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Intermittent and Light Smoking Cessation in a Predominantly Hispanic College Sample

Natasha Kathleen Naylor
University of Texas at El Paso, nknaylor@miners.utep.edu

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PREDOMINANTLY HISPANIC COLLEGE SAMPLE

NATASHA KATHLEEN NAYLOR

Department of Psychology

APPROVED:

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Theodore V. Cooper, Ph.D., Chair

_____

Wendy Francis, Ph.D.

_____

Lawrence Cohn, Ph.D.

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Sharon E. Thompson, Ph.D.

_____

Patricia D. Witherspoon, Ph.D.
Dean of the Graduate School

Dedication

This thesis is dedicated to my mom for all her encouragement and support.

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by

NATASHA KATHLEEN NAYLOR, B.A.

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Abstract

Smoking is deleterious to one's health and is the leading cause of preventable death in the United States; no level of smoking has been found to be safe. Hispanic and college populations smoke at lower levels but for longer periods of time than non-Hispanic whites and are at risk of escalating their smoking. In this study the effect of a brief tailored intervention on quit status, smoking reduction, Transtheoretical measure change, as well as potential correlates of smoking cessation and reduction, were examined. Two hundred fifty participants completed questionnaires at baseline, 1-, and 3- month follow-ups. Questionnaires assessed: demographic information, smoking status, level of nicotine dependence, stage of change, and decisional balance. Descriptive analyses were used to assess participant characteristics, quit status, and reduction status. A test of marginal homogeneity assessed changes in smoking status, Friedman and Wilcoxon sign ranks tests assessed changes in Transtheoretical stages, and repeated measures analysis of variance assessed decisional balance over time. Logistic regression was used to assess predictors of quitting and reducing smoking. Participants demonstrated low levels of nicotine dependence and expired carbon monoxide. Fourteen percent of participants quit smoking at both time points, while 27% and 30% of participants reduced their smoking at the 1-month and the 3-month follow- ups respectively. Participants' smoking status changed in the anticipated direction at both follow-ups; however, participants did not move through the stages of change in the theorized direction from baseline to the 1- month follow-up, yet did so from baseline to the 3-month follow-up. Previous predictors of smoking cessation and reduction were not predictive of cessation or reduction in this sample. Pros and cons of smoking significantly decreased at both follow-ups. These findings suggest non- trivial rates of quitting and reduction, inconsistent changes in Transtheoretical measures, and the absence of cessation predictors. Future studies assessing the intervention relative to a control condition, as well as the assessment of predictors potentially more relevant to light smoking are warranted.

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Chapter 1: Introduction

1.1   Health Consequences and Intermittent and Light Smoking

Smoking is the leading cause of death and disease in the United States and is associated with 438,000 deaths annually from direct tobacco exposure, as well as an additional 38,000 deaths annually from exposure to second hand smoke (Center for Disease Control (CDC), 2005; U. S. Department of Health and Human Services (UDHHS), 2001). Smokers die on average 14 years earlier than non-smokers (CDC, 2002) from a variety of diseases. For example, smoking increases the risk for lung cancer such that 90% of lung cancers in men and 80% of lung cancers in women are smoking related (USDHHS, 2004), and the risk of dying from lung cancer is 22 times higher for male smokers and 12 times higher for female smokers (Novotny & Giovino, 1998). Smoking also increases the risk for other cancers including cancers of the bladder, pharynx, esophagus, cervix, kidney, pancreas, and stomach (USDHHS, 2004). Additionally, smoking cessation is estimated to prevent fifty percent of all cancers (United States-Mexico Border Health Commission (USMBHC), 2003). In addition smoking is associated with reduced endothelium-dependent vasodilatation, which is one of the risk factors for cardiovascular problems and coronary heart disease (Barua et al., 2002). Moreover, smoking affects almost every bodily organ, and ingredients from cigarette smoke are found in almost every part of the body including breast milk (USDHHS, 2004). Smoking is associated with reproductive and childhood defects, such as problems with infertility, stillbirth, low birth weight, and sudden infant death syndrome (USMBHC, 2003; USDHHS, 2004).

No level of smoking has been found to be safe. Smoking lightly does not eliminate the risks associated with smoking, as individuals who smoke lightly have increased rates of death and disease compared to non-smokers (Bjartveit & Tverdal, 2005). For example, relative to non-smokers, light smokers demonstrate reduced endothelium-dependent vasodilatation (Barua et al., 2002), and increased risk for pulmonary disease (USDHHS, 1984), respiratory symptoms (An et al., 2009), myocardial

infarction (Prescott, Scharling, Osler, & Schnohr, 2002), and cardiovascular mortality (Luota, Uutela, & Puska, 2000; Prescott et al., 2002). The duration of smoking may increase the risk for disease more so than simply the amount smoked (Flanders, Lally, Zhu, Henley, & Thun, 2003; Luoto et al., 2000). Despite these clear health risks, light smokers have misconceptions about the addictiveness and health consequences associated with light smoking (Presson, Chassin, & Sherman, 2002).

Intermittent and light smokers have often been overlooked in the tobacco related literature; recently far more emphasis has been placed on the assessment and treatment of intermittent and light smokers (Fiore et al., 2008). Many groups of individuals smoke regularly but with significantly less frequency (Owen, Kent, Wakefield, & Roberts, 1995). These subgroups' smoking habits and behavior, as well as beliefs and attitudes (e.g., cultural), may provide a different model for successful smoking cessation, and evidence suggests that systematically developed and tailored interventions are likely more efficacious in subgroups of smokers than interventions targeted more globally (Fiore et al., 2008).

1.2   Intermittent and Light Smoking in Hispanics

Light smoking is more common in some cultural subgroups. For example, Hispanic smokers demonstrate low levels of nicotine dependence and expired carbon monoxide (Bock et al., 2005; Daza et al., 2006; Rodriguez-Esquivel, Cooper, Blow, & Resor, 2009) and may smoke lightly but for longer duration of time than non-Hispanic whites (Burns, Levinson, Lezotte, & Prochaska, 2007). Social (and/or psychosocial) influences also seem important in understanding Hispanic light smoking. Foraker and colleagues (2005) conducted a study among Hispanic young adults in which participants were interviewed about their reasons for smoking. Results indicated that many participants self-identified as social smokers, indicated nighttime smoking (e.g., in bars /clubs), and suggested that family and friends were important smoking initiation influences (Foraker et al., 2005). Another recent study suggested that reasons to smoke in this subgroup might differ according to gender. Female smoking is related to anxiety, while male smoking is related to alcohol use (Sias et al., 2008). These characteristics associated

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with Hispanic smoking (e.g., low level smoking, social influences) are appropriate considerations for tailored Hispanic smoking interventions.

Although Hispanics often smoke for a longer overall duration and the risk for health consequences is clear in intermittent and light smokers, Hispanics are less likely to receive physician advice to quit smoking (Levinson, Perez-Stable, Espinoza, Flores, & Byers, 2004); 50% of Hispanic smokers compared to 72% of non-Hispanic white smokers received advice to quit smoking in a recent study (Houston, Scarinci, Person, & Greene, 2005). Levinson and colleagues (2004) found that individuals who self-described as Mexican American were less likely than any other Hispanic subgroup to receive physician advice to quit smoking. Perhaps associated with lack of physician advice, Hispanics often have misconceptions about the dangers of smoking, perceive fewer benefits of quitting smoking (Campbell & Kaplan, 1997; Foraker et al., 2005), and demonstrate fewer attempts to quit smoking than other ethnocultural groups (Levinson, Borrayo, Espinoza, Flores, & Perez-Stable, 2006; Levy, Romano, & Mumford, 2004; Palinkas, Pierce, Rosbrook, & Pickwell, 1993). Just as social influences appear to be important reasons for Hispanic smoking, these influences are often reported as salient to smoking cessation (Foraker et al., 2005). For example, Hispanic smokers in one study suggested the two most important reasons to quit smoking were personal and family health (Sias et al., 2008), and Hispanic smokers indicated that family and friends are important to cessation efforts (Serrano & Woodruff, 2003). Considering characteristics associated with Hispanic smoking, lack of physician advice, and smoking cessation indicates that interventions are needed, low level smoking should be a specific target of intervention, and the social influences associated with both smoking and its cessation should be utilized.

1.3   College Smoking

Cigarette smoking prevalence is highest in late adolescence and among young adults aged 18-24 years (SAMHSA, 2003). Like Hispanic smokers, college-aged and college smokers often engage in light smoking (i.e., fewer than 10 cigarettes a day) (Rigotti, Lee, & Wechsler, 2000), and are at risk for

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becoming regular smokers (Holmen, Barett-Connor, Homen, & Bjermer, 2000). For example, individuals who begin smoking during adolescence often continue to smoke 16-20 years after initiation (Barnes, Farrell, & Bangaree, 1994). Although there is a high prevalence of smoking among college students, many of these individuals do not identify themselves as smokers. Fifty-six percent of current college smokers did not consider themselves smokers, while others self-identified as "social smokers" (Levinson et al., 2007).

