementing a full 100% campus smoking ban, allowing no smoking on campus property, indoors and outdoors, except for in privately owned vehicles (ANRF, 2012b; ALA, 2008; USDHHS, 2012).

Many colleges and universities have implemented various types of smoke-free campus policies at different levels of restrictiveness and plans for enforcement. As of January 2014 there were 1,182 colleges of universities that had adopted 100% smoke-free campus policies, and 811 of these institutions' policies applied to all forms of tobacco use (ANRF, 2014). Several governmental and health organizations (e.g., ACHA, ALA, CDC, ANRF, and USDHHS) have established a clear standard for institutions of higher education to have 100% tobacco-free campuses, banning all smoking on all university property (indoors and outdoors) except for in privately owned vehicles (ACHA, 2011; ALA, 2008; USDHHS, 2012). Some states (i.e., Arkansas, Iowa, Oklahoma) have now adopted, and several other states are expected to follow in implementing, state-wide legislation mandating all institutions of education within their jurisdiction to be 100% smoke-free (ANRF, 2012b). Furthermore, in the past five years there has been a trend for universities and colleges to implement more restrictive comprehensive tobacco bans, prohibiting the use of smokeless tobacco products as well as regular and electronic cigarettes (ANRF, 2012b; ALA, 2008; USDHHS, 2012).

## **Effects of Tobacco Control Efforts and Smoking Restrictions on College Student Smoking**

As college student tobacco use poses a public health problem, various public policy efforts have been made to decrease smoking prevalence and initiation and increase cessation in this population (USDHHS, 2012; ALA, 2008). Borders, Xu, Bacchi, Cohen, and SoRelle-Miner (2005) used a sample of 13, 000 undergraduate college students from 12 Texas universities to examine the relationship between students' smoking behaviors and their institutions' use of smoking policies and cessation programs. Borders et al. (2005) found that college students had lower odds of smoking if attending a university with only preventative education available on campus, and there were higher odds of smoking when attending a university with the existence of smoking cessation programs and designated smoking areas. Additionally, policies governing the sale and distribution of cigarettes were not significantly associated with student smoking behaviors (Borders et al., 2005). Results for Borders et al. (2005) do not necessarily imply that higher smoking levels are causally-related to area-smoking restrictions or cessation program availability, but instead may suggest that tobacco control policies and programs may be more developed, or more readily available and used on university campuses with higher smoking rates and quit attempts.

Murphy-Hoefer et al. (2005) presented results that conflicted with those of Borders et al. (2005). Murphy-Hoefer et al. (2005) published a comprehensive review of policy and non-policy interventions that have been implemented and evaluated within the college population. Interventions implemented on college campuses were found to have an overall positive influence on student smoking behaviors, specifically by reducing

smoking prevalence and the amount of cigarettes smoked. Murphy-Hoefer et al. (2005) concluded having college campus interventions increased overall acceptability of smoking policies and restrictions among tobacco users and non-users. Additionally, Taurus (2003) found restrictions on smoking in both private worksites and public places, increased the probability of young adults' smoking cessation. The results of both Murphy-Hoefer et al. (2005) and Taurus (2003) support smoking ban implementation by suggesting that restrictions can have a positive effect on smoking behaviors across various contexts and populations.

Most recently, Seo, Macy, Torabi, and Middlestadt (2011) conducted a study that allowed researchers to compare longitudinal smoking prevalence data between students at two large public universities, both before and after one school implemented a 100% tobacco-ban. Cross-sectional analyses between the two universities indicated there was a significant decrease in the proportion of current smokers among students attending the university with the new tobacco ban, while none was shown for the control university. Additionally, Seo et al. (2011) found that students from the smoke-free campus sample showed a significant difference in perceived smoking norms. For example, significant decreases in students' perceptions of peer tobacco use, acceptance of student smoking, and the belief that students should be allowed to smoke were observed. Overall, these results suggest that tobacco restrictions and programs implemented on a college campus can be an effective and useful tool to promote a more healthy and tobacco-free lifestyle among students (Murphy-Hoefer et al., 2005; Seo et al., 2011; Taurus, 2003). However, other research would support universities offering comprehensive tobacco programs,

specifically those that focus on educating and transforming student perceptions (Borders et al., 2005).

### **College Student Support for Campus Smoking Bans**

Promoting policy compliance and attempting to decrease student smoking behaviors is heavily affected by student support with perceived student-acceptance and continued compliance with restrictions. Consequentially, research surrounding smoking policy compliance has focused on better understanding college students' attitudes towards proposed college policies and public policies to determine how effective tobacco control policies may be in a given context.

Rigotti et al. (2003) used data from the 2001 Harvard School of Public Health College Alcohol Study (CAS) to investigate college student attitudes and opinions of potential, or proposed, campus tobacco control policies in relation to students' smoking status, and their awareness of current tobacco policies set in place at their own colleges' student residences. Student support for all proposed tobacco control policies was strong, even among smokers, and the majority of students believed the right to breathe clean air was more important than smokers' right to smoke. Smokers with plans to quit within the next 30 days reported greater support for all tobacco control policies, and the strongest opposition to the policy was reported by heavy daily smokers without plans to quit, suggesting that cigarette consumption was inversely related to support for proposed policies while having a desire to quit was positively related to support. Also, policies were supported more by females, compared to males, and married students, compared to unmarried students (Rigotti et al., 2003).

