Smoking Intervention Strategy and Relationship Patterns of Smokers

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APPROVAL SHEET

This thesis is submitted in partial fulfillment of
the requirements for the degree of

Master of Arts

Lisa M. Bear

Approved, May 2002

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ABSTRACT

The purpose of this study was to demonstrate how a smoking intervention strategy tailored to each participant’s stage of readiness to quit smoking can aid in the process of smoking cessation in the college population. The methodology was based on the transtheoretical model of behavior change (Prochaska & DiClemente, 1982).

The study consisted of three primary groups—a smoking experimental group, a smoking control group, and a non-smoking control group. Smokers in both the experimental and control groups were further subdivided and categorized as either nicotine-dependent or social smokers. It was hypothesized that the experimental smoking group would decrease in number of cigarettes smoked from initial to follow-up assessment significantly more than smokers in the control group. However, analyses revealed no difference in number of cigarettes smoked between the experimental smoking group and the control smoking group between initial and follow-up assessment. In addition, there was no difference in number of cigarettes smoked between initial and follow-up assessment between nicotine-dependent and social smokers.

Future research should focus on applying this minimal intervention strategy to a more diverse sample of smokers to obtain a greater understanding of the general usefulness of the transtheoretical model in the college population.

The study also attempted to expand on previous findings regarding typical relationship patterns of smokers (Piko, 2000; Wills et al., 2002). Analyses of self-reports of past relationship patterns revealed that smokers reported more negative interactions with parents than non-smokers.
SMOKING INTERVENTION STRATEGY AND
RELATIONSHIP PATTERNS OF SMOKERS
INTRODUCTION

Smoking poses a tremendous and unique health concern to the world today. It accounts for approximately 440,000 premature deaths each year and costs about 157 billion dollars in health-related economic losses annually. Lung cancer, ischemic heart disease, and chronic airways obstruction account for most of the smoking-related deaths in the United States. Additionally, smoking by pregnant women results in the death of more than one thousand infants annually (Centers for Disease Control and Prevention [CDC], 2002a). These devastating losses incurred by individuals and society as a whole are entirely preventable, yet it is expected that of the people alive in the world today, 500 million will die from this voluntary behavior. Overall, these estimates predict the loss of over five billion years of life due to tobacco use (Prochaska, 1996).

One of the national health objectives for the year 2010 set forth by the CDC is to reduce the prevalence of cigarette smoking among adults to 12 percent or less. In 1993, 25% of adults were current smokers. These numbers have dropped slightly over the past decade, and in the year 2000, approximately 23.3% of adults were current smokers. Although these numbers represent a moderate decline in the prevalence of smoking among adults in the United States, they still indicate that approximately 46.5 million people currently smoke (CDC, 2002b). Moreover, smoking remains to be the number one cause of premature death in this country (Velicer et al., 1995). By the year 2000, substantial decreases in the prevalence of smoking among adults occurred in all age groups except those between the ages of 18 and 24. This particular age group evidenced
little to no decline in smoking prevalence between 1993 and 2000 (CDC, 2002b). One common factor shared by many individuals in this age group is college attendance. More than one third of young adults (more than 12 million people) aged 18 to 24 attend college. In fact, cigarette smoking among college aged individuals actually increased by 16% between 1995 and 1997 (Rigotti, Lee, & Wechsler, 2000). This rise in college student smoking appears to be a consequence of the increase in adolescent smoking observed earlier in the 1990s. Thus, this particular cohort of individuals will likely have higher smoking rates as adults unless successful intervention strategies are implemented (Wechsler, Rigotti, Gledhill-Hoyt, & Lee, 1998). Moreover, if this trend continues, it may actually reverse the current decline in the prevalence of smoking among adults in this country (Rigotti et al., 2000).

In 2000, 70% of adult smokers in the United States indicated that they actually wanted to quit smoking, and over 40% had actually tried to quit during the past year. However, studies have shown that the desire to quit decreases significantly as individuals get older. Thus, it is imperative to direct smoking cessation programs at individuals while they are still young and receptive to the idea of quitting (CDC, 2002b).

Although a significant number of college students began smoking as adolescents, Wechsler and colleagues (1998) reported that approximately 28% of college smokers had actually begun smoking regularly after reaching college age. In general, about 28% of college students smoke cigarettes (Rigotti et al., 2000). The majority of these individuals have made attempts to quit smoking. Among college students who indicated that they had ever smoked daily, an overwhelming majority (approximately 83%) had tried to quit smoking. However, only one quarter of these students were actually successful in their efforts to quit (Everett et al., 1999).
Thus, the college years seem to be a time of transition in the smoking behavior of young adults. Many students who began smoking before college are attempting to quit at this time, while others are just beginning to smoke regularly. Smoking cessation programs at colleges and universities must be designed to respond to the varying needs of their student bodies (Wechsler, Kelley, Seibring, Kuo, & Rigotti, 2001). For instance, these years provide a unique opportunity for intervention strategies to actually prevent college students who are simply social smokers from becoming regular, nicotine-dependent smokers (Wechsler et al., 1998). New approaches to smoking cessation must be identified in order to target students at their varying points of transition (Wechsler et al., 2001).