Again similarly to characteristics associated with Hispanic smoking, social influences are relevant to college smoking. For example, many college smokers self-identify as social smokers (Levinson et al., 2007), and in a recent study, individuals who had two or more friends who smoked were more likely to be a smoker (Clarkin, Tisch, & Glicksman, 2008). In addition to peer smoking, alcohol consumption is associated with smoking in college students (Piasecki, Richardson, & Smith, 2007), with number of cigarettes smoked increasing during periods in which alcohol is being consumed (Reed et al., 2007). Smokers reported consuming more drinks during the past two weeks relative to non-smokers, and the amount of alcohol did not differ between smokers and experimental smokers (i.e., low level smokes) (Reed et al., 2007).

Two studies in college students have assessed momentary assessments of college smoking (Piasecki, Richardson, & Smith, 2007; Taylor & Cooper, Manuscript submitted for publication). First, using personal digital assistants (PDAs), Piasecki, Richardson, & Smith assessed participants' motives for smoking. The top reasons noted by college student smokers were habit and social opportunity (which was also associated with alcohol use). Notably, higher levels of nicotine dependence were associated with greater likelihood to smoke of out habit and a lesser likelihood to smoke for social opportunity (Piasecki et al., 2007), again highlighting the importance of social influences in intermittent and light smokers. Second, in a sample of predominantly Hispanic college student light smokers, Taylor and Cooper (Manuscript submitted for publication) noted that increased smoking among intermittent and

light smokers was associated with nighttime smoking at multiple locations (both social (e.g., clubs and bars) and less social (e.g., car) in nature), and alcohol intake.

Few smoking cessation studies in college students exist. However, in a recent review of adolescent and adult tobacco cessation trials (Sussman, 2002), the mean quit rate at a three to twelve month average follow-up period was 12%, compared to approximately 7% across control groups. However, of the programs evaluated, very few made direct treatment versus control comparisons, resulting in a difficulty to conduct formal meta analysis. Of note to the current study, motivational enhancement programs performed well relative to other theoretical underpinnings, and school-based clinics performed well relative to other cessation modalities (Sussman, 2002). In a recent pilot study of a face to face brief intervention program delivered in the Student Health Center to predominantly Hispanic college student smokers (Cooper, Venegas, Rodríguez Ybarra, Taylor, & Ahluwalia, Manuscript submitted for publication), observed quit rates were low, yet intentions to quit smoke and smoking reductions were noted post intervention. The authors concluded that the intervention was not well adapted to the characteristics of the participating smokers, and that future interventions should take into account the importance of low level smoking and social influences on smoking and subsequent cessation (Cooper et al., Manuscript submitted for publication).

1.4   Interventions

Although the Tobacco Clinical Practice Guidelines (Fiore et al., 2008) recommend the use of combined behavioral and pharmacologic cessation interventions, pharmacological interventions such as Nicotine Replacement Therapy (NRT) may not be appropriate for intermittent and light smokers. First, light smokers demonstrate lower levels of nicotine addiction (Cepeda-Benito, 1993, Rodriguez-Esquivel et al., 2009), less tolerance (Soresi, Catalano, Spatafora, Bonsignore, & Bellia, 2005), and fewer symptoms of withdrawal compared to heavier smokers (Shiffman, Paty, Kassel, Gnys, & Zettler-Segal, 1994). Second, some light smokers may hold misconceptions and a misunderstanding of how NRT is

properly used (Cepeda-Benito, 1993). Smith, Curbow and Stillman (2006) found that 16.7% of college freshman thought the nicotine patch was as harmful as the use of cigarettes, and another study of light smokers suggested adherence to nicotine gum was low (Okuyemi et al., 2007). Finally, in the only light smoking cessation study noted in the literature to date, abstinence rates were not associated with the use of NRT relative to placebo (Ahluwalia et al., 2006). Thus, pharmacological interventions may not be appropriate or beneficial for light smokers. More behavioral, social factors seem to contribute to intermittent and light smoking; thus, interventions more behavioral and/or psychosocial in nature may prove more efficacious in this subgroup of smokers.

One intervention that may be appropriate for intermittent and light smokers is Motivational Enhancement (ME), a derivative of Motivational Interviewing (MI) (Miller & Rollnick, 2002). ME is a client-centered approach that helps address ambivalence toward change by enhancing motivation. In ME, the therapist/interventionist does not direct or coerce change; instead the client takes responsibility for whether or not s/he wants to change and determines the best way to implement change (Miller & Rollnick, 2002). Through expressing empathy, supporting the client's self-efficacy, and developing discrepancy (Miller & Rollnick, 2002), the therapist/interventionist's role is to help guide the client through his/her ambivalence in order to create motivation to change.

ME has demonstrated efficacy in promoting quit attempts (Borrelli et al., 2005), smoking reduction (Borrelli et al., 2005), smoking reduction among light smokers (Herman & Fahnlander, 2003), and cessation in adolescent and young adult smokers (Sussman, 2002). However, there is a dearth of literature with regard to ME in predominantly Hispanic populations and in point of contact health interventions (i.e., Student Health Center).

Another potentially efficacious intervention for intermittent and light smokers is Health Education (HE). The focus of HE in cessation interventions is to educate smokers about the health consequences associated with smoking which may increase their motivation to quit. There are three

reasons why HE may be appropriate for intermittent and light smoking cessation. First, both college

student (Van Volkem, 2008) and Hispanic (Sias et al., 2008) smokers report health concerns as the

primary reason to quit smoking. Second, Hispanic (Campbell & Kaplan, 1997), young adult (Foraker et

al., 2005), and light smokers (Presson, Chassin, & Sherman, 2002) have misconceptions about the

dangers of smoking. Third, two studies have demonstrated the efficacy of HE in smoking cessation

(Ahluwalia et al., 2006; Schnoll et al., 2005). In a study of cancer patients, quit rates between those in

the general health education condition did not significantly differ from those in the cognitive behavioral

therapy condition (Schnoll et al., 2005). Only one intervention specific to light smokers is noted in the

literature to date (Ahluwalia et al., 2006). The study was a 2 (nicotine gum v. placebo) x 2 (Motivational

Interviewing (MI) v. health education counseling) randomized clinical trial among African American

light smokers. Over 750 light smokers participated and received an 8 week supply of nicotine gum or

placebo and six counseling sessions over 26 weeks. Results indicated that at all follow-up time points,

health education outperformed MI in increasing cessation (Ahluwalia et al., 2006). These results suggest

the importance of examining HE in intermittent and light smoking college students.

1.5   Theoretical Models

In developing an intervention specific to Hispanic college light smokers, several theoretical

models were used including the Transtheoretical Model, Social Exchange Theory, Self- Determination

Theory, and Health Belief Model.

The Transtheoretical Model (Prochaska & DiClemente, 1983) is a stage-based model of behavior

change (e.g., smoking cessation) and was employed to inform both the intervention and measurement

used in the current study. Individuals are considered to be in one of five stages of readiness to change.

Individuals can progress and digress through the stages, as the stages are neither linear nor static. The

stages based on motivation toward change are: precontemplation, contemplation, preparation, action,

and maintenance. Individuals in the precontemplation stage are not thinking of changing their behavior

and not ready to quit smoking in the next 6 months. In the contemplation stage, individuals want to change their behavior and are considering quitting in the next 6 months. Individuals in the preparation stage are those who are actively engaging in preparing to quit smoking and are considering quitting in the next 30 days. Individuals in the action stage are actively engaging in modifying their behavior, and those in the maintenance stage are working on preventing relapse and maintaining the change.

Evidence suggests the validity of the model. For example, Di Clemente et al. (1991) conducted a longitudinal study and demonstrated that precontemplators made fewer quit attempts relative to those in the preparation and contemplation stages, individuals in the preparation stage smoked fewer cigarettes per day, reported lower levels of nicotine dependence scores, and reported more quit attempts relative to precontemplators and contemplators. In fact, it seems clear that higher levels of readiness to quit smoking are associated with higher smoking abstinence rates (Daza et al., 2006; Fiore et al., 2008), and multiple studies have found evidence to support the use of the Transtheoretical model in studies of smoking and its cessation (Farkas, Pierce, Zhu, Rosbrook, et al., 1996; Prochaska, Velicer, Prockaska, & Johnson, 2004; Velicer, Redding, Sun, & Prochaska, 2007).

Other theoretical models and theories supported facets of intervention development. The social exchange theory (Kotler, 1975) is based on principles from marketing products and services in the private sector. Market segmentation is a principle of social marketing in which groups are divided into subpopulations that require different approaches to induce behavioral change by making the product attractive to the consumer. Here, a culturally sensitive intervention was created by addressing issues specific to Hispanic college light smokers. For example, a social support component was used, as social influences are salient to both Hispanic and college student smokers, and both groups note social support as a potentially important aspect of smoking cessation (Foraker et al. 2005; Serrano & Woodruff, 2003; Sias et al., 2008). A health education component was added, as health concerns have been shown to be important among Hispanic populations (Sias et al., 2008). In addition, a motivational enhancement

component was added, as ME has been shown to be effective in treating young adults (Sussman, 2001) and light smokers (Herman & Fahnlander, 2003) and enables the elicitation of personal cues for smoking, such as drinking alcohol. The intervention was also attractive by making it brief in nature (45 minutes).