In a similar study analyzing college student attitudes towards a potential smoke-free campus ban, Berg et al. (2011) found that overall receptivity was high among smokers and non-smokers. Student receptivity to a potential smoke-free campus was measured by rating if the policy would have a positive or negative effect on students' quality of life, student learning, and student enrollment. The majority of students (63.3%) believed the proposed policy would have a positive effect on student quality of life, while 20.8% thought it would have a neutral effect and 15.9% thought it would have a negative effect on student's quality of life. The majority of students thought the policy would have a positive or neutral effect on student enrollment (e.g., 30.9% and 41.2%, respectively), with 26.9% of students responding the effect would be negative. Most students thought the proposed policy would have a positive (47.1%) or neutral (40.7%) impact on student learning, while only 12.1% thought the ban's effects would be negative. Berg et al. (2011) found that student receptivity to having a potential smoke-free policy was associated with older age, being female, not being married or living with a partner, not having children in the home, being from homes where parents banned indoor smoking, being a non-smoker (i.e., have not smoked a cigarette, even a "puff", in the last 30 days), receptivity to a statewide public smoke-free policy, and implementing private home and car smoking restrictions.

After identifying student smokers, Berg et al. (2011) invited them to participate in small focus groups to discuss their reactions to smoking restrictions implemented on their campuses. The different policies students were exposed to ranged from prohibiting smoking in all buildings and within 20 ft of any building entrance, to more strict policies that banned all smoking on campus except in designated areas. Students reported the

benefits of these policies were that they helped reduce smoking, protected non-smokers, and improved the cleanliness of the campus (Berg et al., 2011). Berg et al. found student smokers were concerned about the burden these policies imposed on smokers and the difficulties associated with enforcing the current policies. When discussing the potential implementation of a smoke-free outdoor policy, students were largely receptive, but were concerned about its impact on smokers living on campus and its impact on enrollment.

Among the broader young adult population, research has examined how different demographic and smoking behavior characteristics predict smokers' and non-smokers' receptivity to general public smoking restrictions (Loukas, Garcia, & Gottlieb, 2006). In one study, Loukas et al. (2006) found general support for tobacco control policies was high among smokers and non-smokers. Results indicated that more favorable attitudes towards policies were reported by non-smokers, women, and those who were black; whereas more unfavorable attitudes were reported by individuals who had past month cigarette use, men, and those who were white (Loukas et al. 2006). Altogether, research examining young adult and college student receptivity to public and private (e.g., campus) tobacco control policies suggests that both smokers and non-smokers generally support smoking restrictions (Berg et al., 2011; Loukas et al. 2006; Rigotti et al., 2003) and support for smoking/tobacco bans appears to increase after policy implementation (Seo et al., 2001).

### **College Student Compliance with Smoking Restrictions and Bans**

With over 1000 colleges and universities implementing campus-wide smoking bans, there has been a need to better understand students' opinions and reactions to policy implementation and the overall policy effectiveness in reducing tobacco use. There is

limited research regarding the effectiveness of policy implementation; however, research has investigated some barriers to implementing college tobacco policies. In a survey of college health directors from 393 different 4-year U.S. colleges, results indicated that there was reluctance among the institutions' administrations to implement stricter tobacco control policies (Wechsler, Kelley, et al., 2001). Wechsler, Kelley, et al. (2001) found that college administrators shared a common fear of student opposition and lack of resources for enforcement of tobacco control policies. Collectively, school administrators or officials have tried to avoid using promotional strategies that are punishment orientated. Most universities have refrained from initiating any actual enforcement policy, ticketing process, or clear disciplinary procedures for multiple policy violations.

Overall, school administrators' reluctance to develop enforcement policies for tobacco bans presents a serious barrier to implementing effective campus tobacco bans and research regarding smoking ban compliance among college students. The existing qualitative research involving unstructured interviews or small group discussions among college student smokers suggests that compliance to campus restrictions in the U.S. is low (Berg et al., 2011). Importantly, some students stated their campus policies are not enforced and smoking on campus is not regulated or ticketed and, therefore, these policies are not taken seriously (Berg et al., 2011).

With regard to measuring college student compliance, there have been no studies published in the U.S. assessing compliance to actively implemented, versus proposed, campus smoking bans. One study with an international sample involving college students from Greece has been published (Lazuras, Eiser, & Rodafinos, 2009). The strongest predictors of college students smoking in a non-smoking public area were higher tobacco

dependency, less anticipated regret from tobacco-related health risk, perceived higher smoking prevalence rates among students and peers, and having significant other's approval of their smoking behaviors. Interestingly, attitudinal beliefs such as supportiveness of smoking restrictions and health risk beliefs were not significant predictors of compliance. Lazuras et al. (2009) suggested that normative beliefs and social acceptance of smoking are important areas to target when developing and promoting compliance strategies. For example, college health administrators or university organizations could help correct smokers' common misperceptions of high smoking prevalence by posting current smoking rates on campus billboards and bus stops, and this might decrease the social acceptability of smoking (ACHA, 2012, Lazuras et al. 2009). With over 1000 colleges and universities implementing campus-wide tobacco bans, there is a clear deficit in published research regarding student compliance and enforcement effort effectiveness.

### **Summary and Hypotheses**

The negative health effects of tobacco use are well-documented, and smoking remains the leading preventable cause of mortality and morbidity in the U.S. Between 2000 and 2004, tobacco use and exposure to tobacco smoke resulted in approximately 443,000 premature deaths and over \$193 billion in healthcare-related costs per year (CDC, 2008). Despite the well-known health consequences of smoking, approximately one in five Americans still smokes.

Smoking trends among young adults have been of particular importance as cigarette use and experimentation remains high among this age group. Tobacco control legislation has been wide-spread across the American population, with the primary goal

of decreasing minors' and young adults' smoking behaviors. Legislative efforts at the federal, state, and municipal level have focused on increasing prices, advertisement restrictions, and product regulation and accessibility; all of which have shown to decrease smoking behaviors among young adults and minors.