In their survey of college smoking cessation programs, Wechsler and colleagues (2001) found that schools where campus health care administrators perceived smoking to be a problem had significantly more smoking cessation programs than those schools that did not view smoking as a problem. Health care administrators reported a number of challenges to developing successful smoking cessation programs on their campuses, including commonly held attitudes, students’ lifestyles, and their reasons for smoking. Some of the smoking cessation programs currently utilized by campus administrators include prohibiting smoking in all public areas on campus and promoting general health and well-being among students, specifically focusing on coping with stress and weight management. Very few colleges or universities used their student health centers to screen for smokers. This extra effort may actually increase the number of people these programs are able to reach. Nonetheless, the difficulty in attracting students to these programs and motivating them to continue to try to quit smoking is evident (Wechsler et al., 2001).
Over the past decade, the prevalence of smoking in the United States has become a cause for national concern. Thus, a number of anti-smoking campaigns that specifically target young adults of college age appear regularly in the media. The message of these advertisements is not a subtle one. They intend to portray the harsh realities of smoking and the health risks associated with it to the public. These ads are viewed as highly relevant to a smoker’s identity. In addition, they are designed to be personally relevant to a smoker’s view of his/her possible or future self. Unfortunately, these harsh ads may actually promote cognitive dissonance within the individual. This dissonance ultimately causes the individual to negatively evaluate the advertisement and to even become defensive in response to its allegations (Freeman, Hennessy, & Marzullo, 2001).

Researchers have attempted to divide smoking cessation studies into overarching categories that are qualitatively distinct from one another. They have been able to identify five unique groupings of intervention efforts designed to aid in the cessation of smoking. First, self-change studies describe those where no specific intervention efforts occur. In this case, attempts to quit smoking are solely the result of individual will. Second, minimal intervention studies are those in which only small amounts of information or materials are available to the participants, such as self-help manuals. Third, minimal interaction studies differ from minimal intervention studies in that the materials are actually tailored to the specific needs of the participants. Fourth, clinic studies are those that require personal interaction with participants over a specified period of time, such as weekly counseling sessions. Lastly, intensive intervention studies are those that require personal interaction with participants either over a long period of time or frequently over a short period of time (Velicer, Prochaska, Rossi, & Snow, 1992).
Several studies have looked at the effectiveness of the various types of smoking cessation studies. Overall, researchers have found low effectiveness rates for clinic studies and intensive intervention studies as compared with instruction based studies, such as minimal interaction studies and minimal intervention studies. Specifically, in the workplace, instructional methods seem to be most effective. However, researchers also found that using aversive techniques, such as the use of fear videos, to promote smoking cessation was highly effective within the school setting (Viswesvaran & Schmidt, 1992).

This finding appears to contradict the findings of Freeman and colleagues (2001), who found that such scare tactics may actually produce cognitive dissonance within individuals, leading them to become more defensive and to view the information more negatively. However, the school-based programs may primarily target young children, most of whom have not yet started to smoke, or at the very least are not yet nicotine-dependent. Thus, the information conveyed in these harsh videos may not be personally relevant, and their message may then be processed in the desired manner, producing feelings of fear and a true understanding of the consequences of smoking as opposed to purely defensive feelings.

The Minnesota Heart Health Project is an example of a community-based intervention program targeting smoking cessation, weight, blood pressure, and other general health problems between 1980 and 1993 (Perry, Kelder, Murray, & Klepp, 1992). Researchers spent a total of 40 million dollars over five years in four communities. This expansive program reached 400,000 individuals. However, researchers ultimately found no significant difference between treatment and control communities on a number of measures, including smoking cessation (Luepker et al., 1994). Similarly, the COMMIT Research Group (1995) performed a four-year community prevention program targeting
smoking behavior. This study, known as the Community Intervention Trial for Smoking Cessation (COMMIT), found no effects with heavy smokers and only a slight effect for light smokers. Efforts by worksite-wellness programs have been similarly ineffective (Glasgow, Terborg, Hollis, Severson, & Boles, 1995).

The primary problem with many of these intervention strategies is their poor retention rates (Prochaska et al., 1996). An analysis of more than 125 studies indicated that the average retention rate of similar smoking cessation programs was only about 50% (Wierzbicki & Pekarik, 1993). Thus, a shift in emphasis among intervention strategies seems to be necessary in order to promote retention of participants throughout the process of smoking cessation. One of the most promising strategies that has been developed to improve these retention rates is the process of tailoring intervention strategies to the individual needs of participants based on their current stages in the process of smoking cessation (Prochaska & DiClemente, 1983).