Self-determination theory (SDT; Deci, & Ryan, 2000) postulates that individuals have three basic needs and when these basic needs are met, there is an impetus for change. The first need is the need for competence, which is the belief that an individual looks for challenges in his/her environment that assist in skill development and aid in personal growth change (Deci & Ryan, 2000; Ryan, 1995). This is consistent with the motivational enhancement principle of self-efficacy in which the interventionist assists in creating discrepancies between behaviors and goals. Second, SDT posits that individuals are seeking autonomy, which indicates that individual, makes their own choice, instead of feeling as if the choice has been coerced. Lastly, this is consistent with the principles of ME. Self-determination theory suggests that an individual needs close supportive relationships (known as relatedness). Both the expression of empathy and reflective listening critical to ME and the social support component of the intervention promote the importance of relatedness.

The Health Belief Model (Becker, 1977; Becker & Maiman, 1975; Rosenstock, 1974.) is used to foster understanding for engaging in healthy behavior. The model is based on perceived susceptibility, perceived severity, benefits and barriers, cues to action, and self-efficacy. Perceived susceptibility is the belief that one is at risk for disease. In the case of smoking, an individual believes he or she is susceptible to health consequences associated with smoking. Perceived severity is how severe the consequences associated with the behavior are deemed by the individual. For example, smoking consequences put one at risk for disease. If individuals are aware of these consequences, they will try to avoid smoking. Barriers retard or decrease the likelihood of smoking cessation, such as having friends who smoke or the lack of social support. Perceived benefits are the beliefs that the recommended action

will reduce the consequences or the seriousness of the consequences of the behavior. For example, the belief that smoking cessation will decrease or eliminate one's risk for smoking related disease. Cues to action are triggers or strategies that help change the problem behavior (e.g., a persistent cough). Lastly, self-efficacy is the confidence in one's ability to take action.

In the current study, interventionists attempted to ensure intermittent and light smokers self-identified as a smoker (i.e., perceived susceptibility), educated the smoker about the consequences of smoking, specifically the consequences of light smoking (i.e., perceived severity), elicited from smokers the costs associated with quitting smoking (i.e., perceived barriers), assisted in creating a social support network (people who want to see the smoker succeed) (i.e., perceived benefit); highlighted with the participant supportive and unsupportive behaviors toward change (i.e., cues to action), and assessed and promoted confidence in cessation (i.e., self-efficacy).

1.6   Predictors of Smoking Cessation

In developing and assessing an intervention specific to light smokers, particularly in the face of little research on light smoking cessation and reduction, exploring significant predictors of abstinence in heavier smoking studies will likely be of utility. Four predictors are of particular note due to their consistent relationship with cessation: age, gender, previous quit attempts, and smoking rate/status (Daza et al. 2006; Harris, Schwartz, & Thompson, 2008; Hatziandreu, Pierce, Lefkopoulou, Fiore, et. al. 1986; Hymowitz et al., 1997; Macy, Seo, Chassin, Presson & Sherman, 2007). First, increasing age is associated with a greater number of quit attempts (Hatziandreu et al., 1990; Hyland et al., 2004). Second, male gender is positively associated with cessation (Hyland et al., 2004; Hymowitz, Cummings, Hyland, Lynn, Pechaceck, & Hartwell, 1997). Potential reasons for reduced likelihood of abstinence may be unique barriers and/or stressors related to quitting such as heightened perceived risks of quitting (Toll, Salovey, O'Malley, Mazure, Latimer, & McKee, 2008), such as weight concern, negative affect, and/or hormonal changes (Fiore et al., 2008). Further smoking and concomitant use of other tobacco

products may reduce smoking rates, yet not overall tobacco use rates. In one study, 91% of individuals who reported abstaining from cigarette smoking, but reported using other tobacco products, were male (Hyland et al., 2004). Third, smoking rate / status is also an important predictor of quit status such that fewer number of cigarettes smoked per day is associated with higher rates of quitting (Fiore et al., 2008; McWhorter, Boyd, & Mattson, 1990). Smoking reduction has demonstrated an association with future abstinence (McDermott, Dobson, & Owen, 2008). Finally, previous quit attempts have been associated with smoking cessation (McWhorter, Boyd, & Mattson, 1990), and having at least one previous quit attempt was associated with greater odds of maintaining abstinence (Macy, Seo, Chassin, Presson & Sherman, 2007). Considering age, gender, smoking rate, and previous quit attempts as predictors in newly developed intermittent and light smoking interventions may inform both current study results and future intervention refinements.

1.7   Aims and Hypotheses

The primary purpose of this study was to examine the effects of a brief tailored intervention on college student light smokers' quit status at 1- and 3- month follow-ups. Secondary aims included: assessing smoking reduction among participants, Transtheoretical changes over time, and the impact of known correlates of smoking cessation on quitting and reducing in a college light smoking sample. It is hypothesized that quit rates and reduction rates at follow-up will be consistent with or higher than typical quit rates published to date for brief interventions (12. 4%, Fiore et al., 2008; 12%, Sussman, 2002). In addition, stage of change and decisional balance measures will demonstrate significant progression in the anticipated direction at both follow-up time points. Age, gender, number of previous quit attempts, and baseline levels of smoking will be predictive of smoking cessation at both follow-ups such that older age, males, individuals who have more quit attempts and smoke less at baseline will be more likely to reduce smoking as well as be more likely to quit smoking.

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Chapter 2: Methods

2.1   Participants

Two hundred and fifty English speaking students who attended the University of Texas at El Paso were recruited from common gathering areas on the University campus. Participants were predominantly Hispanic (79.4%); however, all measures were provided in English, as was the intervention. The average age of participants was 22.29 years, and 53% of participants were male. Forty-three percent of participants reported daily smoking, 42% reported weekly smoking, and 10% reported smoking monthly or experimentally. At the time of this study, no previous studies of light smoking cessation existed; thus, sample size was determined based on the study's budget and an effort to ensure the ability to assess effect sizes and support future power calculations. The smoking inclusion criterion was to report smoking between 1 cigarette a month to 10 cigarettes per day (cpd). Participants were recruited via the question "how many cigarettes have you smoked in the past 30 days," to ensure that individuals who did not consider themselves smokers were still screened and eligible for participation. Posters were displayed around campus with study and contact information, so interested light smokers could self-refer. No other inclusion or exclusion requirements were observed.

2.2   Interventionist

Interventionists were clinical psychology graduate students at the University of Texas at El Paso. A Clinical Psychologist provided training in motivational enhancement and health education. The training empirical and theoretical underpinnings of the intervention, as well as training as to intervention process issues. Interventionists engaged in multiple role-plays to ensure future fidelity of intervention delivery. Supervision was conducted on a weekly and as needed basis.

2.3   Design

The design of the study was prospective in nature. The study assessed the relationships between the independent variables (gender, age, smoking status at baseline, and previous quit attempts) and the dependent variables (quit status and smoking reduction) at two follow-up time points. In addition, changes in stage of change and decisional balance measures over time were assessed.

2.4   Measures

Demographic questionnaire (Appendices A & B)- Examined participants' age, gender, marital status, and education level. The questionnaire also assessed current smoking behavior, age of first use, history of past quit attempts, past use of tobacco cessation aids, general weight concern, cessation-related weight concern, smoking attitudes, and cessation aid and program preferences. At baseline and follow-up, participants' smoking status was defined as follows: "daily" if they smoked on a daily basis, "weekly" if they smoked less than daily but at least weekly, "experimental/monthly" if they had smoked in the past month or tried cigarettes but did not report smoking weekly, and "quitter" if they reported quitting subsequent to smoking. "Reducers" were defined as follow-up change to a lesser smoking category.

Fagerström Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991; Appendix C) – Assesses the degree of psychological dependence on nicotine via 6 items. Scores are summed and range from 0-10, with higher scores indicating higher levels of nicotine dependence. The FTND has been determined to be a valid measure of heaviness of smoking compared to biochemical indices and has acceptable levels of internal consistency, reported at $\alpha = .68$ (Heatherton et al., 1991). However, in this study, internal consistency was low ($\alpha = .480$).

Decisional Balance (Velicer, DiClemente, Prochaska, & Brandenburg, 1985; Appendix D) – Assessed the degree to which participants are inclined to quit smoking. A sample question is "Smoking cigarettes is pleasurable." Participants answered on a five point Likert scale that ranged from "very

important" to "not at all important to me." The measure consisted of two scales measuring the pros and cons of smoking, which had internal consistencies of .87 and .90 respectively. In this study, internal consistency for both scales were adequate (pros $\alpha = .77$; cons $\alpha = .78$). Scores on each scale range from 10 to 50, with higher scores indicating greater endorsement of pros or cons.

Smoking Stage of Change Short Form (DiClemente et al., 1991; Appendix E) – Assessed preparedness to quit smoking while placing smokers in one of five categories of readiness to change smoking behavior (precontemplation, contemplation, preparation, action, or maintenance) by assessing current smoking status, as well as an individuals' motivation to quit smoking.