Private institutions and organizations, for example colleges and universities, have also been stepping up their efforts to further discourage smoking by the use of smoke-free air policies. As of January 2014, there were over 1,000 colleges and universities that adopted a smoke-free campus policy, 811 of which are complete tobacco bans, prohibiting both indoor and outdoor smoking (tobacco use) on all campus property excluding privately owned vehicles (ANRF, 2014). With over 21 million young adults seeking higher education each year, colleges and universities may provide an optimal environment in which to prevent initial cigarette use or experimentation (NCES, 2011).

Research examining college campus tobacco ban's effectiveness suggests that smoking bans have the potential to positively influence student smoking behaviors and perceptions of peer tobacco use prevalence. Other studies have also concluded that overall student support is high for tobacco control policies among smokers and non-smokers.

Although research supports the effectiveness of public and private smoke-free air policies, one common issue associated with these restrictions is promoting compliance among smokers and adopting appropriate enforcement strategies. Fear of student opposition and lack of resources to enforce tobacco control policies appear to be common barriers stated by school administrators' when deciding whether to adopt campus smoking restrictions. Overall, school officials' reluctance to develop enforcement

policies for tobacco policies presents a serious barrier to implementing effective campus tobacco bans. Research regarding college student compliance to smoking bans has been limited, and there is no available research that reports levels of non-compliance and levels of enforcement among college students to college campus tobacco policies.

Research surrounding college student attitudes towards campus tobacco control policies suggests that both smokers and non-smokers generally support tobacco control policies and smoking restrictions; however, research has not yet empirically examined the effectiveness of these policies in terms of compliance. Qualitative data from administrators and students suggest that enforcing and promoting compliance among smokers can be a challenge for college officials; therefore, research directed at better understanding predictors of student non-compliance could provide a useful foundation for developing strategies to increase compliance. Additionally, research has yet to identify how student compliance relates to student acceptance and attitudes towards school policies. The lack of research regarding college student compliance with smoking bans, combined with the recent trend for universities and colleges to implement 100% tobacco-free campus policies, demonstrate a clear need to investigate beyond student attitudes and better understand student behaviors, in terms of smoking and compliance.

The purpose of this study is two-fold: 1) examine the potential predictors of non-compliance and 2) examine the potential predictors of enforcement efforts among students attending a university with a 100% tobacco ban. The prevalence and frequency of witnessed and reported non-compliance will also be measured. For the current study, predictors of student smoker non-compliance and student enforcement efforts will be

examined in three family-wise predictor blocks: demographic characteristics, smoking-related variables, and policy-related variables.

## CHAPTER II

### METHOD

#### Participants

A total of 457 participants were recruited from the undergraduate psychology research pool. The online survey was completed by 333 participants and further in-person survey administration yielded an additional 124 participants. Four participants were withdrawn from the study due to either not being enrolled in at least one non-online course, or they were not living on campus or did not report being on campus at least one day per week. An additional three participants were withdrawn because they reported being below the minimum required age of 18, resulting in a total sample of 450 undergraduate students.

Seventy-four percent of participants ( $n = 331$ ) identified as female, 26% ( $n = 118$ ) participants identified as male, and one participant did not report gender. The majority (55%;  $n = 248$ ) of participants were between the ages 18-19 years, 25% ( $n = 112$ ) were between the ages of 20-21, 15% ( $n = 67$ ) were between the ages of 22-30 years, 5% ( $n = 22$ ) were 31 years of age or older, and one participant did not report his/her age. Ages ranged from 18-50, with average age of 20.72 years ( $SD = 4.79$ ). In terms of race, 64% ( $n = 287$ ) of participants identified as white, 22% ( $n = 99$ ) identified as black, and 14% ( $n = 64$ ) identified as a race other than white or black. The majority of participants were either freshman (40%;  $n = 180$ ) or sophomores (26%;  $n = 119$ ). Juniors (19%;  $n = 86$ ) and seniors (14%;  $n = 64$ ) also were represented in the sample; one participant did not report college class. Among participants who reported their GPA ( $n = 385$ ), the average GPA for the sample was 3.31 ( $SD = .53$ ). Twenty-three percent of the sample reported living

on campus ( $n = 104$ ), and participants spent an average of 4.8 days on campus per week ( $SD = 1.43$ ).

### **Measures**

Due to the exploratory nature of the current study, a researcher-developed survey entitled the College Student Tobacco Survey (CSTS) (See Appendix A) was used to assess participants' basic demographic and student information (e.g., age, gender, and GPA), in addition to self-reported tobacco use and perceptions of student tobacco use prevalence. Finally, the CSTS assessed self-reported and perceived compliance with the tobacco policy, as well as enforcement effort and attitude towards the ban. The CSTS took approximately 3-10 minutes to complete and used a combination of fill-in-the-blank and multiple choice questions.

Smoking status (i.e., smoker or non-smoker) was determined by participants endorsing survey items that admitted any tobacco cigarette use within the past 30 days (i.e., admitted smoking a tobacco cigarette in the past 30 days, admitted smoking a tobacco cigarette on campus within the past 30 days, or reported smoking  $\geq 1$  cigarettes per day on days smoked in the past 30 days). Smoking ban non-compliance was defined as smoking a tobacco cigarette on campus, not in a privately owned vehicle, within the past 30 days. Enforcement was defined as verbally or non-verbally communicating disapproval directly to an individual smoking on campus (not in privately owned vehicle).