The stages identified by Prochaska and DiClemente (1983) were used in this study to classify smokers. A minimal interaction strategy was devised that provided participants with information to aid in smoking cessation based on their current stages of change. This stage of change strategy is based on Prochaska’s transtheoretical model of behavior change. This model attempts to integrate the processes and principles of a number of other major theoretical interventions (Prochaska, Johnson, & Lee, 1998). It focuses on intentional changes made by individuals, as opposed to forced changes imposed by others (Grimley, Prochaska, Velicer, Blais, & DiClemente, 1994). Instead of categorizing individuals as either smokers or nonsmokers, this model approaches the concept of smoking cessation as more of a process than a dichotomous outcome (DiClemente et al., 1991). The core constructs of the model include six stages of change,
ending in complete termination of the problem behavior, and ten processes of change. This model has been successfully applied to a number of other problem behaviors, including substance abuse and weight management problems (Prochaska et al., 1998).

The stages of change paradigm is a unique therapeutic construct because it actually takes into account temporal information. The first stage, in which smokers do not plan to take action to quit in the foreseeable future, is known as precontemplation. The next stage, or the contemplation stage, is marked by the intention to quit smoking within the next six months. Smokers in the preparation stage, the third stage, intend to quit smoking in the next month. The fourth stage, the action stage, includes smokers who have already begun to modify their lifestyles to promote smoking cessation over the past six months. After taking action, individuals then reach the maintenance stage of smoking cessation, in which people are actively working to maintain a smoke-free lifestyle and to prevent relapse. Finally, termination is marked by complete smoking cessation, free of any temptation to smoke again (Hadzima, 1997).

The majority of the existing intervention programs focus solely on the transition of smokers from the preparation stage to the action stage (Velicer et al., 1995). However, this particular model differs from other behaviorally based programs by grouping participants according to which stage they are in and then focusing on their specific needs in those stages (Prochaska & DiClemente, 1982). Approximately 40% of smokers in the population are currently in the precontemplation stage, and approximately another 40% are in the contemplation stage of change. Only about 20% of smokers in the population are currently attempting to make the transition from the preparation stage to the action stage. Thus, interventions that focus on this transition only target about 20% of the population. These statistics can help explain the low retention rates of previous
intervention programs. Participants are unlikely to remain in intervention programs that they feel do not meet their current needs. Moreover, these stage distributions remain relatively stable across age groups and may help to explain why many college students do not take advantage of cessation programs offered by their college health departments. They may view these interventions as highly irrelevant to their current needs and thus, tend to ignore them (Velicer et al., 1995).

Unlike the stages of change, which are temporal in nature, the processes of change delineated in this model are examples of specific behaviors that individuals use to move through the stages. Consciousness-raising is an effort to increase an individual’s awareness of the causes and consequences of a particular behavior. Dramatic relief is used to increase the emotional experience of an individual, and it is typically followed by decreased affect. Self-reevaluation encourages individuals to assess, both cognitively and emotionally, their own self-image both as a smoker and as a non-smoker. Environmental reevaluation, on the other hand, encourages individuals to similarly assess how smoking affects their social surroundings, such as the effect of second-hand smoke on others. Self-liberation involves the belief that one can change this risky behavior, as well as outward gestures of commitment to do so. Social liberation, on the other hand, involves social policies that aid in the process of smoking cessation, such as the implementation of smoke-free zones. Counterconditioning involves learning new, healthier behaviors used to replace riskier behaviors. Stimulus control involves the removal of cues that promote unhealthy behaviors, and the replacement of these cues with other healthier alternatives. Contingency management involves combining positive reinforcement with steps made by smokers towards smoking cessation. Lastly, helping relationships requires the aid of others to promote healthy behaviors. This aid can take the form of supportive friends and
family or the development of a buddy system, in which two smokers help one another in the fight to quit the habit (DiClemente et al., 1982; Prochaska et al., 1998; Hadzima, 1997). Outside support from others is crucial to quit success. Buddy systems provide both useful and cost effective means of support for smokers in the process of smoking cessation (West, Edwards, & Hajek, 1998).

The use of these processes of change during specific stages of change greatly influences success in smoking cessation (Perz, DiClemente, & Carbonari, 1996). Thus, success depends on using the right process during the correct stage of change. Individuals who attempt to quit on their own often make the mistake of mismatching their current stage with an inappropriate process of change. For example, they may rely too heavily on action strategies and try to modify their behavior accordingly before they are ready to do so. On the other hand, some self-changers may rely on introspective processes, such as self reevaluation and consciousness raising, when they are actually ready to develop behavioral strategies to promote smoking cessation (Prochaska, DiClemente, & Norcross, 1992).

Optimally, smokers should use more experiential processes during the precontemplation, contemplation, and preparation stages and more behavioral processes during the action stage (Perz et al., 1996). Thus, in the early stages of smoking cessation, people should apply more cognitive, affective, and evaluative processes of change in order to progress to the action stage. Consciousness raising, dramatic relief, and self reevaluation are examples of processes that should be used in these beginning stages (Prochaska et al, 1998). The preparation stage serves as a bridge connecting these earlier stages with the action stage (Perz et al., 1996). Once in the action stage, however, participants should focus on commitment to the task at hand and apply behavioral
strategies to actively move to a level of maintenance. Counterconditioning, stimulus control, and contingency management are examples of processes that should be used in this later stage of change (Prochaska et al., 1998).

