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Differentiating Young Adult Social Smokers on Psychological Constructs

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Differentiating Young Adult Social Smokers on Psychological Constructs

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ABSTRACT

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A number of researchers have sought to examine psychosocial correlates of smoking behavior and identify differences amongst proposed smoker sub-groupings on measures of psychological constructs; however, few studies to date have investigated the subset of smokers commonly known as social smokers. The recent emergence of the social smoker subtype has led to an upsurge in research on smoking patterns and cessation programming. This dissertation attempts to explore psychosocial differences that may exist between regular smokers and those who identify themselves as social smokers. Further, this study investigated the levels of cigarette dependence, addiction, smoking frequency, perceived health threat of light smoking, readiness to quit, depression, anxiety, social anxiety, and stress experienced by different smokers and nonsmokers. A survey was conducted and results show that social smokers are significantly different from regular smokers and more similar to nonsmokers on numerous variables including: cigarette dependency, depression, anxiety, social anxiety, and stress levels ($p < 0.05$). Smoker type was also found to be associated with gender, age, smoking behavior, stage of change for smoking cessation, addiction levels, and perceived ease of quitting. Implications for future research and cessation interventions are discussed.

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Differentiating Young Adult Social Smokers on Psychological Constructs

Cigarette use in the United States has decreased in the last decade in all age groups except young adults, in which it has increased (Centers for Disease Control and Prevention (CDC), 2002b). The state of West Virginia consistently ranks in the top five states for youth smoking, and in the top 6 states for adult smoking (Wise, Nusbaum, Curtis, Slemp, & Barker, 2003, 2004). One in 5 deaths in the state each year is due to smoking (Wise et al., 2003, 2004). Nationally, cigarette smoking is the principal cause of serious illnesses among approximately 8.6 million people and results in 440,000 deaths annually (CDC, 2002a, 2003). Specifically, smoking is known as the chief factor in heart attack, stroke, hypertension, and lung cancer. As few as 1 to 4 cigarettes per day has been shown to raise the risk of coronary heart disease by 300%, and increase lung cancer risk 3 to 5 times (Prescott, Scharling, Osler, & Schnohr, 2002; Rosengren, Wilhelmsen, & Wedel, 1992).

A great deal of funding has been devoted to the research and development of smoking cessation programs. However, few programs show promise with young adults. Similar to the national averages, the highest rates of smoking reported in West Virginia are for those aged 18-24, and these smokers have become a focus in tobacco prevention program funding for the state (Wise et al., 2004). Traditionally, studies have highlighted the differences between smokers and non-smokers, but often have failed to distinguish various subtypes of smokers. The recent emergence of a new subtype of smokers, who identify themselves as "social smokers," has led to an upsurge in research on smoking patterns and cessation programming for young adults, especially those who attend college (Moran, Wechsler & Rigotti, 2004; Waters, Harris, Hall, Nazir, & Waigandt, 2006). Social smokers have been operationally defined as smokers who

report that they smoke mainly when they are with other people (Moran et al., 2004). They have also been operationalized as those who smoke most commonly while partying or socializing, those who smoke only at festivities, and those who smoke a large proportion of their cigarettes when they go out to "hospitality venues" (Herlitz & Westholm, 1996; Philpot, Ryan, Torre, Wilcox, Jalleh, & Jamrozik, 1999; Waters et al., 2006). However, they are not the only proposed subtype of smokers identified by researchers.

Within the literature, there are several different terms that are frequently used to describe subtypes of smokers, such as tobacco chippers, intermittent smokers, and light/occasional smokers, and these terms vary widely in operational definition. Typically, these terms refer to persons who do not smoke daily and who smoke fewer cigarettes in comparison with regular, daily smokers. Studies conducted on these proposed subtypes of smokers often report findings about the importance of social desirability, cues, and context for the maintenance of smoking behavior in these populations (Hajek, West, & Wilson, 1995; Lindström, Isacsson, & The Malmö Shoulder-Neck Study Group, 2002; Presson, Chassin, & Sherman, 2002; Shiffman, Paty, Kassel, Gnys, & Zetter-Segal, 1994). Also, studies on these subtypes highlight many of the demographic characteristics associated with being a social smoker as identified by recent investigators (Moran et al., 2004). Interestingly, in Moran et al.'s (2004) landmark study, the majority of the respondents identified themselves as being social smokers, including 71% of the light/occasional smokers. In the study conducted by Waters et al. (2006), 70% of the sample endorsed social smoking.

Preliminary studies have identified the demographics of social smokers, but further research is needed (Moran et al., 2004; Waters et al., 2006). There appear to be no studies at this

time that distinguish social smokers from daily smokers on psychological constructs such as depression, anxiety, social anxiety, and stress. Thus, it is important that this group be studied in more detail to determine whether they differ from other types of smokers. Since there is much debate about what maintains smoking behavior in the absence of nicotine dependence, studies that focus on social smokers could help illuminate some of the qualitative differences in smokers who are capable of engaging in long periods of cigarette abstinence and have puzzled researchers for years.

The Transtheoretical Model of Behavior Change (TTM), proposed by DiClemente and Prochaska (1982), is currently the most popular model for describing the change of addictive behaviors (Weinstein, Rothman, & Sutton, 1998). In this model Prochaska (1994) details changes in behavior as progressing through five stages: *precontemplation* (no plans to change behavior in the foreseeable future); *contemplation* (planning to change behavior in the next 6 months); *preparation* (planning to change behavior in the next month, typically with an unsuccessful quit attempt in the past year); *action* (successful change of behavior within the last six months); and *maintenance* (behavior has been successfully changed for at least six months, now working to prevent relapse). Social smokers have been identified as being in the Transtheoretical Model precontemplation stage of smoking cessation, and due to their light cigarette use, which occurs only in social contexts, they often report that they do not even consider themselves as smokers (Moran et al., 2004; Waters et al., 2006). Also, because social smokers experience fewer withdrawal symptoms due to low levels of nicotine dependence, they may be less likely to make quit attempts.

Recently, attempts at designing effective smoking cessation programs have been targeted

at young adults, but have shown little reduction in the rates of smoking by this group. Current methods in use for smoking cessation may be inappropriate for social smokers, because they have been designed for smokers with daily cigarette use. The identification of a new group of smokers, social smokers, has important implications for providing the public, especially young adults, with information about the adverse health effects of social smoking, which may be perceived by this group as less detrimental physiologically. Therefore, it is important that research be conducted on social smokers to identify biopsychosocial aspects of their smoking-related behaviors. Hopefully, studies of the social smoker will lead to more effective targeting of nicotine education and smoking cessation programs for young adults, as well as those who see occasional cigarette use as acceptable.

The purpose of the present study is to contribute to the description of social smokers. The study by Moran et al. (2004) provided important demographic information on social smokers. However, to date no studies have described social smokers on other variables such as depression, anxiety, and stress. Therefore, the purpose of the present study is to contribute to a more detailed description of this population of smokers and highlight proposed differences in the levels of depression, anxiety, social anxiety, and stress experienced by social smokers in contrast to regular smokers and nonsmokers.

Smoking and Young Adults

In the United States smoking prevalence continues to be highest in young adults, persons 18 to 24 years in age (CDC, 2002b). From 1993 to 2000 smoking rates decreased in all age groups except for young adults, in which smoking increased from 17.9% to 22.7%. According to the *MMWR: Morbidity & Mortality World Report*, this age group has consistently failed to meet

or make acceptable progress toward national health objectives.

In Appalachia, there are similar smoking patterns among residents. Young adults, defined in the *2001 National Household Survey on Drug Abuse* as persons 18 to 25 years of age, are also the largest cohort of smokers. Cigarette use in the past month is reported by 45.13% of Appalachian residents 18 to 25 years of age; this rate is alarmingly higher than the 18.27% cigarette usage reported by persons 12 to 17 years of age, and 28.21% of persons above 26 years of age (Wright, 2003). Young adults in this study also exhibit diminished perception of the health risks of cigarette use when compared to the other age groups (Wright, 2003).

There are considerable differences in young adult smokers compared to other age groups. Although more young adults smoke, they are also likely to smoke fewer cigarettes, identify themselves as "social" smokers, and are less likely to be daily smokers and nicotine dependent (Biener & Albers, 2004; Husten, McCarty, Giovino, Chrismon, & Zhu, 1998; Lindström, 2001; Moran et al., 2004; Waters et al., 2006). Other studies have also indicated some differences in young adult smokers that are based on their college and employment status. These studies demonstrate that those young adults who are blue-collar workers or unemployed are more likely to be daily, heavy smokers than their more educated, employed, white-collar counterparts (Hammarstrom & Janlert, 2002; Lawrence, Fagan, Backinger, Gibson, & Hartman, 2007). Because young adult smokers differ from other age groups on numerous aspects of their pattern of cigarette use, appropriate education on the health risks of social smoking is needed at this critical stage of development of health habits.

Historically, studies have focused on the smoking patterns of adolescents and older adults, due to the perception that these were the age groups in which the issues of smoking

uptake and cessation were most salient. However, data from the last several years which highlights the substantial increase in smoking amongst young adults, illustrates that for many individuals this is the age when the smoking habit begins (CDC, 2002b; Wise et al., 2003, 2004; Wright, 2003). Therefore, there has been a shift of focus in scholarly inquiry to the young adult, especially those enrolled in college. Forty percent of college students report cigarette usage in the past year, suggesting that during the years that are recognized as "experimental," smoking is among the tested vices (Emmons, Wechsler, Dowdall, & Abraham, 1998). Little is known about students' reasons for smoking; although, studies show that smoking behavior is highly correlated with social and leisure activities at this age (Emmons et al., 1998; Herlitz, & Westholm, 1996; Moran et al., 2004; Philpot et al., 1999; Rigotti, Moran, & Wechsler, 2005; Sepe, Ling, & Glantz, 2002; Vink, Willemson, & Boomsma, 2003; Waters et al., 2006). Although most of the research conducted on young adult smokers has been with those that attend college, smoking among young adults has increased in *all* persons in this age group, not just those in college (Lantz, 2003). It has taken scholarly research some time to recognize the importance of young adults in smoking studies, but the tobacco industry has long been aware of their status (Ling & Glantz, 2002; Rigotti et al., 2005; Sepe, Ling, & Glantz, 2002).

Following a recent lawsuit, over 40 million pages of previously confidential tobacco industry research reports have been made public (Ling & Glantz, 2002). These reports give detailed information about the marketing strategies used by tobacco companies, including the focus on smoking uptake by young adults. Ling and Glantz (2002) have presented evidence from these documents which emphasize the importance of the young adult college student to the tobacco industry. Most of the focus has been on the promotion of cigarette use in social settings

such as bars, nightclubs, parties, sororities, and fraternities (Ling & Glantz, 2002; Ramsay & Hoffman, 2004; Rigotti et al., 2005; Sepe et al., 2002). Since the release of these documents, which illustrate the startlingly predatorial approach of the industry toward shaping the unhealthy behaviors of vulnerable college students, researchers have shifted their efforts toward studying this population in greater detail (Ling & Glantz, 2002; Moran et al., 2004, Rigotti et al., 2005; Waters et al., 2006). Though the average college student is intellectually above average, this is a particularly vulnerable time due to adjustments to college life, the making of new friends, and the desire to fit in with a group. Thus, young college adults are the perfect target for tobacco industry funded events where it becomes necessary to participate in smoking to fit in with the crowd. Recent research on young adults has focused on predictors of smoking behavior, the context associated with smoking behavior, susceptibility to tobacco industry promotions, trajectories of cigarette use, racial differences in smokers, smoking cessation, and smoking prevention (Biener & Albers, 2004; Emmons et al.,1998; Herlitz & Westholm, 1996; Moran et al., 2004; Ramsay & Hoffman, 2004; Rigotti et al., 2005; Sepe et al., 2002; Vink, Willemson, & Boomsma, 2003; Waters et al., 2006). These studies have overwhelmingly highlighted vast differences in the young adult compared to younger and older smokers.