### **Procedures**

Prior to collecting data, the current study was approved by the Middle Tennessee State University Institutional Review Board (See Appendix B). Participants were

recruited from the undergraduate psychology research pool at a university that has adopted a “100% tobacco-free campus” policy which prohibits the use of all forms of tobacco products on university property, except in privately owned vehicles. Students were offered one research credit towards their psychology course as compensation in return for their participation in the current study, which was described as a “short 10 minute survey.” The only requirement stated to potential participants for their participation was that they must be 18 years of age or older. Students signed-up for participation using an online database. Informed consent was obtained prior to participation, and survey administration was completed through the SONA online survey site. In addition to online data collection, study participation was offered in-person, using the same procedural guidelines. Informed consent was first obtained and survey administration was completed in a group setting (See Appendix C).

## CHAPTER III

### RESULTS

#### Descriptive Statistics

With regard to witnessed non-compliance, 88% ( $n = 397$ ) of participants reported witnessing someone smoking on campus, not in a privately owned vehicle, within the past 30 days (i.e., non-compliance). Twelve percent ( $n = 52$ ) reported not witnessing non-compliance within the past 30 days, and one participant did not respond. Of the 88% that reported witnessing non-compliance and provided data for the average percent of days they witnessed non-compliance within the past 30 days ( $n = 377$ ), 63% ( $n = 236$ ) reported witnessing someone smoking at least 50% of the days they were on campus within the past 30 days. Additionally, 26% ( $n = 99$ ) of participants, who witnessed non-compliance in the past 30 days reported seeing it daily (i.e., 100% of the past 30 days). Of the 88% who witnessed non-compliance and reported estimates for frequency of non-compliance within the past 30 days ( $n = 377$ ), the average percent of days participants witnessed non-compliance was 57% ( $SD = 36.91$ ).

With respect to enforcement, the majority of participants in the full sample (90%;  $n = 406$ ) reported that they *never* verbally or non-verbally attempted to communicate their disapproval towards someone smoking on campus not in a privately owned vehicle (i.e., enforcement effort). Only 1% of the sample ( $n = 4$ ) reported that they *always* communicate disapproval; 8% ( $n = 39$ ) reported they *sometimes* communicate disapproval to non-compliant smokers, and one participant did not provide a response.

When participants were asked to report their general attitude towards the ban (i.e., 1-*extremely negative*, 2-*moderately negative*, 3-*neutral*, 4-*moderately positive*, and 5-

*extremely positive*), the total samples' average was 3.79 ( $SD = 1.23$ ), with three participants not providing a response (1%). Overall, the majority of participants had a *neutral* (26%;  $n = 117$ ), *moderately positive* (18%;  $n = 83$ ), or *extremely positive* view (40%;  $n = 181$ ) view towards the ban; whereas, fewer participants reported having a *moderately negative* view (9%;  $n = 40$ ) or *extremely negative* view (6%;  $n = 26$ ) towards the ban. Of the 15% ( $n = 66$ ) of participants who reported having a negative view towards the ban, more than half (53%;  $n = 35$ ) were smokers. When comparing attitudes among smokers and non-smokers, smokers ( $M = 2.83$ ;  $SD = 1.36$ ) reported having a significant less positive attitude towards the ban than non-smokers ( $M = 4.01$ ;  $SD = 1.09$ ),  $t(445) = 8.49, p < .001$ .

In terms of participants' perception of campus smoking prevalence, participants perceived on average that 44% ( $SD = 19.97$ ) of students were smokers; however, nine participants did not provide a response ( $n = 441$ ). Among participants who provided perception of smoking data ( $n = 436$ ), it was estimated on average that approximately 53% ( $SD = 31.95$ ) of smokers were non-compliant with the ban.

Concerning smoking prevalence, 19% ( $n = 84$ ) of participants were classified as smokers (i.e., admitted smoking a tobacco cigarette in the past 30 days, admitted smoking a tobacco cigarette on campus within the past 30 days, or answered  $\geq 1$  cigarettes per day on days smoked in the past 30 days). The average amount of days smoked in the past 30 days, among smokers who provided data ( $n = 83$ ), was 12.71 ( $SD = 12.51$ ). The average cigarettes smoked per day (CPD) among smokers who provided data ( $n = 81$ ), was 4.07 ( $SD = 5.15$ ). Among smokers who provided data (i.e., *yes* or *no*) as to whether or not they have been non-compliant with the ban within the past 30 days ( $n = 83$ ), 49% ( $n =$

41) reported being non-compliant, and therefore, were categorized as non-compliant smokers. Among non-compliant smokers who provided data for frequency of non-compliance ( $n = 32$ ), the average estimated percent of days smoked on campus was 40% ( $SD = 40.64$ ) and ranged from 1-100%.

### **Regression Analyses**

The major analyses for this study involved several regression analyses to examine the predictors of non-compliance, frequency of non-compliance, and enforcement efforts. Non-compliance (i.e., using tobacco products on campus within the past 30 days, not in privately owned vehicle) was examined only among smokers ( $n = 83$ ). Frequency of non-compliance was examined only among smokers reporting non-compliance ( $n = 32$ ), and enforcement efforts were examined using those in the total sample who provided data on this variable ( $n = 447$ ). Because several regression analyses were performed on the same data set, modified Bonferroni adjustments were made to the critical alpha level to control for Type I error. The critical alpha for each of the three predictor-block analyses (i.e., the logistic regression analysis for compliance, linear regression predicting frequency of non-compliance, and logistic regression predicting enforcement efforts) was set at .0167 (i.e.,  $p = .05/3$ ).