Each process of change reaches its peak usefulness at varying points along the continuum of stages of change. Dramatic relief, helping relationships, and consciousness raising all peak during the contemplation stage of change, indicating that the processing of information about smoking and quitting is key to this early stage. Reinforcement management is the first process to peak in its usefulness during the action stage, followed by stimulus control. Finally, counterconditioning and self-liberation are central processes in the maintenance stage of smoking cessation, indicating continued action to quit and a strong belief in one’s ability to do so (Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991).

Specifically, the pros and cons associated with smoking cessation are central to the decision making process used to progress through the stages of change. In the precontemplation stage, the cons associated with changing one’s behavior typically outweigh the pros for changing. However, by the time smokers reach the action stage, the pros for quitting outweigh the cons. This switch from weighing the cons more heavily to weighing the pros more heavily usually takes place during the contemplation stage. Thus, progress from the precontemplation stage to the contemplation stage is marked by a definite increase in the evaluation of the pros associated with changing. The cons of changing are actually lower in the action stage than in the contemplation stage, indicating a decrease in the priority placed on the cons associated with cessation. These findings have definite implications for intervention strategies. The processes applied during the early stages should focus on increasing the pros of changing in order
to aid individuals in the progression from the precontemplation stage to the contemplation stage. This strategy should switch as people prepare to take action, and the processes applied at this time should focus on decreasing the cons associated with smoking cessation (Prochaska et al., 1994).

Once individuals enter the action stage of smoking cessation, they still need strategies to help them move on to maintenance and to maintain this cessation throughout their lives (DiClemente et al., 1991). However, movement through the various stages is not always a linear process, but individuals are more likely to move forward to adjacent stages than to either move backward or to skip stages (Martin, Velicer, & Fava, 1996). In fact, many individuals actually cycle through the stages several times before achieving long-term maintenance (Prochaska et al., 1992). Thus, many individuals who attempt to quit smoking will relapse at least once before complete termination. A relapse is defined as an occurrence that ends the action or maintenance stage in the cessation process, forcing an individual to cycle back to the beginning stages of smoking cessation (DiClemente et al., 1991). The action stage is the time in which individuals are most likely to relapse (Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991).

Situational temptations and self-efficacy beliefs are also highly involved in the quitting process. Individuals who have recently quit, yet they still feel strongly tempted to smoke again are at a high risk of relapse. Thus, removal of situational cues that increase temptation is an important relapse prevention strategy. Moreover, high feelings of self-efficacy, or the belief that one can cope with these tempting situations and remain abstinent are also highly indicative of quit success (Velicer, Norman, Fava, & Prochaska, 1999). Many previous intervention strategies have been unable to overcome these obstacles and consequently have a particularly high rate of relapse among participants.
However, use of the specific processes of change during the correct stage will aid in reducing this high rate of relapse as smokers progress through the stages (Perz et al., 1996).

In the present study, the core constructs of the transtheoretical model were used to aid in smoking cessation among a group of college students. Students were provided with weekly motivation messages targeted at their specific stages of change in the smoking cessation process. These messages gave the students helpful life strategies to aid in their progression toward abstinence according to the processes of change deemed useful for their stages of readiness. Thus, it was hypothesized that smokers who received these stage-matched strategies would in fact report significantly greater reduction in cigarettes smoked at follow-up times than the smoking controls.

In addition, both smokers and non-smokers completed a Memories of Relationships questionnaire in order to examine the potential differences between the two groups in the type and quality of their relationships with parents, significant others, peers, and other influential people in their lives. Prior research has shown that both negative affect and negative life events are related to an increase in smoking over time in an adolescent sample (Wills, Sandy, & Yaeger, 2002). Moreover, adolescents who begin to smoke as a way of coping with these negative life events are likely to continue and even increase smoking behavior in young adulthood (Schmid, 2001). In general, parental relationships have been shown to be highly influential on adolescent smoking behavior. Specifically, studies have demonstrated that low perceived paternal support doubled the likelihood of smoking, and low perceived maternal support only slightly increased the probability of smoking (Piko, 2000). On the other hand, positive parenting styles may actually protect against smoking by influencing adolescents’ choice to form relationships
with nonsmoking peers (Biglan, Duncan, Ary, & Smolkowski, 1995; Distefan, Gilpin, Choi & Pierce, 1998).