Bedfont Smokerlyzer – Assessesed expired carbon monoxide (CO) with a precision of 99.8% (Hald, Overgaard, & Grau, 2003). Participants are asked to hold their breath for 15 seconds and then to breathe into the machine. The Smokerlyzer then provides a digital reading of CO in parts per million (ppm).

2.5   Procedure

After IRB approval was obtained, two hundred and fifty participants were recruited by interventionists around the UTEP Campus in locations that are highly frequented by students as well as through a media campaign, which advertised the program. The media campaign consisted of posters displayed around the UTEP campus. Posters provided pertinent information so that interested students, who were eligible to participant, could set up an appointment to meet with an interventionist. The UTEP Student Health Center referred all smokers to the study, and obtained consent to forward contact information to the researchers. Appointments were made so that interventionists could meet with participants at either the Student Health Center or in the research lab. Interventionists also met with smokers on a walk-in basis at the Health Center.

When participants first met with the interventionist, informed consent was obtained, and participants completed baseline measures, as well as received a brief tobacco cessation intervention. The

smoking cessation intervention was developed both theoretically and empirically. The intervention was adapted to the specific needs of Hispanic college light smokers while remaining brief in nature to make the intervention less burdensome and more attractive. Once the intervention was completed, participants were notified that Prevention and Treatment in Clinical Health (PATCH) lab staff would contact them throughout the next 3- months in order to complete measures about their smoking. Participants received gift cards for current and future participation. Participants were contacted 1- and 3- months post- intervention in order to encourage them to complete follow- up materials over the phone, in person, by email, or by mail. Upon completion of survey instruments (and the intervention at baseline), the participants were given a $10 online gift card at baseline, the 1-month, and the 3- month follow-ups, for a total of $30 for study completion.

Intervention

The intervention was brief in nature (45 minutes), integrated both motivational enhancement and health education techniques, and contained the following components in the order in which they were provided :

1. Carbon monoxide (CO) feedback such that the interventionist discussed the participant's CO level and the health implications for not only the current CO level but also increasing levels (particularly if CO was low).

2. A motivational enhancement worksheet (Appendix F) in which the participant discussed their confidence and desire to quit smoking. The interventionist elicited motivators to continue smoking as well as to quit smoking, while the participant discussed perceived benefits and consequences of smoking and smoking cessation. The interventionist promoted the benefits of smoking cessation by asking follow- up questions (Appendix G) that elicited an even greater number of benefits from the participant (e.g., "What would happen to your quality of life if you quit smoking?"). During the intervention the interventionist expressed empathy and engaged in reflective listening in order to ensure that the smokers

felt that their individual concerns and difficulties were being addressed.

3. A social support worksheet (Appendix H) in which the interventionist assisted participants in identifying supportive individuals, supportive behaviors from other individuals, unsupportive behaviors from others, and ways to request more supportive behaviors from others—all with the goal of smoking abstinence.

4. Light smoking consequences and cessation benefits handouts (Appendix I), in which the interventionist discussed health consequences associated with the participant's level of cigarette consumption, as well as the benefits of smoking cessation.

5. If the participant indicated readiness to quit smoking, the interventionist and participant set a quit date and the interventionist assisted the smoker to prepare for and engage in the quit attempt on the selected date.

2.6   Approach to Analyses

Descriptive analyses were used to explore participant characteristics. Participants' smoking status at 1- month and 3- month follow-ups were coded into quitters and non-quitters, as well as reducers and non- reducers. Intention to treat analyses were used to assess abstinence and reduction rates such that those who were lost to follow-up were considered to be smoking or not reducing at each follow-up. Reduction was coded such that participants were considered to have reduced smoking if their categorical smoking status changed (e.g., daily to weekly, weekly to monthly/experimental). Two tests of marginal homogeneity were used to determine changes in categorical smoking status from baseline to each follow-up. Wilcoxson and sign rank tests were performed to see if participants progressed through the stages of change in the anticipated direction at the 1- month and 3- month follow-ups. Four logistic regressions were performed to determine predictors of quitting and smoking reduction at each follow-up. Gender, age, smoking rate at baseline, and previous quit attempts were assessed as independent variables. A Repeated Measures ANOVA was used to assess change in scores on the decisional balance

at 1- month and 3- month follow-ups. Two logistic regression analyses assessed the impact of gender, age, baseline smoking rate, and previous quit attempts, on participant attrition at each follow-up.

Chapter 3: Results

3.1   Participant Characteristics

The mean age of participants was 22.29 years ($SD = 4.86$); 53% of the sample was male and 47% was female. Seventy-nine percent of participants were of Hispanic descent; 50% were Mexican-American. The largest percentage of participants smoked one cigarette a day (49%), and the average number of cigarettes smoked on smoking days was 3.76 ($SD= 4.12$). CO levels were low ($M= 3.52$, $SD= 4.46$), as were nicotine dependence scores ($M= 1.05$, $SD= 1.06$). Fourteen percent of participants quit at the 1-month and 3-month follow- ups, and 30% and 27% percent reduced their smoking at the 1-month and 3-month follow-ups respectively (See Table 3.1 for Participant Characteristics).

Table 3.1: Participant characteristics

Participant Characteristics	Statistics
Age (Years)	*M*= 22.29; *SD*= 4.86
Gender	
% Female	47
% Male	53
Smoking Status at Baseline	
% Daily	43
% Weekly	42
% Experimental/Monthly	10
Stage of Change Baseline	
% Precontemplation	33
% Contemplation	32
% Preparation	24
Smoking Cessation	
% Quit 1- month	14
% Quit 3- month	14
Smoking Reduction	
% Reduced 1- month	30
% Reduced 3- month	27
Decisional Balance Baseline	
Pros	*M*= 24.62, *SD*= 7.50
Cons	*M*= 32.15, *SD*= 8.74
Fagerström Nicotine Dependence Baseline	*M*= 1.05, *SD*= 1.06
Ethnicity	
% Mexican National	17.5
% Mexican American	50.4
% Other Hispanic	11.5
% Non Hispanic White	9.5
% African American	0.8
% Asian American	0.4
% Native American	0.4
% Other	6.3
Carbon Monoxide Exhaled CO (ppm) at Baseline	*M*= 3.52, *SD*=4.46

3.2   Change in Smoking Status

The test of marginal homogeneity is used for more discrete categories and accounts for dependency between the variables. It is χ^2 distributed and allows researchers to look at the same group of people over time. The test of marginal homogeneity reveled that participants were changing their

smoking status in the anticipated direction at the 1-month, χ^2 (3)=35.68, p= .000, and the 3-month

follow- up, χ^2 (3)=44.38 p= .000, (See Figure 3.1).
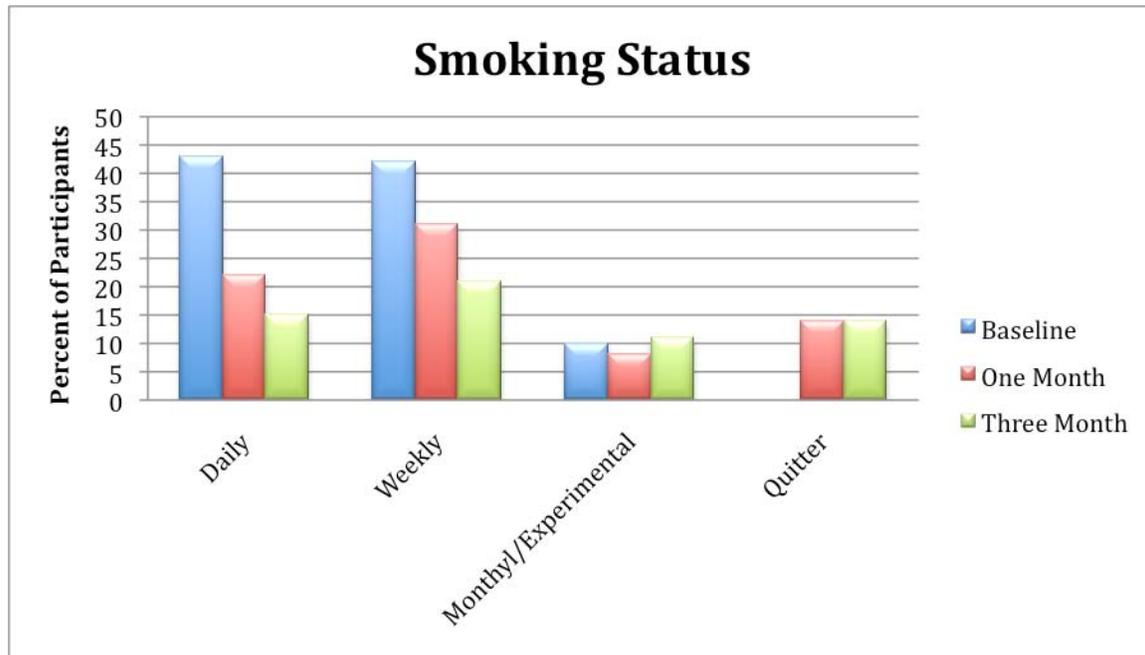
Figure 3.1: Change in Smoking Status.