Non-compliance was examined among smokers using logistic regression. Predictors of non-compliance were categorized into three blocks (i.e., demographic predictors, smoking-related predictors, and policy-related predictors) and were analyzed in three separate logistic regression analyses. Non-significant results were found for all predictors in each analysis when tested at an alpha level of .0167 (See Table 1). The first logistic regression analysis examined the demographic predictors of gender, age, and

Table 1

*Logistic Regression Analyses for Non-compliance among Smokers*

Predictor	$\beta$	<i>SE</i> $\beta$	<i>P</i>	<i>Exp</i> ( $\beta$ )
Demographic predictors				
Gender (1)	-.25	.48	.60	.78
Age	-.03	.05	.50	.97
Race			.85	
Race (1)	-.15	.85	.86	.86
Race (2)	-.34	.60	.57	.71
Smoking-related predictors				
Frequency of smoking	.05	.03	.06	1.05
CPD	.03	.07	.68	1.03
Perception of smoking prevalence	-.57	1.17	.63	.57
Policy-related predictors				
Days on campus	.20	.18	.25	1.23
Perceptions of non-compliance	1.26	.77	.10	3.52
Policy enforcement (1)	-.18	1.08	.87	.84
Attitude towards ban	-.46	.20	.02	.63

*Note.*  $n = 83$ . *SE* = standard error. Gender (1) coding (1 = female, 0 = male). Race (1) coding (1 = black, 0 = white). Race (2) coding (1 = other, 0 = white). Policy enforcement (1) coding (1 = no, 0 = yes)

\* $p < .0167$

race/ethnicity. The second examined the smoking-related predictors including frequency of smoking, average cigarettes smoked per day (CPD), and perception of smoking prevalence among students. The third logistic regression analysis examined policy-related predictors of the amount of days on campus per week (i.e., exposure to the policy), perceptions of non-compliance, frequency of policy enforcement, and attitudes towards the policy.

Frequency of non-compliance (i.e., percent of days, in the past 30 days, participants smoked on campus not in a privately owned vehicle) followed the same block-wise predictors format as above; however linear regression was used due to the continuous nature of the dependent variable. Three separate linear regression analyses were completed using demographic predictors, smoking-related predictors, and policy-related predictors. No significant results were found when tested at an alpha value of .0167 (See Table 2).

Frequency of enforcement of the policy (i.e., *never*, *sometimes*, *always*) was originally planned to be examined using multi-nominal logistic regression. However, due to the limited number of participants endorsing the *sometimes* and *always* response, participants were categorized as enforcers (i.e., *sometimes* and *always* respondents) or non-enforcers (i.e., *never* respondents), and logistic regression analyses were conducted. Predictors were categorized into the three blocks of demographic predictors, smoking-related predictors, and policy-related predictors. Demographic predictors included gender, age, and race/ethnicity; smoking-related predictors included smoking status, frequency of smoking, CPD, and perceptions of student smoking prevalence; and policy-related predictors included the amount of days of campus per week (i.e., exposure to the

Table 2

*Linear Regression Analyses for Frequency of Non-compliance among Non-compliant Smokers*

Predictor	$\beta$	<i>SE</i> $\beta$	<i>p</i>	95% <i>CI</i>
Demographic predictors				
Gender (1)	-.31	.15	.05	[-.61, -.01]
Age	-1.06	.02	1.00	[-.03, .03]
Race			.29	
Race (black)	.58	.41	.17	[-.26, 1.41]
Race (other)	-.13	.20	.50	[-.53, .27]
Smoking-related predictors				
Frequency of smoking	-.00	.01	.61	[-.02, .01]
CPD	.03	.01	.08	[-.00, .05]
Perception of smoking prevalence	-.29	.37	.44	[-1.05, .47]
Policy-related predictors				
Days on campus	-.01	.06	.84	[-.13, .11]
Perceptions of non-compliance	.38	.23	.10	[-.08, .84]
Policy enforcement (1)	.19	.39	.63	[-.62, 1.00]
Attitude towards ban	-.07	.08	.39	[-.24, .10]

*Note.*  $n = 32$ . *SE* = standard error. *CI* = confidence interval. Gender (1) coding (1 = female, 0 = male). Race (black) coding (1 = black, 0 = white). Race (other) coding (1 = other, 0 = white). Policy enforcement (1) coding (1 = no, 0 = yes)

\* $p < .0167$

policy), personal non-compliance, perception of student smoker non-compliance prevalence, and attitude towards the ban. Three separate logistic regression analysis were performed, and no predictors were found significant when tested at an alpha value of .0167 (See Table 3).

Table 3

*Logistic Regression Analyses for Enforcement among the Total Sample*

Predictor	$\beta$	<i>SE</i> $\beta$	<i>P</i>	<i>Exp</i> ( $\beta$ )
Demographic predictors				
Gender(1)	-.14	.36	.71	.87
Age	.03	.03	.25	1.03
Race			.21	
Race(1)	.70	.38	.08	1.91
Race(2)	.39	.46	.40	1.47
Smoking-related predictors				
Smoking status	.10	.60	.87	1.10
Frequency of smoking	-.07	.07	.32	.93
CPD	.06	.15	.67	1.07
Perception of smoking prevalence	-.14	.83	.86	.87
Policy-related predictors				
Days on campus	.23	.12	.06	1.25
Personal non-compliance	.33	.78	.68	1.38
Perceptions of non-compliance	-.04	.53	.94	.96
Attitude towards ban	.30	.16	.06	1.35

*Note.*  $n = 447$ . Gender (1) coding (1 = female, 0 = male). Race (1) coding (1 = black, 0 = white). Race (2) coding (1 = other, 0 = white). Personal non-compliance coding (1 = no, 0 = yes)

\* $p < .0167$

## **CHAPTER IV**

### **DISCUSSION**

Tobacco use remains a major public health concern in the U.S. Despite the well-known health consequences of smoking, however, many Americans still smoke (ACS, 2012; CDC 2008; CDC, 2011c; USDHHS, 2004; USDHHS, 2010). In particular, smoking trends among young adults have been a specific concern as cigarette use and experimentation remain high among this age group (SAMSHA, 2010; USDHHS, 2012). With over 21 million young adults seeking higher education each year, university and college campuses represent an optimal setting for influencing young adult smoking behaviors (NCES, 2011). There has been a trend over the past decade for institutions, such as colleges and universities, to adopt stronger tobacco control policies (ANRF, 2012b; ALA, 2008; USDHHS, 2012). As of January 2014, there were over 1,000 colleges and universities that adopted a smoke-free campus policy, the majority of which are complete tobacco bans prohibiting both indoor or outdoor tobacco use on all campus property, except in privately owned vehicles (ANRF, 2014).