Based on these findings, it was hypothesized that smokers would report more negative relationship interactions with their parents on the Memories of Relationships questionnaire than their non-smoking counterparts. Specifically, smokers with higher levels of nicotine dependence, as measured by the Fagerstrom Test for Nicotine Dependence, will show even more negative interactions with parents than other smokers. Additionally, based on the findings of Piko (2000), it was predicted that smokers will report more negative relationship interactions with their fathers than with their mothers.
METHOD

Participants

147 undergraduate students at The College of William and Mary who are all enrolled in undergraduate psychology courses (60 men and 87 women, mean age = 19.2 years) participated in this study. 90 participants were smokers, and 57 were non-smokers. 57 participants were in the experimental smoking group, 33 participants were in the smoking control group, and 57 participants were in the non-smoking control group.

Materials

The Stages of Change questionnaire was used to assess where each student was in the process of smoking cessation. Students were asked to indicated which stage, among the five outlined in the Pathways to Change Manual (Hadzima, 1997), they felt corresponded best with their current readiness to quit (see Appendix A).

The Fagerstrom Test for Nicotine Dependence is a six item self-report measure for nicotine dependence. Scores on this test can range from 0 (minimum physical dependence) to 10 (maximum physical dependence). The Fagerstrom Test for Nicotine Dependence has been shown to correlate highly with other measures of nicotine dependence, such as carbon monoxide, nicotine, and cotinine levels (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991).

The Data Entry form is another self-report questionnaire, in which participants indicated how many cigarettes they smoked over the past week, beginning on Sunday and ending on Saturday (see Appendix B).
The Memories of Relationships (MOR) questionnaire was used to assess participants’ relationships with parents, significant others, peers, and other influential people in their lives. This questionnaire was developed as an experimental questionnaire measure of Luborsky’s concept of Core Conflictual Relationship Themes that characterize individuals (Luborsky, 1995). The MOR contained 10 open-ended questions inquiring about memories of specific experiences with loved ones, as well as general questions about participants’ mood and affect (see Appendix C). For example, question 4b asked the participant to provide a written narrative description of an interaction with a parent that stands out in some way.

Scoring of the MOR questionnaire was based on Luborsky’s Core Conflictual Relationships Theme method (Luborsky, 1995). According to this method, raters first scored each question based on whether or not it constituted a specific relationship episode. A relationship episode had to incorporate all of the scoring elements, including a wish, a response of other, and a response of self. All of these elements were scored according to the specific categories outlined in the Core Conflictual Relationships Theme method. In addition, each relationship episode was rated as either positive or negative. For scoring purposes, the questionnaire was divided into five sections based on relationship—mom, dad, parents, friends, partner. In each section, the number of negative interactions reported by the participant was recorded. Thus, a score of 1 indicated one negative interaction and so forth. Each question was phrased in a manner that was likely to elicit a different possible number of negative interactions. For example, mom and dad items could elicit only one negative interaction each, parent and partner two possible negative interactions, and friend four possible negative interactions.
Total number of interactions was summed across categories so that each participant received scores for qualities of interactions across a range of contexts and co-interactants. Three raters practiced scoring sample Memories of Relationships questionnaires until they were able to reach a consensus on scoring sample protocols prior to scoring their own questionnaires.

Procedure

Students in the experimental group completed the Stages of Change questionnaire, Fagerstrom Test for Nicotine Dependence, Data Entry form, and the Memories of Relationships questionnaire. These students all indicated in mass testing that they had smoked at least one cigarette in the past thirty days. During the three weeks following the initial phase of the experiment, all 57 students received motivational messages via e-mail that were tailored to their specific stages in the smoking cessation process (See Appendix D for examples of motivational messages). They each received one message a week, and then at the end of one month, they were each sent another copy of the Data Entry form via e-mail to complete. Of the initial 57 participants, four students completed and returned this initial follow-up form. At the end of two months, all 57 students were again sent a copy of the Data Entry form via e-mail to complete. Of the initial 57 students, 21 completed and returned this second follow-up form.

Students in the smoking control group completed the Stage of Change questionnaire, the Fagerstrom Test for Nicotine Dependence, and the Data Entry form indicating the number of cigarettes they smoked over the past week. These students did not receive the weekly motivational messages sent to the experimental group. After one month, another copy of the Data Entry form was sent to each participant via e-mail, and 31 students returned the completed form at this follow-up.
Students in the non-smoking control group completed the Memories of Relationships questionnaire only.
RESULTS

A Repeated Measures ANOVA was conducted to determine if the change in the number of cigarettes smoked from initial assessment to follow-up differed significantly for smokers in the experimental condition and smokers in the control condition. The analysis revealed no significant difference between number of cigarettes smoked over time between the two groups. Smokers in the experimental group smoked 8.24 cigarettes a week on average at initial assessment and 10.24 cigarettes a week on average at follow-up assessment. Smokers in the control group smoked 32.60 cigarettes a week on average at initial assessment and 29.50 cigarettes a week on average at follow-up assessment. Moreover, Paired Samples T-tests revealed no significant change in number of cigarettes smoked from initial assessment to follow-up for either group.

In addition, smokers were divided into two categories based on their score on the Fagerstrom Test for Nicotine Dependence. Participants who scored 0 on the Fagerstrom Test were categorized as social smokers, and participants who scored 1 or higher were categorized as nicotine-dependent smokers. Of the 52 participants who completed and returned their follow-up questionnaires, 37 were categorized as social smokers and 15 were categorized as nicotine-dependent smokers. A Repeated Measures ANOVA was then conducted to determine if number of cigarettes smoked from initial assessment to follow-up differed significantly for social smokers and nicotine-dependent smokers. The analysis revealed no significant difference in the number of cigarettes smoked over time between these two groups.
An Independent Samples T-test was used to analyze the relationship interactions assessed by the Memories of Relationships questionnaire. The analysis revealed that smokers reported significantly more negative interactions with parents ($M = .42$) than non-smokers ($M = .23$), $t(1, 112) = 1.99, p<.05$. Non-smokers actually reported slightly more negative interactions with their moms ($M = .21$) than smokers ($M = .09$). However, this difference was only marginally significant, $t(1, 111) = 1.81, p = .07$. However, there were no significant differences between the ratings of smokers and non-smokers for dad, friend, or partner. See Table 1 for these results.

An Independent Samples T-test was also used to determine if nicotine-dependent smokers reported more negative relationship interactions than social smokers. Only eight participants who completed the Memories of Relationships questionnaire were categorized as nicotine-dependent smokers. The other 48 smokers were categorized as social smokers. The analysis comparing these two groups revealed no significant differences between the number of negative interactions reported by nicotine-dependent smokers and social smokers for parent, mom, dad, friend, or partner.
DISCUSSION

Contrary to predictions that smokers in the experimental condition who received stage-matched strategies to aid in their progression toward abstinence would decrease in the number of cigarettes smoked over time, analyses revealed no significant decreases. In addition, smokers in the experimental condition did not differ significantly from non-smokers based on change in the number of cigarettes smoked over time.

Retention rates posed a considerable problem in this study. An analysis conducted by Wierzbicki & Pekarik in 1993 of more than 100 studies indicated that the average retention rate of typical intervention programs was about 50%. The retention rate in this study was only about 40%. This problem was probably related to the fact that participants received follow-up questionnaires toward the end of the fall semester, just before exams. This time is an unusually hectic one for college students and may have hindered their desire to continue with the study. Moreover, over 50% of participants reported that they were already in the maintenance or termination stage of smoking cessation (see Table 2), and over 75% of participants scored a zero on the Fagerstrom Test for Nicotine Dependence and were categorized as social smokers (see Table 3). Thus, participants more than likely did not view their smoking as a problem and may have had less desire or need to follow-up with the study. They may have viewed the intervention strategy as irrelevant to their current needs and chose to ignore the follow-up to the study (Velicer et al., 1995).

The processes of change outlined by DiClemente and colleagues in 1982 may not
have been useful for this particular research pool either. The weekly motivational
messages sent to participants in the experimental condition focused on strategies to aid in
the process of smoking cessation. Thus, if participants did not view their smoking
behavior as a problem because they smoke so infrequently, these motivational strategies
may have appeared to be useless. More than likely, participants also viewed these
messages and suggestions as highly irrelevant to their current needs and thus ignored
them. Finally, participants earned research participation credits for the study, which may
have been their primary motivation to participate in the study. Therefore, they did not
seek out this intervention on their own.

One of the primary goals of using a minimal interaction strategy such as the
transtheoretical model to aid in smoking cessation was that it approaches the concept of
smoking as more of a continuous process than a dichotomous one (DiClemente et al.,
1991). However, since most of the participants in this study placed themselves in the last
two stages of smoking cessation (maintenance and termination) at the initial assessment,
the study automatically took on a dichotomous nature. This necessitated grouping
smokers in both the experimental and the control group into two sub-groups—nicotine-
dependent smokers and social smokers. Future research should attempt to target more
nicotine-dependent smokers in order to attain a more even distribution among the stages
of change. In addition, having participants complete the Stages of Change questionnaire
at follow-up times would enable future researchers to more clearly understand the
participants' progression through the stages of change. It would also provide a good
check to see if the motivational messages were actually targeting their intended
populations.
Analyses did show support for the finding that smoking behavior among young adults is positively correlated with more negative interactions with parents. In this particular study, however, non-smokers reported more negative interactions with their mothers than smokers. The following is an example of a participant’s response to question 3A in the MOR questionnaire that was scored as a positive relationship episode with mom:

My mother is awesome. She has sacrificed so much for my sis and I. The past year for Mother’s Day, I saved up some money from my summer job and sent it to her with a very nice card I had written. My dad said that when she read the card she was so happy that she started crying. It felt good to give something back to her.

The following is an excerpt from a participant’s response to question 3A in the MOR questionnaire that was scored as a negative relationship episode with mom:

My mother and I don’t have what you would say is a close relationship. She always seems to know what to say to piss me off...One day in particular I came home from school, and usually I’m in a bad mood because I didn’t like school very much but that day I was in a good mood. As soon as I walked in the door, it started, “Tim, you didn’t mow the grass or clean your room.” I told her I’d do it later and she went off...I got pissed and just yelled back at her, then went to my room and slammed the door. My good day was ruined and I was pissy the rest of the day.

There was no difference in the number of negative interactions with fathers reported by non-smokers and smokers. These findings seem to contradict those of Piko (2000), who found that low perceived paternal support was more indicative of adolescent
smoking than low perceived maternal support. However, negative interactions with
parents are not directly indicative of low perceived parental support.

Prior research has shown that both negative affect and negative life events are
related to an increase in smoking over time among adolescents (Wills et al., 2002).

Looked at more broadly, the Memories of Relationships questionnaire could provide key
insights to this concept. Unfortunately, the pilot questionnaire used in this study contains
several questions that actually lead participants to answer either positively or negatively.
For example, the first question asks participants to recall a time when they were
nurtured—obviously a pleasant memory. Due to the nature of some of these questions,
they were not used for scoring responses in this study, since the content of the questions
biased the response given. However, slight alterations to such questions in an effort to
make them more open-ended and less leading may greatly enhance the usefulness of the
questionnaire. Questions that ask participants to describe relationships with families and
friends, rather than specific interactions, may be more useful in a study of this nature.

The development of a more general method of scoring could also prove to be
useful. The scoring of the questionnaire was based on the Core Conflictual Relationship
Theme method outlined by Luborsky in 1995. Each response was deemed a relationship
episode, and every wish, response of other, and response of self was scored. However, an
overall score of life outlook based on participants’ answers to the entire questionnaire,
rather than to individual questions may prove to be more informative. An overall outlook
score may also more accurately reflect the findings of previous researchers, such as Wills
and colleagues (2002).

In conclusion, the primary hindrance to this study was the lack of nicotine-
dependent smokers, or the abundance of social smokers, among the participants. One of
the key concepts of Prochaska’s transtheoretical model is that it tailors intervention strategies to each individual (Prochaska & DiClemente, 1983). People are more likely to continue with the program as long as they feel that the strategies are relevant to their lives (Velicer et al., 1995). Since majority of the participants in this study were only social smokers, they did not necessarily view their minimal amount of smoking as change worthy behavior. Thus, intervention strategies designed to aid them in the process of smoking cessation were viewed as irrelevant and thus, most participants chose not to follow-up with the study. Nonetheless, the relationship interactions reported in the MOR questionnaire did seem to support some previous research (Wills et al., 2002). However, the data may have been more robust if the participants had been regular, nicotine-dependent smokers.

Smoking is still a definite problem among college campuses across the United States. In general, about 28% of college students smoke cigarettes (Rigotti et al., 2000). Moreover, approximately 28% of students who smoke in college actually began to smoke after reaching college (Wechsler et al., 1998). The majority of these students have made several quit attempts, and most were unsuccessful (Everett et al., 1999). Thus, studies focusing on useful intervention strategies with this age group are essential. Moreover, identifying correlates of smoking may aid in the development of successful cessation strategies.

This particular study has demonstrated the importance of reaching a target audience. The target audience in this case is nicotine-dependent smokers—individuals who have an addiction to cigarettes and who potentially desire to quit. Most importantly, the target audience is made up of individuals who know that they have an addiction, regardless of whether or not they believe that they are ready to quit. The transtheoretical
model may still be a useful intervention strategy for college age smokers. However, when using similar intervention strategies, future researchers should make great efforts to weed out individuals who smoke only recreationally and who are not addicted to cigarettes from those who have a serious and identifiable addiction.
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*Marginally significant difference

**Significant difference
TABLE 2
FREQUENCY DISTRIBUTION OF PARTICIPANTS AMONG THE STAGES OF CHANGE

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<tr>
<th>Stage of Change</th>
<th>Frequency</th>
<th>Percent</th>
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<tr>
<td>Contemplation</td>
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<td>Action</td>
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<td>Maintenance</td>
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<td>Termination</td>
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TABLE 3
FREQUENCY DISTRIBUTION OF PARTICIPANTS' SCORES ON THE FAGERSTROM TEST FOR NICOTINE DEPENDENCE

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APPENDIX A

STAGES OF CHANGE QUESTIONNAIRE

Indicate which of the following statements best describes your readiness to stop smoking:

_______ I do not intend to take action to quit smoking in the foreseeable future.

_______ I intend to stop smoking in the next six months.

_______ I intend to stop smoking sometime during the next month.

_______ I have made specific changes in my lifestyle over the last six months in order to try to stop smoking.

_______ I am currently working to prevent myself from relapsing and beginning to smoke again.

_______ I am no longer tempted at all to smoke.
APPENDIX B

DATA ENTRY FORM

Estimated Number of Cigarettes Smoked Daily Over the Past Week

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APPENDIX C

MEMORIES OF RELATIONSHIPS QUESTIONNAIRE

This is a research project about the relationship between personality attributes and aspects of memories of important past interactions. It is not necessary to use actual name or places in your descriptions, but it is important that you only write about memories of actual events. Booklets are number coded so our responses will remain anonymous. Only my research supervisor Professor Shean will have access to the code. Your responses will be coded for group statistical analyses only. Throughout the process confidentiality will be safeguarded so that your name will not be associated with what you have written. All booklets will be disposed of once the project is completed.