3.3   Progression through the Stages of Change

The Wilcoxson & sign rank test revealed that individuals were moving through the stages of

change at 1-month and 3-month follow- up periods, χ^2 (2)= 12.20, p=. 002. From baseline (M= 1.91,

SD= .805, Md=2) to 1-month (M= 2.00, SD= .90, Md=2), individuals did not move significantly through

the stages in the anticipated direction (Z= -1.564, p=. 118.); however the change was statistically

significant from baseline (M= 1.91, SD= .805, Md=2) to the 3-month (M= 2.14, SD= .90, Md=2) follow-

up (Z= -3.33, p=. 001) and from the 1- month (M= 2.00, SD= .90, Md=2) to the three -month (M= 2.14,

SD= .90, Md=2; Z= -3.33, p=. 001) follow- up (See Figure 3.2).
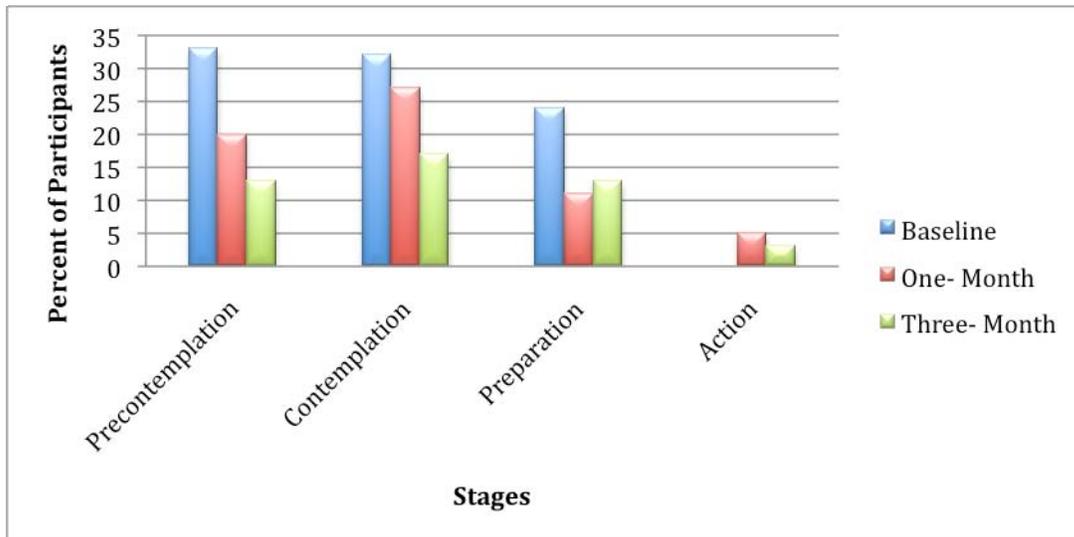
Figure 3.2: Progression through the stages of change.

3.4   Predictors of Smoking Cessation

Two logistic regressions assessed predictors of smoking cessation. The overall model was not significant at the 1-month follow-up, χ^2 (8)=9.21, p=. 32, neither were any of the predictors. At the 3-month follow- up individuals who previously made three quit attempts were removed from the equation because there was no variability in this category. Furthermore, everyone at baseline who previously quit 3 times did not quit at the 3- month follow- up. This lack of variability created an unstable model; thus, individuals who previously quit three times were dropped from the model. The new model was not significant, χ^2 (7)=5.22, p= .63 (see Tables 3.2 & 3.3), and none of the predictors of cessation were significant.

Table 3.2: Logistic regression model- Predicting the odds of quitting at 1- month

Variable	Odds Ratio	CI Lower	CI Higher
Age	1.00	0.91	1.10
Gender	1.49	0.58	3.77
Quit Attempts Greater Than 1 Day (Ref. is more than 3 times)			
None	2.27	0.71	7.26
1 Time	1.27	0.22	7.31
2 Times	0.85	0.16	4.54
3 Times	2.07	0.31	13.69
Smoking Status (Ref. is Daily)			
Monthly/Experimental	4.40	0.90	21.40
Weekly	1.88	0.61	5.82

*p<.05 *
Overall Model (χ^2 (8)=9.21, p=. 32)

Table 3.3: Logistic regression model- Predicting the odds of quitting at 3- month

Variable	Odds Ratio	CI Lower	CI Higher
Age	0.98	0.90	1.06
Gender	0.82	0.30	2.21
Quit Attempts Greater Than 1 Day (Ref. is more than 3 times)			
None	0.29	0.06	1.34
1 Time	0.92	0.18	4.84
2 Times	0.52	0.12	2.22
Smoking Status (Ref. is Daily)			
Monthly/Experimental	2.49	0.44	14.18
Weekly	1.49	0.48	4.60

*p<.05 *
Overall Model (χ^2 (7)=5.22, p= .63)

3.5   Change in Smoking Reduction

Two logistic regressions assessed predictors of smoking reduction. The overall model was not significant at the 1-month, χ^2 (8)= 1.90, p= .98. None of the individual predictors of smoking cessation were significant at the 1- month follow up. The overall model was not significant at the 3-month follow-up, χ^2 (8)= 11.93, p=. 194, however, smoking status was predictive of smoking reduction at the 3-month

follow- up such that experimental smokers were .176 times as likely to reduce their smoking in comparison to daily smokers (*CI*= .03, .988, *p*=. 04.). However, since the overall model was not significant, these results should be cautiously interpreted (See Tables 3.4 & 3.5).

Table 3.4: Logistic regression model- Predicting odds of reducing at 1- month.

Variable	Odds Ratio	CI Lower	CI Higher
Age	0.99	0.93	1.06
Gender	1.17	0.61	2.25
Quit Attempts Greater Than 1 Day			
(Ref. is more than three times)			
None	1.21	0.50	2.92
1 Time	1.03	0.31	3.40
2 Times	0.70	0.22	2.21
3 Times	0.78	0.17	3.49
Smoking Status (Ref. is daily)			
Monthly/Experimental	0.47	0.42	5.12
Weekly	0.92	0.44	1.93

*p<.05 *
Overall Model (χ^2 (8)= 1.90, *p*= .98)

Table 3.5: Logistic regression model- Predicting the odds of reducing at 3- months

Variable	Odds Ratio	CI Lower	CI Higher
Age	0.94	0.87	1.01
Gender	0.79	0.38	1.65
Quit Attempts Greater Than 1 Day (Ref. is			
more than three times)			
None	0.16	0.59	4.63
1 Time	0.77	0.21	2.87
2 Times	2.06	0.65	6.51
3 Times	0.78	0.16	3.77
Smoking Status (Ref. is daily)			
Monthly/Experimental*	0.18	0.31	0.99
Weekly	0.82	0.36	1.89

*p<.05 *
Overall Model (χ^2 (8)= 11.93, *p*=. 194)

3.6   Change in Decisional Balance

The main effect for the pros of smoking at the two follow- up time periods was significant, F (2, 290)= 30.205, $p <$. 001, partial $\eta^2 = .172$. Simple contrasts were significant indicating a decrease of smoking pros from baseline (M= 24.75, SD= 7.50) to 1-month, F (1, 145)= 21.48, $p <$. 001 (M= 22.30, SD= 7.76), and from baseline (M= 24.75, SD= 7.50) to the 3-month follow-up, F (1, 145)= 56.849, $p <$. 001 (M=20.83, SD= 7.5; see Figure 3.3).

The main effect for cons of smoking at the two follow- up periods was significant, F (2, 282) = 36.044, $p <$. 001, *partial η^2= .204*. Simple contrasts were significant indicating a decrease in the number of cons of smoking reported from baseline (M= 32.15, SD=7.44) to the 1-month follow-up, F (1, 141)= 26.297, $p <$. 001 (M= 29.21, SD=8.09), and from baseline (M= 32.15, SD=7.44) to the 3-month follow-up, F (1, 141)= 62.142, $p <$. 001 (M=27.42, SD=8.7; see Figure 3.3).
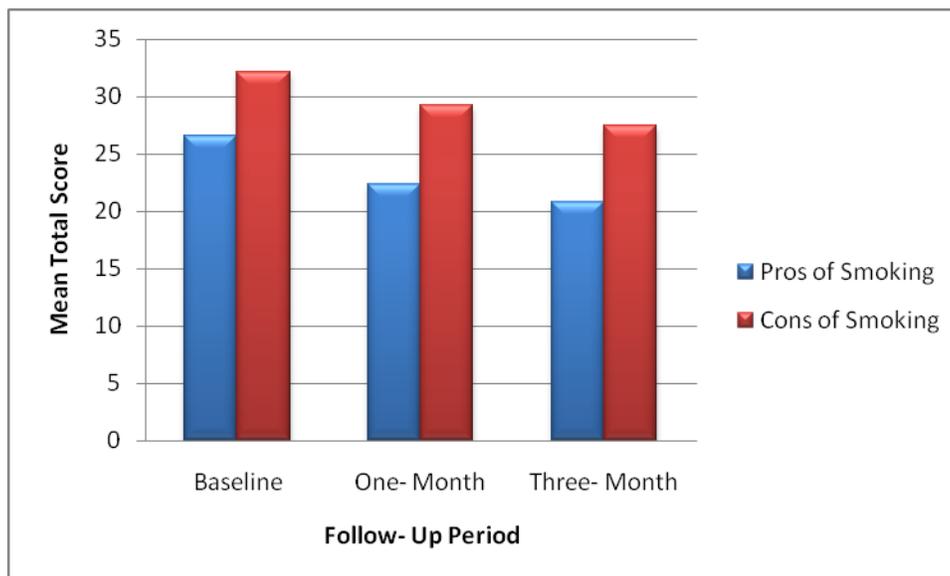
Figure 3.3: Change in Decisional Balance.

3.7   Predictors of Attrition

Seventy-eight percent of participants completed the 1-month follow-up, and 63% completed the 3-month follow-up. Two logistic regressions assessed potential predictors of attrition at the 1-month and

3-month follow-up. For 1-month, the overall model was significant, χ^2 (8)=20.41, p= .009. Predictors of

attrition at 1-month were quit attempts and smoking status such that individuals who had never made a

previous quit attempt were .257 (*CI*= .09, .69, p= .007) times as likely to return at the 1-month follow-

up in comparison to individuals who previously quit more than three times. Individuals who smoked

weekly were 4.882 (*CI*= 1.99, 11.96, p= .001) times more likely to return at 1-month follow- up in

comparison to daily smokers. At the 3-month follow-up, the overall model was significant, χ^2

(8)=17.963, p= .022, and predictors of attrition included age and smoking status such that older

individuals were 1.106 (*CI*=1.02, 1.20, p=.011) times more likely to return at follow- up; experimental

smokers were 3.877 (*CI*= 1.08, 13.89, p=. 037) times more likely to return at the 3-month follow- up,

and weekly smokers were 2.425 (*CI*= 1.24, 4.73, p=. 009) times more likely to return at follow- up in

comparison to daily smokers (See Tables 3.6 & 3.7).

Table 3.6: Logistic Regression model- Predicting attrition at 1- month

Variable	Odds Ratio	CI Lower	CI Higher
Age	0.99	0.93	1.06
Gender	1.47	0.72	3.00
Quit Attempts Greater Than 1 Day (Ref. is more than three times)			
None*	0.26	0.10	0.69
1 Time	0.88	0.25	3.10
2 Times	1.51	0.45	5.07
3 Times	0.66	0.17	2.51
Smoking Status (Ref. is daily)			
Monthly/Experimental	4.00	0.90	17.75
Weekly*	4.88	1.99	11.97

*p<.05 *
Overall Model (χ^2 (8)=20.41, p= .009)

Table 3.7: Logistic regression model- Predicting attrition at 3- month.

Variable	Odds Ratio	CI Lower	CI Higher
Age*	1.10	1.02	1.20
Gender	1.11	0.61	2.02
Quit Attempts Greater Than 1 Day (Ref. is more than three times).			
None	0.68	0.31	1.49
1 Time	1.74	0.55	5.44
2 Times	2.16	0.75	5.07
3 Times	1.53	0.44	5.29
Smoking Status (Ref. is daily)			
Experimental*	3.88	1.08	13.89
Weekly*	2.43	1.24	4.73

*$p<.05$ *
Overall Model (χ^2 (8)=17.963, $p= .022$)

Chapter 4: Discussion

Results of this study indicate that individuals were changing their smoking status at both time periods, with 14% quitting at each follow- up periods and 30% and 27% of participants reducing their smoking at the 1-month and the 3-month follow- up. The observed quit rates are comparable to those reported in the Tobacco Clinical Practice Guidelines (Fiore et al., 2008) for a one- time intervention (12.4%), as well as those reported in the review of adolescent and young adult cessation interventions (12%) (Sussman, 2002). In the only published light smoking intervention to date (Ahluwalia et al., 2006), self-reported abstinence rates at the six month follow-up were 14% for MI and 23% for HE counseling. However, the abstinence rates were four times that of those observed in the initial pilot study of a brief intervention delivered in the Student Health Center in the same population in which 3.5% of daily and weekly smokers quit at a two- week follow- up (Cooper et al., Manuscript submitted for publication). Within the context of the smoking cessation literature, two implications are of note. First, although the observed quit rate is somewhat lower than that found in the Ahluwalia et al. (2006) study, comparisons between the two studies are rather limited in that there were meaningful differences between the participant characteristics (predominantly Hispanic college students v. African American,

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average age mid-forties), the modality of intervention (face to face v. face to face and telephone), and the intensity of intervention (45 minutes face to face v. approximately 1 hour face to face (3 sessions) and 1 hour by telephone (3 sessions). Despite these differences, results from the Ahluwalia et al. (2006) study indicate that HE outperformed MI in counseling light smoking African Americans. As such, future studies in this population should assess the efficacy of HE relative to ME emphasize HE more in a combined HE/ME intervention. Second, consistent with clinical practice recommendations (Fiore et al., 2008), tailoring the intervention to the subgroup of smokers of interest (i.e., predominantly Hispanic college student light smokers) resulted in far higher quit rates over a longer follow-up duration than a less tailored, yet similarly intense intervention (Cooper et al., Manuscript submitted for publication). Future directions include the assessment of the intervention relative to a control or alternative intervention condition to explore its relative efficacy in promoting abstinence.

Reduction rates were non-trivial at both follow-up time points, which is encouraging as reduction seems to be related to continued reduced smoking, and future quit attempts and abstinence. Hughes and Carpenter (2005) observed that individuals who reduced their smoking maintained those reductions over time, while McDermott, Dobson and Owen (2008) found that individuals who reduced their smoking at an initial follow- up were more likely to quit at future follow- ups. Other studies have found that the amount of cigarette reduction increased the odds of future cessation (Broms, Korjonen, & Kaprio, 2007; Harris et al., 2007; Hughes & Carpenter, 2005; Wennike, Danielsson, Landfelt, Westin, Tennesen, 2003). It may be that longer follow-up periods subsequent to the current light smoking intervention would evidence higher cessation rates over time, as those who have already reduced may subsequently quit. Additionally, more sophisticated measurement of smoking reduction may allow for a meaningful assessment of the likelihood of abstinence subsequent to reduction. However, in a light smoking population, the amount of reduction prior to cessation (which is limited by definition) may be negligible, difficult to measure, and ultimately not predictive of cessation. Future studies of intermittent and light

smoking cessation may be enhanced by more nuanced measures of smoking reduction and longer follow-up periods to allow for abstinence rates to reflect cessation post reduction.

Typical predictors of smoking cessation and reduction, both demographic (i.e., age and gender) and tobacco-related (i.e., baseline smoking and previous quit attempts) (Daza et al. 2006; Hatziandreu, Pierce, Lefkopoulou, Fiore, et. al. 1986; Hymowitz et al., 1997) were not predictive of cessation or reduction. Although age has been found to be predictive of smoking cessation in past studies (Hatziandreu et al., 1990; Hyland et al., 2004), limited variability in age in college samples may have resulted in no significant age differences in cessation and reduction. However, future studies in other light smoking and Hispanic populations should continue to assess the relationship between age and abstinence. Although males generally are more likely to quit smoking compared to females (Hyland et al., 2004; Hymowitz, Cummings, Hyland, Lynn, Pechaceck, & Hartwell, 1997), gender differences were not observed. It may be that factors typically more salient to female smokers which serve as barriers to cessation (Fiore et al., 2008; Toll et al., 2008) are not as relevant in light smokers. For example, post cessation weight or negative affect concerns may be less prominent in light smoking college females, thus reducing the often observed gender gap in abstinence rates. Future studies should continue to assess the relationship between gender and cessation and measure empirically derived gender specific barriers to cessation to assess the potential complexities of this relationship in intermittent and light smokers.

Baseline smoking status and previous quit attempts are often associated with smoking cessation (Fiore et al., 2008; McWhorter, Boyd, & Mattson, 1990); however, potential tobacco-related predictors of cessation and reduction were not observed. Although a reasonable (if not large) variability existed with regard to differences in smoking rates at baseline, measures of nicotine dependence (e.g., CO, FTND) were extremely low, and it may be that the use of these and other measures of tobacco use and addiction (i.e., cotinine) would more sensitively predict abstinence and reduction in a sample of intermittent and light smokers. In fact, intermittent and light smoking researchers have begun to assert

the need for the exploration of multiple predictive measures of abstinence in future studies (Husten, 2009). Use of multiple potential tobacco use related predictors of cessation and reduction is suggested. That previous quit attempts were not associated with cessation or reduction is contrary to hypotheses generated based on previous studies in heavier smokers (e.g., McWhorter, Boyd, & Mattson, 1990). However, one recent study in African American light smokers indicated that previous quit attempts were not significantly related to smoking abstinence (Nollen et al., 2005). As such, it may be that the process of repeated quit efforts in intermittent and light smokers is qualitatively different from this process in moderate to heavier smokers. The process of quitting smoking over time may differ in lower level smokers which suggests further exploration of this relationship, perhaps using qualitative focus group studies or long term prospective studies of the abstinence process.

Participants in the study did not move through the stages of change from baseline to 1-month; however, they moved through the stages of change in the anticipated direction from baseline to 3-month and from 1-month to 3-month. Studies found that individuals progress through the stage of change from baseline to follow-up (Schumann, et al., 2005; Schumann, John, Rumpf, Hapke, & Meyer, 2006). However, past studies employed longer follow-up periods; thus, movement through the stages may not be evident after 1-month. In fact, a latent transition analysis suggested that the best fitting time frame to assess stage progression or regression is six months (Martin, Velicer, & Fava, 1996). The stage of change process may progress differently in Hispanic and/or light smoking populations, as the Transtheoretical measures have been less assessed in these subgroups. Future studies should consider the use of longer follow-up time periods, and the continued assessment of theoretically-based motivation measures in the subgroups of interest.

Decisional balance pros and cons decreased at the 1-month and three -month follow-up periods. Pros of smoking decreased as expected, suggesting that post-intervention, participants reported fewer positive aspects of smoking, and this attitude change persisted over time. Interestingly, cons of

smoking also decreased. This finding is counterintuitive in that the smoking cons should increase post-intervention and thus promote cessation. However, the current finding is consistent with other studies which indicate that among recent quitters, the cons of smoking still outweigh the pros of smoking, yet both have dropped in importance (Velicer, DiClemente, Prochaska, & Braneburg,1985), and increased readiness is associated with decreases in smoking cons (Font-Mayolas, Planes, Gras, & Sullman, 2007). One possible reason for these findings is that after participants decrease and/or quit smoking, there are fewer negative aspects to report. Alternatively, light smokers may view consequences of smoking as distal or non-existent, even after receiving health education. This may be in part due to CO feedback. The average carbon monoxide reading for this sample was extremely low, and may have actually decreased perceived susceptibility, rather than heightened smoking cons. Finally, as with the staging algorithm measure, sample characteristics (e.g., Hispanic, light smokers) may have affected Decisional Balance outcomes uniquely; as such these measures, as well as other measures of change motivation should continue to be assessed in multiple diverse ethnocultural and smoking populations.

Three study limitations are of note. First, no control or comparison condition was employed, limiting the ability to assess abstinence rates at follow-up in untreated or otherwise treated intermittent and light smokers. Second, the focus on predominantly Hispanic light smoking college students potentially limits generalizability to other ethnocultural groups or young adults more generally. Third, as follow-up surveys were completed primarily online, as reducing attrition was focal to researchers, smoking status was self reported at follow-up.

Strengths of the study are notable as well. This study was only the second noted in the cessation literature to tailor an intervention effort to intermittent and light smokers. Additionally the intervention was adapted to Hispanic college students, enabling critical health research in an often underserved and understudied population.

In conclusion, a brief intermittent and light smoking intervention resulted in reasonable abstinence and smoking reduction rates, significant changes in smoking status, readiness and attitudinal changes, yet no significant predictors of smoking abstinence or reduction. Future directions include the use of a comparison group to assess intervention efficacy, the intervention's assessment in other common intermittent and light smoking groups (e.g., other ethnocultural groups), the use of longer follow-up periods, the continued exploration of motivationally based measures in intermittent and light smokers, and the assessment of potential cessation predictors, both those common to moderate to heavy smokers and those that are potentially unique to intermittent and light smokers. Such future studies will assist in the refinement and assessment of intermittent and light smoking cessation interventions.

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Appendices

Appendix A
Demographic Survey

Today's Date: _____

How old are you? _____

Gender: _____ Male   _____ Female

What is your level of education?

     _____ Less than High School

     _____ High School or equivalent

     _____ Some College

     _____ Vocational School/Associate's Degree

     _____ College Graduate (e.g., B.A., B.S.)

     _____ Some Post-Graduate training

I am   _____ Single (never married)

     _____ Married

     _____ Divorced

     _____ Widow/Widower

     _____ Separated

     _____ Living with someone

Have you ever received Mental Health Services?   _____ Yes
     _____ No

     If yes, what conditions
     were you treated for?   _____ Substance Abuse

     _____ Depression

     _____ Anxiety

     _____ Post Traumatic Stress Disorder

     _____ Schizophrenia

     _____ Other (please describe) _____

Appendix B
Tobacco Use Behavior and Attitude Survey

What is your smoking status?

      _____ I smoke at least one cigarette per day; **If so, how many cigarettes per day?** _____

      _____ I smoke 1 to 6 cigarettes per week

      _____ I smoke less than 1 cigarette per week

      _____ I smoke less than one cigarette per month

      _____ I no longer smoke, but in the past smoked at least 1 cigarette per day;

                                          If so, how many cigarettes per day? _____

      _____ I no longer smoke, but in the past smoked 1-6 cigarettes per week

      _____ I have smoked a cigarette or a few, just to try it

      _____ I have never smoked before, not even a puff

Do you use cigars? _____Yes   If so, how many per week? _____
                   _____ No

Do you use dip? _____ Yes   If so, how much per week? _____
               _____ No

Do you use chew? _____Yes   If so, how much per week? _____
                 _____ No

Do you use hookah? **_____** Yes   If so, how much per week? **_____**
                  _____ No

At what age did you first try tobacco? _____

If you use tobacco, for how many years have you used at least once per day? _____

How many times have you quit using tobacco for at least one day? _____ None

                                                         _____ Once

                                                         _____ Twice

                                                         _____ Three times

                                                         _____ More than three times

When is the last time you tried to quit using tobacco? _____

What is the longest that you have ever quit tobacco? _____ I have never quit

                                              _____ One day

                                              _____ More than a day but less than a

week

_____ One week

_____ More than a week but less than a
      month

_____ 1 to 3 months

_____ 4 to 6 months

_____ 6 to 12 months

_____ More than one year

During your longest quit attempt, did you gain weight? _____ Yes _____ No

If yes, how much weight did you gain? _____ pounds

In attempts to quit tobacco, have you ever used:

Nicotine patch __yes __no   Nicotine gum __yes __no

Nicotine inhaler __yes __no   Nicotine nasal spray __yes __no

Cold turkey __yes __no   Slowly cutting back __yes __no

Zyban (Bupropion, Wellbutrin) __yes __no

How interested are you in stopping your use of tobacco? _____ Not at all

                                                             _____ A little

                                                             _____ Some

                                                             _____ A lot

                                                             _____ Very much so

If you decide to quit tobacco, why would you considering quitting? (**choose only one**)

       _____ Personal choice

       _____ Health

       _____ Person close to me wants me to (wife, child, friend, etc.)

       _____ Tobacco is expensive

       _____ My faith

       _____ Other _____

1. **Do you smoke in front of your family?**

1	2	3	4	5	6
Never					Always

2. How does your family feel about your smoking?

1	2	3	4	5	6
They approve					They disapprove

3. Have many members of your family smoke?

0	1	2	3	4	5	6	7	8	9	10+

4. Do you smoke in front of your friends?

1	2	3	4	5	6
Never					Always

5. How do your friends feel about your smoking?

1	2	3	4	5	6
They approve					They disapprove

6. Have many of your friends smoke?

0	1	2	3	4	5	6	7	8	9	10+

7. If your family disapproved of your smoking, how likely would you be to quit?

1	2	3	4	5	6
Very unlikely					Very likely

8. If your friends disapproved of your smoking, how likely would you be to quit?

1	2	3	4	5	6
Very unlikely					Very likely

9. If your significant other disapproved of your smoking, how likely would you be to quit?

1	2	3	4	5	6
Very unlikely					Very likely

10. Secondhand smoke is a health risk?

1	2	3	4	5	6
Very unlikely					Very likely

If you chose to quit using tobacco, how likely would it be that you would:

attend 4 group sessions

1	2	3	4	5	6
Not at					Very likely
All likely					

participate in a program where you receive multiple telephone contacts to quit

1	2	3	4	5	6
Not at					Very likely
All likely					

use a program on the internet designed to help you quit

1	2	3	4	5	6
Not at					Very likely
All likely					

participate in one on one counseling at the Student Health Center to help you quit

1	2	3	4	5	6
Not at					Very likely
All likely					

participate in one on one counseling at a smoking cessation clinic to help you quit

1	2	3	4	5	6
`Not at					Very likely
All likely					

use self help materials

1	2	3	4	5	6
Not at					Very likely
All likely					

use nicotine gum

1	2	3	4	5	6
Not at					Very likely
All likely					

use a nicotine patch

1	2	3	4	5	6
Not at					Very likely
All likely					

use Zyban (Bupropion, Wellbutrin)

1	2	3	4	5	6
Not at					Very likely
All likely					

use nicotine nasal spray

1	2	3	4	5	6
Not at					Very likely
All likely					

use a nicotine inhaler

1	2	3	4	5	6
Not at					Very likely
All likely					

1. How soon after you wake up do you smoke your first cigarette?

   ____ 5 minutes or less
   ____ 6 to 30 minutes
   ____ More than 30 minutes

2. Is it hard for you to not smoke in places where it is not allowed like in church, at the library, or at the movies?

   ____ Yes
   ____ No

3. Which cigarette would you hate to give up the most?

   ____ The first one
   ____ Other: _____

4. How many cigarettes per day do you smoke?

   ____ 10 or less
   ____ 11 to 20
   ____ 21 to 30
   ____ 31 or more

5. Do you smoke more when you first wake up than during the rest of the day?

   ____ Yes
   ____ No

6. Do you smoke even when you are so sick that you are in bed most of the day?

   ____ Yes
   ____ No

Smoking: Decisional Balance
(Long Form)

The following statements represent different opinions about smoking. Please rate HOW IMPORTANT each statement is to your decision to smoke according to the following five point scale:

1 = Not important
2 = Slightly important
3 = Moderately important
4 = Very important
5 = Extremely important

1. Smoking cigarettes is pleasurable.
   1   2   3   4   5
2. My smoking affects the health of others.
   1   2   3   4   5
3. I like the image of a cigarette smoker.
   1   2   3   4   5
4. Others close to me would suffer if I became ill from smoking.
   1   2   3   4   5
5. I am relaxed and therefore more pleasant when smoking.
   1   2   3   4   5
6. Because I continue to smoke, some people I know think I lack
   the character to quit.
   1   2   3   4   5
7. If I try to stop smoking I'll be irritable and a pain to be around.
   1   2   3   4   5
8. Smoking cigarettes is hazardous to my health.
   1   2   3   4   5
9. My family and friends like me better when I am happily smoking
   than when I am miserably trying to quit.
   1   2   3   4   5
10. I'm embarrassed to have to smoke.
    1   2   3   4   5
11. I like myself better when I smoke.
    1   2   3   4   5
12. My cigarette smoking bothers other people.
    1   2   3   4   5
13. Smoking helps me concentrate and do better work.
    1   2   3   4   5
14. People think I'm foolish for ignoring the warnings about cigarette smoking.
    1   2   3   4   5
15. Smoking cigarettes relieves tension.
    1   2   3   4   5
16. People close to me disapprove of my smoking.

1   2   3   4   5
17. By continuing to smoke I feel I am making my own decisions.
1   2   3   4   5

18. I'm foolish to ignore the warnings about cigarettes.
1   2   3   4   5
19. After not smoking for a while a cigarette makes me feel great.
1   2   3   4   5
20. I would be more energetic right now if I didn't smoke.
1   2   3   4   5

Appendix E
Smoking: Stage of Change (Short Form)

Are you currently a smoker?

     _____Yes, I currently smoke.
     _____No, I quit within the last 6 months
     _____No, I quit more than 6 months ago
     _____No, I have never smoked

In the last year, how many times have you quit smoking for at least 24 hours? _____

Are you seriously thinking of quitting smoking?

     _____Yes, within the next 30 days
     _____Yes, within the next 6 months
     _____No, not thinking of quitting

Appendix F
Motivational Enhancement Worksheet

Motivators to Quit Smoking	Motivators to Smoke
Benefits of Quitting Smoking (Good Things)	Benefits of Smoking (Good Things)
Costs of Smoking (Bad Things)	Costs of Quitting Smoking (Bad Things)

Appendix G
Boosting the Benefits

Boosting the Benefits: These questions may help increase the number of benefits relative to costs, thus increasing motivation in the student.

What would happen to your health if you quit smoking?

What would happen to the way you feel about yourself if you quit smoking?

What would happen to your relationships if you quit smoking?

What would happen to the quality of your life if you quit smoking?

Social Support

Social Support for the New Smoke-Free You!

Getting support and encouragement from others can help you to stay smoke-free! Use this worksheet to help you identify the people you will rely on for support and the things they can do to help.

My Support Network

Who are three people that really want to see you succeed?
1._____
2._____
3._____

Supportive Behaviors

What things could other people do to <u>help you</u> stay smoke-free?

1._____
2._____

3._____

Unsupportive Behaviors

<u>Are there things that other people might do that would make it harder for you to stay smoke-free?</u>

1._____

2._____
3._____

Requesting Behaviors from Others

I will ask others to do more of these things:

1._____
2._____
3._____

I will ask others to do less of these things:

1._____
2._____
3._____

Appendix I

Common Health Costs of Tobacco

- Tobacco is the only product you can legally buy in the United States that is likely to cause cancer if you use it.

- Stopping smoking is one of the best ways to prevent illness and death in the United States.

- Smoking related illnesses account for almost 20% of all deaths and more that 25% of all deaths in the 35-64 age group.

- People who smoke miss about 7 more days of work per year than people who don't smoke.

- People who smoke go to the doctor about 6 more times a year than people who don't smoke.

- People who live with smokers go to the doctor about 4 more times a year than people who live with nonsmokers.

- About 53,000 people die each year from exposure to secondhand smoke.

- People who live with smokers are at a 15% increased risk of death.

- People who smoke between 1 and 5 cigarettes per day are 3 times more likely to develop lung cancer.

- People who smoke between 1 and 4 cigarettes per day are 3 times more likely to die from lung cancer and heart disease.

- People who smoke occasionally have 60% higher heart disease death rates than nonsmokers.

- Smoking just one or two cigarettes per day increases your risk of heart attack.

- Light smokers have a 50% higher death rate from all causes in comparison to nonsmokers.

- Smoking 3 to 6 cigarettes per day (and not inhaling) increases your risk for heart attack by 60%.

- For all smokers, smoking reduces the quality of life. For example, it causes lower energy levels, more shortness of breath, and more frequent colds.

Cardiovascular (Heart) Disease

- Cigarette smoking increases the risk of cardiovascular or heart disease.

- Nonsmokers living with smokers have a 30% increase in the risk of death from heart disease.

- Smokeless tobacco (e.g. chew, dip) users are at increased risk for high blood pressure.

- Using smokeless tobacco increases your heart rate.

The Benefits of Quitting Tobacco

WITHIN:

20 minutes	Blood pressure, heart rate and the temperature of your hands and feet return to normal. You'll feel less tired when you're working out at the Swimming & Fitness Center.
8 hours	Oxygen level in your blood increases to normal and carbon monoxide level drops to normal. With more oxygen in your blood, you'll feel more awake and you won't need as much coffee from the Student Union.
24 hours	The risk of a heart attack begins to decrease.
2 days	Nerve endings start to re-grow and your ability to smell and taste things increases. Now you'll *really* be able to taste those Chico's Tacos!
3 days	Your body is free of nicotine. Bronchial tubes relax, making it easier to breathe. Your lung capacity increases. Its easier to hike up Cardiac Hill to get to class.
1 to 9 months	Coughing, sinus congestion, fatigue, and shortness of breath decrease. Cilia or tiny hairs reactivate in the lungs, increasing your ability to handle mucus, clean the lungs, and reduce infection, like coughs or colds. You won't have to visit the UTEP Student Health Center as often!
1 year	The risk of heart disease from smoking is reduced by 50%.
5 years	Lung cancer death rate for the average smoker (one pack a day) decreases from 137 per 100,000 to 72 per 100,000.
5 to 10 years	Risk of stroke for ex-smokers return to that for non-smokers.
10 years	Risk of Lung cancer drops to as much as half of that of current smokers. Lung cancer death rate for the average smoker drops to 12 deaths per 100,000 or almost the rate of non-smokers. Pre-cancerous cells are replaced. Other cancers, such as those of the mouth, larynx, esophagus, bladder, kidney and pancreas decrease.
15 years	Health risks are similar to non-smokers.

Appendix J

Satisfaction Survey

1.   **Overall, how satisfied were you with the tobacco services offered to you by PATCH staff?**

    1   2   3   4   5   6

  Not at   Very satisfied

 all satisfied

2.   **How satisfied were you with the advice given to you to quit smoking by PATCH staff?**

    1   2   3   4   5   6

  Not at   Very satisfied

 all satisfied

3.   **Did Student Health Center staff talk with you about your smoking?**

   _____ Yes   _____ No

4.   **How much would you say your knowledge about the costs and benefits of smoking increased?**

    1   2   3   4   5   6

  Not at all   Very much

5.   **Have you been thinking about the pros and cons of smoking more than before your meeting with staff at the Student Health Center?**

    1   2   3   4   5   6

  Not at all   Very much

6.   **How much more likely are you to quit smoking in the next week?**

    1   2   3   4   5   6

  Not at all   Very much

7.   **How much more likely are you to quit smoking in the next month?**

    1   2   3   4   5   6

  Not at all   Very much

8.   **How much more likely are you to quit smoking in the next three- months?**

    1   2   3   4   5   6

  Not at all   Very much

9.   **How much did this program influence your thoughts about quitting smoking?**

    1   2   3   4   5   6

  Not at all   Very much

Curriculum Vita

Natasha Naylor was born to Dr. Anthony and Mirna Naylor August 2nd 1983. She graduated from Jesus Chapel School in El Paso, Texas in 2002 and later went on to attend Texas Tech University where she majored in Psychology with a minor in Addictive Disorders and Recovery Studies. While at Texas Tech, she worked with Dr. Joaquin Borrego in his Parent Child Interaction Therapy Laboratory. After graduation from Texas Tech, Natasha was accepted to the Masters of Arts in Clinical Psychology program at the University of Texas at El Paso. She worked under Dr. Theodore Cooper in the Prevention and Treatment in Clinical Health Laboratory where she performed interventions on light smokers. She will be attending law school at the University of Utah in the Fall of 2009.

Permanent address: 1719 Billy Casper

El Paso, Texas 79936

This thesis was typed by: Natasha Kathleen Naylor