Research examining college campus tobacco ban effectiveness suggests that such bans have the potential to positively influence perception of peer tobacco use prevalence and student smoking behavior (Murphy-Hoefer et al., 2005; Seo et al., 2011). Although research supports the effectiveness of public and private smoke-free air policies, one common issue associated with these restrictions is promoting compliance among smokers and adopting appropriate enforcement strategies (Berg et al., 201; Lazuras et al., 2009; Wechsler, Kelley, et al., 2001). With regard to college campus policies, common barriers reported by school administrators when deciding whether to adopt campus smoking

restrictions include fear of student opposition and lack of resources to enforce tobacco control policies (Wechsler, Kelley, et al., 2001).

With regard to measuring college student compliance, there have been no studies published in the U.S. assessing compliance to actively implemented, versus proposed, campus smoking bans. The purpose of this study was to conduct a survey to measure and analyze college student self-reported compliance and enforcement efforts within the context of 100% tobacco-free campus policy. Potential predictors of non-compliance, frequency of non-compliance, and enforcement efforts were demographics, smoking-related variables (e.g., cigarettes smoked per day), and policy-related variables (i.e., attitude towards the ban). Students' personal smoking behavior, perceptions of student smoking prevalence and compliance, and general attitude towards the ban also were assessed.

In terms of smoking prevalence and perceived smoking prevalence, the current study reported results consistent with past research, such that 19% of the sample were classified as smokers. The results were consistent with nationally representative, federally sponsored surveys that suggest between 14.3-25.8% of college students are smokers (ACHA, 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2012; SAMSHA, 2012; Sutfin, Reboussin, McCoy, & Wolfson, 2009). The current study also produced results consistent with previous research in terms of perceptions of student smoking prevalence in that college student perception of student smoking prevalence (i.e., 44%) was much higher than the samples' reported smoking prevalence (i.e., 19%) (Lazuras et al., 2009; Seo et al., 2011).

In terms of perceptions of tobacco ban non-compliance, participants estimated on average that approximately 53% ( $SD = 31.95$ ) of smokers were non-compliant with the ban. The current study also assessed self-reported non-compliance. In comparison to perception of non-compliance (53%), 49% of smokers reported being non-compliant with the campus tobacco ban in the past 30 days. Among non-compliant smokers who provided data, the average estimated percent of days smoked on campus was 40% ( $SD = 40.64$ ). This was the first study to compare perceived non-compliance with self-reported non-compliance within the same sample. Based on the results of this study, perceptions of non-compliance are not that different from self-reports. Because smokers consisted of only 19% of the sample, this similarity in estimates is not likely to be due to their influence. Reports of perceived non-compliance were consistent with previous limited research that suggests students report being aware of non-compliance among their college student peers that are smokers (Berg et al., 2011).

Concerning enforcement, nearly 9 out of 10 participants reported *never* making an attempt to verbally or non-verbally communicate their disapproval of someone smoking on campus (i.e., enforcement effort). Specifically, only 1% of the sample reported that they *always* attempt to enforce the ban, and 8% reported they *sometimes* communicate disapproval to non-compliant smokers. These results support the limited applicable findings reported by Berg et al. (2011) that college students are aware and concerned that campus policies are not enforced or regulated effectively.

In terms of attitude towards the campus tobacco ban, the current study found that the majority of participants had a *neutral* (26%), *moderately positive* (18%), or *extremely positive* attitude (40%) towards the ban. Of the 15% of participants who reported having

a *moderately negative* (9%) or *extremely negative* (6%) view towards the ban, just over half (53%) were smokers. When comparing attitudes among smokers and non-smokers, smokers ( $M = 2.83$ ,  $SD = 1.36$ ) were reported having a significant less positive attitude towards the ban than non-smokers ( $M = 4.01$ ,  $SD = 1.09$ ). This finding is consistent with the results of Loukas et al. (2006) that suggest young adults generally support smoking restrictions; however, support is generally higher among non-smokers. The current study's results also were consistent with studies examining college student attitudes towards proposed campus tobacco control policies, which found that student support is generally strong; however, receptivity is stronger among non-smokers (Berg et al., 2011; Rigotti et al., 2003).

Due to the exploratory nature of study, hypotheses were logically derived. One rationally derived hypothesis was that heavier (i.e., higher CPD) and more frequent smokers (i.e., more days smoked in the past 30 days) would be more likely to be non-compliant with the campus tobacco ban. The reasoning behind this hypothesis was that heavier, more frequent smokers would be more likely to be dependent on nicotine and less likely to tolerate extended periods of smoking abstinence. It also was hypothesized that smokers who perceive higher student smoking prevalence and non-compliance also would be more likely not to conform to the tobacco ban, mainly because smoking and policy non-compliance are perceived as common. Smokers who are exposed to the policy more often, or are on campus more often (i.e., days per week on campus), were also predicted to be more likely to be non-compliant as compared to smokers who are on campus less often, due to having a greater opportunity not to comply.