Instructions
This packet contains several questions about your memories of past relationships, as well as questions about your current relationships and feelings. It is important that you answer each question in detail, which means brief answers will not be adequate. Your responses to all questions about interactions must include clear descriptions of your own wishes, needs, or intentions as well as your responses both behaviorally and in terms of feelings. Each response should also describe when possible the behaviors, feelings, intentions, and responses of the other person(s) in the interaction. Finally, your response should include some comments on the outcome, e.g., how you responded and/or felt shortly after it was over.

Please write about 100-150 word responses to each question.

1. Describe in detail your most vivid memory of being nurtured.

2. Describe in detail your most vivid memory of being disciplined or punished.

3. Describe two specific encounters with your mother, something that stands out. A. can be an incident that is typical of your relationship, really meaningful, really good, really bad—whatever comes to mind. (Specify if step-parent) B. should describe a frustrating encounter or experience.

   A.

   B.

4. Describe two specific encounters with your father, something that stands out. A. can be an incident that is typical of your relationship, really meaningful, really good, really bad—whatever comes to mind. (Specify if step-parent.) B. should describe a frustrating encounter or experience.
A.

B.

5. Was there another adult person who was really important to you as a child? If so please describe two specific encounters with that person, something that stands out. It can be an incident that is typical of your relationship, really meaningful, really good, really bad—whatever comes to mind.

6. Now we will ask you to write about your friendships. Think about your two closest friends either present or from the past.

Friend Number 1: Describe two specific incidents that stand out in some way about your relationship. It can be an incident that is typical of your relationship, really meaningful, really good, really bad—whatever comes to mind.

A.

B.

Friend Number 2:

A.

B.

7. Now we would like to ask you a few questions about your romantic relationships. Describe your current or most recent romantic relationship. Try to think of two specific incidents that stand out in some way and describe them in detail.

A.

B.

8. Now think of a really difficult, stressful, or upsetting interaction with another person that happened to you in the past 2-3 years. Describe that incident following the instructions given previously.

9. Now we would like you to write about yourself. First describe how you normally feel about yourself.

A. Describe your normal mood.

B. Describe an episode where you felt guilty, ashamed afterward.

C. Describe any beliefs that you hold that some other people might find unusual.
10. Is there anything else that you would like to say about your relationships with people or your feelings about yourself?
Precontemplation: (not ready to quit)
- If your reason for not quitting is that you enjoy smoking, you might want to consider how smoking actually interferes with many pleasures right now. Smoking affects your senses of smell and taste, making food less enjoyable. It limits blood supply to hands and feet, causing a cold feeling. Also, due to limited blood flow, some male smokers find it more difficult to get sexually aroused.
- If your reason is that you’ve been smoking for so long that you feel as though the damage is already done, you should know that it’s never too late to quit. A smoker who quits before the onset of a chronic illness decreases the risk of smoking-related diseases by 66% after one year. After 10 years, your risk of developing most serious smoking-related diseases is the same as if you had never smoked.

Contemplation: (getting ready to quit)
- Some immediate benefits of quitting include:
  - having more energy and less stress within 6 months
  - eyes and throat will be less irritated
  - your smoker’s cough will go away
  - your sense of taste and smell will return
  - you’ll start to feel better within 2 weeks
  - you’ll have fewer colds and flus

- Feel the calm and relief that comes with taking a more active role in managing your own health.

- Helpful Strategies:
  1) delay your first cigarette in the morning by an extra 10 minutes
  2) cut down, or smoke four fewer cigarettes per day
  3) buy only one pack at a time
  4) limit your smoking to just one place
  5) quit smoking for 24 hours

Preparation: (ready to quit)
- A good way to strengthen your commitment is to go public with it. Public commitments are more powerful than are private ones.
- You have 3 action choices: quit cold turkey, gradually decrease or cut down, or use the nicotine patch or nicotine gum.
- After choosing an action choice, set a quit date.
- Get support from family and friends.
Action: (quitting)
- Get rid of all ashtrays, lighters, and cigarettes at home and at work.
- Get rid of hidden cigarettes in pockets, the car, or other areas.
- Tell everyone, family, friends, and co-workers that you have quit.
- Remind yourself of all your pros for quitting smoking.
- Do something special today to reward yourself.

Maintenance and Termination: (staying quit)
- Keep your thinking positive.
- Yes, quitting can be a hassle, but there are at least four pros for each hassle.
- Yes, quitting takes time and effort, but the pay-off is worth all the effort.
- Yes, quitting means I need to plan ahead, but it gets easier every day.
- Yes, quitting can cost, but there are major benefits to my health and well-being. I’m worth it.
REFERENCES


VITA

Lisa M. Bear