Terminology Used for Non-daily Smokers

Many studies have been conducted on smokers who are not considered regular or daily smokers, and the literature includes several commonly used terms for these types of smokers. Unfortunately, researchers do not always use the same guidelines when operationally defining non-daily smokers. Similarly, authors may use terms interchangeably throughout their articles, even though they have already used different operational definitions (Billings & Moos, 1983;

File, Dinnis, Heard, & Irvine, 2002; Gilpin, Cavin, & Pierce, 1997; Hajeck et al., 1995; Husten et al., 1998; Lindstrom, 2001; Lindstrom et al., 2002; Okuyemi, Harris, Scheibmeir, Choi, Powell, & Ahluwalia, 2002; Presson et al., 2002; Shiffman et al., 1994). This practice often leads to confusion. Use of terminology typically varies based on characteristics such as: number of cigarettes smoked per day; the number of days a person smokes per week; periods of abstinence from smoking; levels of nicotine dependence; and presentation of withdrawal symptoms. The following is a brief description of the most commonly used terminology and associated characteristics used to describe non-daily smokers found in the literature: tobacco chippers, intermittent smokers, and light/occasional smokers.

Tobacco Chippers

Tobacco chippers have been described and studied by Shiffman et al. (1994). They have described tobacco chippers as regular smokers rather than occasional smokers. However, these smokers are *not* daily smokers. "Chippers" are smokers who smoke between one and five cigarettes per day, at least four days per week. Interestingly, although tobacco chippers have been found to smoke an average of 46,000 cigarettes in their lifetime, they score very low on scales of nicotine dependence, such as the Fagerström Test for Nicotine Dependence (Shiffman, Paty, Gnys, Kassel, & Elash, 1995; Shiffman et al., 1994). In accordance with their low levels of nicotine dependence, they may go hours after awakening before they have the first cigarette of the day. Also, these smokers report frequent periods of abstinence from smoking in which they experience little to no withdrawal symptoms, and they have a lower perception of their individual addiction to nicotine (Presson et al., 2002; Shiffman et al., 1995; Shiffman et al., 1994). Little distress is reported when they are unable to smoke due to circumstance, and

researchers propose that tobacco chippers may have too little exposure to nicotine to become dependent on smoking, in contrast to heavy smokers nicotine (Presson et al., 2002; Shiffman et al., 1995; Shiffman et al., 1994). Studies also show that tobacco chippers may be more responsive to social cues, though they enjoy smoking alone just as much as smoking with others (Hajek et al., 1995; Presson et al., 2002; Shiffman et al., 1994).

Presson et al. (2002) found that tobacco chippers are more likely to begin smoking at a later age, typically in young adulthood. Psychosocial characteristics included higher expectations for academic success, higher level of education, and an internal locus of control. Also, the chippers in their study reported more social facilitation, positive affect, sensory motives, and weakness motives for smoking, such as lack of willpower. These findings are consistent with the idea that this pattern of smoking behavior may be maintained by the perception of positive benefits rather than nicotine dependence.

Intermittent Smokers

Intermittent smokers have been operationally defined by Husten et al. (1998) as persons who have never smoked daily, yet have smoked a minimum of 100 cigarettes in their lifetime. Their study highlighted the racial differences in the prevalence of non-daily smoking. They found that American Indians/Alaska Natives, Asian Americans/Pacific Islanders, Black non-Hispanics, and Hispanics are significantly more likely to be intermittent smokers than White non-Hispanics. Also, 10 percent of minority populations are intermittent smokers. Similar results have also been reported by White, Nagin, Replogle, and Stouthamer-Loeber (2004). Intermittent smokers seem to have a higher level of educational attainment, are younger, and more likely to be unmarried; this also tends to be a long-term pattern of smoking (Husten et al.,

1998; Lindström et al., 2002). Lindström et al., (2002) also found that intermittent smokers have more psychosocial resources, a high level of social participation, and are less likely to perceive themselves as smokers than daily smokers.

Light/Occasional Smokers

Light and Occasional smoking are two of the most commonly used terms in the literature, but they are also the most poorly defined. The bulk of the literature lists light or occasional smoking as smoking that may or may not occur daily, and includes a consumption of between 6 and 15 cigarettes. However, the number of cigarettes per day is different for virtually every study. Okuyemi et al. (2002) have found that women and young adults are more likely to smoke no more than 10 cigarettes per day. Upon examining previously reported motivations for smoking, these authors also included literature that referred to tobacco chippers, who are defined as smoking less than 10 cigarettes per day. They note that situational motivations found for smoking found by Shiffman et al. (1994) for lighter smokers included: drinking alcohol; attending parties; when in the presence of others; and when nervous, worried, or irritable. Researchers suggest that for young adults in college, light smoking may be an attempt at harm reduction, while still maintaining perceived benefits of smoking (Okuyemi et al, 2002). Other characteristics of light smokers cited in the literature include a higher educational level, uptake of smoking at a later age, fewer quit attempts, and a strong association between smoking and social contexts (Hajek et al., 1995).

Conclusions.

In summary, several different terms are used in the literature to describe persons who do not smoke daily, and who smoke fewer cigarettes. These terms vary widely in operational

definition; however, they are sometimes used by researchers interchangeably. It is not uncommon for authors to use up to three terms in a single article. This practice is confusing and misleading. Technical terminology should have meaning within the field, and thus new jargon should be derived that has simplicity and more meaning. Then, readers would not have to determine if an author's use of terminology is meant to be discriminant or not. Thus, common characteristics of the various terms in use should be combined to arrive at the most widely applicable, meaningful term.

Defining Social Smokers

Young adult smokers commonly refer to themselves as "social" smokers; however, this is a term that is understudied and poorly understood (Biener & Albers, 2004; Moran et al., 2004; Waters et al., 2006). In what is considered the first investigation into this subgroup, Moran et al. (2004) identified social smokers demographically. The operational definition used for social smokers in this study was the participant's self-report that they mainly smoked with others (in contrast to smokers who smoke mainly when alone, or equally as much when alone as with others). More recent studies operationalize social smokers as those who smoke most commonly while partying or socializing (Waters et al., 2006). Researchers conclude that social smoking is a distinct pattern of smoking, especially among young adults attending college. Interestingly, a common finding has been that the majority of the college respondents identify themselves as being social smokers (51-70%), including a consistent average of 71% of light/occasional smokers (Moran et al., 2004; Waters et al., 2006). Studies have also identified associations between social smoking and occasional smoking, lower levels of nicotine dependence, drinking alcohol while smoking, smoking for more than two years, no intention to quit smoking, greater

confidence in their ability to quit, and being less likely to have made a quit attempt (Moran et al., 2004; Waters et al., 2006). Other studies have identified these same relationships in light or occasional smokers (Biener & Albers, 2004; Billings & Moos, 1983; Emmons et al., 1998; O'Connor, 1985; Presson et al., 2002; Rigotti et al., 2005; Shapiro, Jamner, Davydov, & James, 2002; Shiffman, Gwaltney, Balabanis, Liu, Paty, & Kassel et al., 2002; Shiffman et al., 1994; Vink et al., 2003). Researchers also report that light smokers are more likely to smoke with their friends and when others are smoking than are heavier smokers (Billing & Moos, 1983; Shapiro et al., 2002; Shiffman et al., 2002; Shiffman, Paty, Gwaltney, & Dang, 2004; Vink et al., 2003). Shiffman et al. (2002) have proposed that the smoking of others may influence the smoker by providing social cues for smoking, and that social influences will be strongest when the other smokers are part of the same social group as the smoker being studied. However, further research is needed on the social maintenance of smoking behaviors.

Though much of the literature is consistent with characteristics associated with a social smoking pattern, there have been some inconsistencies due to the use of various operational definitions. Shiffman et al., (2004) found that though participants in their study were more likely to be smoking while in a bar or restaurant, they were less likely to be smoking while drinking alcohol. This study stands in contrast to the findings reported in the bulk of the literature. One possible explanation is that these findings are due to the ages of the participants, which were all above 23 years old. Also, in their study, participants kept a personal diary of smoking behaviors; this method of data collection is what the researchers attribute their surprising finding to. Also, there is some debate about whether smokers classified as tobacco chippers smoke in response to social cues and situations. Some researchers show chippers as responding to social cues, while

others do not (Hajek et al., 1995; Presson et al., 2002; Shiffman et al., 1994). A finding which is specific for young adult college students, found perhaps due to the inclusion of "partying" in the operational definition of social smoking employed, is that social smokers are more likely to belong to a sorority or fraternity than other students (Waters et al., 2006). In regard to smoking cessation, Gilpin et al. (1997) found their occasional smokers to be more likely to plan to quit in the next month than daily smokers. This finding is odd, since occasional smokers have also been found to rarely consider themselves as smokers, to be less nicotine dependent, and to see less need to quit for these same reasons (Moran et al., 2004; Waters et al., 2006). In contradiction to the participants' plans to quit within the next month, was their reported perceptions of themselves as not being nicotine dependent, and perceiving nicotine as being less addictive than other drugs in general (Gilpin et al., 1997). Another inconsistency in the literature is that most researchers state that light smoking and social smoking are most likely a part of the process of uptake and subsequent progression to regular smoking. However, recent studies have shown that this pattern may have substantial stability (Biener & Albers, 2004; Gilpin et al., 1997; Lindström et al., 2002; Moran et al., 2004). A final note on literary inconsistencies is the finding on at least two studies which have identified light smokers who are not social smokers, and social smokers who are not light smokers (Biener & Albers, 2004; Moran et al., 2004).

Another interesting characteristic of light and social smokers is the difference noted between smoking patterns and ethnicity. Race has been found to be a significant predictor of cigarette use, and studies have shown that African-Americans are more likely to be light smokers than Caucasians (Lawrence et al., 2007; White et al., 2004). Moran et al. (2004) found that though African-Americans smoke fewer cigarettes, they were less likely to be social smokers.

These findings contradict tobacco industry data which suggests that social smoking is more common among African-Americans (Ling, 2002). Other research has shown that Caucasians and Hispanics are more likely to be non-daily smokers than African-Americans (Gilpin et al., 1997). Racial differences seem to include both the number of cigarettes smoked per day, and the pattern of smoking. Therefore, further research should strive to highlight racial differences in participant smoking patterns.

Conclusions.

Social smoking is a pattern which is not often named directly by researchers, but is readily apparent in their research. Social motives and cues are present in studies on tobacco chippers, as well as light, occasional, and intermittent smokers. Though it has been identified that social smoking does not perfectly correlate with the number of cigarettes smoked per day due to the variability in individual cigarette use, social smoking does correlate with cigarettes per day when coupled with the number of days per week that a person smokes. Social smokers typically are younger, do not see themselves as smokers, are less dependent on nicotine, do not have plans for quitting smoking, and are less likely to have made a quit attempt. There are inconsistencies in the literature due to the mixing of terminology and operational definitions, as well as the conflicting reports of racial differences in social smokers. Also, the research identifying social smokers is thus far limited to descriptions of demographics and nicotine dependence. Therefore, more research is needed to further identify and distinguish social smokers as a relevant group to consider for purposes of conducting thorough research. This study will employ the operational definition outlined by Moran et al. (2004) which describes social smokers as those persons who report that they have smoked "mainly with others," rather

than “mainly when alone,” or “as often by themselves as with others,” in the past 30 days.

