DISSERTATION

SMOKING PATTERNS, ATTITUDES, AND MOTIVES OF COLLEGE STUDENT DAILY AND NONDAILY SMOKERS

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ABSTRACT

SMOKING PATTERNS, ATTITUDES, AND MOTIVES OF COLLEGE STUDENT DAILY AND NONDAILY SMOKERS

To further expand on the existing research on college student smokers, the aims of the current study were threefold: (1) to use a the 17-item College Students Motives for Smoking Scale (CSMSS) to identify different subtypes of daily and nondaily student smokers present across different colleges and universities, (2) to investigate whether smoking variables such as smoking frequency, smoking environment, cigarette purchasing habits, products used, cessation efficacy, and alcohol use patterns predict typologies of college student smokers, and (3) to investigate whether subgroups of college student smokers differ on attitudinal variables such as health-related attitudes, smoker identity attitudes, smoking secrecy, smoker image, and perceived feelings of stigma.

Participants included 876 students smokers between the ages of 18 and 24 enrolled at a four-year university or college. Results of the Latent Profile Analysis using the CSMSS revealed that five typologies of smokers were present in the sample. Three of these typologies were nondaily smokers: (1) stress/emotional regulation smokers, (2) low endorser smokers, and (3) nondependent smokers. The remaining two typologies, high endorser smokers and addiction/dependence smokers, were daily smokers.

An LPA with covariates revealed that days smoked, purchasing patterns, and environment in which smoking occurs were all predictive of membership within the three nondaily smoker typologies. These constructs as well as cessation efficacy predicted membership between nondaily smoker typologies and daily smoker typologies. Lastly, an LPA with outcomes revealed that the nondaily smoker typologies differed from the daily smoker typologies on smoker identity, perceived stigma towards use, smoker image, secrecy of use, and perceived harm of current use.

In general, the current study found that motives for smoking can differentiate between daily and nondaily smokers. However, the CSMSS was not as effective at distinguishing within the nondaily smoker typology. The current study also showed that nondaily smokers and daily smokers differed on both their smoking behaviors and their attitudes towards smoking. Future research should continue to investigate better methods of distinguishing within nondaily smoker and daily smoker typologies.

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Chapter 1: Introduction to College Student Smoking Patterns

According to the Center of Disease Control (CDC; 2005) and the United States (U.S.) Department of Health and Human Services (USDHHS; 2004), cigarette smoking is linked to various preventable illnesses and continues to contribute to mortality rates in the U.S. About 444,000 people die each year due to smoking-related illnesses such as cancer, cardiovascular disease, and emphysema (CDC, 2010; CDC, 2012). Even smoking at lower rates is associated with health problems such as cardiovascular disease, shortness of breath, lower lung capacity, and pulmonary infections (An et al., 2009; CDC, 2012). In addition, smoking rates in the U.S. remain a public health problem, especially for young adults between the ages of 18 and 24 (CDC, 2012). This age group has higher rates of smoking than other adult populations (CDC, 2010). Of particular relevance to the current study is the college student population, whose smoking rates are as high as 27% (Substance Abuse and Mental Health Service Administration, 2010). Due to the high smoking rates of college students (Foldes et al., 2010; Nichter et al., 2010), the U.S. Surgeon General (CDC, 2012) indicated that efforts should focus more on this population. Focusing on this population is particularly important because the odds of developing smoking-related illnesses decreased dramatically when cessation occurs before the age of 30 (CDC, 2005).

Researchers have also indicated that focusing on college student smokers should be a major priority in the field of prevention and intervention (Lantz, 2003; Wells & Canty-Mitchel, 2012), but research on tobacco use patterns and smoking-related attitudes of college students has been limited (Costa, Jessor, & Turbin, 2007; Wells & Canty-Mitchel, 2012). This is particularly concerning since research is now showing that this population is different from other adult and adolescent populations regarding their smoking-related attitudes and patterns (Caldeira et al., 2012; Thompson et al., 2007). Therefore, the current study will investigate both smoking patterns (e.g., frequency, smoking context, and quitting efficacy) and smoking attitudes (e.g., smoking motives, smoker image, and perceived stigma) of college student smokers.

Progression of Smoking in the College Student Population

One of the main differences between the college student population and other adult populations is the high rate of progression into daily smoking. In particular, one study indicated that 50% of young adults progress to daily smoking while still in college (Thompson et al., 2007) and between 50% and 80% of smokers continued to smoke after college (Wetter et al., 2004). Therefore, this may be a transitional period for many smokers, where experimentation with smoking may still be occurring, but smoking patterns are continuously changing (Chassin, Presson, Pitts, & Sherman, 2000; Choi, Harris, Okuyemi, & Ahluwalia, 2003). Although not all individuals who experiment with cigarettes during this time period become daily smokers (Rigotti, Lee, & Wechsler, 2000; Thompson et al., 2007), there is strong evidence to suggest that this time period is a developmental period where life-long smoking habits may also become more concrete (Patterson et al., 2004).

Although smoking patterns may be progressing with this population, in general, college student smokers are often highly motivated to quit smoking (Moran, Wechsler, & Rigotti, 2004; Wells & Canty-Mitchel, 2012) and generally have plans for cessation (Brown, Carpenter, & Sutfin, 2011; Hines, Nollen, & Fretz, 1996). Thus, it is possible that this population will be more susceptible to interventions that promote quitting behaviors. However, research has shown that different types of smokers require different types of interventions (Hertel & Mermelstein, 2012; Wortley et al., 2010), though there is not a clear understanding in the research as to what types of smokers are present on college campuses. Additional research investigating different types of college student smokers may also be essential because smoker typologies were found to be predictive of dependence, smoking outcome expectancies, and smoking escalation (Hertel & Mermelstein, 2012). Moreover, the design of effective intervention programs may be informed by these components.

Daily and Nondaily College Student Smokers

Traditionally, research has indicated that there are two types of smokers present on college campuses: daily college student smokers and nondaily college student smokers. In this population, daily smokers are less common than nondaily smokers (Berg et al., 2012; Caldeira et al., 2012; National Cancer

Institute, 2008) and usually make up between 14% to 28% of the college student smokers (Caldeira et al., 2012; Sutfin, Keboussin, Wolfson, & McCoy, 2009). Nondaily smokers may make up to 41% to 75% of college students smokers depending on how "nondaily smoker" is defined (e.g., Levinson et al., 2007; Moran et al., 2004; Oksuz, Mutlu, & Malhan, 2007; Sutfin et al., 2009; Waters et al., 2006). For the current study, nondaily smokers are defined as individuals who do not smoke on a daily basis and smoke less than 20 cigarettes during the span of 30 days. Daily and nondaily college student smokers are distinct typologies of smokers since they vary in their smoking patterns and their attitudes towards smoking.

Characteristics of Daily Smokers. Daily college student smokers are easily defined by their frequency of smoking. The main factor that distinguishes these smokers from their nondaily smoking peers is that they smoke more and often on a daily basis (Berg et al., 2010; Oksuz et al., 2007). Sutfin et al. (2009) found that these smokers typically smoked between 6 to 10 cigarettes a day while Rose et al. (2007) found that some of these smokers could smoke up to a pack (20 to 25 cigarettes) or more a day. This variance in smoking frequency can lead to the sub-categorizations of daily smokers as light, moderate, and heavy; however, few differences are observed between these typologies. A previous study conducted by Rosa and Aloise-Young (2015) found that amount smoked was the only difference reported between daily smoker subgroups.

Compared to nondaily smokers, daily smokers typically smoke with family members or by themselves at home (Oksuz et al., 2007). Daily smokers are also more likely to purchase their own cigarettes (Berg et al., 2010). Concerning age, daily college student smokers tend to be older than nondaily college student smokers (Sutfin et al., 2009) are. This is not surprising since progression is still likely to occur during the college years while students are still in school (e.g., Thompson et al., 2007). However, there are daily smokers who also increased their smoking patterns between high school and college (Chassin et al., 2000). Due to their progression over the years and their age, it is likely that these smokers are addicted to cigarettes (Fagan & Rigotti, 2009; Oksuz et al., 2007) and experience urges as well as withdrawal symptoms when unable to smoke (Shiffman & Paty, 2006) which may make it harder

for these smokers to quit smoking. Daily smokers also have lower self-efficacy towards quitting compared to nondaily smokers, which is predictive of future quitting behavior, intentions to quit, and quit attempts (Oksuz et al., 2007).

Characteristics of Nondaily Smokers. Since research suggests that college smoking is an extension of experimentation from adolescence, a nondaily smoking pattern is typical with this population (Caldeira et al., 2012; Moran et al., 2004; Harris, Schwartz, & Thompson, 2008; Thompson et al., 2007) and is arguably increasing (Berg et al., 2012). Generally, nondaily smokers are defined as individuals who do not smoke on a daily basis, and smoke fewer than 25 days out of the month (Hassmiller et al., 2003; Levy, Biener, & Rigotti, 2009). However, studies have indicated that the exact frequency of smoking in this population may vary. For example, one study found that there were some nondaily college student smokers who smoked one to five days out of the month while other nondaily college student smokers could smoke between 26 and 29 days out of the month (Berg et al., 2012). These findings show that nondaily smokers may not be a homogenous group of smokers.

Researchers have acknowledged that variability in frequency and amount smoked are common with this population (Sutfin et al., 2009; Wortley et al., 2003); therefore, the nondaily smoker category is not as easily defined as the daily smoker category. This has led to the development of multiple different descriptions of these smokers, such as low-rate smokers (e.g., Stormberg, Nichter, & Nichter, 2007), nondaily smokers (e.g., Wortley et al., 2003), occasional smokers (e.g., Wetter et al., 2004), light and intermittent smokers (e.g., Husten et al., 1998), and social smokers (e.g., Moran et al., 2004). Due to these various labels and descriptions, research on these college student smokers has been somewhat inconsistent (Sutfin et al., 2009).

Some similarities have emerged in the literature. For example, one similarity that has emerged is that many nondaily college student smoking patterns tend to be very sporadic with various increases and decreases in smoking frequency during the month (Colder, Flay, Segawa, & Hedeker, 2008). Due to this sporadic pattern, there has been a debate in the field regarding whether these smokers are just in transition (from nonsmoker to smoker and from smoker to former smoker) or if there is a stable pattern of nondaily

smoking (Hines et al., 1996).There is evidence to suggest that there are nondaily college student smokers who are in the process of initiating smoking or quitting (Hassmiller et al., 2003) which indicated that trajectory is important. However, there is also evidence to support that there are nondaily college student smokers who have an established pattern of smoking and who are not in the process of initiating or quitting (e.g., Caldeira et al., 2012; Hassmiller et al., 2003; Hines et al., 1996; Moran et al., 2004; Stormberg et al., 2007; Sutfin et al., 2009). One study found that 6.5% of college student smokers increased their smoking frequency, 3.2% decreased their smoking frequency, and 13.3% maintained a nondaily smoking pattern (Caldeira et al., 2012).

Concerning age, nondaily college student smokers tend to be younger than their daily smoking peers (Hassmiller et al., 2003). This may be because some of these smokers, unlike daily smokers, have only recently initiated smoking (Hassmiller et al., 2003; Hines et al., 1996). Nondaily college student smokers are also less likely to buy their own cigarettes and will typically get their cigarettes from friends when in social or drinking situations (Oksuz et al., 2007). Unlike daily smokers, it is uncommon for nondaily college student smokers to report smoking at home or by themselves but prefer to smoke with others outside of their homes (Oksuz et al., 2007). In addition, due to their low levels of smoking, many of these smokers do not consider themselves to be addicted to cigarettes (Brown et al., 2011).

In general, nondaily college student smokers have been found to have higher self-efficacy regarding quitting than do daily college student smokers (Businelle et al., 2009) and typically have an ideal time to quit in mind (e.g., before the end of college; Brown et al., 2011). In addition, research has shown that nondaily smokers are more likely to attempt to quit (Wetter et al., 2004; Wortley et al., 2003) and are more likely to indicate that they have attempted already (Berg et al., 2012); therefore this is a population that may be easier to target with interventions before there is an increase in smoking patterns.

Due to the variability in frequency of smoking, some researchers have started to distinguish between subtypes of nondaily smokers, such as social smokers and deniers (also referred to as phantom smokers; Choi et al., 2010).The debate in the field is whether these smokers are the same since many

smokers who smoke socially do not acknowledge they are smokers. However, Levinson et al. (2007) found an overlap of only 60% between deniers and social smokers, providing some evidence that these two smokers may be independent from each other to some extent.

Social Smokers. Social smokers may be the most common type of nondaily smoker on college campuses (Gilpin et al., 2001; Harrison, Desai, & McKee, 2008; Wechsler et al., 1998), with estimates ranging from 26% to 70% of all college student smokers (Levinson et al., 2007; Moran et al., 2004; Waters et al., 2006). Studies have been mixed regarding how social smokers are defined (e.g., Levinson et al. 2007; Song, Kim, & Kim, 2011; Waters et al., 2006); for example, some studies define social smokers as individuals who identify as such (e.g., Levinson et al. 2007). However, this definition is problematic since many nondaily smokers may exhibit smoking patterns similar to social smokers but may not acknowledge that they are smokers (Song et al., 2011). Social smokers have also been defined as nondaily smokers who mainly smoke in public with others, whether it be at bars or restaurants (Philpot, Ryan, & Torre, 1999) or in socializing areas such as parties (Waters et al., 2006). Social smokers only smoke in social situations, typically with other smokers (Gilpin et al., 2005), and not due to addiction (Moran et al., 2004) but are socially motivated to smoke (Thompson et al., 2007).

In general, frequency of smoking for social smokers varies substantially based on the context in which smoking occurs. Some studies have found that these smokers smoke less than 10 cigarettes a day (Schane, Glantz, & Ling, 2009) and smoke on average fewer than 25 days out of the month (Waters et al., 2006). However, these studies also indicated that social smokers smoke in high concentration on days that smoking occurs, which is typically during the weekend or on other days in which social activities are prevalent (Shiffman, Kirchner, Ferguson, & Sharf, 2009). Since alcohol is linked to the social environment across many campuses, there is also a link between social smoking and drinking behaviors. More specifically, social smokers tend to smoke more heavily on days when they are also drinking (Dierker et al., 2006).

Similar to other nondaily smokers, social smokers rarely acknowledge that addiction plays a role in their smoking patterns (Debevec & Diamond, 2012; Schane et al., 2009), and there is limited evidence to suggest that they are addicted (Moran et al., 2004; Waters et al., 2006; Wetter et al., 2006). Additionally, social smokers generally have a high interest in quitting smoking (Moran et al., 2004). In fact, many social smokers have high confidence and self-efficacy in their ability to quit (Debevec & Diamond, 2012; Waters et al., 2006) and plan on quitting before the end of their four years at school (Hines et al., 1996). However, these smokers are less motivated to actually make a cessation attempt while still in school mainly because they do not perceive their smoking to be problematic (Moran et al., 2004; Waters et al., 2006).

Deniers. There is a unique group of student smokers who self-identify as nonsmokers although smoking behavior is still occurring (Berg et al., 2009; Levinson et al., 2007). This is concerning since there is evidence to suggest that these smokers, referred to as deniers or phantom smokers, can easily go undetected by clinicians and for intervention efforts (Schane et al., 2009). In addition, deniers make up a large percentage of the nondaily smoker category**.** Two studies have found that up to 50% of nondaily smokers fall under this category of smoking (Berg et al., 2009; Song et al., 2013).

In general, deniers are very similar to social smokers and overlap may be present. For example, their smoking behavior is very social in nature (Choi et al., 2010), and alcohol plays a role with deniers as much as with social smokers (Berg et al., 2009). Deniers also have high cessation confidence since they believe they are in complete control of their smoking patterns (Berg et al., 2009; Lee et al., 2013; Levinson et al 2007; Ridner, Walker, Hart, & Myers, 2010). In addition, these smokers typically do not purchase their own cigarettes and usually smoke whatever is available at the time (Choi et al., 2010). However, there are some differences that have been reported in the research. Some evidence suggests that that smoking frequency is lower for these smokers compared to social smokers (e.g., deniers smoke 1-9 cigarettes a month; Lee et al., 2013), while other studies have indicated that these smokers rarely have a concrete pattern of smoking (Choi et al., 2010; Rifon et al., 2004). It is possible that these students are experimenting with smoking in college since they have the lightest smoking patterns compared to other

smokers (Choi et al., 2010). The most important difference between social smokers and deniers is seen in regard to quitting behavior. Song et al. (2011) found that the likelihood of attempting to quit is higher for social smokers who identify as smokers than for deniers; therefore, deniers may be at higher risk for escalating to heavier smoking especially since they are commonly missed by intervention efforts.

Chapter 2: Current Studies on College Student Smokers

As is apparent from the multiple terms that are used to describe college student smokers and the broad criteria used to classify these smokers, it is possible that many different types of categories of smokers beyond just social smokers could fit into this category. Due to lack of available research differentiating between types of nondaily smokers, many researchers default to assuming that most, if not all of college nondaily smokers are social smokers (Oksuz et al., 2007). Although social smokers and deniers have been somewhat established as additional subtypes of nondaily smokers, there is still the possibility that other typologies of nondaily smokers are present in this population. Lack of information on these subtypes is especially problematic because college student smokers are primarily nondaily smokers.

Researchers have started to acknowledge that the nondaily category of smoker could be divided further into more meaningful typologies (Berg et al., 2012; Hassmiller et al., 2003; Sutfin et al., 2009). For example, Berg et al. (2012) found three types of nondaily smokers: one who smoked between 1-5 days a week for social reasons (possibly deniers), one who smoked 6-29 days a month for social reasons (possibly social smokers), and one type (42%) of nondaily smoker who did not fit the social smoker or denier typology. However, there was no clear description of moderate smokers and how these smokers are a unique variation of nondaily smokers. Another study also found similar results in that not all nondaily smokers fell within the social smoker category, and that there are other types of nondaily smokers present who smoked during the day without the social component being a factor (Shiffman et al., 2009). It is apparent from the studies conducted by Sutfin et al. (2009) and Shiffman (2009) that these individuals may be on a continuum and may be qualitatively different, which could mean that unique interventions may be needed to promote cessation for each subtype (Hertel & Mermelstein, 2012). However, research attempting to differentiate between smoker typologies within this category has been mixed.

A Qualitative Study of College Student Smokers

To help better distinguish between different types of nondaily as well as daily smokers on campus, a qualitative focus group study with 41 Colorado State University students was conducted (*M* = 18.73 years old, *SD* = .867; 65.9% female; 80.5 % White, 9.8% Hispanic, 9.7% other; Rosa & Aloise-Young, 2015). Participants were divided into one of six focus groups based on their smoker identity and cigarette use pattern (i.e., two social smoker groups, two nondaily smoker groups, and two regular/daily smoker groups).

The participants were asked questions about their own smoking patterns as well as the perceived patterns of their smoking peers. The questions included categories of smokers (e.g., *What are some of the different categories of smokers on campus?*), smoker identity (e.g., *Compared to the general student population, do you consider yourself a smoker or a nonsmoker?)*, smoking patterns (e.g., *How much do you typically smoke in a month?*), and motives for smoking (e.g., *Why do you continue smoking?*). Four coders used a two-step coding system, open and focused coding, to extract multiple codes from the results and also to consolidate those codes into more meaningful themes (Emerson, Fetz, & Shaw, 1995). A 75% agreement rate between coders was required for the theme to be retained. The results revealed that both nondaily and daily smokers could be divided into more meaningful subtypes.

Results for Daily Smokers. Students divided daily smokers into three subtypes of smokers: light, regular, and heavy smokers. The regular smoker focus groups indicated that there are no differences in reasons for smoking for daily smokers. All three subtypes of daily smokers reported smoking due to addiction, habit, and the withdrawal symptoms associated with lack of use which is supported by previous research (Businelle et al., 2009).

Concerning smoking patterns, daily smokers smoked more often and more cigarettes than any of the nondaily smokers (similar to findings from Ling & Glantz, 2004; Schane et al., 2009). This difference was also acknowledged for the light smokers. All three subtypes of daily smokers reported primarily

smoking cigarettes (no other tobacco products) and only varied in frequency of use, with light smokers smoking the least and heavy smokers reporting smoking the most on a daily basis. All three daily smoker subtypes also acknowledged that they self-identified as smokers.

Results for Nondaily Smokers. Nondaily smokers were also divided into three subtypes: stress smokers, party smokers (also referred to as "drunk" smokers by the participants) and social smokers. Motives for smoking were the primary way participants generated different nondaily smoking typologies. Stress smokers indicated that they smoked more often under high stress situations or as a form of emotional regulation (similar to findings from Brown et al., 2011; Oksuz et al., 2007). In addition, these smokers rarely reported that they smoked due to peer influence (similar to findings from Brown et al., 2011; Oksuz et al., 2007). As also indicated by previous research, social smokers acknowledged that they smoked primarily due to peer influence and in social environments (Moran et al., 2004).

Previous research has been limited on the existence of party smokers, which emerged in this study. Nichter et al. (2010) indicated that there are types of college student smokers who only smoke while drinking. Similarly, these smokers indicated smoking occurred only when in a drinking situation due to the paired effects of smoking and drinking alcohol. Party smokers were very similar to social smokers in that they also smoke for social and environmental reasons. However, these smokers were also more likely to be deniers than the social smoker category. Participants acknowledged that they were not really considered smokers if they only smoked while in drinking situations.

These subtypes of smokers also differed in the amount smoked, type of tobacco products used, and the context in which smoking occurred. Stress smokers reported having the highest frequency of use and being somewhat loyal to a brand. In contrast, social smokers reported smoking using a hookah at higher rates than cigarettes, and those who did report smoking cigarettes typically smoked during social events or during the weekend (similar to findings from Schane et al., 2009; Shiffman et al., 2009; Stormberg et al., 2007). However, no brand loyalty was present with this type of smoker. Party smokers

reported that neither hookah use nor brand loyalty was common. Frequency of use was commonly dependent on amount of alcohol consumed, but some of these smokers reported smoking more during one drinking occasion than social smokers.

In general, these findings expanded on the subtypes of smokers present on a college campus. This study indicated that there are three subtypes of daily smokers: light, regular, and heavy smokers. It also found evidence for three subtypes of nondaily smokers on campus: social smokers, party smokers, and stress smokers. All types of smokers varied regarding their frequency of use and products used, but the most pronounced differences, especially for nondaily smokers, were in their motives for smoking. Therefore, a population specific motive for smoking scale may be a good attitudinal measurement tool that can be used to distinguish between smokers present on campuses.

Using Motives to Differentiate between College Student Smokers

Several studies have focused on differentiating smokers using measures related to frequency of use and other patterns of smoking (e.g., Sutfin et al., 2009). However, it is possible that attitudinal measures, such as motives for smoking, may also be able to differentiate between and within both daily and nondaily college student smokers. Many researchers have acknowledged that to better understand youth smoking behaviors, it is essential to understand their motives for participating in that behavior (e.g., Lantz, 2003; Nichter et al., 2010), especially since there is evidence to support strong motivational influences in smoking (Shiffman, Dunbar, Scholl, & Tindle, 2012). In addition, researchers have called for the investigation of the underlying motives for smoking in this population (Fidler & West, 2009; Hertel & Mermelstein, 2012; Song et al., 2013) so that effective cessation programs that target specific motivations can be developed (Boudrez & Dacquer, 2012; Fidler & West, 2009). This is especially important since smoking motives have also been linked to quitting intentions (Berg et al., 2012) and quit attempts (Fidler & West, 2009).

Investigating motives for smoking as a way to distinguish between smoker types is not a new approach. Motives for smoking have been used extensively to effectively distinguish between non-college student smokers (e.g., Berlin et al., 2003; Fidler & West, 2009; Ikard, Green, & Horn, 1969).

Originally, research considered smokers to be mostly motivated by pharmacological reasons; however, this has changed over the years to include many non-pharmacological and psychosocial reasons, such as smoking for enjoyment, stress relief, boredom relief, concentration, socialization, to increase positive affect, and to decrease negative affect (Boudrez & Dacquer, 2012). Some of the first researchers to acknowledge the usefulness of smoking motives were Ikard et al. (1969), who initially argued that there were six motives for smoking: habitual motives (smoking out of habit), addictive motives (smoking due to dependence), negative affect reduction motives (smoking to reduce sadness or anger), pleasurable relaxation motives (smoking to relax), stimulation motives (smoking to increase alertness), and sensorimotor manipulation motives (smoking due to the enjoyment of the act of smoking). Russell, Peto, & Patel (1974) later added the social motive for smoking.

Ever since the initial smoking motives research from Ikard et al (1969) and Russell et al. (1974), various researchers attempted to conceptualize how motives influence smoking. Many instruments like the Reasons for Smoking Scale (Ikard et al., 1969), Motives for Smoking Scale (Russell et al., 1974), the Wisconsin Inventory of Smoking Dependence Motives (Piper, Piasecki, Federman, & Bolt, 2004), and the Smoking Motives Questionnaire (West, 2005) have been developed in an attempt to update past measures as well as categorize smokers based on both pharmacological and psychosocial reasons for smoking. These scales have been successful with the general adult population. For example, one study, which used the Smoking Motives Questionnaire (West, 2004), found that the top smoking reasons were stress relief and enjoyment. Other reasons for smoking included to control weight, to help socialize, and to relieve boredom (Fidler & West, 2009).

Most of these motives scales were not created for the college student smoker population and research is limited on what motivates college student smokers to smoke (Shiffman et al., 2012). This dearth of research is problematic since college student smokers have a different smoking pattern than other adult smokers. This is especially relevant because older smokers have been found to report more dependence-related motives for smoking, which is not as relevant for college student smokers; college student smokers are more prone to endorse psychosocial reasons for smoking (Fidler & West, 2009).

Recently, motives have started to be investigated in the college population. For example, one diary study reported that motives present in the college population included habit, to reduce cravings, to take a break from work, to deal with negative emotions, to relieve stress, and to socialize (Piasecki, Richardson, & Smith, 2007).

More is known about motives regarding daily smokers which also applies to daily college student smokers. Research has indicated that daily smokers typically smoke for pharmacological and addiction/dependence motives due to addiction, tolerance, craving, automaticity, and loss of control (Shiffman et al., 2012). Similarly, Piasecki et al. (2007) found that daily smokers were more likely to smoke due to cravings, habit, smoking in anticipation of restrictions, and automaticity. Daily smokers also report smoking due to internal cues such as to relieve boredom and for emotional regulation of both positive and negative emotions (Berg et al., 2012; Haight, Dickter, & Forestell, 2012; Oksuz et al., 2007) and for enjoyment (Fidler & West, 2009). Other studies have also reported that social elements can also influence daily smokers, such as to improve self-confidence (Berg et al., 2012; Nichter et al., 2010) and to reduce social anxiety (Buckner & Vinci, 2012).

Some research has started to emerge that investigates motives for nondaily college student smokers. For example, Stromberg et al. (2007) found two types of smokers who had an established pattern of nondaily smoking; smokers who smoke mostly in social settings and smokers who smoke to relieve stress and boredom. Other studies have confirmed that stress reduction motives (Brown et al., 2011; Piasecki et al., 2007), social motives (Brown et al., 2011; Haight et al., 2012; Piasecki et al., 2007; Shiffman et al., 2012), and drinking motives (Rosa & Aloise-Young, 2015) influence college student smokers.

Stress Reduction and Emotional Regulation. Individuals in the general population who smoke for stress motives are typically labeled as relaxation smokers (Ikard et al., 1969; Russell et al., 1974) or tension reduction/relaxation smokers (Berlin et al., 2003). There is also some evidence to suggest that these smokers are present on college campuses. For many students, college is very stressful and research has shown that individuals who are stressed academically and are unhappy with their college experience

are more likely to smoke (Emmons, Wechsler, Dowdall, & Abraham, 1998; Patterson et al., 2004). Since research has shown there to be a relationship between stress and tobacco use (e.g., Ny & Jeffery, 2003), it is not surprising that some college students smoke in response to stress for relaxation and for stress relief (Berg et al., 2011; Brown et al., 2011; Darlow & Lobel, 2012; Levinson et al., 2007; Stormberg et al., 2007).

Individuals who are motived to smoke due to stress are also more likely to smoke in higher concentration during academic periods of high anxiety (Patterson et al., 2004). However, individuals who smoke for stress regulation may not always smoke on a daily basis (Lantz, 2003). In addition, these are motives that are not typically endorsed by social smokers (Levinson et al., 2007). It is expected that these smokers will be present in the college population because academic stress can play a role in smoking behaviors.

College students may also smoke for emotional regulation, especially when frustrated, upset or angry, or to help control and cope with negative moods or depressive symptoms (Berg et al., 2011; Berlin et al., 2003; Brown et al., 2011; Piasecki et al., 2007; Stormberg et al., 2007). This motive for smoking is expected in any smoking population since depression regulation has repeatedly been linked to smoking (e.g., Vinci, McVay, Copeland, & Carrigan, 2012). One study found that these negative moods or depressive symptoms serve as a smoking trigger for some nondaily as well as daily smokers (Brown et al., 2011). However, Piasecki et al. (2007) also found that some smokers may be motivated to smoke to enhance their positive mood, but not much is known about these smokers in regard to frequency and amount of smoking. It is expected that these smokers will also be present in the college student population.

Social Motives. As was previously discussed, social motives for smoking are very common in the college population. Social motives may include smoking to help fit in, to build connections with other students, to enhance self-confidence, and to help facilitate social situations (Nichter et al., 2010). As is the case in early and middle adolescence, having friends who also smoke has been shown to be highly correlated with smoking behaviors during the college years (Gilpin et al., 2005; Hines et al., 1996;

Levinson et al., 2007; Morell, Cohen, Bacchi, & West, 2005; Staten et al., 2007). More specifically, one study found that 64% of smokers reported that most of their friends were smokers (Nichter et al., 2010; Thompson et al., 2007). In this context, smoking may be seen as a vehicle to help better fit in with social groups (Hines et al., 1996). In addition, smoking may facilitate social interactions for students (McKee, Hinson, Rounsavill, & Petrelli, 2004; Moran et al., 2004), decrease social anxiety (Lantz, 2003; Stromberg et al., 2007), and help students mold their social environment (Stromberg et al., 2007). For example, the act of smoking may help reduce awkward situations by helping start conversations with friends or strangers and even serves as an ice-breaker to initiate conversation with potential romantic partners (Brown et al., 2011; McKee et al., 2004; Hines et al., 1996).

Like stress reduction and emotional regulation motives, social motives may also be influenced by the college environment. For example, being a member of a college social organization (e.g., fraternities or sororities) is associated with smoking as part of the activities (Waters et al., 2006). More generally, the college atmosphere is very social in nature and smoking visibility on campus and by fellow peers may contribute to this smoking pattern (Rigotti et al., 2000). College is also a time period with fewer rules and more freedom where students are trying to create their own identities (Stromberg et al., 2007), which could easily be facilitated by smoking. Although smoking is both social and individual in nature for college students (Costa et al., 2007), there is evidence that some specific types of smokers are influenced more by social forces than other types of smokers (Thompson et al., 2007).

Drinking Motives. Pairing smoking with drinking may also be a motive for some students, especially since alcohol use and tobacco use peak during this time period (SAMHSA, 2005) and are the most common substances used across campuses (SAMHSA, 2010). One study found that 59% of college drinkers are also smokers (Weitzman & Chen, 2005). Smoking and drinking are generally paired, and college students who smoke typically drink more heavily than nonsmokers (Dawson, 2000; Harrison et al., 2008; Schane et al., 2009; Werner, Walker, & Greene, 1996; Wetter et al., 2004). Smokers are also

more likely to smoke the highest concentration of cigarettes during drinking situations (Dierker et al., 2006). More specifically, as drinking rates increase so do smoking rates (Bien & Burge, 1990). However, this relationship is bidirectional in nature (Dierker et al., 2006).

One possible reason for this pairing between drinking and smoking is that each substance enhances the effects of the other (Harrison et al., 2008; Nichter et al., 2010; Stromberg et al., 2007). Nicotine also helps reduce the negative sedative side effects of drinking and helps students stay awake and feel more sober (Nichter et al., 2010; Rose et al., 2004). Smoking while drinking may also increase enjoyment, satisfaction, and relaxation (McKee et al., 2004; Nichter et al., 2010; Rose et al., 2004). This type of smoking has been labeled a form of "play" for college students (Stromberg et al., 2007) since alcohol use is socially based in the college environment (Jackson, Colby, & Sher, 2010). For example, one study found that students would smoke while drinking to feel like they belonged in a group, to feel self-confident when interacting with others, and to facilitate social interactions (Nichter et al., 2010).

Although some research has found that alcohol use and smoking may be strongly correlated for most smokers (e.g., Sutfin et al., 2009), some researchers would argue that there are college student smokers who are only smoking while drinking. These individuals have been referred to as play smokers, deniers (Levinson et al., 2007; Nichter et al., 2010), and party smokers (Rosa & Aloise-Young, 2015). In regard to patterns of smoking, those who primarily smoke while drinking have weekly lags in smoking and drinking behaviors (Dierker et al., 2006). For example, one study found that there is higher use of cigarettes and drinking at the beginning and end of the academic year as well as weekends versus the weekdays (Dierker et al., 2008). Similarly, many researchers argue that drinking motives are common with nondaily smokers (Caldeira et al., 2012; Jackson et al., 2010). One study found that about 85% of nondaily smokers smoke while drinking (Jackson et al., 2010), but these smokers also smoke 86% of their cigarettes while drinking (Shiffman et al., 2009). Therefore, it is important to investigate whether drinking motives may be a standalone motive for some smokers in this population or whether it is seen across all smoker typologies.

A Quantitative Study using Motives to Distinguish Smoker Typologies

All of the above studies point to the possibility that different college student smokers, both daily and nondaily, could be differentiated further based on their motives for smoking (e.g., addiction or dependence, regulation motives, social motives, and drinking motives). To test this idea, Rosa et al. (2014) conducted a quantitative survey study to identify the different smoker typologies present on one campus, to estimate the prevalence of these typologies, and to find characteristics and measurement items that can help predict these various smoker typologies. It was hypothesized that types of smokers could be distinguished beyond the nondaily and daily smoker categories using their motives for smoking and that these patterns of use, quitting behavior, level of addiction, and pattern of drinking and smoking could predict these typologies.

Participants for this study consisted of 335 Colorado State University students between the ages of 18 and 21 (M = 18.6 years old, SD = 1.15). The majority of the participants identified as White/Caucasian (85%) first year students (72%) who lived in the residence halls (73%). In regard to self-identified types of smokers, 16% of participants identified as moderate to heavy smokers, 33% identified as very light to light smokers, 27% identified as social smokers, and 24% identified as nonsmokers who smoke occasionally. Participants completed a 30 to 45 minute survey that included questions on demographics (i.e., age, gender, ethnicity, student status, level of education, income, living arrangements, and relationship status), age of initiation, current smoking habits (e.g., *How many cigarettes have you smoked in the last 30 days*?), reasons for smoking (e.g., *Rate your reasons for smoking…I smoke because it is pleasurable*), smoking cessation (e.g., *How likely are you to quit?),* dependence using the Severity of Dependence Scale (e.g., *Do you think your smoking of cigarettes is out of control?*; Gossop et al., 1995), and alcohol use (e.g., *On how many occasions have you had a drink of alcohol in the past 30 days?).*

Latent Class Analysis (LCA), an analytical technique that investigates group clusters (Feldman, Masyn, & Conger, 2009), was conducted using an 18-item Reasons for Smoking Scale (n=327). The results showed that either a three class (BIC = 5137.786, entropy = .912), a four class (BIC = 5136.275,

entropy = .883) or a five class model (BIC = 5142.598, entropy =.889) was plausible. Since the results for the classes were similar, the four class model was retained based on BIC, significant VLMR-LRT, high entropy, and substantive reasons derived from the literature. The classes included addicted smokers (23.55%), non-endorsing smokers (18.04%), stress smokers (33.03%), and social smokers (25.38%). These smokers varied on their reported reasons for smoking which can be seen in Figure 1**.**

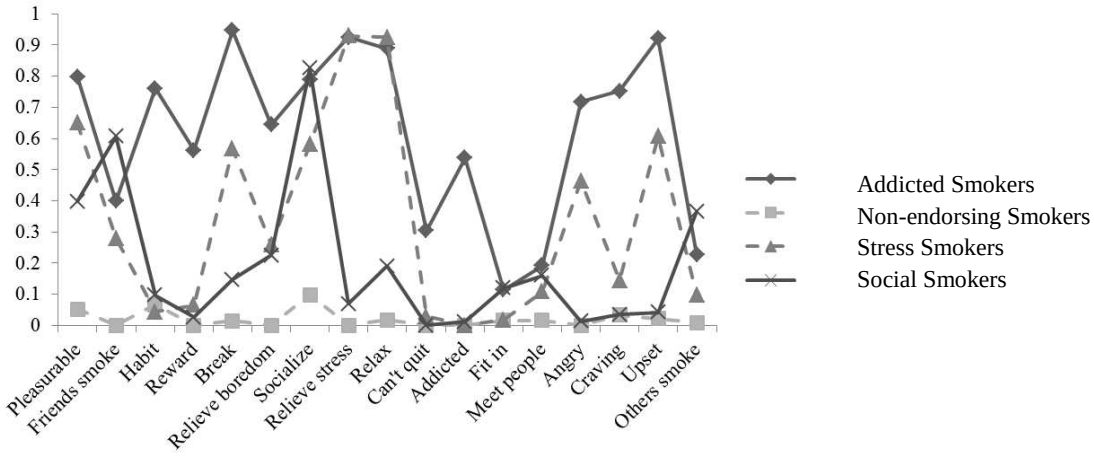

Figure 1. **Four Latent Class Model Item Response Probabilities**

Current age, age of initiation, smoker identity, smoking cessation, current weekly cigarette use, and alcohol use were used as predictors for A Conditional LCA model (n = 303) to predict smoker classes. The social smoker class was used as the reference group for interpretation of the results. The results showed that compared to the social smoker class, weekly use was the only variable that significantly (p<.05) predicted membership in the stress smoker class; age of initiation, smoking cessation, and weekly cigarette use significantly predicted class membership in the addicted smoker class; and smoker identity and amount of weekly cigarette use significantly predicted class membership in the non-endorsing smoker class (see Table 1). Interestingly, alcohol use did not predict membership in any smoker class.

Table 1
Combined Covariates as Predictors of Membership in Latent Classes (n=303)

	Latent Classes			
	Non-Endorsing	Stress	Social	Addicted
Overall Model				
βo	1.649	2.300	ref	-11.990*
Odds	5.202	9.974	ref	0.001*
Age				
β1	-1.058	-0.141	ref	2.220
Odds Ratio	0.347	0.868	ref	9.207
Age of Initiation				
β1	0.317	-1.107	ref	-3.878*
Odds Ratio	1.373	0.331	ref	0.021*
Smoker Identity				
β1	-1.744*	-0.375	ref	-0.688
Odds Ratio	0.175*	0.687	ref	0.503
Smoking Cessation				
β1	1.531	0.448	ref	4.734*
Odds Ratio	4.623	1.565	ref	113.750*
Weekly Use				
β1	-3.923*	0.657*	ref	3.924*
Odds Ratio	0.019*	1.928*	ref	50.602*
Alcohol Use				
β1	0.214	-0.349	Ref	-0.23
Odds Ratio	1.239	0.705	Ref	0.795

*Note: *p*<.05; Natural log was applied to Weekly Use

This study was one of the first studies to categorize college student smokers based on their reasons for smoking. The results revealed that there were four different types of smokers on campus with distinct reasons for smoking. As was indicated by previous researchers (e.g., Moran et al., 2004; Patterson et al., 2004; Stormberg et al., 2007; Waters et al., 2006), these results showed that there are multiple types of nondaily smokers which made up over 76% of the sample. Previous research has confirmed that almost 50% of students fall under the nondaily smoker category, especially in their earlier college years, as is represented by this sample (Oksuz et al., 2007). In addition, this study supported the presence of social smokers on campus as a unique type of nondaily smoker (e.g., Moran et al., 2004; Oksuz et al., 2007; Waters et al., 2006)**.** However, it was not clear from these results whether party smokers or deniers were present in this sample due to the limitations of the motives scale that was used.

Development and Validation of the College Student Motives for Smoking Scale

Since reasons for smoking emerged in both of our previous studies as an important attitudinal construct in categorizing college student smokers (Rosa & Aloise-Young, 2015; Rosa et al., 2014), a study was conducted that aimed to develop and validate a scale to capture the reasons for smoking students endorsed in those studies and in the literature (Rosa & Aloise-Young, n.d.). The final scale, referred to as the College Student Motives for Smoking Scale (CSMSS), was developed based on the results from a previous focus group (Rosa & Aloise-Young, 2015). The scale consisted of 17 reasons for smoking with response options ranging from 1(*Strongly disagree*) to 5 (*Strongly agree*).

Participants for the validation study consisted of 307 students (M = 18.84 years old, SD = 1.13; 70% female) who reported smoking at least one cigarette in the last 30 days. Self-identified types of smokers for this sample ranged from 15% nonsmokers (but still reported smoking), 16% former smokers, 29% very light to light smoker, 19% social smokers, 12% stress smokers, and 7% moderate to heavy smokers. Participants were given the CSMSS as well as demographic questions, the Modified Reasons for Smoking Scale (MRSS; Berlin et al., 2003), a question on smoking status (i.e., *nonsmokers, former smokers, very light to light smoker, social smokers, stress smokers,* and *moderate to heavy smokers*), and three questions on frequency of smoking (α=.70): how much students smoked in the last 30 days, the last six months, and the year (1= *Not at all* to 3=*Everyday*), which were similar to questions used by Colder et al. (2008).

To investigate the internal structure and reliability of the scale, an exploratory Factor Analysis (EFA) was conducted on the 18 items using Varimax Rotation. The EFA results indicated that there were four potential factors: emotional regulation motives (an eigenvalue of 5.91 and 34.81% variance explained), alcohol-related motives (an eigenvalue of 3.11 and 18.34% variance explained), dependence motives (an eigenvalue of 1.82 and 10.72% variance explained), and social motives (an eigenvalue of 1.44 and 8.50% variance explained). The four factor model accounted for 72.37% of the total variance. A Confirmatory Factor Analysis (CFA) was used to confirm the finding of the EFA. The results revealed that this scale structure was a decent fit [χ^2 [(df=113, n=304) =288.85, p<.001; RMSEA= .07, 90% CI=.06

to .08; SRMR =.04]. The R^2 results showed that most of the items were contributing well to the model. Out of the 18 items, 17 items were retained for the final scale. Table 2 shows the factor loadings for each item. The internal consistency (α) of the four factor subscales were .91 (emotion regulation motive), .87 (alcohol-related motive), .88 (dependence motive), and .80 (social motive) which met the acceptable criteria of .80 or above.

Table 2
CSMSS Factor Loadings for EFA and Fit Indices for CFA (n=305)

	Factors			
I continue to smoke …	Emotional Regulation	Alcohol-Related	Dependence	Social
1. to help relax	**0.734**	0.111	0.168	0.014
2. when I am angry	**0.792**	0.113	0.239	0.010
3. when I am upset about something	**0.854**	0.085	0.191	0.006
4. to relieve stress	**0.838**	0.047	0.183	0.035
5. when I feel depressed	**0.746**	0.096	0.208	0.106
6. because it goes well with drinking alcohol	0.053	**0.849**	0.044	0.241
7. when I am drinking alcohol	0.141	**0.853**	0.133	0.116
8. because drinking makes smoking taste better	0.098	**0.701**	0.152	0.139
9. because smoking improves the buzz I get from drinking	0.049	**0.747**	0.087	0.125
10. out of habit	0.275	0.145	**0.650**	0.190
11. because I've tried to quit but was unsuccessful	0.225	0.071	**0.777**	0.135
12. because I am addicted	0.217	0.091	**0.864**	0.096
13. because I crave cigarettes	0.294	0.211	**0.653**	0.099
14. to help me meet new people	0.046	0.152	0.143	**0.724**
15. to help me fit in	0.026	0.017	0.192	**0.767**
16. to socialize	0.024	0.363	0.007	**0.663**
17. because my friends smoke	0.002	0.275	0.075	**0.597**

Note. Items with highest loading on each factor are in bold

To test for concurrent validity, a MANOVA was conducted on demographic variables and smoking-related variables. The results indicated that there were no differences between age, gender, student status, or living arrangement regarding how participants scored on the subscales. The results did reveal, however, that there were significant differences based on ethnicity. More specifically, White/Caucasian students (Dependence M = 1.94, SD = .98; Alcohol-related M = 2.96, SD = 1.12) scored higher on the addiction and drinking subscales than individuals from other ethnicities (Dependence M = 1.63, SD = .82; Alcohol-related M = 2.62, SD = 1.30). In addition, differences were present regarding

smoker status for the emotion regulation [$F(5, 292) = 16.91$, $p < .001$; $\eta^2 = .22$], the social motive subscale [$F(5, 292) = 5.02$, $p < .001$; $\eta^2 = .08$], the dependence motive subscale [$F(5, 292) = 27.47$, $p < .001$; $\eta^2 = .32$], and the alcohol-related motive subscale [$F(5, 292) = 8.36$, $p < .001$; $\eta^2 = .13$]. These results indicate that the scale can effectively differentiate between different typologies of smokers.

Concurrent validity was also investigated by examining the bivariate correlations of the CSMSS subscales with the MRSS subscales. It was expected that three of the CSMSS subscales would be highly correlated with three of MRSS subscales (emotion regulation to stimulation, social to social, and dependence to habit). Since the alcohol-related subscale included new items related to drinking, it was unclear whether it could be correlated to any of the MRSS subscales. As expected, the results of the correlations indicated that the subscales of the CSMSS and the MRSS were highly correlated (See Table 3).

Table 3

CSMSS Correlations with MRSS

	1	2	3	4	5	6	7	8
1. CSMSS Emotional Regulation	1							
2. CSMSS Social	.09	1						
3. CSMSS Dependence	.49*	.27*	1					
4. CSMSS Alcohol-related	.22*	.46*	.30*	1				
5. MRSS Stimulation	.69*	.33*	.53	.31*	1			
6. MRSS Pleasure	.43*	.61*	.46*	.46*	.62*	1		
7. MRSS Social	.27*	.70*	.47*	.42*	.47*	.66*	1	
8. MRSS Habit	.32*	.36*	.66*	.24*	.49*	.45*	.52*	1

Note: *p*= significance level (*$p < .05$; **$p < .001$)

Lastly, it was important to investigate whether the CSRSS had predictive validity and could predict smoking-related variables such as frequency of use. The results revealed that three subscales (i.e., emotional, addicted, and drinking) positively predicted frequency of smoking (See Table 4); however, the social reason subscale was not predictive. This is possibly because most of the sample reported smoking for social reasons due to the nature of college student smoking patterns. All four factors explained 59% of variance in frequency of smoking.

Table 4

Regression Analysis Summary for CSMSS Subscales Predicting Frequency of Use

	B	*SE B*	*β*	*t*	*p*
Emotion Regulation	.113	.025	.247	4.576	.001**
Dependence	.204	.031	.373	6.664	.001**
Social	-.022	.030	-.040	-.747	.455
Alcohol-related	.071	.026	.150	2.768	.006*

*Note. R = 0.59, N= 303; p= significance level (*p<.05; **p<.001)*

The results of the above study revealed that the CSRSS is a valid and reliable measure of smoking motivation for college students. More specifically, this study showed that this scale had high reliability, concurrent validity (especially with smoker status), and predictive validity. Due to these results, this scale was used in the current study to differentiate between smoker types across several campuses. Two changes were needed for the current scale: (1) the item *'I continue to smoke when I am drinking alcohol'* was dropped from the scale due to small variance indicating that it may not be a good item in differentiating between smokers and (2) the item *'I continue to smoke to socialize'* was divided into two separate questions (i.e., b*ecause it helps me be able to talk to other*s and *because it helps me be more confident around others*). These changed were implemented due to research which indicates that some college students use smoking as a tool to start conversation and socialize with peers (Piasecki et al., 2007). More specifically, smoking may help relieve social anxiety and enables students be more comfortable and confident in social situations (Buckner & Vinci, 2013; Fidler & West, 2009).

Chapter 3: Additional Smoking Attitudes

Although it is important to understand smoking behaviors and patterns of college students, researchers have also called for a better understanding of attitudes that contribute to college smoking as well as denial of smoking status (e.g., Levinson et al., 2007). Research has indicated that it is common for some college student smokers to have discrepancies between their attitudes and their actual smoking behaviors (Choi et al., 2009). It is possible that certain attitudes or discrepancies in attitudes and behavior could differentiate smoker typologies and could shed light on why some smokers identify as nonsmokers, nondaily smokers, or daily smokers. The attitudes that have emerged repeatedly in the literature which will be included in the current study are: 1) students' perceived susceptibility to negative health outcomes, 2) students' perception of smoker stigma, and 3) attitudes about what it means to be a smoker.

Health-Related Attitudes

Research has indicated that the majority of smokers are aware of the health consequences associated with smoking (Levinson et al., 2007). Similarly, one study showed that college students are also aware of these health consequences (Patterson et al., 2004). However, differences are seen regarding perceived susceptibility to smoking-related illnesses. According to the Health Belief Model (Rosenstock, 1974), perceived susceptibility is an individual's opinion about his or her chances of getting a behavior-specific negative health outcome. According to this theory, individuals who do not perceive themselves to be susceptible to an illness are more likely to continue the behavior.

In general, daily college student smokers acknowledge that they are susceptible to negative health outcomes due to their smoking patterns, but studies seem to indicate that this knowledge does not always influence smoking behavior once the behavior has initiated (Ganley & Rosario, 2013). In addition, several studies have found that nondaily college student smokers, such as social smokers and deniers, underestimate the health risks associated with their smoking (e.g., Berg et al., 2009; Kenford et al., 2005; Levinson et al., 2007; Moran et al., 2004; Song et al., 2011; Thompson et al., 2007). One reason these

smokers feel less susceptible to negative health outcomes is due to their low rates of smoking (Dedevec & Diamond, 2012). These smokers only see a risk of negative health outcomes if someone smokes between one to five cigarettes per day (Seigers & Terry, 2011). In other words, these smokers believe that their low rate smoking behavior is healthier than that of other smokers and will protect them from negative health outcomes.

However, one study found that other types of smokers believe that these nondaily smokers are at risk for harming their health even with low rates of smoking behavior (Seigers & Terry, 2011). This perception is correct, since studies have shown negative health outcomes associated with lower rate smoking (e.g., An et al., 2009; CDC, 2012). The results of these studies indicate that health-related attitudes may differ for daily smokers and nondaily smokers. It is unclear from the research whether these differences may also be apparent within the nondaily smoker category.

Perception of Stigma

Over the years, there has been a drastic change in public opinion about cigarette smoking. During the 1940s, smoking was seen as more acceptable in society, but this positive view of smoking did not last long (Goldstein, 1991). Public opinion about smoking changed during the 1960s through the 1990s when the Surgeon General and other health officials began to circulate information about the negative effects of smoking cigarettes and the effects of second hand smoke (Kim & Shanahan, 2003). As public policies began to change surrounding smoking, there was also a dramatic shift in public opinion where smoking started to be seen as not just an unhealthy behavior but also as a deviant, socially unacceptable, and stigmatized behavior (Bayer & Colgrove, 2002; Kim & Shanahan, 2003; Stuber et al., 2009). Recent studies have found that public opinion towards smokers continues to be unfavorable (Dillard, Magnan, Koblitz, & McCaul, 2013; Kim & Shanahan, 2003), and smokers continue to be described more negatively as a low status group compared to nonsmokers (e.g., Moore, 2005). For example, smokers are now typically described as dirty, litterers, polluters, addicts, unattractive, under educated, smelly, selfish, thoughtless, irresponsible, ignorant, lacking in self-control, and as responsible for their own health outcomes (Chapman & Freeman, 2008; Warner, 2009).

It is apparent that smoking-related stigma is still present in our society. There is also some evidence that smoking-related stigma may be more prevalent in young adult populations since social identity is salient and the desire to conform to social norms is more powerful at this age (Stuber et al., 2009). One study conducted by Stuber et al. (2009) found that 38% of the young adult participants felt like their smoking patterns were devalued and stigmatized and 13% felt like they were discriminated against due to their smoking. As is apparent from the statistic, not all smokers feel stigmatized; many nondaily college student smokers indicate that stigma is only associated with regular or daily smokers but not with nondaily smokers (Nichter et al., 2010).

This perception that only specific types of smokers are stigmatized is not only present with college student smokers but with nonsmokers as well. For example, Dillard et al. (2013) conducted an experiment where college student nonsmokers were given descriptions of smokers and their social identity. Participants who were given a description of a smoker who saw their smoking as part of their social identity (i.e., daily smokers) were more likely to have negative attitudes toward that smoker. In contrast, participants who were given a description of a smoker who did not see smoking as part of their social identity (i.e., nondaily smokers) were more likely to have positive attitudes towards that smoker (Dillard et al., 2013). This study showed that not all smokers are stigmatized and that social identity may play a role in these perceptions.

Smoker Identity

According to the Social Identity Theory and Self-Categorization Theory (Tajfel & Turner, 1986), individuals get their self-esteem from membership in certain groups. Belonging to a high status group will boost one's self-esteem, while belonging to a lower status group could potentially threaten one's self-esteem. Related to smoking identity, research has indicated that many nondaily college student smokers identify as nonsmokers despite the fact they smoke with varying degrees of regularity (Berg et al., 2009; Choi et al., 2009; Schane et al., 2009; Seigers & Terry, 2011; Song et al., 2011). Based on the stigma

associated with smoking and the social sanctions associated with this behavior, many college student smokers may not wish to be identified as part of the lower status smoker group since it may be a threat to their self-esteem.

In addition, this approach states that individuals may develop a social identity based on their behaviors and the context in which their behaviors are occurring (Tajfel & Turner, 1986). Unlike with daily smokers, it is possible that some nondaily smokers do not embrace a smoker identity because their smoking pattern is seen as context specific. For example, studies have found that college students saw smoking in social and drinking situations as more acceptable than smoking in other situations (Nichter et al., 2010; Rosa & Aloise-Young, 2015; Waters et al., 2006). For many nondaily smokers, these contexts are perceived to be atypical of the daily context and therefore not part of their social identity (Brown et al., 2011; Nichter et al., 2010). Since these behaviors are seen as atypical as well as to avoid the smoker identity, some nondaily smokers may go so far as to say that smoking while drinking or smoking occasionally is not "real" smoking (Brown et al., 2011; Nichter et al., 2010).

As is apparent from these perceptions of the "real" smoker, one of the most important components of this approach is how important social comparison is in the development and acceptance of a social identity (Tajfel & Turner, 1986). This begs the question of what these students perceive "real" smokers and smoking behaviors look like. More recent studies have found that college student smokers define a typical smoker as an individual who: 1) smokes at least one cigarette a day (Thompson et al., 2007), 2) smokes on a regular or daily basis (Berg et al., 2009; Thompson et al., 2007), 3) has been smoking for a year or more (Thompson et al., 2007), 4) smoked for reasons other than social reasons (Thompson et al., 2007), 5) purchases their own cigarettes (Berg et al., 2009), and 6) is addicted to cigarettes (Berg et al., 2009).

It is apparent from this definition that the discrepancy between the students' smoking behavior and smoker identity may be occurring because nondaily smokers do not fall under this typical smoker description. For example, when asked why these individuals do not identify as smokers, many nondaily college student smokers reported that their smoking is acceptable because it is not like the behaviors of

"other" smokers (Moran et al., 2004; Thompson et al., 2007; Waters et al., 2006; Wetter et al., 2006), therefore indicating that they are not like daily smokers who are perceived to be typical smokers. More specifically, one study found that many nondaily smokers do not see themselves as being like other daily smokers in regard to dependency and health (Thompson et al., 2007; Waters et al., 2006). Rather, they tend to see themselves as more similar to nonsmokers than a typical smoker in this regard (Hahn & Renner, 1998). However, researchers have indicated that more research is needed to understand why some nondaily smokers acknowledge they are smokers while others do not (e.g., Song et al., 2011).

Chapter 4: Aims and Hypotheses

Reports continue to indicate that college students' smoking prevalence remains high at around 27% (SAMSHA, 2010). Due to the prevalence of smoking in this population, the Surgeon General (CDC, 2012) and many researchers in the field of prevention and intervention have called for more attention to be paid to this population (Lantz, 2003; Wells & Canty- Mitchel, 2012). More specifically, researchers have called for a focus on the development of a universal definition for both daily and nondaily college student smokers, the investigation of whether student smoking typologies go beyond the traditional daily and nondaily smoker labels, and the investigation of both the patterns and smoking-related attitudes of these smokers (e.g., Costa et al., 2007; Fagan & Rigotti, 2009; Wells & Canty-Mitchel, 2012). Since researchers have indicated that it is important to investigate both between and within group differences among college student smokers (Fagan & Rigotti, 2009), the general purpose of the current study is to conduct a quantitative survey study across different universities to not only make comparisons between nondaily and daily smokers but also to make comparisons within these groups of smokers. The research questions, aims, and hypotheses for this study can be seen in Table 5. The results of this study could potentially help researchers, healthcare providers, and prevention/intervention specialists have a better understanding of the motivational and attitudinal aspects of college student smoking behavior as well as patterns of smoking behaviors in this population.

Table 5

Research Aims

Research Questions & Aims of Study	***Hypothesis***
Aim 1: To use a motives scale specifically created for college student smokers to identify different subtypes of daily and nondaily student smokers present across different campuses. **Research Question 1:** How many smoker typologies emerge from the latent profile analysis? **Research Question 2:** What is the composition of the typologies based on the CSMSS?	**H1**: It is hypothesized that four typologies of both nondaily and daily smokers will emerge: addiction/dependence smoker, social smoker, stress/regulation smoker, and experimenters/nonendorsers.
Aim 2: To investigate whether smoking variables such as smoking frequency, smoking environments, cigarette purchasing habits, products used, cessation efficacy, and alcohol use patterns predict typologies of college student smokers. **Research Question 3:** Do additional smoking and drinking variables predict typologies of smokers?	**H2**: It is hypothesized that nondaily smokers will differ from daily smokers in that they will smoke less, smoke in more social environments, get their cigarettes from others, smoke with a hookah at higher rates, have higher cessation efficacy, and drink alcohol at a higher rate. It is unclear the differences that will emerge within the nondaily and daily smoker categories.
Aim 3: To investigate whether subgroups of college student smokers differ on attitudinal variables such as health-related attitudes, smoker identity attitudes, smoking secrecy, smoker image, and perceived feelings of stigma. **Research Question 4:** Do the attitudinal variables have differential mean levels across smoker typologies?	**H3:** Based on the research, it is expected that nondaily smokers will have: 1) lower perception that their current smoking is harmful to their health, 2) a more liberal definition of what it means to be a smoker, and 3) higher perceived stigma for smokers in general but less stigma towards their own smoking behavior compared to their daily smoking peers. However, the relationship between smoker subtypes and these attitudes are unclear; therefore this aim is exploratory in nature.

Chapter 5: Method

Participants

The original sample consisted of 914 participants. The sample was restricted based on some eligibility criteria (e.g., between ages of 18 and 24, currently enrolled at a four-year university or college, and reported smoking at least one cigarette in the 90 days prior to taking the survey). The final sample consisted of 876 participants, which represented over 240 colleges and universities. This included students who took more than 10 minutes to complete the survey and who completed 50% or more of survey questions. Students were between the ages of 18 and 24 years old (M=19.52; SD=1.51) and 51.8% female, 48.1% male, or 0.1% transgender. The majority of the sample identified as White (75.7%) followed by Hispanic/Latino (7.5%), Asian/Asian American (5.8%), Black (5.1%), and other (5.9%).The sample was almost equally divided across year in school; 30.7% first year, 25% second year, 20.5% third year, 23.7% fourth year or above.

Procedure

Recruitment included three different recruitment methods which spanned over two years. The first approach was to use a previously generated list of eligible universities and contact key officials/researchers to help recruit for this study. The aim was to recruit five to seven schools to participate in the study. Once confirmations from the interested schools were received, contact information and an email recruitment message was sent out which the school personnel could use to email students themselves (see Appendix A).

After a year of constant contact with key personnel across various schools in the United States, only four schools enlisted in the study (i.e., Texas State University, Macalester College, Southern Illinois University, and Sam Houston State University) in addition to Colorado State University. Together, participants from these schools totaled 500 student.

The second approach to data collection was to buy advertisement space on Facebook for three months with an embedded link to the survey. Facebook has been cited as a good tool for participant recruitment since participants tend to be younger and more geographically dispersed (Head, Dean, Flanigan, Swicegood, & Keating, 2015). Participants can also be reached more quickly via Facebook than using other methods such as Craigslist and snowball recruiting (Head et al., 2015). A Facebook page was created for this study, and the main message was created. The message was reposted twice a month for three months. Only 50 participants completed the survey due to this method of recruiting.

The third approach to data collection was to use Amazon Mechanical Turk (MTURK) which is an online site that allows users to complete jobs and surveys for companies, researchers, and other agencies and get paid a small reimbursement (i.e., $1 for this study). The benefits of using MTURK are the low cost of participation as well as easy access to a highly diverse sample (Mason & Suri, 2011). In addition, research has shown that data collected from MTURK is very similar to data collected in other online and offline settings (Mason & Suri, 2011). MTURK allows for limited restrictions to be placed on possible participants. The current study restricted the study by age (18-24years old), location (United States of America), and occupation (student) which resulted in 340 student participants. Additional demographic questions were asked in the survey to eliminate participants who did not fit the full criteria for the study (e.g., *what university/college do you attend? Have you smoked a cigarette in the last 90 days?*).

For all three recruitment strategies, the surveys were online. Participants clicked on the survey link and were directed to the consent form for the study. Once consent was attained, the students were directed to the questions (measures for this study can be seen in the Appendix). Once participants completed the survey, they were directed to a referral page where they could refer a friend to the study by providing their name and email address. Referrals resulted in an additional 24 participants. Participants were also debriefed at the end of the study. Approval from the Colorado State University Institutional Review Board was obtained for all collection methods and all measures used. Table 6 compares the recruitment procedures.

Table 6

Recruitment Procedures

	Level	Type	Compensation	Number Recruited
Method 1	School and Classroom	Online	Chance to win $25 gift card to Amazon or Class Credit	500 students
Method 2	Individual via Facebook	Online	Chance to win $25 gift card to Amazon	50 students
Method 3	Individual via MTURK	Online	$1	340 students
Referrals	Individual	Online	Chance to win $25 gift card to Amazon	24 students

Demographics. Students were asked several demographic questions about their age, gender, and ethnicity. Students were also asked which university they attended and their student status.

Age of Initiation. Participants were asked: *How old were you when you smoked your first cigarette* (Saules et al., 2004). Students were categorized as an early onset smoker if they initiated smoking before the age of 18 and as a late onset smoker if they indicated they initiated smoking at or after the age of 18.

Smoking Frequency. Two questions were used to assess smoking frequency. Similar to the study conducted by Costa et al. (2007),the first question asked participants '*During the last 30 days, how many cigarettes have you typically smoked on the days you did smoke.'* Response options were on a scroll bar from between *1* to *24 or more*. Participants were also asked '*In the past 30 days, how many days did you smoke a cigarette -even a puff.'* Response options ranged from *1* to *all 30 days* (Berg et al., 2010; Sutfin et al., 2009).

Smoking Environment. One scale was used to measure which environments smokers had smoked in that last 30 days (α=.92; Sutfin et al., 2009). Environment options included social situations (e.g., fraternity/ sorority, restaurant/bar, campus party, off campus party, tailgating, hanging out with friends, drinking alcohol) and nonsocial situations (e.g., your room/ apartment/house, studying, watching

TV, before and/or after class, and by yourself). The combined scale ranged from lower scores indicating that smoking was occurring more in social situations to higher scores indicating that smoking was occurring more in nonsocial situations.

Purchasing Patterns and Products Used. Participants were asked two questions about their smoking purchasing patterns and the products they preferred to use. The first question asked participants how they usually got their cigarettes (Choi et al., 2010). Similarly, participants were asked about what products they typically used (i.e., *please indicate how often you have used the following tobacco products: cigarettes, pipe/hookah, e-cigarettes*; Rigotti et al., 2000). The scale ranged from 1 (*never used*) to 5 (*used in the past week*).

Smoking Cessation. Participants were asked about their efficacy to quit smoking (i.e., *If you decided to quit smoking now, how likely do you think you would be to succeed; very likely* to *very unlikely*; Sutfin et al., 2009).

Alcohol Use. Since alcohol use is highly correlated with smoking behaviors, participants were asked two questions (adapted from Harvard Alcohol Study) that measured how often the student had a drink containing alcohol (*never* to *4 or more times a week*) and how often participate in heavy episodic drinking was occurring (*never* to *daily*). Heavy episodic drinking for this study was defined as 5 or more drinks on one occasion for males and 4 or more drinks on one occasion for females. The definition of episodic drinking has since changed to include five or more drinks in two hours for males and four or more drinks in two hours for females (National Institute of Alcohol Abuse and Alcoholism, 2015).

Smoker Identity. To assess how smokers categorize their own smoking identity, three items were used. The first item asked participants whether compared to *other students*, they considered themselves to be a smoker (*yes* vs. *no;* Rosa & Aloise-Young, 2015). The second item asked participants whether compared to *other smokers*, they considered themselves to be a smoker (*yes* vs. *no;* Rosa & Aloise-Young, 2015). These two items were combined into one scale with three options: (1) *nonsmoker identity*, (2) *inconsistent identity*, and (3) *smoker identity*. Almost all students who were categorized as having an "inconsistent" identity indicated that they considered themselves to be a nonsmoker compared

to other smokers but a smoker compared to other college students. The follow-up question asked participants to identify whether they considered themselves to fall into any of the following smoker categories:(1) *someone who has tried smoking*,(2) *party smoker,* (3) *social smoker*,(4) *occasional smoker,* (5) *stress smoker,* (6) *daily smoker or* (7) *heavy smoker* (similar to Rosa & Aloise-Young, 2015).

Perceived Harm. Two questions were used to measure if participants felt susceptible to negative health outcomes due to their smoking (Pinsker et al., 2013). The first question asked: **'***How concerned are you about the possible effects of your cigarette smoking on your health*?' (*Not at all concerned* to *Very concerned*). The second question asked**: '***Do you believe there is any harm in smoking an occasional cigarette*?'(*Strongly agree* to *Strongly disagree*).

Attitudes towards Smoker Image. The Classifying a Smoker Scale (α=.91; Berg et al., 2011) was used to assess how smokers conceptualized behaviors of a typical smoker. This scale included 10 questions (e.g., *To be considered a smoker, a person must smoke everyday)* and responses ranged from 5 (*strongly agree*) to 1 (*strongly disagree*). Higher scores on this scale indicated that the typical smoker definition is similar to a regular smoker's smoking patterns while lower scores on this scale indicated that the typical smoker definition is similar to an occasional smoker's smoking patterns. A smoker image scale used by Gerrad et al. (2005) was also used to assess the qualities smokers associate with smokers. The scale consisted of 11 adjectives (e.g., considerate, smart, self-centered) that participants rated from *strongly disagree* to *strongly agree*. The items were divided into two subscales: six positive characteristics (α=.82) and five negative characteristics (α=.62).

Smoking Secrecy. Participants were asked whether they had kept their smoking status a secret from their health care provider or doctor, parents/guardian, siblings, other family members, close friends, casual friends, and acquaintances which was summed to create the smoking secrecy item (ranging from 0 to 7).

Perceived Stigma towards Smokers. Participants were asked if stigma is present for daily smokers (i.e., *most people think less of a person who smokes on a daily basis*), nondaily smokers (i.e., *most people think less of a person who smokes occasionally),* and their own smoking behavior (i.e., *most people think less of me because of my smoking behavior).* These questions (α=.68) were modeled after a scale developed by Stuber et al. (2009).

Motives for Smoking. The CSMSS, described above, was used and consisted of 17 items with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Chapter 6: Results

The sample of students consisted primarily of nondaily smokers (73.7%) which was expected with this population. The participants who self-identified as nondaily smokers further identified as party smokers (22.6%), experimenters (13.9%), occasional smokers (13.5%), social smokers (12.8%), and stress smokers (10.9%). Age of initiation was almost equally divided; 59.6% of participants were early onset smokers and 40.4% were late onset smokers. On average, participants reported smoking 7.56 cigarettes (*SD*=11.43) in a 30 day period and smoked on 11.75 days (*SD*=11.85) in a 30 day period. Demographics for each method of recruitment are listed in Table 7.

Table 7

Demographics by Method of Recruitment

	Method 1 & 4	Method 2	Method 3
Average Age	19.74 (*SD*=2.0)	19.92 (*SD*=2.0)	Not Available
Gender	62.6% Female 37.2% Male	66.7% Female 33.3% Male	33.6% Female 66.4% Male
Ethnicity	78.4% White 7.7% Hispanic 4.1% Multiracial 3.3% Black 3.3% Asian 3.2%Other	66.7% White 15.2% Multiracial 9.1% Hispanic 6.0% Black 3.0% Asian	73.6% White 9.8% Asian 7.4% Black 6.5% Hispanic 2.1% Multiracial 0.6% Other
School Status	41.8% First Year 23.7% Second Year 17.5% Third Year 15.8% Fourth Year 1.2% Other	40% First Year 38.2% Second Year 16.4% Third Year 5.4% Fourth Year	10.9% First Year 23.8% Second Year 26.2% Third Year 35.9% Fourth Year 3.2% Other
Smoking Status	13.3% Daily 86.7% Nondaily	63.6% Daily 36.4% Nondaily	37.9% Daily 62.1% Nondaily
Smoking Initiation	73.5% Early Onset 26.5% Late Onset	72% Early Onset 28% Late Onset	55% Early Onset 45% Late Onset
Cigarettes Smoked	3.0 Cigarettes (*SD*=1.6)	22.8 Cigarettes (*SD*=9.6)	4.25 Cigarettes (*SD*=1.6)
Days Smoked	7.8 Days (*SD*=10.2)	15.7 Days (*SD*=18.1)	15.9 Days (*SD*=11.9)

Note. SD=Standard Deviation

EFA and CFA of Revised CSMSS

An EFA was conducted on the revised 17 item CSMSS using Varimax Rotation. Similar to the previous study, the EFA results indicated that there were four potential factors: emotional regulation motives (an eigenvalue of 6.95 and 40.9% variance explained), social motives (an eigenvalue of 2.50 and 14.7% variance explained), dependence motives (an eigenvalue of 1.70 and 10.0% variance explained), and alcohol-related motives (an eigenvalue of 1.33 and 7.8% variance explained). The four factor model accounted for 73.5% of the total variance. Table 8 shows the factor loadings for each item in the scale. A CFA was used to confirm the finding of the EFA. The results revealed that this scale structure was a decent fit [χ^2 [(df = 113, n = 870) = 763.67, p < .001; RMSEA = .08, 90% CI = .08 to .09; SRMR =.05]. The R^2 results showed that all the items were contributing well to the model. All 17 items were retained for the final scale. The internal consistency (α) of the four factor subscales were .89 (emotion regulation motive), .84 (alcohol-related motive), .92 (dependence motive), and .87 (social motive).

Table 8
Revised CSMSS Factor Loadings for EFA and Fit Indices for CFA

	Factors			
I continue to smoke because…	Emotional Regulation	Alcohol-Related	Dependence	Social
1. it helps me relax	**.753**	.163	.218	.078
2. it helps me manage my anger	**.719**	.045	.273	.163
3. it helps when I am upset about something	**.847**	.057	.267	.136
4. it helps to relieve stress	**.825**	.112	.214	.111
5. I feel depressed	**.508**	.059	.259	.282
6. it goes well with drinking alcohol	.104	**.871**	.105	.123
7. drinking makes smoking taste better	.129	**.776**	.202	.187
8. smoking improves the buzz I get from drinking	.063	**.648**	.041	.246
9. it is out of habit	.303	.267	**.637**	.167
10. I've tried to quit but was unsuccessful	.281	.099	**.781**	.202
11. I am addicted	.285	.081	**.904**	.147
12. I crave cigarettes	.361	.092	**.789**	.136
13. it helps me meet new people	.144	.190	.144	**.683**
14. it helps me to fit in	.058	.141	.076	**.807**
15. my friends smoke	.007	.178	.099	**.595**
16. it helps me be confident around others	.296	.085	.163	**.728**
17. it helps me be able to talk to others	.229	.101	.135	**.815**

Note. Items with highest loading on each factor are in bold

Profile Model

Latent Profile Analysis (LPA) is a person-centered mixture modeling approach which assumes that groups in a population can be divided into homogeneous typologies, or profiles, based on participants' response patterns to continuous indicators (Feldman et al., 2009; McCutchen, 1987). Profile membership, which is a latent variable, is determined based on covariation between these indicators. Each profile is comprised of participants with similar response probabilities on the continuous indicators. Based on previous research (e.g., Rosa & Aloise-Young, 2015), it was assumed that smokers in the college population could be divided into qualitatively different typologies of smokers (e.g., social smokers) based on their motives for smoking. Therefore, a LPA with the items in the CSMSS was conducted using MPLUS (version 7.3; Muthén, & Muthén, 2012) to determine what type of typologies of smokers are present on college campuses. To avoid a false maximum likelihood solution, the number of random start values for this analysis was set at 500 (100 iterations for each random start).

The first step in the analysis was to run several models with differing numbers of profiles (Muthén & Muthén, 2008). Since LPA is exploratory in nature, a two profile model to a seven profile model were conducted to cover a wide range of possible profiles. Model fit was assessed in comparison to other models using several fit indices (Muthén & Muthén, 2008). Bayes Information Criterion (BIC; Schwartz, 1978), Akaike Information Criterion (AIC; Akaike, 1987), and Sample-Size Adjusted BIC (SABIC; Yang, 2006) statistics were used to compare the model results, where smaller values indicate a better fitting model (McCutchen, 1987; Rose et al., 2007). More weight was placed on BIC and SABIC values as is recommended by Nylund, Asparouhov, and Muthén (2007). In addition, Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT) and Lo-Mendell-Rubin Adjusted LRT Test were also used to assess model fit since these indices are less sensitive to sample size and allow for more specific model comparisons (Lo, Mendell, & Rubin, 2001). A significant result ($p < .05$) indicates that a model with one additional profile is a better fit than a model with one fewer profile. Relative entropy was also compared

between models to assess classification error. Relative entropy is not used to select a model but provides information on the probability of classification error where values closer to one indicate a lower probability of error (Magidson &Vermunt, 2002). Lastly, the current literature was also considered when selecting the final model.

All fit indices for the LPA can be seen in Table 9**.** The results revealed that values for AIC, BIC, and SABIC decreased across all six of the models. However, these values plateaued at around the five and six profile models indicating that either model was possibly a good fit (see elbow plot in Figure 2). Entropy levels were nearly identical across models.

Table 9
Latent Profile Analysis Fit Statistics for CSMSS (n=870)

	2 Profile Model	3 Profile Model	4 Profile Model	5 Profile Model	6 Profile Model	7 Profile Model
Parameters	52	70	88	106	124	142
Loglikelihood	-23099.81	-22157.22	-21776.67	-21284.26	-21062.77	-20875.94
AIC	46303.62	44454.45	43729.54	42780.53	42373.55	42035.88
BIC	46551.59	44788.25	44148.98	43285.99	42964.85	42713.01
SABIC	46386.45	44565.90	43869.51	42949.36	42571.05	42262.05
VLMR LRT	-25057.46*	-23099.81*	-22157.22*	-21776.67*	-21284.26	-21062.77
LMR LRT	3883.43*	1869.82*	754.90*	976.80*	439.36	370.62
Entropy	0.93	0.94	0.92	0.93	0.92	0.91

Note. BIC=Bayesian information criteria; AIC= Akaike information criterion; SABIC=Sample-Size Adjusted BIC; VLMR LRT= Voung-Lo-Mendell-Rubin Likelihood Ratio Test; LMR LRT= Lo-Mendell-Rubin Adjusted Likelihood Ratio Test; *p<.05

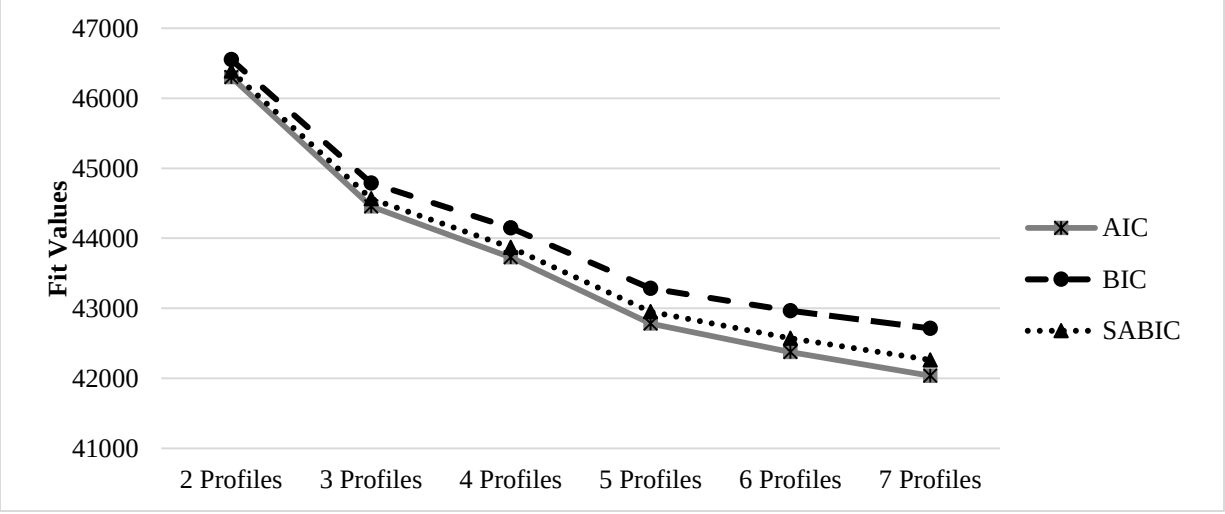

*Figure 2.***Elbow Plot of the Information Criteria for the Latent Profile Analysis**

In addition to the elbow plot, the VLMR-LRT and LMR LRT results revealed that the five profile model fit significantly better than the four profile model ($p<.05$), but the six profile model did not fit significantly better than the five profile model ($p = .17$). This indicated that the five profile model was a good fit for the data. Classifications of posterior probabilities were high (closer to 1 is better) for all the profiles which showed that the profiles were relatively distinct from one another (see Table 10).

Table 10
Classification Posterior Probabilities for the 5-profile Model

	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
Profile 1	**0.949**	0.013	0.036	0.000	0.002
Profile 2	0.010	**0.976**	0.011	0.000	0.000
Profile 3	0.032	0.014	**0.936**	0.012	0.007
Profile 4	0.000	0.000	0.013	**0.961**	0.026
Profile 5	0.002	0.000	0.012	0.031	**0.954**

Note. Values in bold are the average posterior probability associated with the profile assigned to individuals.

Interpretation of Profiles

The mean scores for each of the CSMSS items across the five profiles are presented in Table 11 and Figure 3. Participants in profile 1, stress/emotional regulation smokers, consisted of 17% (n=145) of the sample and mean scores were higher for emotional regulation items (e.g., *to help relax, when I am upset about something to relieve stress*) but lower for other items in the CSMSS. Participants in profile 2, low endorser smokers consisted of 25% (n=217) of the sample and mean scores were consistently low for almost all items on the scale but were slightly higher for the alcohol-related items (e.g., *because drinking makes smoking taste better, because smoking improves the buzz I get from drinking*). Participants in profile 3, nondependent smokers, consisted of 25% (n=226) of the sample and mean scores were moderate across all items except for addiction or dependence-related items (e.g., *because I am addicted, because I crave cigarettes*) which were low. Participants in profile 4, high endorser smoker, consisted of 14% (n=115) of the sample and mean scores were high for all items of the scale with no distinctive patterns in mean scores. Participants in profile 5, addiction/dependence smokers, consisted of 19%

(*n*=167) of the sample and mean scores were high for the addictions items (e.g., *because I am addicted, because I crave cigarettes*) and stress-related emotional regulation items (e.g., *it helps me relax*). Notably, profile 5 had low scores for all the social items**.**

Table 11

Mean Scores of CSMSS for Final Model of Latent Profile Analysis (n=870)

	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
I continue to smoke because…	Stress/ Emotional Regulation (n=145)	Low Endorser (n=217)	Non-Dependent (n=226)	High Endorser (n=115)	Addiction (n=167)
1. it helps me relax	4.14 (0.06)	1.97 (0.01)	3.46 (0.07)	4.28 (0.07)	4.11 (0.06)
2. it helps me manage my anger	3.04 (0.13)	1.19 (0.03)	2.55 (0.08)	3.75 (0.11)	3.11 (0.11)
3. it helps when I am upset about something	3.82 (0.11)	1.26 (0.04)	3.00 (0.09)	4.15 (0.09)	3.83 (0.08)
4. it helps to relieve stress	4.08 (0.07)	1.59 (0.07)	3.46 (0.08)	4.21 (0.07)	4.06 (0.07)
5. I feel depressed	2.45 (0.12)	1.24 (0.04)	2.54 (0.08)	3.57 (0.13)	2.71 (0.11)
6. it goes well with drinking alcohol	3.10 (0.14)	2.82 (0.11)	3.59 (0.08)	4.11 (0.09)	3.65 (0.10)
7. drinking makes smoking taste better	2.48 (0.13)	2.25 (0.10)	3.32 (0.09)	3.93 (0.12)	3.31 (0.10)
8. smoking improves the buzz I get from drinking	2.17 (0.12)	1.51 (0.07)	2.93 (0.08)	4.05 (0.09)	4.32 (0.07)
9. it is out of habit	2.44 (0.13)	2.37 (0.11)	3.19 (0.08)	3.55 (0.12)	2.61 (0.10)
10. I've tried to quit but was unsuccessful	1.39 (0.06)	1.11 (0.02)	1.99 (0.07)	3.62 (0.11)	3.61 (0.09)
11. I am addicted	1.37 (0.06)	1.07 (0.01)	1.89 (0.09)	4.14 (0.09)	4.25 (0.07)
12. I crave cigarettes	1.69 (0.11)	1.13 (0.03)	2.17 (0.08)	4.04 (0.10)	4.16 (0.07)
13. it helps me meet new people	1.69 (0.10)	1.60 (0.07)	3.18 (0.09)	3.74 (0.11)	2.30 (0.11)
14. it helps me to fit in	1.39 (0.07)	1.56 (0.06)	2.95 (0.08)	3.51 (0.15)	1.68 (0.08)
15. my friends smoke	1.91 (0.10)	2.12 (0.09)	3.27 (0.08)	3.67 (0.12)	2.29 (0.10)
16. it helps me be confident around others	1.53 (0.10)	1.31 (0.05)	2.93 (0.08)	3.80 (0.11)	1.86 (0.11)
17. it helps me be able to talk to others	1.45 (0.08)	1.34 (0.06)	3.02 (0.08)	3.91 (0.13)	1.70 (0.09)

Note: Mean and Standard Deviation *M(SD)* presented for the continuous

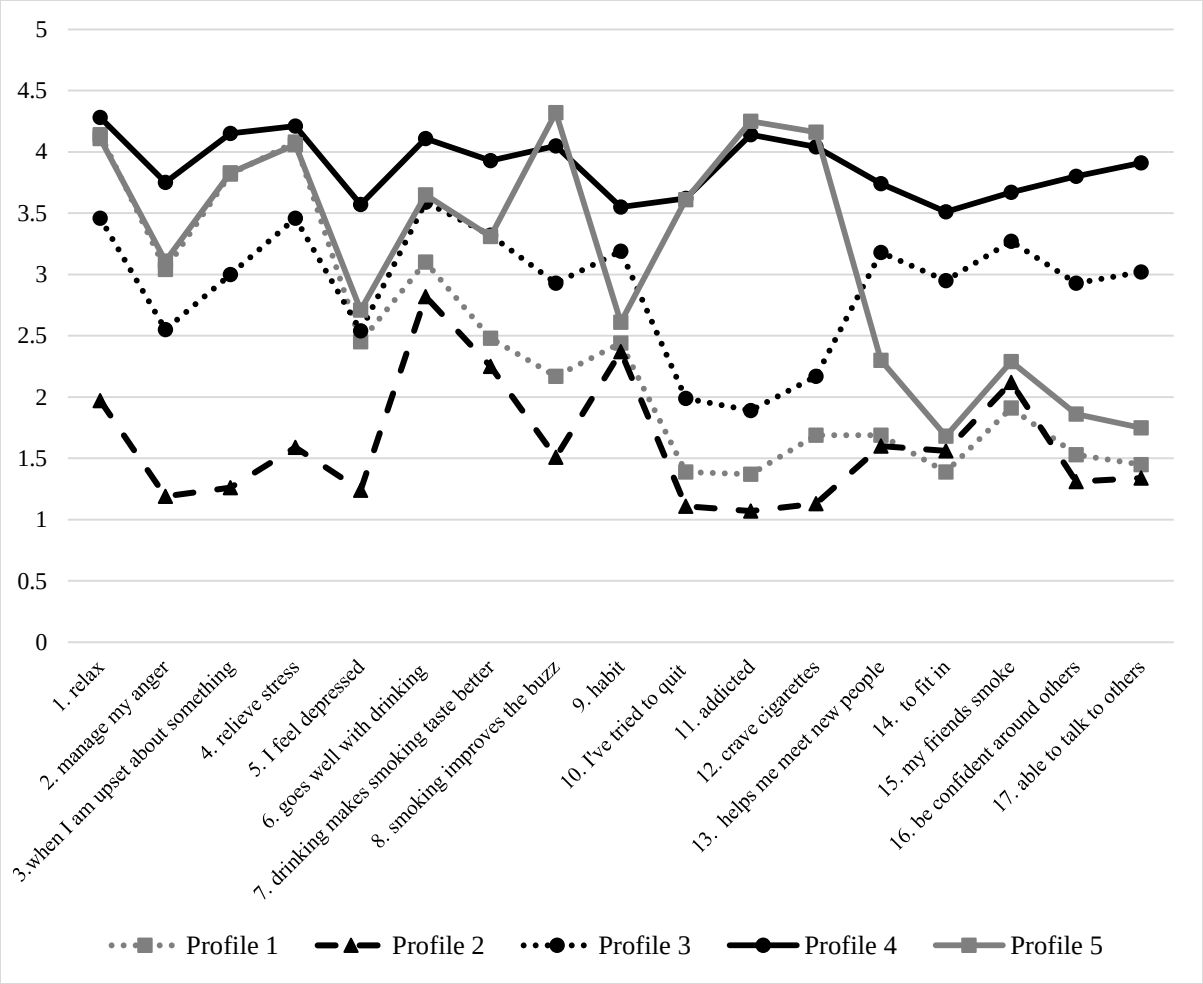

Figure 3. **Item Means from a Six Latent Profile Model of CSMSS**

Latent Profile Model with Predictor Variables

Once the decision was made on the number of profiles to retain in the LPA model, the relationship between the model variables and predictor variables was investigated. Predictor variables included smoking frequency (i.e., days and amount used), smoking environment, purchasing patterns, products used (i.e., hookah/pipe and e-cigarettes), smoking cessation efficacy, and alcohol use patterns (i.e., regular use and heavy episodic drinking). Intercorrelations for all the predictor variables in the LPA can be seen in Table 12.

Table 12

Correlations Between Predictors (n=876)

	1	2	3	4	5	6	7	8	9
1. Days Smoked	1								
2. Amount Used	.527**	1							
3. Purchasing	.607**	.345**	1						
4. Hookah/Pipe	.117**	-.108**	-.127**	1					
5. e-cigarettes	.171**	.079*	.111**	.234**	1				
6. Cessation	.536**	-.381**	-.386**	.095**	-.15**	1			
7. Alcohol Use	.019	.005	-.107**	.111**	.05	.001	1		
8. HED	.025	.046	-.127**	.162**	.09**	-.015	.720**	1	
9. Environment	.593**	.447**	.441**	-.081*	.17**	-.462**	.203**	.175**	1

Note: HED=Heavy Episodic Drinking; *p*= significance level (*$p<.05$; **$p<.001$)

The first step of this analysis was to investigate the unique contribution of each covariate. The predictor variables were individually investigated using multinomial logistic regression (Asparouhov & Muthén, 2014).The inclusion of the predictors in the model did not significantly affect the original LPA model profiles. Table 13 compares the original LPA model with no predictors to the model with individual predictors. Profile 2, low endorser smokers, was used as the comparison group since they were the closest group to social/party smokers which was the comparison group used in the previous Rosa et al. (2014) study. Results showed that alcohol use did not significantly vary across most smoker typologies, but the remaining predictors were better able to differentiate between profiles. Results including the estimates for the intercepts (βo), regression coefficients (β1), and odds ratios are shown on Table 14.

Table 13

Latent Profile Analysis Fit Statistics for models with Predictors

	n	Loglikelihood	AIC	BIC	SABIC
Model without Predictors	876	-21284.26	42780.53	43285.99	42949.36
Frequency: Days Smoked	775	-18769.50	37759.01	38270.82	37921.52
Frequency: Amount Used	784	-19132.10	38484.20	38997.29	38647.98
Purchasing Pattern	826	-20025.25	40270.51	40789.33	40440.01
Product: Hookah/Pipe	842	-20548.72	41317.43	41838.37	41489.05
Products: e-cigarettes	841	-20516.38	41252.75	41773.56	41424.24
Cessation Efficacy	839	-20336.41	40892.82	41413.36	41064.04
Frequency of Alcohol Use	842	-20552.87	41325.74	41846.67	41497.35
HED	800	-19545.58	39311.17	39826.47	39477.16
Environment	838	-20262.97	40745.944	41266.35	40917.03

Note. HED=Heavy Episodic Drinking; *n*=sample size; AIC= Akaike information criterion; BIC=Bayesian information criteria; SABIC=Sample-Size Adjusted BIC

Table 14

Covariates as Individual Predictors of Membership in Profiles

	Stress/ Emotional Regulation	Low Endorser	Nondependent	High Endorser	Addiction
Frequency: Days Smoked					
βo	-1.186**	Ref	-0.690**	-3.179**	-3.719**
Odds	0.305**	Ref	0.502**	0.042**	0.024**
β1	0.174**	Ref	0.162**	0.286**	0.321**
Odds Ratio	1.190**	Ref	1.176**	1.331**	1.379**
Frequency: Amount Used					
βo	-0.851**	Ref	-.606*	-1.928**	-1.415**
Odds	0.427**	Ref	0.546*	0.145**	0.243**
β1	0.206*	Ref	0.238*	0.316**	0.303**
Odds Ratio	1.229*	Ref	1.269*	1.372**	1.354**
Purchasing Pattern					
βo	-2.768**	Ref	-1.628**	-5.275**	-5.708**
Odds	0.063**	Ref	0.196**	0.005**	0.003**
β1	1.120**	Ref	0.809**	1.820**	2.021**
Odds Ratio	3.065**	Ref	2.246**	6.172**	7.546**
Products: Hookah/Pipe					
βo	-0.608*	Ref	-0.122	-0.115	0.455
Odds	0.544*	Ref	0.885	0.891	1.576
β1	0.083	Ref	0.054	-0.281	-0.298**
Odds Ratio	1.087	Ref	1.055	0.755	0.742**
Products: e-cigarettes					
βo	-0.983**	Ref	0.863**	-1.434**	-1.444**
Odds	0.374**	Ref	2.370**	0.238**	0.236**
β1	0.290**	Ref	0.396**	0.378**	0.491**
Odds Ratio	1.336**	Ref	1.486**	1.459**	1.634**
Cessation Efficacy					
βo	1.579	Ref	3.546**	6.213**	6.405**
Odds	4.850	Ref	34.674**	499.197**	604.862*
β1	-0.530*	Ref	-0.986**	-2.117**	-2.077**
Odds Ratio	0.589*	Ref	0.373**	0.120**	0125**
Frequency of Alcohol Use					
βo	0.203	Ref	-0.068	-1.086*	0.022
Odds	1.225	Ref	0.934	0.338*	1.022
β1	-0.182	Ref	0.028	0.146	-0.110
Odds Ratio	0.834	Ref	1.028	1.157	0.896
HED					
βo	0.369	Ref	0.391	-0.797	0.002
Odds	1.446	Ref	1.478	0.451	1.002
β1	-0.265*	Ref	-0.108	0.087	-0.100
Odds Ratio	0.767*	Ref	0.898	1.091	0.905

Environment					
βo	-1.187**	Ref	-2.461**	-6.682**	-5.009**
Odds	0.305**	Ref	0.085**	0.001**	0.007**
β1	0.469*	Ref	1.240**	2.490**	2.067**
Odds Ratio	1.598*	Ref	3.456**	12.061**	7.901**

Note: HED=Heavy Episodic Drinking; *p<.05; **p<.001

The predictor variables were then added together to the model using multinomial logistic regression (Asparouhov & Muthén, 2014). Due to missing data on one or more of the predictors, the sample size was reduced to 707 students which influenced the fit of the model. Logliklihood was lower than the original model at –17034.15. AIC (34352.30), BIC (34999.97), and SABIC (34549.08) were also lower than the original model with no predictors. However, the composition of the classes remained the same. Table 15 shows the means and standard deviations for the predictor variables included in the model for each profile. Table 16 shows the results including the estimates for the intercepts (βo), regression coefficients (β1), and odds ratios.

Table 15

Means and Standard Deviations of Predictor Variables Included in Model (n=707)

	Stress/ Emotional Regulation (*n*=133)	Low Endorser (*n*=155)	Nondependent (*n*=173)	High Endorsers (*n*=104)	Addiction (n=142)
Frequency: Days Smoked	9.88 (9.74)	2.60 (4.01)	8.24 (8.39)	22.34 (9.77)	25.26 (7.92)
Frequency: Amount Used	4.60 (8.24)	2.64 (5.52)	5.41 (8.37)	16.35 (15.31)	12.34 (12.68)
Purchasing Pattern	2.90 (1.07)	1.69 (1.09)	2.52 (1.09)	3.48 (0.93)	3.63 (0.53)
Product: Hookah/Pipe	2.87 (1.33)	2.92 (1.33)	2.87 (1.31)	2.62 (1.36)	2.38 (1.23)
Products: e-cigarettes	2.43 (1.56)	1.92 (1.32)	2.63 (1.49)	2.50 (1.40)	2.84 (1.46)
Cessation Efficacy	3.53 (0.60)	3.75 (0.75)	3.28 (0.83)	2.43 (0.91)	2.47 (0.78)
Frequency of Alcohol Use	2.97 (1.09)	3.47 (0.96)	3.36 (0.94)	3.42 (1.03)	3.14 (1.00)
HED	2.55 (1.04)	3.00 (1.04)	2.75 (0.99)	3.02 (1.11)	2.73 (1.01)
Environment	1.95 (0.68)	1.81 (0.67)	2.48 (0.76)	3.47 (0.93)	3.09 (1.00)

Note: HED=Heavy Episodic Drinking; Mean and Standard Deviation *M(SD)* presented for the continuous

Table 16

Combined Covariates as Predictors of Membership in Profiles (n=707)

	Stress/ Emotional Regulation (*n*=133)	Low Endorser (*n*=155)	Nondependent (*n*=173)	High Endorser (*n*=104)	Addiction (*n*=142)
Overall Model					
βo	-0.209	Ref	-0.383	-2.107	-1.680
Odds	0.811	Ref	0.682	0.122	0.186
Frequency: Days Smoked					
β1	0.220**	Ref	0.158*	0.235**	0.299**
Odds Ratio	1.246**	Ref	1.171*	1.265**	1.349**
Frequency: Amount Used					
β1	-0.077	Ref	-0.061	-0.054	-0.075
Odds Ratio	0.926	Ref	0.941	0.947	0.928
Purchasing Pattern					
β1	0.563**	Ref	0.316*	0.741*	0.949**
Odds Ratio	1.756**	Ref	1.372*	2.098*	2.583**
Products: Hookah/Pipe					
β1	-0.068	Ref	-0.044	-0.093	-0.271*
Odds Ratio	0.934	Ref	0.957	0.911	0.763*
Products: e-cigarettes					
β1	0.153	Ref	0.196*	0.063	0.288*
Odds Ratio	1.165	Ref	1.217*	1.065	1.334*
Cessation Efficacy					
β1	-0.108	Ref	-0.516*	-1.303**	-1.209**
Odds Ratio	0.898	Ref	0.597*	0.272**	0.298**
Frequency of Alcohol Use					
β1	-0.374	Ref	-0.064	-0.458	-0.640*
Odds Ratio	0.688	Ref	0.938	0.633	0.527*
HED					
β1	-0.034	Ref	-0.206	0.220	0.191
Odds Ratio	0.967	Ref	0.814	1.246	1.210
Environment					
β1	-0.229	Ref	0.807**	1.333**	0.789**
Odds Ratio	0.795	Ref	2.241**	3.792**	2.201**

Note: HED=Heavy Episodic Drinking*; *p<.05*

Days and Amount Smoked. The results revealed that days smoked predicted membership in the stress/emotional regulation profile, nondependent profile high endorser profile, and addiction/dependence profile compared to the low endorser profile. The more days smoked in a 30 day period, the higher likelihood of membership in the stress/emotional regulation profile (OR = 1.246, $p<.001$; for every unit increase in the days smoked item, the odds of belonging to the stress/emotional regulation profile

compared to the low endorser profile increase by 24.6%), the nondependent profile (OR = 1.171, $p<.05$; for every unit increase in the days smoked item, the odds of belonging to the nondependent profile compared to the low endorser profile increase by 17.11%), the high endorser profile (OR = 1.265, $p<.001$; for every unit increase in the days smoked item, the odds of belonging to the high endorser profile compared to the low endorser profile increase by 26.49%), and the addiction/dependence profile (OR = 1.349, $p<.001$; for every unit increase in the days smoked item, the odds of belonging to the addiction/dependence profile compared to the low endorser profile increased by 34.9%). Compared to the low endorser profile, amount smoked was not predictive of profile membership.

Purchasing Patterns. Compared to the low endorser profile, purchasing patterns predicted profile membership in the stress/emotional regulation profile, nondependent profile, high endorser profile, and addiction/dependence profile. The more students purchased their own cigarettes, the higher likelihood of membership in the stress/emotional regulation profile (OR= 1.756, $p<.001$; for every unit increase in the purchasing pattern item, the odds of belonging to the stress/emotional regulation profile compared to the low endorser profile increased by 75.59%), the nondependent profile (OR= 1.372, $p<.05$; for every unit increase in the purchasing pattern item, the odds of belonging to the nondependent profile compared to the low endorser profile increased by 37.16%), the high endorser profile (OR= 2.098, $p<.05$; for every unit increase in the purchasing pattern item, the odds of belonging to the high endorser profile was 2.098 times higher compared to the low endorser profile), and the addiction/dependence profile (OR= 2.583, $p<.001$; for every unit increase in the purchasing pattern item, the odds of belonging to the addiction/dependence profile was 2.583 higher compared to the low endorser profile).

Products Used. Compared to the low endorser profile, hookah use predicted profile membership only in the addiction/dependence profile. Higher hookah use decreased the likelihood of membership in the addiction/dependence profile (OR= 0.763, $p<.05$; for every unit increase in the hookah use item, the odds of belonging to the addiction/dependence profile compared to the low endorser profile decreased by 23.73%). E-cigarette use also predicted membership in the nondependent profile and addiction/dependence profile compared to the low endorser profile. Higher use of e-cigarettes increased

the likelihood of membership in the nondependent profile (OR= 1.217, $p<.05$; for every unit increase in the e-cigarette use item, the odds of belonging to the nondependent profile compared to the low endorser profile increased by 21.65%) and the addiction/dependence profile (OR= 1.334, $p<.05$; for every unit increase in the e-cigarette use item, the odds of belonging to the addiction/dependence profile compared to the low endorser profile increased by 33.37%) compared to the low endorser profile.

Cessation Efficacy. Compared to the low endorser profile, cessation efficacy predicted profile membership in the nondependent profile, high endorser profile, and addiction/dependence profile. Higher cessation efficacy decreased the likelihood of membership in the nondependent profile (OR= 0.597, $p<.05$; for every unit increase in the cessation efficacy item, the odds of belonging to the nondependent profile compared to the low endorser profile decreased by 40.30%), the high endorser profile (OR= 0.272, $p<.001$; for every unit increase in the cessation efficacy item, the odds of belonging to the high endorser profile compared to the low endorser profile decreased by 72.82%), and the addiction/dependence profile (OR= 0.298, $p<.001$;for every unit increase in the cessation efficacy item, the odds of belonging to the addiction/dependence profile compared to the low endorser profile decreased by 70.15%).

Alcohol Use and Heavy Episodic Drinking. Compared to the low endorser profile, alcohol use only predicted profile membership in the addiction/dependence profile. Higher alcohol use decreased the likelihood of membership in the addiction/dependence profile (OR= 0.640, $p<.05$; for every unit increase in the alcohol use item, the odds of belonging in the addiction/dependence profile compared to the low endorser profile decreased by 47.27%). Heavy episodic drinking was not predictive of profile membership.

Smoking Environment. Compared to the low endorser profile, smoking environment predicted profile membership in the nondependent profile, high endorser profile, and addiction/dependence profile. The more students indicated they smoked in nonsocial situations, the higher likelihood of membership in the nondependent profile (OR= 2.241, $p<.001$; for every unit increase in the smoking environment scale, the odds of being in the nondependent profile was 2.241 times higher compared to the low endorser profile), the high endorser profile (OR= 3.792, $p<.001$; for every unit increase in the smoking

environment scale, the odds of belonging to the high endorser profile was 3.792 times higher compared to the low endorser profile) and the addiction/dependence profile (OR= 2.201, $p<.001$; for every unit increase in the smoking environment scale, the odds of belonging to the addiction/dependence profile was 2.201 higher compared to the low endorser profile).

Latent Profile Model with Outcome Variables

The next step in the analysis was to investigate the equality of means for the nine outcomes of interest: smoker identity (comparison and smoker category), perceived harm (current use and occasional smoke), smoking secrecy, perceived stigma towards smoking, and attitudes towards smoker image (positive image, negative image, and typical image). A flexible model-based approach proposed by Lanza, Tan, and Bray (2013) was selected for this study over other available approaches for several reasons: 1) it avoids shifts in the latent profiles when adding auxiliary variables, 2) it performs well when entropy is high and when variances across classes/profiles are relatively equal, and 3) this approach outperforms the more traditional classify-analyze techniques such as the maximum-probability assignment and multiple pseudo-class draws (Lanza et al., 2013). This approach assumes that the profiles are latent and the outcome variables of interest are manifest variables and focuses on the distribution of the outcomes given the latent profiles (Lanza et al., 2013). Table 17 shows the mean scores for the outcome variables across each of the five profiles. Table 18 shows the results for the test of mean equality.

Table 17

Means of Outcome Variables Across Profiles

	Stress/ Emotional Regulation	Low Endorser	Nondependent	High Endorser	Addiction
SI Comparison	1.70 (0.06)	1.13 (0.12)	1.75 (0.05)	2.81 (0.04)	2.81 (0.03)
SI Smoker Category	4.53 (0.14)	2.75 (0.10)	3.99 (0.11)	6.03 (0.11)	6.5 (0.06)
PH Current Use	2.15 (0.07)	2.08 (0.06)	2.20 (0.06)	2.62 (0.08)	2.92 (0.07)
PH Occasional Smoke	2.75 (0.06)	2.86 (0.05)	2.78 (0.05)	2.91(0.06)	2.90 (0.05)
Smoking Secrecy	2.22 (0.14)	2.42 (0.12)	2.18 (0.11)	1.55 (0.14)	1.48 (0.11)
Perceived Stigma	2.68 (0.05)	2.48 (0.04)	2.60 (0.04)	2.70 (0.05)	2.75 (0.04)
Positive Image	3.06 (0.04)	2.86 (0.04)	3.11 (0.03)	3.39 (0.05)	3.21(0.04)
Negative Image	3.03 (0.04)	3.15 (0.03)	3.07 (0.03)	3.13 (0.05)	3.03 (0.04)
Typical Image	3.72 (0.04)	3.89 (0.03)	3.63 (0.03)	3.86 (0.04)	3.82 (0.04)

Note: SI: "Smoker Identity," PH: "Perceived Harm." Mean and Standard Deviation *M(SD)* presented for the continuous

Smoker Identity. Similar to the Rosa and Aloise-Young (2015) study, the smoker identity construct consisted of two variables: smoker identity category (*nonsmoker identity*, *inconsistent identity*, and *smoker identity)* and smoker identity comparison (*someone who has tried smoking, party smoker, social smoker, occasional smoker, stress smoker, daily smoker* or *heavy smoker*).

The results showed that the only outcome variable which significantly differed across all profiles was the smoker identity category; the low endorser profile scored the lowest (*M*= 2.75, *SD*=0.10) followed by the nondependent profile (*M*=3.99, *SD*=0.11), stress/emotional regulation profile (*M*=4.53, *SD*=0.14), high endorser profile (*M*=6.03, *SD*=0.11), and addiction/dependence profile (*M*=6.50, *SD*=0.06). Results also showed that compared to all of the profiles, the low endorser profile was categorized by significantly lower scores on smoker identity comparison (*M*=1.13, *SD*=0.02) compared to the stress/emotional regulation profile (*M*=1.70, *SD*=0.06), nondependent profile (*M*=1.75, *SD*=0.05), high endorser profile (*M*=2.81, *SD*=0.04), and addiction/dependence profile (*M*=2.81, *SD*=0.03). The high endorser profile and the addiction/dependence profile did not significantly differ on the smoker identity comparison item.

Perceived Harm. The perceived harm construct consisted of two variables: perceived harm of an occasional smoke and the perceived harm of current use. Results showed that scores on the perceived harm of current use item did not significantly differ between the low endorser profile (*M*=2.08, *SD*=0.06),

the stress/emotional regulation profile (*M*=2.15, *SD*=0.07), and the nondependent profile (*M*=2.20, *SD*=0.06). However, the low endorser profile did score lower on the perceived harm of current use item compared to the addiction/dependence profile (*M*=2.92, *SD*=0.07) and the high endorser profile (*M*=2.62, *SD*=0.08). None of the five profiles were categorized by differences on the perceived harm occasional smoke item. Further investigation of mean scores showed that all smoker profiles perceived little harm of occasionally smoking.

Smoking Secrecy. Compared to the low endorser profile (*M*=2.42, *SD*=0.12), the addiction/dependence profile (*M*=1.48, *SD*=0.11) and high endorser profile (*M*=1.55, *SD*=0.14) were categorized by significantly lower scores on smoking secrecy. Results also showed that scores on the smoking secrecy item did not significantly differ between the low endorser profile, the stress/emotional regulation profile (*M*=2.12, *SD*=0.14), and the nondependent profile (*M*=2.18, *SD*=0.11).

Perceived Stigma. Results showed that the low endorser profile was categorized by significantly lower scores on perceived stigma (*M*=2.48, *SD*=0.04) compared to the stress/emotional regulation profile (*M*=2.68, *SD*=0.05), the nondependent profile (*M*=2.60, *SD*=0.04), the addiction/dependence profile (*M*=2.75, *SD*=0.04), and the high endorser profile (*M*=2.70, *SD*=0.05). The stress/emotional regulation profile did not significantly differ from any other profiles except for the low endorser profile.

Smoker Image. The smoker image construct was measured by three variables: positive smoker image, negative smoker image, and typical smoker image. Results showed the low endorser profile was categorized by a significantly lower positive smoker image score (*M*=2.86, *SD*=0.04) compared to the stress/emotional regulation profile (*M*=3.06, *SD*=0.04), the nondependent profiles (*M*=3.11, *SD*=0.03), the addiction/dependence profile (*M*=3.21, *SD*=0.04), and the high endorser profile (*M*=3.39, *SD*=0.05). However, the low endorser smoker (*M*=3.15, *SD*=0.03) only significantly differed from the stress/emotional regulation profile (*M*=3.03, *SD*=0.04) and the addiction/dependence profile (*M*=3.03, *SD*=0.04) in regard to negative smoker image. Further investigation of mean scores showed that almost all of the profiles had a similar negative smoker image. In addition, results showed that the low endorser profile was categorized by a significantly higher typical smoker image score (*M*=3.89, *SD*=0.03)

compared to the stress/emotional regulation profile (*M*=3.72, *SD*=0.04), and the nondependent profile (*M*=3.63, *SD*=0.03). Interestingly, the low endorser profile had a similarly high score on the typical smoker image scale compared to the addiction/dependence profile (*M*=3.82, *SD*=0.04) and high endorser profile (*M*=3.86, *SD*=0.04).

Table 18

Results from Tests of Mean Equality

	Global $\chi 2$	LE vs. ER	LE vs. ND	LE vs. Dep	LE vs. High	ER vs. ND	ER vs. Dep	ER vs. High	ND vs. Dep	ND vs. High	Dep vs. High
Smoker identity-comparison	1945.72**	64.73**	101.86**	1381.53**	1139.69**	0.29	214.02**	199.97**	254.65**	233.03**	0.005
Smoker identity-category	1066.79**	98.85**	59.73**	873.48**	419.49**	8.46*	155.43**	65.08**	338.71**	147.81**	12.01**
Perceived harm-regular smoke	107.31**	0.44	1.82	80.65**	26.18**	0.29	56.34**	17.35**	59.33**	16.04**	7.07*
Perceived harm-occasional smoke	6.14	1.98	1.23	0.31	0.41	0.17	3.37	3.30	2.52	2.49	0.01
Smoking secrecy	46.00**	1.09	2.02	30.53**	21.73**	0.05	15.63**	10.99**	17.63**	11.77**	0.13
Perceived stigma	22.08**	9.83*	4.43*	17.53**	9.68*	1.62	0.77	0.02	5.19*	1.88	0.43
Positive Image	68.16**	10.14**	20.85**	32.58**	58.87**	0.90	5.39*	21.07**	2.53	16.86**	6.49*
Negative Image	7.51	4.46*	2.58	4.53*	0.10	0.47	0.001	2.36	0.45	1.05	2.35
Typical Image	33.71**	9.80*	27.04**	1.49	0.29	2.31	3.30	4.94*	12.71**	14.82**	0.29

Note. *p < .05; **p ≤ .001; ER: “Emotional Regulation,” LE: “Low Endorser,” ND: “Nondependent, " High: "High Endorser," Dep: "Addiction/Dependent"

Chapter 7: Discussion

Although research on college student smokers has been somewhat limited (Costa et al., 2007; Wells & Canty- Mitchel, 2012), existing studies have found that smoking patterns and smoking-related attitudes of college student smokers can vary substantially (e.g., Berg et al., 2010; Oksuz et al., 2007). Due to the varied nature of college student smoking patterns, a few studies have determined that there may be different typologies of college student smokers present on college campuses beyond the daily and nondaily smoker distinctions (e.g., Rosa & Aloise-Young, 2015; Rosa et al., 2014). Understanding these different types of college student smokers is essential so that targeted interventions can be developed specifically for each typology. If these smokers are successfully targeted and cessation occurs before college graduation, or even before the age of 30, the odds of these smokers developing a smoking-related illness decreases dramatically (CDC, 2005).

To better understand college student smoker typologies, the three aims of the current study included: (1) to use the CSMSS created for college student smokers to identify different subtypes of daily and nondaily student smokers present across different campuses, (2) to investigate whether smoking variables such as smoking frequency, smoking environments, cigarette purchasing habits, products used, quitting likelihood, and alcohol use patterns predict typologies of college student smokers, and (3) to investigate whether subgroups of college student smokers differ on attitudinal variables such as health-related attitudes, smoker identity, smoking secrecy, smoker image, and perceived feelings of stigma.

Prevalence of Nondaily and Daily Smokers on Campus

In general, the results of this study confirmed the findings from previous research indicating that a large proportion of college student smokers are nondaily smokers (Berg et al., 2012; Caldeira et al., 2012; Foldes et al., 2010; Rigotti et al., 2000; Nichter et al., 2010). Over 70% of the students who participated in the current study self-identified as nondaily smokers: 22.6% party smokers, 13.9% experimenters 13.5% occasional smokers, 12.8% social smokers, and 10.9% stress smokers. Although these students are not smoking on a daily basis, research has shown that this may be a transitional period

where nondaily smoking can quickly progress to daily smoking (Chassin et al., 2000; Choi et al., 2003; Thompson et al., 2007); therefore, researchers as well as practitioners should still pay close attention to these types of smokers.

Motives for Smoking

Given that different types of smoker typologies may be present in the college population (Brown et al., 2011; Rosa et al., 2014), the question that remains is how best to identify these typologies. Rosa and Aloise-Young (2015) conducted a qualitative study which found that smoker typologies varied regarding their frequency of use and products used, but the most pronounced differences were in students' motives for smoking. To better understand smoking behaviors, it is important to understand individuals' motives for participating in that behavior (Lantz, 2003; Nichter et al., 2010; Shiffman et al., 2012).

In the current study, motives for smoking, as measured by the CSMSS, were used as a way to differentiate smoker typologies across college campuses. It was hypothesized that four typologies of both nondaily and daily smokers would emerge: addiction/dependence smoker, social smoker, stress/regulation smoker, and experimenters/nonendorsers. The results of the current study somewhat confirmed the original that several typologies of nondaily and daily smokers are present on college campuses. These typologies included low endorser smokers (similar to experimenters/nonendorsers/social smokers) which made up 25% of the sample, nondependent smokers (similar to experimenters/nonendorsers) which made up 25% of the sample, stress/emotional regulation smokers which made up 17% of the sample, high endorser smokers (14% of sample), and addiction/dependence smokers which made up 18% of the sample. Three out of the five subgroups, which made up over 67% of the sample, could be categorized as nondaily smokers based on their motives for smoking and smoking patterns: low endorser smokers, stress/emotional regulation smokers, and nondependent smokers. This supports previous findings that there are multiple types of nondaily smokers on campus (e.g., Moran et al., 2004; Stormberg et al., 2007; Waters et al., 2006). The remaining two categories, high endorser and addiction/dependence smokers could be categorized as daily smokers based on their smoking motives and patterns.

Smoking-Related Variables

Previous studies have found that smoker typologies can be predictive of dependence, smoking outcome expectancies, and smoking escalation (Hertel & Mermelstein, 2012; Rosa et al., 2014). The current study also hypothesized that nondaily smokers would differ from daily smokers in that they will most likely smoke less, smoke in more social environments, get their cigarettes from others, smoke with a hookah at higher rates, have higher cessation efficacy, and drink alcohol at a higher rate. It was unclear the differences that will emerge within the nondaily and daily smoker categories. The results somewhat confirmed this hypothesis; frequency of smoking (days smoked in the last 30 days), purchasing patterns, and environment smoking occurs were all predictive of membership in the three nondaily smoker typologies. These constructs as well as cessation efficacy also differentiated membership between nondaily smoker typologies and daily smoker typologies. Similar to the Rosa et al (2013) study, frequency of alcohol use and heavy episodic drinking did not vary across typologies. Surprisingly, number of cigarettes smoked in the last 30 days was also not predictive of these typologies. Research has shown that college student smoking patterns can be sporadic with various increases and decreases in amount of cigarettes smoked during the month (Colder et al., 2008). It is possible that the item used to measure smoking frequency did not capture the differences in smoking amount whereas the number of days smoked did capture a difference. In addition, there has been an increase in college student use of alternative tobacco products such as hookahs, pipes, and e-cigarettes; up to 52% of college student smokers report using these alternatives (Backenger et al., 2008; Enofe, Berg, & Nehl, 2014; Rigotti et al., 2000). Some students even reported only smoking using a hookah or pipe (Rosa & Aloise-Young, 2015). The frequency question in the current study was specific to cigarette smoking and did not specifically capture the frequency of use of other alternative products.

Smoking-Related Attitudes

Research has also indicated that college student smokers vary in their smoking-related attitudes and typically have discrepancies between their attitudes and their actual smoking behaviors (Choi et al., 2009). In the current study, it was hypothesized that nondaily and daily smokers would differ on their

harm perception, smoker identity, and perceived stigma. The results somewhat supported the original hypotheses that nondaily smokers and daily smokers differed in their smoking-related attitudes. The nondaily smoker typologies differed from the daily smoker typologies on smoker identity, perceived stigma towards use, smoker image, secrecy of use, and perceived harm of current use.

Discrepancies between students' smoking behavior and smoker identity were present in the nondaily smoker typologies. The majority of daily smokers identified as smokers while a large majority of the nondaily smokers identified as a nonsmoker or only as a smoker when compared to their nonsmoking peers. More specifically, low endorser smokers typically identified as a nonsmoker while the other two nondaily smoker typologies were more likely to identify as a nonsmoker or as a smoker based on the comparison group presented. This supports previous research, which indicates that many nondaily college student smokers identify as nonsmokers despite the fact that they smoke (Berg et al., 2009; Choi et al., 2009; Schane et al., 2009; Seigers & Terry, 2011).

College student smokers may be deterred from identifying as a smoker due to the stigma and the social sanctions associated with smoking (Bayer & Colgrove, 2002; Kim & Shanahan, 2003; Stuber et al., 2009). According to the Social Identity Theory and Self-Categorization Theory (Tajfel & Turner, 1986), the stigma and social sanctions associated with smoking puts those who identify as a smoker in a lower status group. This may lead to many smokers identifying as nonsmokers because membership in the low status group may pose a threat to their self-esteem. Students may also be developing their smoker identity based on their smoking behaviors and the context in which their smoking behaviors occur. Many nondaily smokers may not embrace a smoker identity because their smoking pattern is seen as atypical and context specific, therefore not part of their social identity (Brown et al., 2011; Nichter et al., 2010; Rosa & Aloise-Young, 2015; Waters et al., 2006) and more acceptable (Moran et al., 2004; Thompson et al., 2007; Waters et al., 2006; Wetter et al., 2006).

The current study also confirmed that not all smokers feel stigmatized and that social identity may play a role in these perceptions. Student who identified as a nonsmoker or as a nondaily smoker indicated that they did not feel as stigmatized due to their smoking behaviors compared to their daily

smoking peers (similar to previous findings from Dillard et al., 2013; Nichter et al., 2010). Denying a smoker identity may protect students from perceived stigma. Similarly, keeping their smoking behaviors a secret could also reduce perceived stigma. Unfortunately, denying a smoker identity and keeping smoking behaviors a secret decrease the chances that these smokers will be targeted for cessation interventions (Kontz et al., 2004).

As expected, perceived harm of occasional use was similar across all typologies of smokers in the current study (similar to findings from Dedevec & Diamond, 2012; Seigers & Terry, 2011). Nondaily smokers were also more likely to report that their current use was not harmful (similar to findings from Berg et al., 2009; Kenford et al., 2005; Levinson et al., 2007; Moran et al., 2004; Song et al., 2011; Thompson et al., 2007). Research has shown that nondaily smokers see their low rate smoking as healthier than other smoking behaviors which will protect them from future negative health outcomes (Dedevec & Diamond, 2012). This low perceived susceptibility is problematic since studies have shown that lower rate smoking is also associated with negative health outcomes (e.g., An et al., 2009; CDC, 2012; US Surgeon General, 2004). According to the Health Belief Model (Rosenstock, 1974), individuals who do not perceive themselves to be susceptible are more likely to continue the behavior which increases their risk of having future health related outcomes.

Detailed Description of Typologies

Overall, the current study showed that college student smoker typologies differ on motivations, behaviors, and attitudes lending evidence to support that unique interventions are necessary to promote cessation for these different subtypes of smokers (Hertel & Mermelstein, 2012). To be able to better develop unique interventions, a detailed understanding of each smoker typology is needed.

Low Endorser Smokers. Low endorser smokers (referred to as non-endorsing smokers in the Rosa et al., 2014 study) consisted of individuals who had low mean scores on all the motives for smoking items. However, when comparing across items, the low endorser smokers did score slightly higher on several alcohol-related items (e.g., it goes well with alcohol, drinking makes smoking taste better), one social smoking-related item (e.g., because my friends smoke), and one habit item (e.g., it is out of habit).

Previous studies have confirmed that many nondaily smokers smoke due to social motives (e.g., Brown et al., 2011; Haight et al., 2012; Piasecki et al., 2007; Shiffman et al., 2012), and drinking motives (e.g., Rosa & Aloise-Young, 2015). Based on their motives for smoking, it is possible that these smokers belong to the social smoker typology. Social smokers have typically been defined as students who smoke due to friends or because others are smoking (Gilpin et al., 2005; Hines et al., 1996; Rosa & Aloise-Young, 2015) and smoke to help improve social interactions (Choi et al., 2010, Lantz, 2003; McKee et al., 2004; Moran et al., 2004). It is also possible these smokers may fall into the party smoker typology since alcohol use is also socially based in the college environment and helps facilitate social interactions (Jackson et al., 2010; Nichter et al., 2010; Rosa & Aloise-Young, 2015). Solely based on the motives present in the CSMSS, it is unclear if these smokers could fall under either smoker typology of if they are two different typologies.

When investigating whether low endorser smokers differed in smoking-related attitudes, the results showed that these smokers did not typically identify as a smoker. There is evidence that there is unique group of student smokers, sometimes referred to as deniers or phantom smokers who do not identify as smokers (Berg et al., 2009; Levinson et al., 2007; Schane et al., 2009). These smokers also make up a large percentage of the nondaily student smoker population (Berg et al., 2009; Song et al., 2013). However, when forced to select a smoker typology, low endorser smokers were more likely to identify as an experimenter, a party smoker, or a social smoker. This may indicate that several types of nondaily smokers were captured by the low endorser profile. More research needs to be done to investigate this smoker typology and whether further efforts are needed to further divide these subtypes of smokers.

When investigating smoking patterns, low endorsers smokers reported smoking on less days during the month than any other of the smokers in the study (on average only two to three days a month). These smokers reported bumming cigarettes as a main way of obtaining cigarettes and smoking more in social environments which is typical behavior associated with social smokers (Rosa & Aloise-Young, 2015; Waters et al., 2007). The smoking at low rates reported for this type of smoker may also be more

characteristic of experimental smokers who are just initiating smoking (Hassmiller et al., 2003; Rosa & Aloise-Young, 2015). Although low endorser smokers reported the highest hookah use, the only group whose hookah/pipe use differed from theirs was addiction/dependence smokers. Previous research has indicated that social smokers smoke using a hookah at higher rates than cigarettes (Rosa & Aloise-Young, 2015) which may explain the low rate of cigarette use for these smokers. In addition, low endorser smokers reported the least amount of e-cigarette use compared to other smokers.

Possibly due to their low cigarette use, low endorser smokers were more likely to report a higher confidence in their ability to quit smoking compared to all other smoker typologies with the exception of stress/emotional regulation smokers. This supports previous studies that have shown that nondaily smokers have higher self-efficacy towards quitting compared to daily smokers, (Oksuz et al., 2007). In addition, these smokers reported higher alcohol use compared to addiction/dependence smokers but reported drinking at a similar rate as the additional typologies.

Low endorser smokers also perceived lower stigma towards their smoking patterns. This confirms previous research revealed that many nondaily college student smokers do not feel stigmatized and only see stigma as associated with regular or daily smokers (Nichter et al., 2010). Similarly, low endorser smokers reported a less positive view of smokers and defined a "typical smoker" as a daily smoker. Many college student smokers define a typical smoker as an individual who smokes at least one cigarette on a daily basis, has been smoking for a year or more, purchases their own cigarettes, and is addicted to cigarettes (Berg et al., 2009; Thompson et al., 2007).

Since these smokers do not consider themselves smokers, low endorser smokers also indicated their current smoking pattern was not harmful to their health. Several studies have shown that social smokers and deniers underestimate the health risks associated with their smoking due to their low rates of smoking (e.g., Berg et al., 2009; Dedevec & Diamond, 2012; Kenford et al., 2005; Levinson et al., 2007; Moran et al., 2004; Song et al., 2011; Thompson et al., 2007). In addition, low endorser were more likely to keep their smoking a secret compared to their daily smoking peers. Since these smokers are not internalizing a smoker identity due to their atypical and context specific smoking patterns (Brown et al.,

2011; Nichter et al., 2010; Rosa & Aloise-Young, 2015; Waters et al., 2006) and do not perceive their smoking as harmful (e.g., Berg et al., 2009; Dedevec & Diamond, 2012; Song et al., 2011), they might feel like there is no reason to disclose their smoking to others. It is also possible that these smokers are more likely to keep their smoking a secret to avoid feeling stigmatized and to protect their self-esteem by not acknowledging that they participate in behaviors associated with a low status group.

Social Smokers. One surprising result from the current study was that social smokers did not emerge as a distinct typology like in the previous study (Rosa et al., 2014), but instead was captured in the low endorser typology along with students who are experimenting with smoking (possibly deniers). Some studies have repeatedly shown that these smokers are the most common type of nondaily smoker on college campuses (e.g., Gilpin et al., 2001; Harrison et al., 2008; Levinson et al., 2007; Moran et al., 2004; Waters et al., 2006; Wechsler et al., 1998). However, there is still some debate on whether social smokers are truly different from experimenters, deniers (Levinson et al., 2007), or party smokers (Rosa et al., 2014).

The main limitation of this study might have contributed to why social smokers did not emerge as a distinct typology of smoker; items included in the scale only included motives that emerged in one focus group study at one university (Rose & Aloise-Young, 2015). Additional motives that have been acknowledged as contributing factors to smoking in adult populations were not included (e.g., weight management and appetite suppression; Fidler & West, 2009; Ikard et al., 1969). It is possible that other motives could be included in the scale if additional universities and colleges are sampled for both qualitative and quantitative studies on motives for smoking. For example, a scale was recently developed to measure reasons for nondaily smoking specifically for college students and was validated at six universities (Berg, 2014). The Reasons for Nondaily Smoking Scale (RNS) is very similar to the scale used in the current study, but the scale included additional reasons such as *because I like how cigarettes make me feel when I am using other drugs*, *because I feel awkward being around friends who are smoking without smoking*, *because I like the image that smoking projects about me*, *because I feel rebellious when I'm smoking,* and *because I feel mature when I'm smoking.* Future research should

compare profiles generated from the CSMSS to the profiles generated from other scales such as the RNS to determine whether the additional reasons for smoking generate clearer profiles or additional profiles that were not generate by the CSMSS.

Stress/Emotional Regulation Smokers. Also referred to in the research as tension or relaxation smokers, stress/emotional regulation smokers emerged as a typology of college student smokers in the current study. Similar to results from previous research (e.g., Berlin et al., 2003; Rosa et al., 2014; Stromberg et al., 2007), these smokers reported smoking motives related to stress reduction (e.g., it helps relieve stress), relaxation enhancement (e.g., it helps me relax), and emotional regulation (e.g., it helps when I am upset about something). Notably, these smokers did not score as high on any of the other motives in the CSMSS. The presence of this typology of smokers is not surprising since college is very stressful for many students and research has shown that individuals who are stressed academically are more likely to smoke (Emmons et al., 1998; Patterson et al., 2004).

In addition, the results showed that stress/emotional regulation smokers smoked on fewer days than all the other typologies of smokers except for low endorser smokers (on average, 9 to 10 days a month). It is important to note that stress/emotional regulation smokers have a more sporadic smoking pattern in which they smoke in higher concentration during academic periods of high anxiety (Patterson et al., 2004). Unfortunately, the current study did not capture sporadic use but instead measured use in the last 30 days. Stress/emotional regulation smokers were also more likely to purchase their cigarettes compared to low endorser smokers which supports previous findings from the study conducted by Rosa and Aloise-Young (2015). Similar to low endorser smokers, cessation efficacy for these smokers was also higher compared to their daily smoking peers. In general, nondaily college student smokers are highly motivated to quit smoking (Moran et al., 2004; Wells & Canty- Mitchel, 2012).

Some unexpected results revealed that the stress/emotional regulation smoker typology had very similar smoking patterns to low endorser smokers. For example, smoking environment was similar for both stress/emotional regulation smokers and low endorser smokers in that they were just as likely to endorse smoking in social situations. Research has indicated that some nondaily student smokers smoke

to help enhance self-confidence and to help facilitate social situations (Nichter et al., 2010). Inconsistent with past research, stress/emotional regulation smokers did not endorse the two motives related to social anxiety. This indicates that social situations not only influence social smokers, but also influence stress/emotional regulation smokers. Similar to low endorser smokers, these smokers were also more likely to use a hookah and less likely to use e-cigarettes than high endorser smokers or addiction/dependence smokers. Research on hookah and e-cigarettes smoking by typology of smoker is limited, but the existing research indicates that hookah smoking occurs at a lower rate for stress/emotional regulation smokers (Rosa &Aloise-Young, 2015). Patterns of alcohol use and heavy episodic drinking also did not vary between stress/emotional regulation smokers and low endorser smokers (Schane et al., 2009). Some researchers argue that different types of smokers are drinking at the same rate (Harrison et al., 2008; Nichter et al., 2010; Wetter et al., 2004) which seems to be the case with the current sample. The only differences present between stress/emotional regulation smokers and low endorser smokers, other than their motives for smoking, were days smoked and purchasing patterns. Stress/emotional regulation smokers smoked on more days and were more likely to purchase their own cigarettes. This supports previous research that showed that differences in purchasing patterns and amount used were distinguishing factors between social smokers and stress/emotional regulation smokers (Rosa et al., 2014). This is important since purchasing patterns are related to heavier use and addiction (Berg et al., 2010).

When investigating whether stress/emotional regulation smokers differed in smoking-related attitudes compared to the other typologies, the results showed that these smokers did not typically identify as a smoker or had an inconsistent smoker identity based on the reference group. It is common for nondaily student smokers to identify as a nonsmoker (Berg et al., 2009; Rosa et al., 2014; Song et al., 2013). When asked to select a specific category of smoker, these smokers more often identified themselves as stress or occasional smokers. This indicates that this typology of smoker was accurately identified by the latent profile analysis.

In regard to attitudes towards smoking and smokers, stress/emotional regulation smokers also had a higher positive smoker image and a lower negative smoker image than low endorser smokers. These smokers also had a more fluid definition of a "typical smoker" compared to low endorser smokers although they were still more likely to identify as a nonsmoker. This is in contrast to previous research findings that showed that many nondaily college student smokers consider themselves to be nonsmokers because their smoking pattern is perceived to be acceptable and not like the behaviors of a "typical smoker" (Moran et al., 2004; Thompson et al., 2007; Waters et al., 2006; Wetter et al., 2006). However, nondaily smokers typically describe smoking while drinking or smoking occasionally as not "real" smoking (Brown et al., 2011; Nichter et al., 2010), and it is possible that stress/emotional regulation smokers also see smoking in stressful situations as not "real" smoking.

Stress/emotional regulation smokers also reported a less positive view of smokers compared to the daily smokers and higher perceived stigma towards their smoking than low endorser smokers. However, their attitudes did not differ from nondependent smokers and the daily smokers. As smoking patterns increase, smokers move closer to fitting into a typical smoker identity which can also lead to higher perceived stigma (Nichter et al., 2010). Although it is possible that stress/emotional regulation smokers perceive their behavior as atypical, therefore identifying as a nonsmoker, the context in which they smoke may be perceived by their peers as similar to a typical smoker. For example, these smokers are more likely to buy their own cigarettes compared to social smokers (Rosa & Aloise Young, 2015). This behavior may be seen as less acceptable and more stigmatized.

Similar to the low endorser smoker, stress/emotional regulation smokers reported that they also kept their smoking a secret for possibly the same reasons as low endorser smokers. In addition, stress/emotional regulation smokers did not see their current cigarette use or occasional cigarette use as harmful to their health. This continues to confirm research which indicates that nondaily smokers underestimate the health risks associated with their smoking (e.g., Berg et al., 2009). Unfortunately, keeping their smoking a secret and identifying as a nonsmoker makes it less likely that these smokers will be targeted for interventions that can help prevent further smoking progression (Kontz et al., 2004).

Nondependent Smokers. An unexpected profile of smokers that emerged in the model was nondependent smokers who moderately endorsed all the motives for smoking except for addiction-related motives (e.g., I am addicted; I crave cigarettes; I've tried to quit but was unsuccessful) and depression or anger management motives (e.g., I feel depressed). Nondaily smokers are unlikely to be addicted and have lower rates of dependence and addiction than other smokers (Moran et al., 2004; Wetter et al., 2006). It has previously been assumed that most college nondaily smokers were social smokers. There have been some studies that showed that there may be additional subtypes of nondaily smokers other than social smokers. For example, Berg et al. (2012) found three types of nondaily smokers on college campuses, one of which did not fit the denier and social smoker typology. Another study also found that there were other types of nondaily smokers present on college campus who smoked during the day without the social component being a factor (Shiffman et al., 2009).

In regard to use, these smokers smoked about eight to nine days per month which is higher than their low endorser peers. Nondaily smokers do not have homogenous smoking patterns. One study found that there were some nondaily college student smokers who smoked one to five days out of the month while other nondaily college student smokers could smoke up to between 26 and 29 days out of the month (Berg et al., 2012). It is possible that the students who typically smoke on the higher end of the spectrum may be transitioning into daily smoking. The nondependent smokers in the current study were smoking at lower levels indicating that transitioning may not yet be occurring.

What distinguishes these smokers from low endorser smokers was that they were more likely to purchase their own cigarettes, were less likely to smoke in social environments, and were more likely to smoke using an e-cigarette. Based on their responses, it is clear that nondependent smokers are not considered social smokers or party smokers. These smokers may have an established pattern of smoking and are not in the process of initiating or quitting as has been found in several studies (e.g., Caldeira et al., 2012; Hassmiller et al., 2003; Hines et al., 1996; Moran et al., 2004; Stormberg et al., 2007; Sutfin et al., 2009).

This study also showed that nondependent smokers did not typically identify as a smoker compared to daily smokers or reported having an inconsistent smoker identity based on their comparison group. An inconsistent smoker identity refers to students who identify as smokers compared to their nonsmoking college student peers, but also identify as nonsmokers compared to their college smoking peers. The results show how important social comparison is in the development and acceptance of a social identity (Tajfel & Turner, 1986). Nondaily smokers, like these nondependent smokers, do not typically see themselves as their typical smoking peers (Moran et al., 2004; Thompson et al., 2007; Waters et al., 2006; Wetter et al., 2006). However, when changing their reference of comparison to nonsmoking college students, these smokers acknowledge that they are not similar to that group of students. When asked to select a smoker typology, these smokers were more likely to identify as occasional smokers.

Similar to stress/emotional regulation smokers, nondependent smokers also reported higher perceived stigma towards their smoking patterns, a positive smoker image, and a more fluid definition of a "typical smoker" compared to low endorser smokers. As mentioned above, as their smoking patterns increase and as they exhibit more typical smoker behaviors such as smoking in isolation, these smokers move closer to fitting a typical smoker identity, therefore perceiving more stigma towards their behavior. Similar to both low endorser smokers and stress/emotional regulation smokers, nondependent smokers did not see their current cigarette use or occasional cigarette use as harmful to their health and kept their smoking a secret from a similar amount of people. This again supports the notion that nondaily smokers underestimate the health risks associated with their smoking (Berg et al., 2009) which would also make it difficult to target these smokers for intervention services (Kontz et al., 2004).

High Endorser Smokers. Previous research has shown that daily smokers are likely to endorse several motives for smoking (Berg et al., 2012; Haight et al., 2012; Rosa et al., 2014) which was the case with high endorser smokers. These smokers also endorsed smoking due to addiction, which is an important characteristic of daily smokers (Businelle et al., 2009). What distinguishes daily smoker from their nondaily smoking peers is that they smoke more often and on more on 0a daily basis (Berg et al., 2010; Oksuz et al., 2007) which was also the case in the current study. Compared to low endorser

smokers, these smokers were likely to smoke on more days (on average 22 days). Similar to nondaily smokers, Sutfin et al. (2009) and Rose et al. (2007) found that daily smokers range in frequency of use which can lead to sub-categorizations such as light, moderate, and heavy smokers (Rosa & Aloise-Young, 2015). Based on the smoking frequency reported by high endorsing smokers in the current study, these smokers would most likely be considered light or moderate daily smokers. As is typical of daily smokers, high endorser smokers were more likely to buy their own cigarettes, were less likely to smoke in social environments, and were less likely to report high cessation efficacy than their low endorser peers. This supports previous findings that daily smokers have lower self-efficacy towards quitting compared to nondaily smokers (Oksuz et al., 2007). However, e-cigarette use, hookah use, and alcohol use were similar between high endorser and low endorser smokers.

Compared to the nondaily smokers in this study, high endorser smokers more often identified as a smoker and specifically as a daily smoker. This indicates that these smokers developed their social identity based on their smoking behaviors and the context in which their smoking is occurring (Tajfel & Turner, 1986). Due to their smoker identity, these smoker also did not keep their smoking a secret from as many people and had a more positive image of smokers that the nondaily smoker typologies. Interestingly, high endorser smokers had a similar rigid view of the "typical smoker" as low endorser smokers. High endorser smokers also indicated that their current use was more harmful to their health compared to all other smokers except for the addiction/dependence smokers. This supports previous research that has indicated that daily smokers are aware of smoking-related health consequences associated with smoking (Levinson et al., 2007).

Addiction/Dependence Smokers. Research has indicated that daily smokers typically smoke due to addiction, tolerance, craving, automaticity, and loss of control (Shiffman et al., 2012). This is evident with the addiction/dependence smoker typology that emerged in the current study (also seen in Ikard et al, 1969). Similar to high endorser smokers, these smokers endorse several reasons for smoking (Oksuz et al., 2007; Rose et al., 2007), but unlike high endorser smokers, addiction/dependence smokers reported smoking for all motives on the CSMSS except for social motives (e.g., it helps me fit in, it helps me be

confident around others, it helps me be able to talk to others). Similarly, these smokers were less likely to smoke in social environments and to drink alcohol. Based on their motives for smoking and the context in which their smoking occurs, addiction/dependence smokers may fall more under the "typical" smoker definition of college students (Thompson et al., 2007).

Similar to the high endorser smokers, addiction/dependence smokers smoked on more days (on average 25 days) than low endorser smokers and were more likely to purchase their own cigarettes. Based on the smoking frequency reported by addiction/dependence smokers in the current study, these smokers would most likely be considered moderate to heavy smokers (Rosa & Aloise-Young, 2015). These smokers were also more likely to smoke using e-cigarettes than low endorser smokers. Recent studies have shown that many smokers start using e-cigarettes as a tool to quit smoking or to reduce their cigarette consumption (e.g., Etter, 2010). Smokers also use e-cigarettes as a way to continue their use in a more socially acceptable way (Etter, 2010). However, although hookah smoking is also seen as a more socially acceptable way to smoke, addiction/dependence smokers were less likely to smoke using hookah. This supports previous findings that daily smokers are less likely to smoke using a hookah compared to nondaily smokers (Smith-Simone, Maziak, Ward, & Eissenberg, 2008). It is important to note that hookah use across college smoker groups has been increasing and that preferences for smoking may be changing (Smith-Simone et al., 2008).

Addiction/dependence smokers more often identified as a smoker which indicates that these students developed their social identity based on their smoking behaviors (Tajfel & Turner, 1986). These smokers also identified closer to daily or heavy smokers. Identifying higher on the smoker continuum item was one of the differences between these smokers and high endorser smokers. Some other differences between these two daily smoker typologies were that addiction/dependence smokers had a less positive smoker image and they perceived their personal smoking patterns as more harmful. According to the Health Belief Model (Rosenstock, 1974), individuals who perceive themselves to be susceptible to an illness are more likely to change their behavior. However, these smokers did report having less confidence in their ability to quit smoking compared to all other smokers.

Strengths, Limitations, and Future Directions

One strength of this study was that over 240 campuses across the U.S. were represented in this sample. The diverse number of schools allows for a somewhat more representative sample of college student smokers compared to the previous study conducted by Rosa et al. (2014). However, although the sample included more schools, not all schools were equally represented. Some schools only had one or two student responses while other schools were overrepresented with up to 150 students in the sample. Unfortunately, this was due to the various methods of recruitment. Ideally, the study would have been conducted with a handful of schools who agreed to invite students to participate. Although this was the original plan, not many schools showed interest in helping with the study during the 2 years of active recruitment primarily due to lack of funding to compensate students. Due to a limited sample size, other methods such as Facebook and MTURK were used to collect data from the needed participants.

Facebook has been used successfully in many studies as a tool to effectively recruit young adults. However, research now shows that participants who are recruited via Facebook tend to be non-Hispanic Caucasian individuals who are more likely to live in urban settings (Duggan & Smith, 2013) which was also true in the current study. Facebook also restricts the recruitment message to 50 characters with no images which may have decreased the effectiveness of the original recruitment message used to announce the study at other schools. Lastly, Facebook requires additional funding to maintain the campaign overtime. The current study did not have enough funding to maintain the study long enough to recruit more participants from Facebook.

MTURK has also been used successfully to recruit participants in many behavioral sciences studies. One study found that MTURK is a great tool to use to recruit demographically diverse populations and is as accurate as data obtained in more traditional settings (Buhrmester, Kwang, & Gosling, 2011). However, the same study reported that MTURK does not traditionally host college student populations which was the main recruitment target for this study. Although many safeguards were in place, it does not guarantee that the participants recruited from MTURK were college students at the time of the study.

The quality of the data collected from MTURK may also not have been as good as the quality of data collected in other ways. Buhremester et al. (2011) found that as the length of the survey increases, the response rate decreases. Although each participant was offered $1 to participate in our 20 minute survey, many responses were returned with a substantial amount of missing data. Participants who completed less than 50% of the survey were excluded from the sample. Another issue with using MTURK was the possibility of inattentive participants. One study found that up to 30% of a sample collected using MTURK included participants who were not closely paying attention to the survey (McGonagle, 2015). Based on response timing of four research assistants, participants who responded in less than 10 minutes were excluded from the sample. There was also evidence of some similar responses to reverse-scored items or inconsistent responses to similar items asked in different ways. However, there were not enough of these items programmed into the survey to be an effective tool at screening participants. It is possible the inconsistent responses were due to misreading a question and not inattention, but there was no clear way to determine the difference. In the future, adding a scale or items specific to measuring inattention should be included in studies using online surveys.

Since college student smoking patterns are sporadic (Colder et al., 2008) and continuously changing (Choi et al., 2003; Chassin et al., 2000), a onetime snapshot of cigarette use may not be sufficient to capture actual use patterns of college student smokers. Researchers have called for additional investigations of motives for smoking in the college student population so that cessation programs can target specific motivations (Boudrez & Dacquer, 2012; Fidler & West, 2009). This is especially important since smoking motives have also been linked to cessation attempts and success in cessation (Berg et al., 2012; Fidler & West, 2009). In addition, college student smokers are highly motivated to quit smoking (Moran et al., 2004; Wells & Canty- Mitchel, 2012) and generally have plans for cessation before graduation (Brown et al., 2011; Hines et al., 1996) which makes this population a good target for customized cessation services.

Future studies should also consider following students over the four or five years that they are enrolled at a college or university. By following students longitudinally, researchers can get a more

accurate picture of college student smoking patterns as well as be better able to understand whether the sporadic nature of their smoking is due to being in transition (from nonsmoker to smoker and from smoker to former smoker) or if there is a stable pattern of nondaily smoking (Hines et al., 1996). It is important to better understand this developmental period since this is the time where life-long smoking habits may continue into adulthood (Patterson et al., 2004).

Lastly, there has been an increase in college student use of alternative tobacco products such as hookahs, pipes, and e-cigarettes (Backenger et al., 2008; Enofe, Berg, & Nehl, 2014; Rigotti et al., 2000). The current study and previous studies (e.g., Rosa & Aloise-Young, 2015) have found that some smokers primarily smoked using a hookah or e-cigarettes instead of traditional combustible cigarettes. Future research should focus on alternative tobacco product use and how it influences attitudes such as perceived stigma, smoker image, health perceptions, and especially smoker identity. It is possible that use of nontraditional tobacco products may change the definition for students of what it means to be a smoker.

Conclusion and Implications

In general, the current study found that motives for smoking can be used to differentiate between daily and nondaily smokers. For example, it is possible that the social motive subscale and the alcohol-related motive subscale are more likely to be highly endorsed by nondaily smokers while the dependence subscale and the emotion regulation subscale might be highly endorsed by daily smokers (Piasecki et al., 2007). Although the scale was able to differentiate between these two general typologies of smokers, it did not provide a useful distinction within the nondaily smoker typology. It is commonly acknowledged in the literature that social smokers are present in the college population (e.g., Harrison et al., 2008; Levinson et al., 2007; Moran et al., 2004; Waters et al., 2006), but social smokers did not emerge as a distinct typology of smoker in the current study. Instead, social smokers were captured in the low endorser typology.

In general, the CSMSS could continue to be used to better understand college student smoking motives, but due to its inability to consistently distinguish between nondaily smokers in the current study and the length of the scale, the scale is not recommended for use in clinical or applied settings as was the

original intent. To be able to better differentiate between nondaily smokers, further work on the scale would be necessary. The current scale only included motives that emerged in one focus group study at one university (Rosa & Aloise-Young, 2015) and should include motives for smoking across several universities in the U.S. Additional motives to consider could include weight management (Fidler & West, 2009; Ikard et al., 1969), to relieve boredom (Fidler & West, 2009), co-use with other drugs (Berg, 2014), social pressure (Schaefer & Haas, 2013; Staten et al., 2007), and development of self-image (Berg, 2014). However, if the purpose of the scale is to be used in a clinical setting to identify student smokers and determine the most effective cessation interventions, adding additional items would not be practical.

It is also possible that a new direction is needed since using motives for smoking may not be the best approach when distinguishing between college student smokers. One interesting finding that emerged from the focus groups conducted by Rosa and Aloise-Young (2015) as well as the current study was that nondaily smokers identified as either a nonsmoker or as a specific type of smoker based on the reference group presented to them. When students were asked to compare themselves and their smoking patterns to other college smokers, nondaily smokers would typically self-categorize as a nonsmoker. However, when asked to compare themselves and their smoking patterns to other college nonsmokers, nondaily smokers were more likely to self-categorize as a specific type of nondaily smoker (e.g., *someone who has tried smoking*, a *party smoker*, a *social smoker*, an *occasional smoker* or a *stress smoker*). This was a unique phenomenon that only occurred with nondaily smokers. Although the idea that nondaily smokers may possess inconsistent smoker identities based on a reference group is supported by SCT (Tajfel & Turner, 1986), it is a fairly new finding that warrants further investigation. Moreover, it is a promising direction for both research and practice because it could potentially categorize smokers with far fewer questions than the smoking motivations strategy originally laid out in this research. The current approach of simply asking students if they are a smoker or a nonsmoker may lead nondaily smokers to compare themselves to other smokers. Using precise smoker identity questions that take both the smoker and nonsmoker reference groups into account may lead more students to accurately self-categorize as a smoker.

To create measurement items that effectively distinguish between nondaily smoker typologies, developing precise definitions for the different typologies of nondaily smokers is important. The SCT also states that individuals may self-categorize based on their behaviors and the context in which their behaviors occur (Tajfel & Turner, 1986). Several studies (e.g., Rosa & Aloise-Young, 2015; Rosa, Aloise-Young, & Henry, 2014) including the current study have shown that motives for smoking, smoking frequency, purchasing patterns, and environment in which smoking occurs may be useful behaviors and context to include in the definition of the typologies presented to students. The future goal of this line of research is to move away from using the CSMSS to distinguish between student typologies and identify a few measurement items for clinicians to use based on these new findings and the principals of SCT.

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Appendix A: Recruitment Materials

Method 1 Recruitment Script

My name is Juliana Rosa. I am a graduate student at Colorado State University (I was referred to you by _____). I am looking for help from different universities to conduct my dissertation project on cigarette smoking behaviors of college students. The goal of my project is to try to get a better sense of the different types of college student smokers who are present across several campuses especially since the changing laws and societal views on smoking may be influencing the type of smokers that are now present on campus. I want to be able to identify these different smokers and provide useful information on their smoking patterns so that they can be effectively targeted for intervention efforts at different campuses.

My project consists of a simple 30 minute online survey targeted at college students who report smoking in the last three months. The survey will include questions on smoking frequency and patterns, drinking patterns, motivations to keep smoking, attitudes towards smoking and smoking related illness, how these students define what it means to be a smoker, and motivations to quit smoking. What I need help with is attaining participants from different universities. It would be of a great help if I could work with you or other individuals at your institution to be able to access student smokers for this study.

This project will add to the literature on college student smokers but could really benefit your school too. If I get enough participants from each school, I can analyze the results for the school separately and provide you with information about what smokers are on your campus. I am open to sharing my results and working with your school to help in their smoking related efforts. Please let me know if you would be interested in helping with this project and I can provide you with more information. I would also appreciate it if you could forward this on to anyone you think might be interested too.

Method 1 Additional Recruitment Script

My name is _____ and I am _____ at _____. I am emailing you to see if you would be interested in helping me by completing an online survey which should take 30 minutes or less to complete. I am looking for undergraduate students between the ages of 18 and 24 who have smoked at least one cigarette in the past three months. You do not have to be a regular smoker to participate in this study. We are interested in including people with many different patterns of smoking (for example, people who have tried smoking in the past and are open to smoking in the future, people who have smoked regularly in the past and are trying to quit, people who only smoke occasionally, etc.). The aim of this study which is being conducting by Juliana Rosa at Colorado State University, is to get a better sense of college student smoking patterns and attitudes towards smoking. At the end of the survey, you can enter to a $25 gift card to Amazon. If you are eligible to participate, I would really appreciate your help by clicking on this link [link] and completing the survey. Thank you.

Method 2 Recruitment Script

Are you between 18 to 24 years old, are enrolled full-time or part-time in college, and have smoked at least one cigarette in the past 90 days? You are eligible to be part of an exciting study on smoking behaviors and attitudes of college students: [Link].

Method 3 Recruitment Script

If you are between 18 to 24 years old, are enrolled full-time or part-time in college, and have smoked at least one cigarette in the past three months (90 days), you are eligible to be part of an exciting study on smoking behaviors and attitudes of college students. You do not have to be a regular smoker to participate in this study. We are interested in including people with many different patterns of smoking (for example, people who only occasionally smoke, people who have smoked regularly in the past and are trying to quit, people who only smoke while drinking, etc.).

Appendix B: Measures and Materials Used for Analysis

Consent to Participate in a Research Study

TITLE OF STUDY: Smoking Patterns of College Students

PRINCIPAL INVESTIGATOR: Patricia Aloise-Young, PhD.
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CO INVESTIGATOR: Juliana Rosa, M.S.,
Graduate Student in the Psychology Department
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WHY ARE YOU BEING INVITED TO TAKE PART IN THIS STUDY? You are being invited to take part in this study because you are currently enrolled at a 4 year university/college.

ARE THERE ANY ELIGIBILITY REQUIREMENTS? In order to be eligible for participation, you have to be between the ages of 18 and 24, you must be a student at a college or university, and must have smoked at least one cigarette in the last three months.

WHO IS DOING THE STUDY? This study is being conducted by Dr. Aloise-Young and Juliana Rosa, a graduate student, in the Applied Social Psychology Program at Colorado State University.

WHAT IS THE PURPOSE OF THIS STUDY? The purpose of this online survey is to assess students' smoking patterns and attitudes towards smoking and drinking behaviors.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST? This study is conducted online only and should take up to 30 minutes to complete.

WHAT WILL I BE ASKED TO DO?
You will be asked to read and fill out a consent form and also fill out a survey which includes demographic questions (e.g., what is your age?) and mostly questions about your smoking patterns (e.g., How often do you typically smoke?) and some questions about your drinking patterns (e.g., How often do you have a drink containing alcohol?). At the end of the survey, you will be directed to a separate link so that you can enter your name and contact information for a chance to win a $25 gift card to Amazon.com. Entering the raffle is optional so you do not have to provide this information if you don't want to. If you do decide to enter the raffle, the contact information you provide will not be linked to your survey responses. Your data responses will not have your name, and I won't be able to connect your name to your data.

ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY? If you have not smoked a cigarette in 30 days, you should not complete this study. Also, if you are not between the ages of 18 to 24 (as of today) you should not complete this study. If you are uncomfortable with topics such as smoking and alcohol use, you should consider not participating in this study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?
There are no known risks for participating in this study. The data collection will be held online for your convenience. We ask that you please keep all information shared from these surveys confidential. By doing this, we can guarantee confidentiality to you and all other participants. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risk.

ARE THERE ANY BENEFITS FROM TAKING PART IN THIS STUDY? There are no known benefits for participating in this study, but answering our questions about your smoking may help you to understand the events and contexts that trigger you to smoke. Since the majority of smokers eventually develop a desire to quit smoking, this knowledge may help you be more successful in future quit attempts. In addition, your answers will be used to create a measure to classify different types of smokers for prevention purposes.

DO I HAVE TO TAKE PART IN THE STUDY? Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.
WHAT WILL IT COST ME TO PARTICIPATE? It will not cost you anything (other than 30 minutes) to participate in this study.

WHO WILL SEE THE INFORMATION THAT I GIVE? We will keep private all research records that identify you, to the extent allowed by law. This study is anonymous. For this study, we are not obtaining your name or other identifiable data from you in the survey, so nobody (not even the research team) will be able to identify you or your data. We may be asked to share the research files for audit purposes with the CSU Institutional Review Board ethics committee, if necessary. Only the individuals conducting this study will be able to see the survey materials. These individuals include Dr. Aloise-Young and Juliana Rosa. Any information with your name or contact information (for the raffle) on it will only be seen by the PI, Dr. Aloise-Young, and the CO-PI, Juliana Rosa, and will be kept in a password safe file.

WHAT WILL IT COST ME TO PARTICIPATE AND WILL I RECEIVE COMPENSATION?
There are no costs for people to be in this study. It is optional whether you choose to enter your name into a raffle for one of eight $25 gift cards for Amazon.com.

WHAT IF I HAVE QUESTIONS?
If you have questions about the study, you can contact the co-investigator, Juliana Rosa at 970- 691-0779 or the PI, Dr. Aloise-Young, at 970-491-6941. If you have any questions about your rights as a volunteer in this research, contact Janell Baker, Human Research Administrator at 970-491-1655. Please feel free to print a copy of this consent form to take with you.

This consent form was approved by the CSU Institutional Review Board for the protection of human subjects in research on _____.

If you have read and understand the above information, please click on the 'I Consent' button below to indicate your consent to participate in this study.

Yes, I consent and wish to proceed or No, I do not consent.

Survey Questions

Age: _____
Sex:

- Male
- Female

What is your ethnic background? Circle all that apply:

- Caucasian/White
- African-American/Black
- Hispanic/Latino
- Asian-American
- Native-American
- Bi-racial
- Other: _____

What college or university are you currently attending? _____

What is your student status?

- Full-time
- Part-time

What is your level of education? (Based on years in college, not credit hours) Circle one:

- 1st year undergraduate
- 2nd year undergraduate
- 3rd year undergraduate
- 4th year undergraduate
- Other_____

What is your current living arrangement? Circle one:

- Dorms/ Residence Halls
- Other On Campus Housing
- Greek Floor/ House
- Parent/Guardian Home
- Off campus
- Other_____

How old were you when you smoked your first cigarette? _____
In the past 30 days, how many days did you smoke a cigarette (even a puff)? ____
(*Scroll down option from 1 to 30)*

During the past 30 days, how many cigarettes have you typically smoked on the days you did smoke? _____ (*Scroll down option from 1 or 24 or over)*

Compare to other college students, do you consider yourself a smoker?

- Yes
- No

Compared to other college student smokers, do you consider yourself a smoker?

- Yes
- No

Based on your smoking patterns, how would you categorize your smoking status?

- Someone who has tried smoking
- Party smoker (only smoke when drinking)

- Social smoker
- Occasional smoker
- Stress smoker
- Daily smoker
- Heavy Smoker
- Past smoker

In the last 30 days, how often have you smoked cigarettes in the following situations?

	Never	**Almost Never**	**Occasionally**	**Almost Always**	**Always**	**N/A**
a. Your house/room	1	2	3	4	5	6
b. fraternity/ sorority	1	2	3	4	5	6
c. restaurant/bar	1	2	3	4	5	6
d. on campus party	1	2	3	4	5	6
e. off campus party	1	2	3	4	5	6
f. tailgating	1	2	3	4	5	6
g. hanging out with friends	1	2	3	4	5	6
h. drinking alcohol	1	2	3	4	5	6
i. studying	1	2	3	4	5	6
j. watching TV	1	2	3	4	5	6
k. before and/or after class	1	2	3	4	5	6
l. by yourself	1	2	3	4	5	6

How do you usually get your cigarettes?

- I always buy them myself
- I usually buy them myself, but sometimes I get my cigarettes from others
- I usually get my cigarettes from others, but sometimes I buy them myself
- I get my cigarettes from others and I never buy

Please indicate how often you have used the following tobacco products:

	Never Used	**Used in the Past**	**Used but not in the past 12 months**	**Used but not in the past 30 days**	**Used in the past 30 days**
a. Cigarettes	1	2	3	4	5
b. Hookah/Pipe	1	2	3	4	5
c. E-cigarettes	1	2	3	4	5

Why do you continue to smoke?

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. It helps me relax	1	2	3	4	5
2. It helps manage my anger	1	2	3	4	5
3. It helps when I am upset about something	1	2	3	4	5
4. It helps to relieves my stress	1	2	3	4	5
5. I feel depressed or blue	1	2	3	4	5
6. It goes well with drinking alcohol	1	2	3	4	5
7. Drinking and smoking taste better together	1	2	3	4	5
8. It is out of habit	1	2	3	4	5
9. It improves the buzz I get from drinking	1	2	3	4	5
10. I have tried to quit but was unsuccessful	1	2	3	4	5
11. I am addicted	1	2	3	4	5
12. I crave cigarettes	1	2	3	4	5
13. It helps me meet new people	1	2	3	4	5
14. It helps me to help me fit in	1	2	3	4	5
15. My friends smoke	1	2	3	4	5
16. It helps me be confident around others	1	2	3	4	5
17. It helps me be able to talk to others	1	2	3	4	5

Other reasons not mentioned above:

_____

_____

Do you believe there is any harm in smoking an occasional cigarette?

- □ Strongly Agree
- □ Agree
- □ Disagree
- □ Strongly Agree

How concerned are you about the possible effects of your smoking on your health?

- □ Not at all concerned
- □ Slightly concerned
- □ Fairly concerned
- □ Very concerned

Do you keep your smoking a secret from any of the following people? (Select all that apply)

- □ Your health care provider or doctor
- □ Your parents/guardians
- □ Your siblings
- □ Other family members
- □ Close friends
- □ Casual friends
- □ Acquaintances

Please indicate how much you agree or disagree with the following questions…

	Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
a. Most people think less of a person who smokes cigarettes on a daily basis	1	2	3	4
b. Most people think less of a person who smokes cigarettes occasionally	1	2	3	4
c. Most people think less of me because of my smoking behavior	1	2	3	4

We would like to get your opinion of other smokers, in other words, the "typical" smoker. We are not looking for anyone in particular; we just want to know what you think the average person (or most people) who smokes is like. A typical smoker is…

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
a. Considerate	1	2	3	4	5
b. Smart	1	2	3	4	5
c. Self-Centered	1	2	3	4	5
d. Friendly	1	2	3	4	5
e. Moody	1	2	3	4	5
f. Attractive	1	2	3	4	5
g. Honest	1	2	3	4	5
h. Dependent	1	2	3	4	5

i. Irrational	1	2	3	4	5
j. Reliable	1	2	3	4	5
k. Weak	1	2	3	4	5

A typical smoker …

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
a. Smokes almost everyday	1	2	3	4	5
b. Smokes for quite a while, for over a year	1	2	3	4	5
c. Smokes alone	1	2	3	4	5
d. Smokes when he or she is not drinking alcohol	1	2	3	4	5
e. Buys their own cigarettes rather than bum them	1	2	3	4	5
f. Has a certain personality such as being more stressed or depressed than other people	1	2	3	4	5
g. Has a certain physical characteristics, such as smelling like cigarettes or having yellow teeth	1	2	3	4	5
h. Has to be addicted to nicotine	1	2	3	4	5
i. Must have a hard time quitting or keep smoking when they try to quit	1	2	3	4	5
j. Smokes habitually or as part of their daily routine	1	2	3	4	5

On a scale from 1 (not at all) to 10 (very much), how motivated are you to quit smoking?
_____ (******sliding scale****)

If you decided to quit smoking now, how likely do you think you would be to succeed?

- Very Likely
- Likely
- Unlikely
- Very Unlikely

How often do you have a drink containing alcohol?

- Never had a drink
- Monthly or less
- 2 to 4 times a month
- 2 to3 times a week
- 4 or more times a week

For males: How often do you have 5 or more drinks on one occasion? For females: How often do you have 4 or more drinks on one occasion?

- Never

- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

Debriefing Script

Thank you for your participation in the ***Smoking Patterns of College Students*** study. The purpose of this study was to look at different patterns of smoking on campus and especially to look at social smoking. As you probably already know, smoking can lead to many negative health consequences such as cancer and heart disease. To prevent these negative consequences it is important for researchers and health practitioners to know about the patterns of smoking on different campuses so that progression into addiction can be prevented with appropriate programs. This is why this study is being conducted. I would like to remind you that your responses will be kept confidential, so that only the PI will know the students results.

If you are interested in reducing or quitting your smoking, you may get more information at smokefree.gov. In case of injury during the study the Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study and claims against the University must be filed within 180 days of the injury. Also, in case of psychological distress, please seek help at your university counseling center or the CSU counseling center at 970-491-7121. Most importantly, no adverse or serious events are anticipated, but should a problem occur, the project's principal investigator, Juliana Rosa, will report the event to the IRB through the RICRO as soon as communication is available.

If you have any questions or concerns about the study, please contact me at Colorado State University, 1876 Campus Delivery, Fort Collins, CO 80523-1876 or (970)691-0779 or jdrosa@rams.colostate.edu. If you have concerns about this study, you may also contact Janell Baker, Human Research Administrator at 970-491-1655.

As thanks for your participation in this study, you can enter a raffle to win a $25 gift card to Amazon.com by following this link _____. All identifying information you provide will be kept confidential. I will notify you whether you are a winner at the end of the study.

Thank You,

Raffle Information

To enter the raffle for a $25 gift card to Amazon.com, please provide the following information below. This information will not be linked to your responses on the survey and will be kept confidential. Only Juliana Rosa will have access to this information. If you have any questions, feel free to email her at jdrosa@rams.colostate.edu. Thank you for your participation.

1) Name: _____

2) Best way to contact you (circle): phone or email

3) Please provide the best way to contact you.

Email Address: _____

Phone Number: _____