Regarding hypotheses for policy enforcement predictors, those who perceive higher smoking prevalence among students and higher non-compliance among smokers were hypothesized to be less likely to engage in policy enforcement. The reasoning behind this was that the more prevalent one perceived smoking and non-compliance to be, the less motivated they may be to attempt to deter such behavior. Students who spend more time on campus also were predicted to be more likely to engage in policy enforcement efforts by virtue of greater opportunity. These hypotheses, however, were not supported in the current study.

When testing the above hypotheses, there were no significant predictors found when analyzing non-compliance, frequency of non-compliance, or enforcement. This lack of significant findings may be a true representation of the lack of predictors or it may be due to limitations of the current study.

### **Limitations and Future Directions**

There are several limitations to this study that are worth mentioning, specifically concerns over the characteristics of the sample and measures used in the study. With regard to the sample, males were under-represented (74% female, 26% male) and the sample consisted of mostly white students (64%). Although the racial characteristics of the sample are consistent with the university's demographic make-up; the current sample may not accurately represent college students across the U.S. Additionally, because the numbers of smokers and non-compliant smokers in the sample were small, the analyses involving predictors of non-compliance and frequency of non-compliance had low statistical power. A larger sample of smokers would increase statistical power, and might lead to the finding of significant predictors. Additionally, given the small sample size,

modified Bonferroni adjustments may have been too stringent. Finally, the College Student Tobacco Survey (CSTS) was a novel survey developed by the researcher for the purposes of the study and, therefore, is of unknown reliability and validity. Self-reports and open-response questions (i.e., “What percent ...”) also were used in the CSTS, and declining to answer survey items may have been less likely if responses were offered in a multiple-choice format.

A major limitation in analyzing non-compliance is related to how smokers were classified in that the definition used was fairly broad. For example, participants were considered smokers if they smoked a tobacco cigarette in past the 30 days. However, this definition could have included participants who were not regular smokers, for example their smoking behavior could have been experimental, social, or context specific. If a more stringent definition of smoking status were used, demographic and smoking-related predictors of non-compliance may have been significant. Another limitation is that several participants declined providing a response to frequency of non-compliance even after admitting non-compliance. Due to the nature of admitting policy violating behavior, participants may have been less willing to provide honest feedback to their behavior as the survey was completed on a university related survey site and/or on campus.

Despite the limitations and non-significant results from analyzing predictors of non-compliance and enforcement, the current study offers valuable descriptive data for understanding non-compliance and enforcement efforts among college students. This was the first study to assess self-reported non-compliance and enforcement efforts among college students in the context of a 100% college campus tobacco ban. The current study

also was novel in comparing self-reported non-compliance and perceived non-compliance within the same sample.

Future research could improve upon the limitations of the current study, such as having a larger sample of smokers or analyzing data with different statistical procedures (e.g., stepwise forward selection). Research could examine potential significant differences in descriptive data between smokers' (vs. non-smokers'), and non-compliant smokers' (vs. compliant smokers') perceptions of non-compliance. For example, they could assess if smokers or non-compliant smokers are likely to report a higher or lower perceived student smoking prevalence, perceived smoker non-compliance, or witnessed smoker non-compliance. Analyzing data with a more stringent definition of smoking status, or restricting participation requirements to students who report being on campus more frequently also may produce different perceptions of smoking prevalence and non-compliance.

In summary, the current study analyzed potential predictors (i.e., demographics, smoking-related variables, and policy-related variables) of college student non-compliance and enforcement efforts with respect to a 100% campus tobacco ban. Although no significant predictors were found, the current study offers valuable descriptive data when examining the effectiveness of college campus tobacco bans in terms of prevalence of non-compliance among smokers and limited enforcement efforts reported by the total sample. Due to limitations of this study, such as sample size, self-reporting measures, and broad smoking status classification, results should be interpreted with caution. The lack of research surrounding tobacco ban effectiveness provides a

considerable opportunity for future researchers to better understand non-compliance and enforcement efforts within the context of university tobacco restrictions.

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**APPENDICES**

## APPENDIX A

## College Student Tobacco Survey

DEMOGRAPHIC INFORMATION AND STUDENT STATUS
<p><b>A.1) What is your gender?</b> <u>Please check one:</u> Male Female</p>
<p><b>A.2) What is your current age?</b> _____</p>
<p><b>A.3) What option best describes your racial or ethnic identity?</b> <u>Please check one:</u> White Black Hispanic Asian Middle Eastern Native American Mixed or Other</p>
<p><b>A.4) Excluding online courses, how many credit hours are you currently enrolled in at MTSU?</b> _____</p>
<p><b>A.5) Do you live on campus?</b> <u>Please check one:</u> __ NO __ YES</p>
<p><b>A.6) How many days a week are you on MTSU's Campus?</b> _____</p>
<p><b>A.7) In terms of college class, which of these options best applies to you?</b> <u>Please check one:</u> Freshman Sophomore Junior Senior</p>

**A.8) Estimated current Grade Point Average (GPA) at MTSU?**

\_\_\_\_\_

**TOBACCO USE**

**B.1) Within the past 30 days, how many days have you smoked a (tobacco) cigarette?**

\_\_\_\_\_

**B.2) Within the past 30 days, on the days you smoked about how many (tobacco) cigarettes did you smoke per day?**

\_\_\_\_\_

**B.3) If you have used tobacco products in the past 30 days, please indicate ANY of the responses below that describe your tobacco use?**

Please check ALL that apply:

I am a (tobacco) cigarette smoker.

I am a smokeless tobacco user.

I am a smokeless electronic cigarette user.

I smoke only when in specific social settings (e.g., while playing/watching sports).