Measuring Nicotine Dependence

Historically, there has not been a consistent, universal determinant of cigarette dependence used by clinicians. The most widely used diagnostic tools are the descriptions for nicotine dependence in the Diagnostic and Statistical Manual-Fourth Edition Text Revision (DSM-IV-TR), and Tobacco Dependence Syndrome in the International Code for Diseases-Tenth Edition (ICD-10) (American Psychiatric Association, 2002; World Health Organization, 1991). Designed to match the DSM-IV and ICD-10 diagnostic criteria is the most popular measure used for the last 25 years to study nicotine dependence, The Fagerström Tolerance Questionnaire (Fagerström, 1978). There is also a shorter version of this instrument which is widely used, known as The Fagerström Test for Nicotine Dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991).

These instruments, however, are extremely problematic by nature. First, they are not statistically validated because they are, by definition, clinimetric scales (Etter, Houezec, & Perneger, 2003). A clinimetric scale is one that is based on current medical opinion rather than statistical properties (Etter, Houezec, & Perneger, 2003). Therefore, it is difficult to know if these scales have convergent or construct validity. Also, nicotine dependence can arise from using any combination of tobacco products, and it is unknown if there is any variability between groups of tobacco product users. Furthermore, these instruments can not discriminate between various groups of nicotine consumers, such as those with social/occasional use versus daily/frequent use (Etter, Duc, & Perneger, 1999).

While the notion that people smoke mainly in response to withdrawal symptoms from

nicotine dependence has long been accepted, with the emergence of literature on persons who are social and light smokers came the realization that not all smokers are nicotine dependent, and that context is often an important cue for smoking. Gilpin et al. (1997) have suggested that in these anomalous smokers, cigarette smoking may be maintained by social pressure rather than nicotine dependence. Therefore, a distinction can be made in smoker type by assessing for nicotine dependence (Etter et al., 1999). Thus, in 2003 a new scale was published which better assesses cigarette dependence in light and social smokers (Etter et al., 2003). Before discussing the strengths of the newer Cigarette Dependence Scale, a thorough examination of the limitations of The Fagerström Test for Nicotine Dependence is warranted.

The Fagerström Test for Nicotine Dependence

Addiction to cigarettes has primarily been assessed with The Fagerström Tolerance Questionnaire (FTQ), which consists of eight items, and The Fagerström Test for Nicotine Dependence (FTND), which consists of six items (Fagerström, 1978; Heatherton et al., 1991). Though the tests have been in wide usage, and their validity had been confirmed to some extent, reports of issues surrounding internal consistency and validity for light smokers began to surface until Heatherton et al. (1991) concluded that the FTND was a valid measure of heaviness of smoking, and that it had higher face and predictive validity than the FTQ. These researchers found the coefficient alpha of the FTQ to be 0.48, and a coefficient alpha of the FTND to be 0.61, which speaks to the increased internal consistency in the shorter measure (Heatherton et al., 1991).

Other researchers have suggested that the FTND is not a good instrument because it does not address many important aspects of nicotine dependence such as: withdrawal symptoms,

using the substance for longer than intended, perception of cigarette addiction, and failed quit attempts (Etter et al., 1999; Moolchan, Radzius, Epstein, Uhl, Gorelick, & Cadet et al., 2002). Also, most of the items poorly assess the rates of cigarette dependency among light smokers (Etter et al., 1999; Heatherton et al., 1991). Etter et al., (1999) observed floor effects on the FTND when used with light smokers on all items. This led to the conclusion that the instrument has little ability to make distinctions among relatively light smokers, and that the FTND did not account for more variance of external criteria of addiction than did the number of cigarettes a person reports smoking per day (Etter et al., 1999). The study also confirmed previous reports of problems with the marginal internal consistency of the FTND, with alpha coefficients of 0.70 at baseline, and 0.67 at follow-up. Test-retest reliability, however, was good for the FTND, $r = 0.85$, $p < 0.001$). Also, Etter et al., (1999) found that all FTND items were associated with saliva continine levels, which suggests they are valid measures of smoking intensity. Overall, The Fagerström Test for Nicotine Dependence does not hold up well for light smokers, who were used in the Etter et al. (1999) study. The items are not those that are pertinent to their smoking typology, and would be especially invalid for social smokers due to item wording (ie. How long do you go until your first morning cigarette?).

The Cigarette Dependence Scale

With the increased focus on the identification of social smokers as a "new" class of smokers, it becomes much more important to identify instruments which will further aid in the distinction of various types of tobacco product users. One of the most common ways for researchers to identify nicotine dependence in survey respondents is by asking the participant the amount of time which passes between waking and their first cigarette. Obviously, this is an

imprecise way of making a decision about a respondent's nicotine dependence, and says nothing about the intensity thereof. Furthermore, it also is a question which fails to assess the nicotine dependence of a social smoker, who may never smoke daily or in the morning. Therefore, a statistically sound and reliable measure of nicotine dependence was needed for research purposes since The Fagerström Test for Nicotine Dependence (FTND) is inadequate for such use (Etter et al., 1999).

Etter et al. (2003) developed the Cigarette Dependence Scale for use with such smokers. The final result was the construction of a 12-item scale (CDS-12), and a shorter 5-item scale (CDS-5). Due to the age of the original sample (18-70 years), the scales were also assessed for validity of use in persons 12-19 years of age. Factor analysis revealed that there was only one factor present in the CDS-12 and CDS-5; this factor accounted for 45% of the total variance in CDS-12, and 55% of the variance in the CDS-5. Internal consistency was higher for both the CDS-12 and CDS-5 than the Fagerström Test for Nicotine Dependence (Cronbach's alpha > 0.84). The test-retest correlations ranged from moderate to strong for all items, and were greater than 0.83 for the CDS-12 and CDS-5. Also, the test-retest correlations were higher for the CDS-12 than the FTND. Daily smokers had significantly higher scores than occasional smokers, and all items and scales were associated with the intensity of the urge to smoke, as well as the number of cigarettes smoked per day. All items were associated with saliva continine levels, which suggests that these items are valid measures of smoking intensity (Etter et al., 2003).

The Cigarette Dependence scale will be useful in the proposed research in defining social smokers as a separate group from daily smokers based on cigarette dependence levels. It will also be useful for clinical purposes, while maintaining statistical integrity which is lacking in

current dependence assessment instruments. It addresses a number of the limitations noted with The Fagerström Test for Nicotine Dependence, and will be more accurate in assessing cigarette dependence in relatively light smokers, such as social smokers who have been shown in previous studies to engage in less cigarette use less frequently (Moran et al., 2004; Rigotti et al., 2005; Waters et al., 2006).

Smoking and Mood

Much research has been generated, especially in the last 25 years, which examines the correlation between smoking and various psychological constructs related to a person's mood state. Included in the literature review for this study were articles on the relationship between smoking and: depression, anxiety, social anxiety, and stress. Overwhelmingly, the literature is plagued by inconsistent methodology on all examined constructs. Also, there has been much debate on the direction and nature of the significant relationships observed. Researchers have typically proposed three pathways for the identified relationship between smoking and mood. These include: smoking as the causal factor; mood as the causal factor; and confounding variables as the mediating factors for the relationship observed between smoking and mood states. The following is a detailed description of the research on each of the proposed psychological constructs for this study, including debate on the direction and nature of the relationships observed between these variables, as well as the various methodologies used to study them.

Smoking and Depression

The association between major depression, cigarette smoking, and nicotine dependence is well documented (Bonnet, Irving, Terra, Nony, Berthezene, & Moulin, 2005; Covey, Glassman,

& Stetner, 1998; Covey & Tam, 1990; Escobedo, Reddy, & Giovino, 1998; Fergusson, Goodwin, & Horwood, 2003; File et al., 2002; Goodman & Capitman, 2000; Lenz, 2004; Lerman, Caporaso, Main, Audrain, Boyd, & Bowman, et al., 1998; Ludman, Curry, Grothaus, Graham, & Stout, 2002; Martini, Wagner, & Anthony, 2002; Patton, Hibbert, Rosier, Carlin, Caust, & Bowes, 1996; Patton, Carlin, Coffey, Wolfe, Hibbert, & Bowes, 1998; Tamburrino, Lynch, Nagel, Stadler, & Pauling, 1994; Vickers, Patten, Lane, Clark, Croghan, & Schroeder, et al., 2003). However, there is much inconsistency regarding how the relationship between depression and smoking has been studied. For example, several studies have examined the relationship between the intensity of smoking and depression (ie. light smoking vs. heavy smoking), and these researchers find that there is a positive correlation between the rates of depression and intensity of smoking (Bonnet et al., 2005; Covey et al., 1998; Fergusson et al., 2003; File et al., 2002; Tamburrino et al., 1994). Other studies have highlighted the association between levels of nicotine dependence and the likelihood of depression, with the findings pointing to the likelihood of depression increasing with a person's dependence on nicotine (Covey et al., 1998; Fergusson et al., 2003; Patton et al., 1998). Some researchers have sought to identify patterns of smoking in persons with a diagnosis of depression, while others have tried to identify patterns of depression among smokers. Another inconsistency is the variability of the instruments used to assess depression. The range of instruments includes: statistically validated scales, newly developed scales, structured interviews, and self-report of depression.

Also the nature of the relationship between depression and smoking has been debated by researchers. There are two conflicting explanations for the relationship observed between smoking and depression. The first explanation suggests that smoking and depression appear in

persons who have common confounding variables which put them at risk for both increased rates of smoking and depression (Fergusson et al., 2003). These factors have been shown to include both genetic and environmental variables; however, there is debate about whether the confounding variables can entirely account for the relationship between smoking and depression. It seems that there is only partial mediation of the relationship between smoking and depression by various confounding variables (Fergusson et al., 2003; Vickers et al., 2003). On the other hand, some researchers have found that confounding variables fully mediate the relationship between smoking and depression (Latimer & Sheahan, 1995; Martini et al., 2002).

The second general explanation is that there is a causal relationship between smoking and depression. There is disagreement among researchers, however, about the direction of the relationship. One suggestion is that depression leads to increased smoking by way of self-medication in order to reduce the symptoms associated with depression (Escobedo et al., 1998; Lerman et al., 1998; Ludman et al., 2002). An alternative explanation is that increased smoking and nicotine dependence leads to greater individual vulnerability to depression (Goodman & Capitman, 2000). Unfortunately, many researchers have not taken a stance on the proposed mechanisms for the association.

Instruments for Measurement of Depression

The most commonly used instruments to measure depression in smoking studies are the Hospital Anxiety & Depression Scale (HAD) and the Center for Epidemiological Studies Depression Scale (CES-D). The HAD scale is a 14-item self-report questionnaire that has been statistically validated for the diagnosing of anxiety and depression (Snaith & Zigmond, 1986). However, it does not discriminate between various types of depression and anxiety disorders

which are major factors in the proposed study. While it has been used in several studies to highlight the relationship between smoking, depression, and anxiety, the HAD is not the most appropriate instrument for this particular investigation (Bonnet et al., 2004; File et al., 2002).

The Center for Epidemiological Studies Depression Scale (CES-D) is a 20-item Likert scale used to assess depressive symptoms (Radloff, 1977). It correlates with clinical ratings of severity of depression, has high internal consistency (r = 0.85 to 0.90), and fairly good test-retest reliability r = 0.57 for 2 to 8 weeks, and has been shown to correlate with clinical ratings of depression severity (Radloff, 1977). Scores range from 0 to 60, and a cutoff score of 16 is used to classify persons as depressed. Also, the CES-D has been demonstrated as appropriate for use with college students (Radloff, 1991). This instrument has also been used in several studies to establish the significance of the relationship between smoking and depression (Covey & Tam, 1990; Goodman & Capitman, 2000; Latimer & Sheahan, 1995; Lerman et al., 1998; Vickers et al., 2003). Other means of assessing depression that surfaced in the literature review included the use of various structured interviews, newly developed measures, clinical checklists, and questionnaire self-report items.

Conclusions.

It is likely that a relationship between social smoking and depression would be observed, since the literature finds a links between light smoking and depression. Since research shows that level of depression varies with the number of cigarettes smoked per day and level of nicotine dependence, it is unlikely that the association between depression and smoking would be as high for social smokers as for daily smokers, but it would also logically follow that there would be higher levels of depression found in the social smokers than nonsmokers. Therefore, it is

expected that in the proposed sample, levels of depression would increase with level of smoking (non, social, or daily) and nicotine dependence.

Smoking and Anxiety

The pattern of association between smoking and anxiety is similar to that of smoking and depression, and is also well documented (Bonnet et al., 2005; File et al., 2002; Kassel & Unrod, 2000; Lakshminarayanan & Rangaraju, 1988; Lantz, 2003; Patton et al., 1996; Patton et al., 1998; Sonntag, Wittchen, Hoffler, Kessler, & Stein, 2000). The studies which examine the correlation between anxiety and smoking are just as inconsistent in methodology as those that focus on depression. Studies which examine the role of the intensity of smoking, (ie. non-smoking vs. light smoking vs. heavy smoking), find that there is a relationship between anxiety and smoking which increases with smoking intensity (Bonnet et al., 2005; File et al., 2002; Lakshminarayanan & Rangaraju, 1988; Patton et al., 1996). Interestingly, Bonnet et al. (2005) found sex differences between smokers on measures of anxiety. They found that anxiety correlated significantly with smoking in men, but not women. However, other studies do not report sex differences. Other studies have simply examined the association between smoking and anxiety in smokers versus non-smokers, which again, produce significant correlations (Kassel & Unrod, 2000; Patton et al., 1998).

Hypotheses about the nature of the relationship between anxiety and smoking are similar to those for depression and smoking. The most popular hypothesis is that there is a causal relationship between anxiety and smoking. The bulk of the literature supports the notion that high levels of anxiety lead to increased smoking by way of self-medication in order to achieve anxiolytic effects associated with nicotine (File et al., 2002; Lantz, 2003; Kassel & Unrod, 2000;

Lakshminarayanan & Rangaraju, 1988; Lantz, 2003; Niaura, Shadel, Britt, & Abrams, 2002; Patton et al., 1996; Patton et al., 1998; Sonntag et al., 2000). Some studies which discuss the anxiolytic effects of nicotine note that smoking may be perceived as beneficial in social situations for persons who suffer from varying degrees of social anxiety (Lantz, 2003; Lakshminarayanan & Rangaraju, 1988; Niaura, Shadel, Britt, & Abrams, 2002; Sonntag et al., 2000). Similarly, Kassel and Unrod (2000) have found that smoking may help relieve anxiety temporarily while focusing on a task. This may lead smokers to perceive the effects of nicotine as beneficial for sustained mental effort, such as when working or studying.

An alternative explanation is that increased smoking and nicotine dependence lead to greater individual susceptibility to anxiety (Patton et al., 1998). This direction of causality may also be due to the effects of nicotine withdrawal which may induce anxiety in smokers (File et al., 2002; Parrot, 1995a). However, this hypothesis does not seem to be as popular.

A third proposal suggests that smoking and anxiety appear in persons who have common confounding variables which put them at risk for both increased rates of smoking and anxiety. There is debate about whether the confounding variables can entirely account for the observed relationship. Some research demonstrates that there is only partial mediation of the relationship between smoking and anxiety by various confounding variables (Patton et al., 1996). However, Patton et al. (1998) found that the relationship between smoking initiation and anxiety was not present when analyzed in conjunction with peer smoking.

Instruments for Measurement of Anxiety

There is a considerable inconsistency in the measurement of anxiety in relation to smoking. The most common measure found in studies is the Hospital Anxiety & Depression

Scale (HAD), which has been previously described (Snaith & Zigmond, 1986). However, this scale was used in studies which also examined the association between depression and smoking (Bonnet et al., 2005; File et al., 2002). Again, the HAD is not the most appropriate instrument for this particular investigation due to its relative inability to discriminate between various types of depression and anxiety disorders which are major factors in the proposed study. Kassel & Unrod (2000) used The Trait Anxiety subscale of the State-Trait Anxiety Inventory, Form Y (STAI-T) to assess general propensity to experience anxiety (Speilberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This instrument consists of 20 self-descriptive statements in which responses allow for the measurement of feelings of apprehension, nervousness, and worry ($\propto$ = 0.89). Other studies used structured interviews for the assessment of anxiety (Patton et al., 1996; Patton et al., 1998).

Conclusions.

It is likely that a relationship between social smoking and anxiety would be observed. Since the research shows that levels of anxiety vary corresponding to smoking intensity, it is unlikely that the correlation between anxiety and smoking would be as high for social smokers as daily smokers. Interestingly, it has been noted that persons may smoke in order to relieve social anxiety. Thus, it stands to reason that those engaging in a more social form of smoking may have similar or greater levels of social anxiety as compared to heavier smokers which may be relieved by the presence of nicotine during social interactions. However, it is expected that there would be a significant difference in the levels of anxiety between social and daily smokers found, with daily smokers still having the highest overall levels of anxiety.

Smoking and Stress

The role of stress in smoking behaviors has long been debated by researchers. In a recent study of undergraduate's attitudes toward smoking, stress was the motivating factor for 49.3% of the current smokers (DeBernardo & Aldinger, 1999). Several other studies have also documented that stress often serves as a motivational factor in smoking behavior (Latimer & Sheahan, 1995; Shadel & Mermelstein, 1993; Shapiro et al., 2002; Todd, 2004). However, there is much disagreement about the nature of the stress-smoking relationship, and its ability to make predictions about smoking behavior. Thus, the direction of the relationship remains unclear. While most researchers seem to agree that there seems to be a causal relationship between smoking and stress, they often disagree about the direction of the pathway. Some researchers argue that smoking does indeed cause stress, while others maintain that smoking behaviors arise from increased susceptibility to smoke from perceived levels of stress. These perceived levels of stress are argued to result in the need for self-medication of symptoms through smoking.

The first explanation of the relationship between smoking and stress is that smoking causes stress (Parrott, 1999; Parrott, 2000). It has been proposed that nicotine exacerbates stress as a person becomes dependent on cigarettes, and that stress levels are highest for smokers during periods of abstinence between cigarettes which induce withdrawal symptoms (Parrott, 1995a; Parrott, 1995b; Parrott, Garnham, Wesnes, & Pincock, 1996; Parrott, 1998; Parrott, 1999; Parrott, 2000). This theory has been supported by reports that former smokers experience significant stress reduction over time after smoking cessation (Parrott, 1995a; Parrott, 1995b; Parrott, 1999; Parrot, 2000). However, the immediate stress reduction that is experienced from smoking is highly reinforcing, and the relief response increases with mounting levels of

environmental stress (Parrott, 2000). Thus, smoking is maintained by immediate negatively reinforcing benefits associated with cigarettes, and smokers often report more smoking when under greater stress (Latimer & Sheahan, 1995, Shadel & Mermelstein, 1993; Shapiro et al., 2002). Warburton, Revell, and Thompson (1991) reported that significantly more smokers than nonsmokers report feeling constantly under stress, and this could be due to the fact that they are repeatedly experiencing withdrawal from nicotine while between cigarettes. Cigarettes then become increasingly necessary after the establishment of nicotine dependence for the maintenance of a "normal" mood that is free from the stress of withdrawal symptoms (Parrott, 1995b; Parrott, 1998; Parrott, 1999; Parrott & Garnham, 1998). Interestingly, the stress levels of smokers when they have just smoked are similar to those of nonsmokers, and their mood subsequently worsens from increased stress (Parrott, 1995b; Parrott & Garnham, 1998; Parrott et al., 1996). Also, intensity of cigarette smoking has been found to be associated with greater mood fluctuations and higher levels of perceived stress, with heavier smokers experiencing the most changes in mood (Parrott, 1999). Heavier smokers are also said to experience the greatest amount of stress, followed by lighter smokers and nonsmokers (Parrott & Garnham, 1998; Presson et al., 2002; Shadel & Mermelstein, 1993).

While the overwhelming majority of the research findings seem to suggest that smoking does indeed cause stress, there are conflicting reports. Kassel (2000) posits two alternative explanations. The first is that the smoking-stress relationship is a correlation rather than causal by nature, and that the stress experienced by smokers may have multiple determinants unrelated to smoking behavior (Kassel, 2000). Secondly, Kassel (2000) proposes that if the relationship were causal, that the direction would be reversed; and thus, increased levels of stress would lead

to increased susceptibility to smoke for self-medication of stress symptoms. This notion of cigarettes as self-medication for stress has also been noted by other researchers (Ludman et al., 2002; Warburton, Revell, & Thompson, 1991) Following in this line of reasoning, Kassel (2000) also proposed that the reduced stress experienced by smokers at cessation is related to perception rather than actual biochemical changes from the removal of nicotine. In another contradictory study, Lenz (2004) found that there was no association between cigarette smoking and stress in her sample of college students when conducting multivariate analyses, but significance was found in a univariate analysis of the association. Thus, confounding variables such as other drug use, mental health issues, and health of lifestyle were shown to mediate the relationship between stress and smoking. Similarly, Todd (2004) found that the interaction between stress and nicotine dependence did not predict smoking behavior or urges. Also, levels of perceived stress have been found to not be predictive of the change or progression of smoking behavior (Wetter, Kenford, Welsch, Smith, Fouladi, & Fiore et al., 2004).

Some researchers have indicated that there may be gender and racial differences in the stress-smoking relationship (Ludman et al., 2002; Presson et al., 2002). For example, female tobacco chippers have been found to be more stressed than male chippers, and significantly more stressed than female nonsmokers (Presson et al., 2002). Also, in a study which compared African American and European American low-income female smokers, it was found that greater stress levels in African American women predicted smoking dependency, and that these women may smoke for affect regulation more than European American women do (Ludman et al., 2002). In conclusion, while there is overwhelming support for the causal relationship between smoking and stress, there are contradictory findings which warrant further explanation.

Some of the reasons that contradictory evidence might surface include the fact that most researchers do not examine racial or gender differences in the stress-smoking relationship. Also, there is no uniformity of measures of stress used at this time by researchers. Clearly, more studies are needed which examine gender and racial differences in smoking patterns as well.

Instruments for the Measurement of Stress

In the measurement of stress, there does not seem to be an agreed upon instrument that is widely used. The most common method of assessing stress employed by researchers is a Likert-style self-rating of stress perception which varies widely by study, and typically ranges from 3 to 10 choice options (Latimer & Sheahan, 1995; Presson et al., 2002; Shadel & Mermelstein, 1993; Todd, 2004). Other studies include a simple self-report of stress (DeBernardo & Aldinger, 1999; Shapiro et al., 2002). Lenz (2004) operationally defined levels of stress experienced by college students by the number of class credits they were enrolled for in a given semester and the number of hours they worked per week.

Parrott (1995b) developed a questionnaire known as the UEL from the Short Adjective Check List. With this scale participants self-report feelings of stress, arousal, and pleasure on a 5-point bipolar scale. This scale has been used by Parrott in many of his studies, but it does not appear to have been statistically validated (Parrott, 1995b; Parrott & Garnham, 1998; Parrott et al., 1996). There appears to be only one statistically validated scale currently used by researchers to examine the stress-smoking relationship. This scale is the Perceived Stress Scale (PSS; Cohen, Karmarck, & Mermelstein, 1983). Coefficient alpha reliability for the PSS is 0.84-0.86. The PSS has been shown to have test retest-reliability values ranging from 0.66 to 0.85 depending upon the type of study.

Conclusions.

It is difficult to say if social smokers would have higher levels of stress in comparison to nonsmokers. If stress is caused by nicotine dependency, and social smokers are not nicotine dependent, it could be concluded that they would not exhibit different levels of stress when compared to nonsmokers. Also, it could be presumed that social smokers may demonstrate a significantly less of stress in comparison to daily smokers, since they are used to long periods of abstinence from smoking. However, if stress is the cause of smoking, then the supposition would be expected that there might be a significant difference in the levels of stress experienced by social smokers when compared to nonsmokers.

Stages of Change and Smoking Cessation Implications

Before the introduction of stage theories of health behavior, maintenance of healthy behaviors, (ie. not smoking), was seen to exist as a continuous process rather than as a progression through stages (Weinstein et al., 1998). The Transtheoretical Model of Behavior Change (TTM), proposed by DiClemente and Prochaska (1982), is currently the most popular stage model in wide use (Weinstein et al., 1998). In this model, changes in behavior progress through five stages: *precontemplation* (no plans to change behavior in the foreseeable future); *contemplation* (planning to change behavior in the next 6 months); *preparation* (planning to change behavior in the next month, typically with an unsuccessful quit attempt in the past year); *action* (successful change of behavior within the last six months); and *maintenance* (behavior has been successfully changed for at least six months, now working to prevent relapse); (Prochaska, 1994). Several studies have shown support for the progression through these five stages of change in relation to smoking (DiClemente, Prochaska, Fairhurst, Velicer, Velasquez,

& Rossi, 1991; Prochaska, 1994; Prochaska, Velicer, DiClemente, & Fava, 1988). This model of health behavior change was initially exciting for researchers and clinicians, because it came with the assumption that a person's stage of change could be identified with regard to a targeted behavior, and then an intervention could be implemented more accurately and effectively (DiClemente et al., 1991; Dijkstra, De Vries, Roijackers, & van Breukelen, 1998; Weinstein et al., 1998). However, there has been conflicting evidence with regard to the effectiveness of matching interventions with a person's stage of change.

It has been found that interventions which are mismatched with regard to a person's stage of change in smoking behavior are equally and sometimes more effective than matched interventions (Dijkstra et al., 1998; Quinlan & McCaul, 2000). For example, Quinlan and McCaul (2000) found that in their sample of primarily young adult, light smokers (most averaging less that 10 cigarettes per day), intervention matching was not supported, and more smokers made quit attempts when administered mismatched interventions. Similarly, Dijkstra et al., (1998) compared smokers based on readiness to quit and found that for smokers low in readiness to quit stage-matched interventions were not more effective that mismatched interventions. Only those smokers high in readiness to quit demonstrated the need for stage-matched interventions, and that persons in the precontemplation stage may derive just as much benefit from information about smoking cessation programs as those in the preparation stage (Dijkstra et al., 1998). Thus, the benefits of stage-matched interventions may not be as promising as hoped and clinicians need to be more creative in the design of smoking cessation programs, especially when working with young adults and light smokers.

Previous studies on light smokers have shown that this particular group may be less

committed to smoking behavior due to their typically brief smoking histories, and thus, they may be able to advance through the stages of change more easily and quickly than heavier smokers (Rose, Chassin, Presson, & Sherman, 1996). This would support the findings that smokers in the precontemplation stage can derive benefit from interventions typically targeted toward smokers who are ready to quit (Dijkstra et al., 1998). Other researchers who have taken a more creative approach to smoking cessation program development at the university level, have found that successful smoking cessation by young adults in college is best predicted by having supportive peers as facilitators of change (Ramsay & Hoffman, 2004). In their pilot study, Ramsay and Hoffman (2004) trained peer support facilitators of smoking cessation groups, and achieved a quit rate of 88.2%, with 63.3% of participants smoke free at follow-up. Rose et al. (1996) found that successful quitting for their sample of adolescent, light smokers was associated with fewer smoking friends and less social pressure from others to quit. These studies demonstrate that while knowing a persons self-perceived stage of change with regard to smoking cessation is helpful, there is still much to be learned about the smoking cessation needs of the group with the highest rates of increased smoking, young adults.

Shiffman (1996) has noted the need to also take into account a person's level of nicotine dependence along with their stage of change when designing smoking cessations programs, because the severity of their nicotine addiction should moderate their success at quitting. He also notes that intent to quit should be the most important for heavier, more dependent smokers; because the lighter, less dependent smokers can presumably quit without much motivation. However, this is inconsistent with actual quit rates of young adult smokers. Though they are typically lighter smokers and less nicotine dependent, the perceived social desirability of

smoking in the social context often maintains their smoking behavior, making it more difficult to quit over time (Moran et al., 2004).

Conclusions.

Social smokers have been identified as being in the precontemplation stage of smoking cessation, and due to their light cigarette use which occurs only in social contexts, they may report that they do not even consider themselves as smokers (Moran et al., 2004). Also, because social smokers may experience fewer withdrawal symptoms due to low levels of nicotine dependence, they may be less likely to make quit attempts. Thus, it becomes difficult to match smoking intervention to stages of change for this group without considering their level of nicotine dependence and self-perceptions of smoking behaviors. A non-nicotine dependent smoker in the pre-contemplation stage must be considered qualitatively different than the nicotine dependent smoker in the same stage. Because only recently have smoking cessation programs have been targeted at young adults, few results are available on the reduction in the rates of smoking by this group. The identification of a new group of smokers, (social smokers), has important implications in providing the public, especially young adults, with information about the adverse health effects of social smoking, which may be perceived by this group as less detrimental physiologically. Also, current methods in use for smoking cessation may not be appropriate for social smokers, since they have been designed for smokers with daily cigarette use. For example, the nicotine replacement patch, which delivers a steady amount of nicotine into the body on a daily basis, would provide the social smoker with more than their usual amount of nicotine exposure. Therefore, it is important that research be conducted on social smokers to identify biopsychosocial aspects of their smoking-related behaviors, since studies of

the social smoker will lead to more effective targeting of nicotine education and smoking cessation programs for young adults and those who see occasional cigarette use as acceptable.

Present Study

Purpose

The purpose of the present study was to further contribute to the description of social smokers. Only current smokers were considered as such for this study and were defined as those who have "used cigarettes in the past 30 days" as opposed to persons who have "never used," or "used but not in the past 30 days." For the purpose of this study, social smokers were defined as those persons who report that they have smoked "mainly with others," rather than "mainly when alone," or "as often by yourself as with others," in the past 30 days. These were the criteria used by Moran et al. (2004) to operationally define social smokers in their study. Non-smokers were used to serve as a control group, and were defined as persons who have "never used" cigarettes, or have "used but not in the past 30 days" to allow for former smoker participation. The study conducted by Moran et al. (2004) provided important demographic information on social smokers. However, to date there have not been studies which describe differences in social smokers on other variables such as depression, anxiety, and stress which are popular areas of focus in the smoking literature. While many studies have shown a link between smoking and these psychological constructs, there are few studies which examine within-group differences in smokers. Therefore, the purpose of the present study is to replicate demographic differences found in smoker types found by Moran et al. (2004), and to highlight proposed differences in the levels of depression, anxiety, social anxiety, and stress experienced by social smokers in contrast to regular smokers and nonsmokers. This research will contribute to a more detailed description

of this population of smokers.

Hypotheses

Analyses in this study were conducted both to serve as a replication of demographic variables examined by Moran et al. (2004), and to further contribute to the knowledge base by investigating the levels of cigarette dependence, addiction, smoking frequency, perceived health threat of light smoking, readiness to quit, depression, anxiety, social anxiety, and stress experienced by different smokers and nonsmokers. It is initially hypothesized that social smokers, as operationally defined, would significantly differ from regular daily smokers and nonsmokers in their overall level of cigarette dependence and the frequency of their smoking. Their level of dependence was assumed to be more similar to ratings of cigarette dependence endorsed by nonsmokers, and their cigarette use as occasional rather than daily. It was also hypothesized that there would be an overall significant difference between each of the three categories of smokers as defined in this study as: nonsmokers, social smokers, and regular smokers on the combined mood measures and level of cigarette dependence. More specifically, it was hypothesized that on the individual measures of depression, anxiety, and stress the order of prevalence of these moods would significantly increase with intensity of smoking from nonsmoker, to social smoker, and finally ending with regular smokers reporting the highest significant degree of mood disturbance. On the measure of social anxiety, however, it was proposed that social smokers would endorse significantly higher rates of social anxiety than regular smokers, with nonsmokers reporting the least amount. These hypotheses were informed by the reviewed literature and are consistent with a causal relationship of the proposed relationship between smoking and mood states. This study, however, did not seek to determine

the direction of the causal relationship between the two variables.

In an effort to present a more detailed picture of cigarette dependence in the literature, cigarette dependence was measured with the 12-item Cigarette Dependence Scale which is a relative newcomer to the research scene (Etter et al., 2003). It was hypothesized that results would be similar to those reported by Moran et al. (2004) in that cigarette dependence would increase with frequency of smoking (occasional versus daily), leading to lower levels of dependency observed in the social smokers. Also, it was hypothesized that regular smokers would report the highest subjective rating of cigarette addiction on the dependence scale and greater perceived difficulty of quitting. Analysis of participant's current perceptions of their stage of change for smoking cessation was assessed by the initial demographic questionnaire and was theorized to show that social smokers would be aggregated in the pre-contemplation phase while regular smokers were expected to be more varied in their response. It was believed that when responding about perceived health threat of light smoking, social and regular smokers would endorse light smoking as not at all or somewhat harmful to one's health; and that nonsmokers, in contrast, would report light smoking as very harmful to a person's health. Demographic replication of smoker type intercepted by gender, age, college status, ethnicity, and level of parental educational attainment are exploratory and not necessarily hypothesized to show significant differences between groups due to lack of heterogeneity in the population being sampled on these variables (see Table 1).

Method

Participants

The sample consisted of young adult college students, aged 18 to 25. The students' demographic characteristics as well as smoker type (nonsmoker, regular smoker, or social smoker) were assessed by a brief questionnaire. These demographics included: gender; age; year in college; ethnicity; and level of parental education (estimator of socioeconomic status). Other important variables assessed by the questionnaire included: assessment of smoking behavior; social context of smoking; smoking frequency; stage of change in relation to smoking behavior; and perceived health threat of light smoking. A copy of the Smoking Behavior Questionnaire is included in Appendix A.

Cigarette Dependence

Cigarette dependence was assessed with the Cigarette Dependence 12-item scale (CDS-12; Etter et al., 2003). This scale covers the main components of DSM-IV and ICD-10 criteria for dependence, except for tolerance. Internal consistency for the CDS-12 is Cronbach's alpha > 0.84. The test-retest correlations ranged from moderate to strong for all items, and were greater than 0.83. A copy of the CDS-12 is included in Appendix B.

Depression

Depressive symptomatology was assessed with the Center for Epidemiological Studies-Depressed Mood Scale (CES-D; Radloff, 1977). The CES-D is a 20-item scale which has very good internal consistency with alphas of about 0.85 for the general population, and 0.90 for the psychiatric population. Test-retest reliability is $r = 0.57$ for 2 to 8 weeks and the scores have been shown to correlated with clinical rations of depression severity. Split-half and Spearman-

Brown reliability coefficients range from 0.77 to 0.92. The CES-D also has excellent concurrent validity. A copy of the CES-D is included in Appendix C.

Anxiety

Anxiety was measured with the Clinical Anxiety Scale (CAS), which is a 25-item scale that assesses the degree of clinical anxiety through self-report (Hudson, 1992). The CAS has excellent internal consistency with a coefficient alpha of 0.94. The CAS is reported to not be affected by demographic variables such as age, gender, and level of education. A copy of the CAS is included in Appendix D.

Social Anxiety

Social anxiety was assessed on a separate measure from the CAS to determine if there is a significant difference in the general level of anxiety and level of social anxiety experienced by various groups of smokers. The 30-item Fear of Negative Evaluation scale will be used to measure social anxiety, or the fear of the loss of social approval (Watson & Friend, 1969). Internal consistency using the Kuder-Richardson formula 20 was excellent, with a correlation of 0.94 for college students. A copy of the Fear of Negative Evaluation scale is included in Appendix E.

Stress

Perceived level of stress was measured by the Index of Clinical Stress (ICS; Abell, 1991). This 25-item scale was created to measure subjective perceptions associated with degree of experienced stress. The ICS has excellent internal consistency with an alpha of 0.96. Also, it is reported to have fair beginning construct validity. A copy of the ICS is included in Appendix F.

Procedure

This study was advertised to students enrolled in psychology classes at a Mid-Atlantic University. Students who participated received extra credit in their courses. The study was marketed as a study of tobacco use and mood in young adults, with specific mention of the need for tobacco as well as non-tobacco users. Data collection occurred during the 2006-2007 academic year, and terminated upon collection of a minimum of 50 participants in each category of smoker (non, social, and regular). Each data collection session was less than 1 hour in duration.

The informed consent was anonymous, and all present persons were given a participant packet. Those in attendance were instructed to not complete the surveys if they did not wish to participate, and to return their packets at the completion of data collection along with other students. Participants were informed that the purpose of the study was to gather information on types of smokers that might exist in the population, and correlates between smoking and mood. Measures were organized into participant packets, and the sequence of instruments, as presented to the participants, was varied to minimize any order effects. The packets of measures were distributed randomly on each occasion of data collection. Participants were instructed to mark "N/A" beside questions which they felt were non-applicable to them based on their smoking status where appropriate. Individual psychology instructors were responsible for assigning extra credit to students that participated.

Data Analysis

The collected data was analyzed using the Statistical Package for Social Sciences Software (SPSS). There were three separate analyses conducted. The first analysis sought to

differentiate social smokers as less dependent smokers, who typically smoke alone and on a more occasional, infrequent basis when compared with regular, dependent, daily smokers who smoke frequently alone as well as with others. This analysis served to separate the social smokers from the regular smokers on the variables which comprise the stereotypical behaviors associated with these subtypes and operationally define these smoker types for the purposes of this particular study. The second analysis sought to replicate demographic differences found in smoker subtypes by Moran et al. (2004). Also there were other comparison analyses conducted to examine group differences on other categorical variables important for expanding comprehension of these subtypes. And finally, the third analysis served to further contribute to the literature by identifying statistically significant differences in smoker subtypes on measures of mood constructs.

Analysis One

The first analysis consisted of a Multivariate Analysis of Variance (MANOVA) which served to differentiate the two smoker subtypes (social and regular) on dependent variables which comprise the stereotypical behaviors associated with these subtypes and operationally define these smoker types for the purposes of this particular study. Therefore, the independent variable was smoker type, and the dependent variables included cigarette dependency as measured by the CDS-12 and smoking frequency (as measured by the number of days of cigarette use in the past 30 days). Occasional smoking was operationally defined as smoking on greater than 1 but less than 30 days of the past month, as compared to daily smoking. Non-smokers were defined as persons who have never smoked or have not smoked in the past 30 days, allowing for participation of former smokers.

Analysis Two

The purpose of the second analysis was to replicate demographic differences found in social smokers in previous literature (Moran et al., 2004) and to examine group differences on other categorical variables important for expanding comprehension of these subtypes. The analysis consisted of a series of chi-square tests of independence which compared the categorical variable of smoker type to the other categorical demographic variables. Individual demographic variables compared with smoker type include: gender; age (18-24 yrs or 25 and older); year in college (freshman, sophomore, junior, senior, or graduate student); ethnicity (Caucasian, African American, Hispanic, Asian, or other); and level of parental education (some high school, diploma/GED, or college degree). Other important variables assessed by the questionnaire were compared individually with smoker type through chi-square analyses, as well, and included the variables of: smoking behavior (never used, used but not in the past 30 days, or used in the past 30 days); stage of change in relation to smoking behavior (precontemplation, contemplation, or preparation); perceived health threat of light smoking; and ease of quitting smoking. In addition, an Univariate Analysis of Variance (ANOVA) was conducted to examine differences in smoker type on the continuous variable of perceived addiction to smoking which was rated on the Cigarette Dependence Scale-12 (range = 0 to 100). Stage of change was assessed by the initial questionnaire and smokers were asked to decide if they were: 1) "not planning to quit in the next 6 months;" 2) "planning to quit in the next 6 months, but not the next 30 days;" or 3) "planning to quit in the next 30 days and have made a successful 24-hr quit attempt in the past year." They could also endorse the question as non-applicable to them based on their smoking status. Perceived health threat of light smoking was measured by the initial questionnaire and smokers

were asked to endorse if this type of smoking was "very harmful to one's health," "somewhat harmful to one's health," or "not at all harmful to one's health." Ease of quitting was assessed by the Cigarette Dependence Scale-12, respondents were asked to rate their perception of personal ease of quitting on a Likert-type rating which ranged from 1 to 5, from "very easy" to "impossible." Again, based on smoking status participants did endorse this item as "N/A" when appropriate.

Analysis Three

The third analysis served to further contribute to the literature by identifying statistically significant differences in smoker subtypes on measures of mood constructs and cigarette dependency. This analysis consisted of a MANOVA in which smoker type was the independent variable. The dependent variables included: the measure of cigarette dependency, CDS-12; and the mood measures for depression (CES-D), anxiety (CAS), social anxiety (FNE), and stress (ICS).

Results

Sample Demographics

A total of 183 students from introductory psychology courses at a Mid-Atlantic University participated in this study. Among the respondents 54% were female and 75% were between the ages of 18 to 21 years. The number of participants declined with increasing seniority in regard to college status with 40% freshmen, 27% sophomores, 18% juniors, 12% seniors, and 3% in graduate or professional school. The ethnicity of the sample was fairly homogeneous with participants endorsing their background as 85% Caucasian, 7% African American, 4% Asian, 2% Hispanic, and 2% Other. Parental education attainment of the

participants was assessed to serve as an approximation of socioeconomic status and 47% reported their parents as having earned a college degree, 46% a diploma or GED, and 7% as having completed some high school. Smoking status in the sample was as follows: 45% non-smokers, 28% regular smokers, and 27% social smokers (see Table 2).

Hypothesis One

The first hypothesis stated that social smokers, as operationally defined, would significantly differ from regular daily smokers and nonsmokers in their overall level of cigarette dependence and the frequency of their smoking. A Multivariate Analysis of Variance (MANOVA) was conducted to differentiate the two smoker subtypes (social and regular) on dependent variables which comprise the stereotypical behaviors associated with these subtypes and operationally define these smoker types for the purposes of this particular study. The results indicated that there is a significant difference amongst smoking types (non, social, and regular) on measures of cigarette dependency and smoking frequency ($F = 151.446$; $df = 2$; $p < 0.001$). Post-hoc analyses show that social smokers are very similar to non-smokers on these measures, and both groups are significantly different from regular smokers in their endorsements (see Table 3).

Hypothesis Two

The second hypothesis postulated that there would be a significant relationship found between smoker type and smoking behavior. This hypothesis was tested in the second analysis which served to examine group differences on categorical variables that have previously been found to show positive relationship with smoking subtype (Moran et al., 2004). The analysis consisted of a chi-square test of independence which compared the categorical variable of

smoker type to the categorical variable of smoking behavior (see Table 2). A significant relation did emerge between smoker type and smoking behavior (never smoked; smoked, but not in the past 30 days; and smoked in the past 30 days) (X^2 (4, N = 183) = 183.00, $p < 0.001$). Of the non-smoker participants, 28% endorse having smoked at some point previously, suggesting that some respondents are former smokers. In comparison, all of the smokers, socials and regulars, had smoked in the past 30 days.

Hypothesis Three

The third hypothesis proposed the existence of a significant relationship between smoker type and stage of change for smoking cessation, which examines need and readiness to quit. This hypothesis was also tested in the second analysis which served to examine group differences on categorical variables that are important for expanding comprehension of smoking subtypes (Moran et al., 2004). This analysis consisted of a chi-square test of independence which compared the categorical variable of smoker type to the categorical variable of stage of change for smoking cessation (see Table 2). A significant relationship between smoker type and stage of change for smoking cessation did emerge (X^2 (3, N = 183) = 32.514, $p < 0.001$). Participants were given the option to mark "N/A" if they felt that this question did not apply to them. Social smokers were more likely to mark that the question did not apply to them than endorse a specific stage of change (46% marked "N/A"). Those social smokers who did endorse a stage were more likely to say they were in the next 30 days: preparing to quit (24%); contemplating quitting (16%); or not thinking about making a quit attempt (14%). Regular smokers were more likely to report that in the next 30 days they were: not thinking about making a quit attempt (43%); preparing to quit (31%); or contemplating quitting (25%). Of the

nonsmoking participants, 27% endorsed themselves as being in the maintenance phase of quitting which suggest that these respondents are former smokers.

Hypothesis Four

The fourth hypothesis posited that there would be a significant relationship between smoker type and perceived ease of smoking cessation. Again, this hypothesis was tested in the second analysis which served to examine group differences on categorical variables and consisted of a chi-square test of independence which compared the categorical variable of smoker type to the categorical variable of perceived ease of smoking cessation (see Table 2). When responding to the likert-type question about how easy it would be for the individual to quit smoking, the participants were again given the option of marking "N/A" if the question did not apply to them. There was a significant relationship found between smoker type and their response to perceived ease of quitting (X^2 (5, N = 183) = 60.179, $p < 0.001$). Social smokers were more likely to report that quitting would be "very easy" (56%) or that the question did not apply to them (30%). Regular smokers were more likely to endorse that quitting smoking would be "very difficult" (37%) or "fairly difficult" (29%).

Hypothesis Five

The fifth hypothesis stated that there would be a significant relationship found between smoker type and perceived health threat of light smoking. This hypothesis was also tested in the second analysis which served to examine group differences on categorical variables that are important for expanding comprehension of smoking subtypes (Moran et al., 2004). This analysis consisted of a chi-square test of independence which compared the categorical variable of smoker type to the categorical variable of perceived health threat of light smoking (see Table 2).

A significant relationship was found between smoker type and perceived health threat of light smoking (X^2 (4, N = 183) = 52.099, $p < 0.001$). Nonsmokers were more likely to endorse light smoking as "very harmful" (83%); social smokers were more likely to report light smoking as being "somewhat harmful" (66%); and regular smokers were almost equally likely to perceive light smoking as being either "somewhat harmful" (47%) or "very harmful" (41%) to one's health. Very few respondents from any group endorsed light smoking as not at all harmful to one's health (8%).

Hypothesis Six

The sixth hypothesis postulated that there would be a significant difference observed between smoking types on self-rated addiction. To examine the within group differences of smoker type and self-report of cigarette addiction a Univariate Analysis of Variance (ANOVA) was conducted (see Table 3). A significant difference was found between group ratings of overall addiction ($F = 230.976$; $df = 2$; $p < 0.001$). Post-hoc analyses revealed that social smokers rated their cigarette addiction at levels similar to those reported by nonsmokers, and regular smokers perceived cigarette addiction was significantly higher than reported by the other groups. On a scale of 0-100 (100 being the highest level of subjective addiction) nonsmokers feelings of addiction were rated at a zero average ($M = 0.08$, $SD = 0.67$), while social smokers addiction ratings averaged 6.76 ($M = 6.76$, $SD = 14.46$), a non-significant difference ($p > 0.05$). Regular smokers, comparatively, endorsed a subjective rating of 67.86 ($M = 67.86$, $SD = 32.03$) of addiction to cigarettes, a rate that is significantly different than reported by non and social smokers ($p < 0.001$).

Hypothesis Seven

Hypotheses seven proposed the existence of a significant relationship between smoking types on measures of cigarette dependency, depression, stress, anxiety, and social anxiety. A Multivariate Analysis of Variance (MANOVA), which served to further contribute to the literature by identifying statistically significant differences in smoker subtypes on measures of mood constructs and cigarette dependency, was conducted (see Table 3). The results indicate that there is a significant difference amongst smoking types (non, social, and regular) on measures of cigarette dependency, depression, anxiety, social anxiety, and stress ($F = 37.785$; $df = 2$; $p < 0.001$). Specifically, post-hoc analyses show that significant differences exist amongst groups of smokers on measures of cigarette dependency, depression, and anxiety. Significant differences were not found amongst the groups on measures of stress and social anxiety.

Hypothesis Eight

Hypotheses eight stated that on the individual measures of depression, anxiety, and stress the order of prevalence of these moods would significantly increase with intensity of smoking. A Multivariate Analysis of Variance (MANOVA) was conducted to identify statistically significant differences in smoker subtypes on measures of these mood constructs in the third analysis (see Table 3). The results indicate that there is a significant difference amongst smoking types (non, social, and regular) on measures of depression, anxiety, and stress ($F = 37.785$; $df = 2$; $p < 0.001$). Post-hoc analyses show that social smokers are very similar to non-smokers on measures of cigarette dependency, depression, and anxiety, with both groups being significantly lower than regular smokers in their endorsements. There were not significant differences found amongst the groups on the measures of stress and social anxiety. Overall, the

results do not suggest a stepwise progression of mood disturbance with increased intensity of smoking.

Hypothesis Nine

Hypothesis nine proposed that social smokers would endorse significantly higher rates of social anxiety than other smoking types. However, this hypothesis was not supported as significant differences were not observed amongst the groups on the measure of social anxiety ($F = 2.436$; $df = 2$; $p > 0.05$). In fact, social smokers endorsed lower levels of social anxiety on average ($M = 27.98$) than non-smokers ($M = 32.45$) and regular smokers ($M = 32.27$), with non-smokers actually endorsing the highest degree of fear of negative evaluation.

Additional Analyses

Though particular relationships were not postulated, chi-square tests of independence were also performed to explore the existence of possible relationships between smoker subtype and demographic variables of gender, age, college status, ethnicity, and level of parental educational attainment. On the variable of gender there was a significant difference found amongst groups, (X^2 (2, N = 183) = 8.76, $p < 0.015$), with females more likely to be non-smokers than social or regular smokers. Males were fairly evenly distributed amongst the three groups. In relation to the participants age social smokers were more likely to be 18 to 21 years of age and regular smokers made up a great portion of the 22 to 25 age grouping, (X^2 (2, N = 183) = 15.473, $p < 0.001$). The proportion of nonsmokers was shown to decrease with age. In regard to college status, there was not a significant relationship between smoking subtypes and college year (X^2 (8, N = 183) = 15.326, $p > 0.05$). Also, there were no significant relationships found between ethnicity and smoking type (X^2 (8, N = 183) = 3.296, $p > 0.05$), or parental educational

attainment and smoking type (X^2 (4, N = 183) = 2.937, $p > 0.05$). The majority of the sample as a whole was Caucasian and had parents with a high school diploma or college degree.

Discussion

Traditionally, studies have highlighted the differences between smokers and non-smokers, but often have failed to distinguish various subtypes of smokers. This is apparently the first examination of psychological differences between social and regular smokers.

As initially hypothesized, social smokers, were significantly different from regular, daily smokers in their overall level of cigarette dependence and in the frequency of their smoking and were remarkably similar to nonsmokers in their ratings of dependency. Social smokers do not appear to feel the physiological and psychological drive to smoke cigarettes that motivates regular smokers. Also, as predicted, social smokers endorse their cigarette use as being occasional rather than daily, with the average social smoker smoking 8 days per month compared to 25 days per month endorsed by regular, more dependent smokers. This data is consistent with previous studies on social smoking patterns (Moran et al., 2004; Waters et al., 2006).

The ability to go long periods without engaging in smoking behavior is a unique characteristic also found in previous studies that have included this sub-grouping and makes the social smoker qualitatively different than the tobacco chippers defined by Shiffman et al. (1994). Tobacco chippers smoke at a rate that is almost double the average smoking frequency endorsed by social smokers in the present and previous studies (Moran et al., 2004; Shiffman, 1994). Tobacco chippers have also been shown to vary in their degree of response to social cues. This research supports previous studies which clearly show that social smokers primarily engage in cigarette use in response to social cues, hence the label (Moran et al., 2004).

Demographic data and other important traits of smokers were analyzed and compared to the findings of the Moran et al. (2004) study on social smoking amongst U.S. college students. In the present investigation, half of the respondents who endorsed current smoking also identified themselves as social smokers, which is consistent with the 51% rate reported by Moran et al. (2004). Waters et al. (2006) reported a 70% incidence of social smoking in their sample. The present study found no significant relationships between smoking status and college year, level of parental educational attainment, and ethnicity. Approximately one half of the participants endorsed having parents who earned a college degree, and very few reported having parents without high school diplomas, suggesting that the student population sampled may represent a more affluent group of young adults than might typically be found in the general population in Appalachia. It should also be noted that the population of this particular university and the Appalachian area in general is primarily Caucasian with minimal racial diversity. While there have been differences in the occasional use and tendency toward social smoking reported by young adult African-Americans in other studies, there was little availability of these participants for examination by this researcher (Moran et al., 2004; Waters et al., 2006).

Associations were found between smoking status and both age and gender. Consistent with findings presented in earlier research, younger college students were more likely to report a pattern of social smoking than older students. In 18-21 year old respondents there were proportionately twice as many social smokers than in the 22-25 year old group who were over three times more likely to engage in a regular smoking pattern instead. While the full history of the respondents' smoking behaviors was not assessed in this study, this finding is consistent with (Moran et al., 2004; Waters et al., 2006) who found that social smoking may be the precursor to

more regular uptake of cigarette use.

In regard to gender, data showed that there was a significant relationship between smoking status and sex as the majority of females sampled were nonsmokers. Overall, there was a greater of percentage of female than male nonsmoker participants in this study, 54% and 33.7% respectively. Males were more likely to endorse themselves as being a social smoker than females, and there was a fairly even representation of the genders amongst regularly smoking participants. Significant gender differences have not been found in previous studies presented in the literature to suggest that young men are more likely to engage in social smoking than young women.

Previous researchers have also identified significant relationships between social smoking and variables such as occasional cigarette use, lower level of nicotine dependence, and lower stage of change in relation to quitting which were supported by this examination. In the current study social smokers were found to be significantly different on these particular variables as compared to regular smokers, and in fact made endorsements that are more similar to reports from nonsmokers. The present results indicate that social smokers experience levels of cigarette addiction that are minimally higher than those encountered in nonsmokers and much lower than those experienced by regular smokers. Motivation for smoking was not addressed by study, but clearly subjective feelings of addiction and dependency are not the source of smoking maintenance for social smokers. The minimal endorsement of subjective feelings of addiction in social smokers is not surprising given that the data in the present study also show that when social smokers are asked to evaluate their readiness to quit smoking they are more likely to respond “n/a” indicating that the need to quit smoking does not apply to them. In this

investigation almost half all social smoking respondents endorsed "n/a" when asked about smoking cessation goals and another 14% indicated that they are not contemplating quitting in the foreseeable future. The remaining 40% of social smoking respondents indicated that they are either contemplating or preparing to quit smoking in the next 30 days. In contrast, none of the regular smokers denied the personal relevance of the smoking cessation question, and were more likely to say that they are either not contemplating quitting soon or are preparing to quit now.

Given that there appears to be a sense among college students that social smokers are not "real smokers," a notion supported by previous literature examining this population, it would be interesting to explore the motivation for these smokers to quit and the ideology that leads to their successful attempts. Interestingly, previous studies have indicated that smokers with lighter cigarette use and those who report feeling less dependent on cigarettes are the persons that have the most interest in and greatest success with quitting. However, investigations which have isolated social smokers typically report a general lack of interest in smoking cessation (Moran et al., 2004; Waters et al., 2006). In the present study, further data which supports the notion of social smokers perceiving themselves as a sub-grouping of nonsmokers rather than smokers became evident when ease of quitting smoking was assessed in the present study. On a likert-type question the majority of social smokers reported that quitting would be "very easy" if they were to do so, but again approximately one-third of this group endorsed that the question did not apply to them. This is consistent with reports from earlier studies which suggest that social smokers are more confident in their ability to quit (Waters et al., 2006). The majority of regular smokers, in comparison, endorsed the ease of quitting to most likely be "very difficult" or "fairly difficult" for them. In examining perceived health risks of light smoking, it was found that

nonsmokers and regular smokers were more likely to perceive this behavior as a serious health threat in comparison to social smokers who typically endorsed the behavior as minimally harmful. Therefore, social smokers are not falling into the previously conceived notions held by the medical community of who is best-suited or most prepared for kicking the habit. Specially designed quit campaigns will have to be developed to market to a population of young adults who do not see themselves as being smokers or as addicted to cigarette use, and who do not recognize the deleterious health effects from light smoking. More traditional methods of smoking cessation are not likely to work for this population. They may especially refrain from cessation that involves commitment to a daily patch or medication to treat a habit that is not daily.

Other important factors that have previously been assessed as predictors of smoking behavior and cessation include mood related indicators of depression, anxiety, and stress. This particular study also examined participants' ratings of social anxiety, or fear of negative evaluation, to explore the possibility of an association between these specific anxiety-based feelings and smoking status. Significant differences were not found between smoker types on their endorsement of clinical stress and fear of negative evaluation. The lack of a finding in the field of social anxiety was quite surprising. It had been originally hypothesized that a greater level of social anxiety might exist in the population of social smokers, leading them to engage in smoking in the social setting to reduce feelings of nervousness. Social anxiety was not hypothesized to be as great of an impetus for cigarette use in regular smokers as they smoke in a variety of settings while alone as well. However, social smokers actually had the lowest level of social anxiety endorsed compared to nonsmokers and regular smokers who endorsed equal

concern with of fear of negative evaluation. Another discrepancy in these particular findings is the lack of significant differences between smoker types and level of perceived stress. Previous researchers have found a plethora of evidence which indicates that level of stress is said to increase with smoking frequency and amount. Parrot takes the position that cigarette use may indeed cause stress (Parrott, 1999; Parrott, 2000). One possible explanation for the discrepant nature of the current results is the fact that the college student population may experience a higher number of stressors, in comparison to the general population, which may make it harder to differentiate stress that is smoking related or smoking behaviors that are maintained by perceived stress.

Significant differences were found between smoker types on measures of depression and general clinical anxiety. On both measures of mood, social smokers endorsed levels of dysthymia and anxiety similar to those reported by nonsmokers. The levels of depression and generalized anxiety reported by both the nonsmokers and social smokers were significantly less than those endorsed by regular smokers. This is somewhat surprising given that previous studies have suggested that there is a positive relationship between depression and anxiety with smoking amount and frequency. Researchers have commonly cited the reduction in these symptoms following smoking cessation as further evidence of the relationship. However, social smokers appear to not experience any greater amount of depression or anxiety than nonsmokers. There was minimal to no variation in the averages of these two groups on both variables. This evidence would seem to contradict findings that cigarette use alone is responsible for induction of greater feelings of depression and anxiety.

There are a number of limitations to this particular study. One issue is that the

experimental design failed to consider or account for the participation of former smokers in the nonsmoking population sampled. Therefore, it is unknown what effects, if any, the representation of those who were successful at quitting had on the results. Previous research does indicate that former smokers shortly return to similar levels of dependency, depression, anxiety, and stress as those persons who have never smoked. Thus, it is the assumption that these results would have been minimally affected if at all. The prevalence of former smoker participation in this study accounted for approximately one-tenth of the total sample and approximately a quarter of the nonsmoking respondents. Future researchers may wish to consider former smokers separately from those who have never smoked. Another limitation of the present study is the lack of ethnic variation represented in the sampled population. It is important to note, however, that the respondents attend a Mid-Atlantic University located in Appalachia where the majority of the student population primarily hails from primarily Caucasian, isolated, rural areas. Thus, this setting does not naturally lend itself to much racial diversity. The absence of a significant relationship between ethnicity and smoker type is not surprising, but cannot be used as conclusive evidence of a true lack of relationship between these variables in the general population.

The literature appears to be establishing the notion that social smokers are indeed a subtype of smokers that are significantly different from the general, daily smoking population and are worthy of further clinical consideration. However, there is much work to be done to further explore the differences in this subpopulation, as well as the modifications needed in the current models of psychoeducation, prevention and intervention for these individuals. Medical research is clear that light and occasional smoking is detrimental to a person's health (Prescott et

al., 2002; Rosengren et al., 1992). Further research is needed to examine the motivation or rationale for smoking that is endorsed by social smokers, as well as the factors which maintain their cigarette use. Also, more information is needed about the uptake of social smoking and the stability of this particular pattern across the lifetime. It is unknown if social smoking behavior is simply a precursor to increased smoking later in life. Finally, increased knowledge of social smoking should be used to explore more appropriate means of smoking cessation for smokers who do not experience addiction or identify themselves as smokers. It has been shown that those who smoke for a short period of time, engage in light cigarette use, and have no disease at cessation reap the greatest long-term health benefits (U.S. Department of Health and Human Services, 1990). However, as few as 1 to 4 cigarettes per day has been shown to raise the risk of heart disease by 300%, and increase lung cancer risk 3 to 5 times (Prescott et al., 2002; Rosengren et al., 1992). It is extremely important that we begin to educate young adults, especially those on college campuses, that even very limited tobacco consumption has detrimental health effects.

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Table 1

Hypotheses

1) Social smokers, as operationally defined, will significantly differ from regular daily smokers and nonsmokers in their overall level of cigarette dependence and the frequency of their smoking.
2) There will be a significant relationship between smoker type and smoking behavior.
3) There will be a significant relationship between smoker type and stage of change for smoking cessation.
4) There will be a significant relationship between smoker type and the perceived ease of smoking cessation.
5) There will be a significant relationship between smoker type and perceived health threat of light smoking.
6) There will be a significant difference between smoking types on self-rated addiction.
7) There will be a significant difference between smoking types on measures of cigarette dependency, depression, stress, anxiety, and social anxiety.
8) On the individual measures of depression, anxiety, and stress the order of prevalence of these moods will significantly increase with intensity of smoking.
9) Social smokers will endorse significantly higher rates of social anxiety than other smoking types.

Table 2

Demographic Questionnaire Responses by Smoker Type

	Non-smokers n = 82 %	Social Smokers n = 50 %	Regular Smokers n = 51 %
Gender*			
Female	65.85	40.00	50.98
Male	34.15	60.00	49.02
Age**			
18-21	80.49	86.00	54.90
22-25	19.51	14.00	45.10
College Year			
Freshman	50.00	38.00	27.45
Sophomore	20.73	34.00	29.41
Junior	19.51	18.00	15.69
Senior	7.31	10.00	21.57
Grad/Prof.	2.45	0.00	5.88
Ethnicity			
Caucasian	84.15	86.00	86.27
African-Am.	6.10	8.00	5.88
Asian	4.89	2.00	5.88
Hispanic	3.65	2.00	0.00
Other	1.21	2.00	1.97
Parents Ed.			
Some High S.	4.88	8.00	7.85
Diploma/GED	51.22	48.00	37.25
College Deg	43.90	44.00	54.90

*: $p < 0.05$ for variables x smoker type on chi-square tests of independence

**: $p < 0.001$ for variables x smoker type on chi-square tests of independence

Table 2 (continued)

Demographic Questionnaire Responses by Smoker Type

	Non-smokers n = 82	Social Smokers n = 50	Regular Smokers n = 51
	%	%	%
Smoking Beh.**			
Never Smoked	71.95	0.00	0.00
Not in 30 days	28.05	0.00	0.00
In past 30 days	0.00	100.00	100.00
Stage of Change**			
N/A	100.00	46.00	0.00
Pre-Contemp.	0.00	14.00	43.14
Contemp.	0.00	16.00	25.49
Preparation	0.00	24.00	31.37
Action	0.00	0.00	0.00
Maintenance	28.05	0.00	0.00
Ease of Quitting**			
N/A	100.00	30.00	0.00
Very Easy	0.00	56.00	13.73
Fairly Easy	0.00	10.00	13.73
Fairly Difficult	0.00	2.00	29.41
Very Difficult	0.00	0.00	37.25
Impossible	0.00	2.00	5.88
Light Smoking**			
Very Harmful	82.93	22.00	41.18
Somewhat Harm.	14.63	66.00	47.06
Not at All Harm.	2.44	12.00	11.76

*: $p < 0.05$ for variables x smoker type on chi-square tests of independence

**: $p < 0.001$ for variables x smoker type on chi-square tests of independence

Table 3
Group Comparisons on Psychological Measures, Dependency, and Perceived Addiction

	Non-smokers *n* = 82		Social Smokers *n* = 50		Regular Smokers *n* = 51			
	M	SD	M	SD	M	SD	*F*	*p*
Measure								
Depression (CES-D)	12.84	10.56	14.76	8.63	20.65	11.38	9.20	.00*
Stress (ICS)	67.36	24.27	66.46	25.33	76.20	29.27	2.30	.10
Anxiety (CAS)	41.57	10.32	41.38	9.43	54.55	18.68	18.53	.00*
Social Anxiety (FNE)	32.45	12.59	27.98	12.29	32.27	10.79	2.44	.09
Cigarette Dependence	8.51	3.58	19.24	20.41	114.92	45.99	275.13	.00*
Perceived Addiction	0.08	0.67	6.76	14.46	67.86	32.03	230.98	.00*

*: The mean difference is significant at the $p < 0.001$ level

APPENDIX A

Smoking Behavior Questionnaire

***Please read questions carefully, and choose the answer that best describes you.*

Demographics

Gender
□ Female
□ Male

Current Age
□ 18-21 years
□ 22-25 years

Ethnicity
□ Caucasian
□ African American
□ Asian
□ Hispanic
□ Other

Current College Status
□ Freshman
□ Sophomore
□ Junior
□ Senior
□ Graduate/Professional Student

Parents Education Level
□ Some High School
□ Diploma/GED
□ College Degree

Smoking Behavior

I have:

□ Never smoked
□ Have smoked, but not in the past 30 days
□ Have smoked in the past 30 days

I typically smoke:

□ Mainly Alone
□ Mainly with Others
□ Alone as well as with Others

In the last 30 days I have smoked on:

□ 1-7 days
□ 8-14 days
□ 15-21 days
□ Everyday

In relation to smoking, I am currently:

□ Not planning to quit in the next 6 months
□ Planning to quit in the next 6 months, but not the next 30 days
□ Planning to quit in the next 30 days, and have made a successful 24 hr quit attempt in the past year

I feel that light smoking is:
□ Very harmful to my health
□ Somewhat harmful to my health
□ Not at all harmful to my health

APPENDIX B

Etter, J.F., Houezec, J.L, & Perneger, T.V. (2003). A self-administered questionnaire to measure dependence on cigarettes: The cigarette dependence scale. *Neuropsychopharmacology, 28*, 359-370.

APPENDIX C

Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.

APPENDIX D

Hudson, W.W. (1992). The WALMYR Assessment Scales scoring manual. Tempe, AZ: WALMYR Publishing Co.

APPENDIX E

Watson, D. & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448-457.

APPENDIX F

Abell, N. (1991). The Index of Clinical Stress: A brief measure of subjective stress for practice and research. *Social Work Research and Abstracts, 27,* 12-15.

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Master of Arts, General Psychology August 2003-May 2005
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PROFESSIONAL INVOLVEMENTS

Student Affiliate of American Psychological Association (since 2006)

PROFESSIONAL PRESENTATIONS AND RESEARCH

April 2004-April 2008
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Dissertation Chairperson: Keith Beard, Psy.D.
Committee Members: Thomas Ellis, Psy.D. & Christopher Legrow, Ph.D.
Dissertation Proposal: August 2006
Dissertation Defense: April 11, 2008

Saunders, S. (2008, April). *Autism and Asperger's Disorder: Signs and Treatment.* A seminar conducted for the Marshall University School of Medicine Department of Family Medicine in Huntington, West Virginia.

Saunders, S. (2008, March). *Psychosis, Primary Care, and Health Care Barriers.* A seminar conducted for the Marshall University School of Medicine Department of Behavioral Medicine in Huntington, West Virginia.

Saunders, S. (2008, January). *Clinical Health Psychology and Primary Care.* A seminar conducted for the staff of University Psychiatric Associates in Huntington, West Virginia.

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PROFESSIONAL EXPERIENCE

Supervised Psychologist, Pre-Doctoral Intern July 2007-Present
University Psychiatric Associates *Huntington, West Virginia*

Maintain psychotherapy caseload of children, adolescents, & adults; Consultation with medical staff; Conduct developmental, cognitive, and neuropsychological evaluations; Conduct suicide risk assessments; Maintain medical records; Work as a part of an integrative health care team; Present on special topics per request

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Maintain psychotherapy caseload of adolescents; Consultation with medical staff; Crisis management; Maintain clinical records

Supervisor: Pamela Mulder, Ph.D.

Psychological Trainee September 2006-May 2007
ABLE Families & Christian Help *Kermit, West Virginia*

Staff development presentations provided per request; Conduct community service

Supervisor: Marianna Linz, Ph.D.

Clinic Administrative Coordinator August 2006-May 2007
Marshall University Psychology Clinic *Fort Gay, West Virginia*

Maintain Marshall University Clinic files; Monitor student clinician caseloads; Conduct quality assurance audits; Maintain clinic equipment and assessment materials

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Marshall University Psychology Department *Huntington, West Virginia*

Taught Psychology 201 course for six semesters

Supervisor: Stephen Mewaldt, Ph.D.

Psychology Intern September 2005-August 2006
Ohio River Valley Juvenile Correctional Facility *Franklin Furnace, Ohio*

Maintain psychotherapy caseload of incarcerated adolescents; Conduct suicide risk assessments; Crisis management; Medication monitoring; Participate in multidisciplinary treatment teams; Conduct cognitive and socio-emotional evaluations per request

Supervisor: Joseph Carver, Ph.D.

Psychological Trainee August 2004-August 2005
Marshall University Psychology Clinic *Huntington, West Virginia*

Maintain psychotherapy caseload of children, adults, couples, and families; Conduct Adult cognitive and socio-emotional evaluations

Supervisors: Pamela Mulder, Ph.D., Keith Beard, Psy.D., & Marianna Linz, Ph.D.

Mental Health Consultant August 2004-August 2005
Wayne County Head Start *Huntington, West Virginia*

Monitor Head Start classes at Kenova & Ceredo Elementary Schools; Provide recommendations for treatment of mental health issues in pre-school children for teachers and parents

Supervisors: Marianna Linz, Ph.D.

Psy.D. Student Representative August 2004-May 2005
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Act as representative for post-bachelor's Psy.D. students; Sit on program development committees dedicated to training issues and APA accreditation