**REPORTED AND PERCEIVED STUDENT SMOKING PREVALENCE, COMPLIANCE, AND ENFORCEMENT**

**C.1) Within the past 30 days, have you smoked a (tobacco) cigarette on campus (not in a privately owned vehicle)?**

Please check one:

NO

YES

**C.2) If “YES,” of the days you have been on campus, what percent of those days have you smoked a (tobacco) cigarette (not in a privately owned vehicle)?**

\_\_\_\_\_

**C.3) Within the past 30 days, have you witnessed someone smoking a (tobacco) cigarette on campus (not in a privately owned vehicle)?**

Please check one:

NO

YES

**C.4) If “YES,” of the days you have been on campus, what percent of those days have you personally observed someone smoking a (tobacco) cigarette (not in a privately owned vehicle)?**

—

**C.5) With respect to those you have observed smoking (tobacco) cigarettes on campus (not in a privately owned vehicle) within the past 30 days, how often did you (verbally or non-verbally) communicate your disapproval directly to them?**

Please check one:

- Never  
 Sometimes  
 Always

**C.6) What percent of MTSU students do you think smoke (tobacco) cigarettes?**

—

**C.8) Of these student smokers, what percent of them do you think have smoked (tobacco) cigarettes on campus (not in a privately owned vehicle)?**

—

#### **GENERAL ATTITUDE TOWARDS THE BAN**

**E.1)** *MTSU adopted a "tobacco-free campus" policy on January 1, 2012 prohibiting the use of all forms of tobacco products on University property, except in privately owned vehicles. All forms of tobacco products are included in this ban including, but not limited to, cigarettes, pipes, cigars, chewing tobacco and snuff, as well as smokeless electronic cigarettes and other similar devices.*

**How would you best describe your general attitude towards the MTSU tobacco-free campus policy?**

Please check one:

- 1-Extremely negative  
 2-Moderately negative  
 3-Neutral  
 4-Moderately positive  
 5-Extremely positive

**APPENDIX B****Middle Tennessee State University Institutional Review Board Approval Letter**

4/18/2014

Investigator(s): Brianna Duncan & Dr. James Tate  
Department: Psychology  
Investigator(s) Email Address: bjd3c@mtmail.mtsu.edu, james.tate@mtsu.edu

Protocol Title: Predictors of Student Noncompliance and Enforcement Efforts of a Total Tobacco Ban on a College Campus

Protocol Number: #14-333

Dear Investigator(s),

Your study has been designated to be exempt. The exemption is pursuant to 45 CFR 46.101(b)(2) Educational Tests, Surveys, Interviews, or Observations.

We will contact you annually on the status of your project. If it is completed, we will close it out of our system. You do not need to complete a progress report and you will not need to complete a final report. It is important to note that your study is approved for the life of the project and does not have an expiration date.

The following changes must be reported to the Office of Compliance before they are initiated:

- Adding new subject population
- Adding a new investigator
- Adding new procedures (e.g., new survey; new questions to your survey)
- A change in funding source
- Any change that makes the study no longer eligible for exemption.

The following changes do not need to be reported to the Office of Compliance:

- Editorial or administrative revisions to the consent or other study documents
- Increasing or decreasing the number of subjects from your proposed population

If you encounter any serious unanticipated problems to participants, or if you have any questions as you conduct your research, please do not hesitate to contact us.

Sincerely,

Lauren K. Qualls, Graduate Assistant  
Office of Compliance  
615-494-8918

## APPENDIX C

## Middle Tennessee State University Institutional Review Board Informed Consent

## Document for Research Form

MTSU  
IRB Approved  
Date: 04/18/2014

## Informed Consent

Middle Tennessee State University

**Project Title:** Predictors of Student Noncompliance and Enforcement Efforts of a Total Tobacco Ban on a College Campus

**Purpose of Project:** The purpose of the current study is to measure and analyze college student self-reported compliance and enforcement efforts within the context of a tobacco-free campus policy. Participants' personal smoking behavior, perceptions of student smoking prevalence and compliance, and general attitude toward the policy will be assessed. You are being asked to participate in a research study because you are a college student currently attending a college that has a tobacco-free campus policy and little is known about college student compliance and enforcement efforts towards these types of policies.

**Procedures:** You will be asked to complete an anonymous survey that will take approximately 10 minutes to complete.

**Risks/Benefits:** There are no expected risks to participating in this study. There is no cost to participate in this study. The potential benefits to science and humankind that may result from this study are increased understanding of the predictors of college student noncompliance and enforcement efforts towards 100% campus tobacco bans. Potential benefits to you as a participant include learning more about the research process, the type of research which psychologist perform, and research credit in your psychology course.

**Confidentiality:** All surveys will be anonymously completed and your name will only be recorded for research credit purposes. There will be no way to connect your identity or name to your survey responses.

**Principal Investigator/ Contact Information:** If you should have any questions about this research study, please feel free to contact Brianna Duncan at bjd3c@mtmail.mtsu.edu or my Faculty Advisor, Dr. James Tate at james.tate@mtsu.edu.

Participating in this project is voluntary, and refusal to participate or withdrawing from participation at any time during the project will involve no penalty or loss of benefits to which the subject is otherwise entitled. All efforts, within reason, will be made to keep the personal information in your research record private but total privacy cannot be promised, for example, your information may be shared with the Middle Tennessee State University Institutional Review Board. In the event of questions or difficulties of any kind during or following participation, the subject may contact the Principal Investigator as indicated above. For additional information about giving consent or your rights as a participant in this study, please feel free to contact the MTSU Office of Compliance at (615) 494-8918.

## Consent

I have read the above information and my questions have been answered satisfactorily by project staff. I believe I understand the purpose, benefits, and risks of the study and give my informed and free consent to be a participant.

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE