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# Values-based motivational interviewing : effectiveness for smoking cessation among New Mexico veterans

Lavina Sanders

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**Values-Based Motivational Interviewing: Effectiveness for  
Smoking Cessation Among New Mexico Veterans**

**BY**

**LAVINA SANDERS**

B.S., Industrial Organizational Psychology, Abilene Christian  
University, 2003

M.S., Psychology, University of New Mexico, 2007

DISSERTATION

Submitted in Partial Fulfillment of the  
Requirements for the Degree of

**Doctor of Philosophy**

**Psychology**

The University of New Mexico  
Albuquerque, New Mexico

**December, 2011**

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**ABSTRACT**

This study evaluated the effectiveness, for smoking cessation, of the Values Card Sort intervention based on the theoretical therapeutic model of Motivational Interviewing. Veterans at the New Mexico Veteran Affairs Healthcare System who elected to participate were randomly assigned to either one session of the MI-based Values Card Sort or one session of an education-based intervention called Preskills Training, which was designed specifically for this research study. All veterans who participated in the study then went through three sessions of the standard smoking cessation psychoeducational group at the VA. It was predicted that veterans who received one session of Values-Based MI would be smoking significantly fewer cigarettes per day at one-month and three-month follow-ups than veterans who received one session of Preskills Training. According to several analyses investigating differences between veterans in the Values-Based MI condition and veterans in the Preskills Training condition, there were no significant differences between the two groups on measures of cigarettes smoked per day, scores on the Fagerstrom Test of Nicotine Dependence, or on the subscale scores of the SOCRATES. However, it is important to note that there were

significant decreases in smoking behaviors for all veterans in the study, regardless of the condition to which they were randomly assigned. Finally, the Values-Based MI condition was found to result in significantly greater decreases in smoking for those veterans who did not initially perceive their smoking to be discrepant with their values as opposed to those who did initially recognize a discrepancy.

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Values-Based Motivational Interviewing: Effectiveness for Smoking Cessation Among  
New Mexico Veterans

INTRODUCTION

Researchers in psychology have been trying for many years to determine exactly how to help people quit smoking. Smoking cigarettes is the leading cause of preventable death in the United States, and yet there have been very few advances in psychological therapies that help people quit. It is estimated that 20% of Americans smoke and that 38% of veterans smoke (McKinney, McIntire, Carmody, & Joseph, 1997). Gender differences in smoking among veterans are similar to those in the general population in that significantly fewer female veterans smoke than male veterans, with an estimated percentage of 25% women and 39% men; however, the percentage of female veterans who smoke is still significantly higher than the national average (Bastian et al., 2001). This provides evidence that there is indeed a great need for a smoking cessation program that will work effectively, especially within the veteran population. On the other hand, according to population surveys, smoking rates in the United States have dropped by half from 1965 to 2006, falling from 42% to 21% of adults (Pleis & Lucas, 2009). It is also noteworthy that the percentage of smokers who have utilized smoking cessation interventions increased from 8% to 20% between 1986 and 1996 (Zhu, Melcer, Sun, Rosbrook & Pierce, 2000).

Smoking cessation programs that are typically offered through healthcare systems across the US are education-based, advice-based, or a mix between psychological therapies such as Cognitive Behavior Therapy (CBT) and education about smoking and quitting. These programs are often offered within a group therapy context. It has

become clear through years of research that these types of interventions are not as successful for smoking cessation as they are for other health-related behavior changes (i.e., diabetes management and weight loss). Motivational Interviewing (MI) has been used with success for many health-related behavior changes as well. However, it has performed only about as well as other psychological interventions for smoking cessation (Hettema, Steele & Miller, 2005). The current study looked specifically at using a brief Motivational Interviewing strategy based on the Values Card Sort in combination with three sessions of a smoking cessation program that was already in place at the New Mexico Veterans Administration Health Care System. This intervention was compared to an education-based session designed only to educate veterans on how to get the most out of the smoking cessation program that they were about to enter. To set the stage for the current research, literature in the following areas relevant to this study will be reviewed: Motivational Interviewing, smoking cessation intervention studies, the combination of Motivational Interviewing and smoking cessation, and research in the area of values (as this is pertinent to the use of the Values Card Sort task). Treatment fidelity measures for Motivational Interviewing will then be briefly introduced before stating the predictions for the current study.

### *Motivational Interviewing*

This study utilized the therapeutic model of Motivational Interviewing. This method of psychotherapy has been shown to be quite successful in several areas of health-related behavior change such as quitting drinking, diet and exercise, HIV/AIDS prevention, treatment adherence and illicit drug use (Hettema, Steele & Miller, 2005). As

of yet, there have been inconsistent results in using MI as a smoking cessation intervention, with most of these studies reporting somewhat low effect sizes.

Motivational Interviewing originated in the work of Dr. William Miller, a psychologist who created a client-centered environment in which his clients were then able to explore their ambivalence about changing their behavior, especially when there was a discrepancy between their current unhealthy behaviors and their deepest held values. He realized that his interventions were quite successful with clients who were trying to quit drinking alcohol and quit using drugs. His methods were based primarily in empathy and trying to understand clients' perspectives, while encouraging them to realize the benefits of change. MI has been defined as a "directive client-centered counseling style that is designed to assist clients in exploring and resolving ambivalence and to increase motivation for change" (Miller & Rollnick, 2002, p. 25). MI draws upon Rogerian therapy, which emphasizes unconditional positive regard. Miller was also strongly influenced by Cognitive Behavior Therapy, and so many of the techniques used in MI are also based on targeting and influencing behavior change. Researchers have had a difficult time documenting exactly what elements of MI are responsible for eliciting change when MI is effective. The core elements of empathy, egalitarianism, and "rolling with resistance" from the client have yet to be consistently and reliably demonstrated in the research to be critical in promoting change (Miller & Rollnick, 2002).

#### *Overview of the Efficacy of Motivational Interviewing*

As mentioned above, MI has had some conflicting results when used particularly with smoking cessation. There have, however, been several studies targeting other behaviors that show that MI is as effective (and sometimes more so) as several other

widely used therapies (Miller, Yahne, & Tonigan, 2003). When MI is used as a brief intervention with problem drinkers, it has proven to be as effective as other more intensive therapies, such as Cognitive Behavioral Therapy and Alcoholics Anonymous (Burke, Arkowitz & Dunn, 2002; Burke, Arkowitz & Menchola, 2003; Burke, Dunn, & Atkins, 2004; Hettema, Steele, & Miller, 2005; Noonan & Moyers, 1997; Project MATCH Research Group, 1997). Although most studies that have used MI as a therapeutic technique are conducted with addictive behaviors such as alcohol abuse and dependence, there are certainly other areas in which MI has been effective. For example, MI is effective in helping patients reduce their hypertension (Wollard et al., 1995) and even in helping clients to overcome their gambling addictions (Hodgins, Currie, & el-Guebaly, 2001).

In a study that added one MI session to the beginning of a drug treatment program, participants were randomly assigned to either have one session of MI before treatment or not (Miller, Yahne & Tonigan, 2003). The results of this study were particularly interesting and indicated that there was not a significant difference in treatment outcome between participants who had the single session of MI before treatment and those who did not. This goes to show that, despite its documented successes, MI is not always effective. In the future, hopefully researchers will know exactly what dynamics of MI are eliciting the changes that are often seen in individuals who are trying to make health-related behavior changes, and it is certainly hoped that MI can be truly as effective for smoking cessation as it is for alcohol abuse and dependence.

With regards to MI, there seems to be a particular subset of people with whom MI is more effectively used. Prochaska and DiClemente's (1984) stages of change model

posits that clients may cycle through the following stages: precontemplation (client does not think there is a problems with current health-related behaviors); contemplation (is thinking about changing current behavior, but is still resistant); preparation (is thinking about change and preparing for it); action (has chosen to make changes and thought about a course of action); and maintenance (has already changed and is maintaining the new behaviors). MI appears to be particularly useful in helping clients who are currently in the precontemplation and contemplation stages (Heather, Rollnick, Bell, & Richmond, 1996). This will be useful information to consider for the current study, as veterans' levels of motivation, readiness to change, and steps that they have already taken to make a change in their tobacco use, are all part of the assessment battery. In the next section, smoking cessation studies in the general adult population will be reviewed briefly.

#### *Overview of Smoking Cessation in Adult Populations*

Smoking cessation has been one of the health-related behavior changes that psychologists have been least successful in promoting. Throughout most of the smoking cessation field, psychologists and addiction counselors alike have been operating under assumptions or myths about smoking, some of which are widely accepted as well as some that have not held up in research. In many programs, it is assumed that people will not be able to quit smoking until they have decided on their own and that there is no reason to try to influence someone into cessation. However, as is seen in some of the studies discussed below, even people who are not particularly motivated to quit smoking may benefit from being offered help. Another myth is that a person will typically have to attempt to quit multiple times before being successful. However, there has been some recent research that shows that the majority of individuals who successfully quit were



able to quit on their first or second attempt, and that individuals who have more than six quit attempts generally smoke more cigarettes than others and are more nicotine-dependent than those who are able to quit on earlier attempts (Ulrich, Meyer, Hapke, Hans-Jurgen, & Schumann, 2004). This certainly is more complicated than a simple rule that most people must try to quit a certain number of times before being successful. Tobacco dependence, it seems, is one of the most complicated and confusing addictions identified in the field of psychology.

One indication of the difficulty posed by tobacco dependence is the relatively low rate of success individuals have when they attempt to quit smoking. It is important to note, however, that there are differences in the percentages of those who successfully quit smoking (quit rates) based on what resources are utilized by the person attempting to quit. Levy, Graham, Mabry, Abrams, and Orleans (2010), based on a review of many different studies, reported that the average quit rate for adults 25 years and older who are attempting to quit on their own with no use of evidence-based treatments is generally around 4-8%. For individuals who use only behavioral treatment, the average quit rate is around 6-12%. The average quit rate for individuals who use pharmacological treatments only is generally around 8-16%, and the average quit rate for individuals who use both behavioral and pharmacological treatments is about 12-24%. The authors summarize these findings by stating: "when compared to NoEBT [no evidence-based treatment], quit rates were estimated to increase 100% when pharmacologic treatment is used, 60% when behavioral treatment is used, and 200% when pharmacologic treatment and behavioral treatments are used" (Levy et al., 2010, p. 3).

For many years, psychologists have assumed that it is too difficult for individuals to change their tobacco use in the context of other substance abuse problems (such as alcohol abuse or dependence and illicit drug abuse or dependence), and so smoking cessation is usually put on the back burner until other substance abuse problems are under control. However, according to a recent review of smoking cessation treatment in 19 randomized clinical trials in the context of other substance abuse treatment, individuals were able to quit smoking as well as quit other substances at the same time, with a somewhat higher percentage of success than stand-alone substance use treatment (Prochaska, Delucchi & Hall, 2004). In fact, researchers found that there was a significant 25% increase in cessation of either alcohol use or illicit drug use among individuals who were randomly assigned to also receive smoking cessation treatment relative to the cessation rates of individuals in control groups who did not receive smoking cessation treatment (rates of abstinence from alcohol and illicit drugs in these two conditions were 37% and 31%, respectively). Psychosocial smoking cessation interventions were used in all but one of the studies that were reviewed. Overall rates of smoking abstinence across the 18 studies reviewed were significantly higher immediately post-treatment in the groups that received a smoking cessation intervention (21%) than in the control conditions that did not receive an intervention (9%). However, at long-term follow-ups of 6 to 12 months, the smoking abstinence rates in these two conditions (12% and 9%, respectively) were no longer significantly different. Four of the studies that were reviewed utilized a form of Motivational Interviewing (Gariti et al., 2002; Haug, Svikis, & DiClemente, 2002; Hitsman et al., 2002; Rohsenow, Monti, Colby, & Martin, 2002), but the two of these studies completed at the time of the review did not show

differences in smoking abstinence across conditions (3% versus 0% for the intervention and control groups, respectively). Even though smoking cessation rates were not significantly different at long-term follow-up as a result of receiving a smoking cessation treatment, it is promising that overall the smoking cessation treatments seemed to increase the percentages of quitting other substances at long-term follow-ups. This meta-analysis also suggests that psychologists can readily focus on substance abuse treatment at the same time as smoking cessation treatment, and that it might actually be better this way.

In a recent meta-analysis of smoking cessation interventions offered in the hospital setting, researchers found that interventions of less than 20 minutes were better than no treatment at all for helping people quit smoking, but they were not as effective as more intensive counseling (longer sessions, greater follow-up, or offering additional strategies) for smoking cessation (Wolfenden, Campbell, Wiggers, Walsh, & Bailey, 2008). Perhaps because these researchers were primarily concerned with smoking cessation in the hospital setting, their meta-analysis focused more on the length and follow-up of the interaction, than on the details of the content of the intervention. They found that nursing staff were just as competent to deliver smoking cessation counseling as other hospital staff. These researchers also indicated that smoking cessation rates were higher if the hospital staff utilized brief telephone follow-ups after the initial counseling session.

A review of smoking cessation studies between 1994 and 1998 addressed various issues related to smoking cessation research (Gutmann et al., 2004). Gutmann and her colleagues found in their review of over 100 smoking cessation studies that there did not

seem to be a standardized outcome assessment, and most studies did not even report changes in the number of cigarettes smoked or the number of days abstinent since the intervention. The researchers suggest that smoking cessation studies should take some advice from the alcohol abuse studies and use harm reduction rather than full abstinence as a success. There also seemed to be a few problems in the follow-up intervals. The researchers spoke to the high relapse rates of cigarette smokers, and argued that 3 to 6 month follow-ups may not be adequate to get a real sense of how a person is doing after going through a smoking cessation intervention. The researchers suggest that future studies should use at least a two-year interval for follow-up. This study highlighted some of the problems that have plagued smoking cessation research for many years. In the current study, I hope to address some of these problems, namely using standardized outcome assessments and interpreting harm reduction as success rather than full abstinence.

Smoking cessation rates appear to be similar regardless of the psychosocial intervention that is used (Barth, Critchley & Bengel, 2006). In the meta-analysis by Barth, Critchley, and Bengel (2006), 19 randomized clinical trials of smoking cessation interventions targeting patients who had been diagnosed or treated for Coronary Heart Disease were reviewed. The overall quit rate from 16 studies included in their final analysis was 49% for the various psychosocial intervention conditions. While this was significantly greater than the quit rate in the treatment as usual conditions, even in those conditions the quit rate was 38%, which is understandable given many of the patients had recently undergone a stressful life-threatening event (p. 11). The researchers indicated that there were not significant differences between behavioral therapeutic approaches,

telephone support, and the provision of self-help materials. They did, however, notice a difference depending on the intensity of the intervention. The longer the follow-up period and the more frequent the follow-ups, the more likely the individuals were to quit smoking. It seems to be a consistent finding regarding smoking cessation in adult patient populations that the more intense the intervention (regardless of what the intervention is), the better.

A recent book, *Treating Tobacco Use and Dependence: Clinical Practice Guideline*, which reviews of hundreds of research studies, suggests that smoking cessation interventions work best when there are four or more sessions of treatment (Fiore et al., 2008). These researchers also concluded that different interventions seem to work better according to where the person is in terms of motivation. People who are not motivated to quit smoking seem to benefit more from motivational techniques, such as motivational interviewing, and so they recommend these types of interventions for this subset of current smokers. They also found that for individuals who were already motivated to quit smoking and had tried quitting in the past, skills based interventions worked best. In particular, the types of interventions that seemed to work the best were providing smokers with practical counseling (e.g., problems solving skills) and providing support and encouragement. One of the best interventions identified was combining counseling with medication. These investigators recommend combining at least four sessions of counseling with nicotine replacement therapy (nicotine patches or gum), bupropion (anti-depressant), or varenicline (the new smoking cessation medication, Chantix). It is interesting to note, however, that for most other addiction treatments (not including tobacco), the average number of sessions is 15 or greater. This leads some

researchers to wonder why it is expected that people addicted to tobacco should be able to quit with only four sessions, when tobacco addiction is as much of an addiction as alcohol or illicit drug addiction (Fiore et al., 2008).

### *Overview of Smoking Cessation in Veteran Populations*

Smoking cessation studies that focus specifically and directly on veteran populations, although much needed, are not very prevalent. In addressing the specific issue of smoking cessation among veterans, there are many different studies that address the guidelines and standards of care for treating smoking cessation in the Veterans Healthcare Administration (VHA), as well as the percentages of different veteran populations who are currently smoking or who have tried to quit. However there are not as many studies that evaluate the direct effectiveness of these interventions that are mandated. This highlights the importance of the current study and the need for further studies in this area.

Veteran and active military populations often have higher incidence rates of both drug and alcohol addiction than the overall national average, as well as higher incidence rates of tobacco addiction (Beckham et al., 2008). There have been many speculations as to why these incidence rates are higher among veterans, with some hypotheses including: the specific stresses of military combat that most civilians have never experienced; "military culture," which is the idea that most veterans become strongly bonded to their comrades and since others in the military are smoking, they should as well to feel even more a part of the culture; and, as often cited in studies of veteran populations, general "stress and boredom" (Forgas, Meyer & Cohen, 1996). It has also been demonstrated that smoking rates increase among military personnel who have never smoked when they

are called up for active duty, with the average percentage increase ranging from 7% to 9% of nonsmokers beginning to smoke (Beckham et al., 2008). Also, there has been shown to be an even greater percentage of military personnel who were already smoking before being called up for active duty who increase their smoking, with the average percent of soldiers who increase being between 29% and 56%.

Other studies have shown that between 60% and 70% of veterans who have returned to the US express an interest in quitting smoking, but that even recently, only 7% of veterans had been prescribed medications or nicotine replacement therapy to help them quit (Jonk et al., 2005). In a recent study, researchers were interested in seeing if better dissemination of invitations to a smoking cessation program through the Veterans Affairs Hospitals (VA) would result in higher quit rates, since there appears to be such high interest among the veterans who are utilizing the VA systems (Beckham et al., 2008). In this study, three cohorts (500 soldiers in each cohort) who had recently returned from the Iraq/Afghanistan theaters were sent letters of invitation to join a smoking cessation program. Interested veterans received a phone call and were given information about free telephone quitlines (free counseling over the telephone using evidence-based treatments), were told how to get smoking cessation medications through the VA, and were told about the smoking cessation programs that were also offered through the VA. Of the veterans contacted, 72 reported being regular smokers, but of these, only 31 expressed interest in participating in the offered program, which included access to the quitline, as well as brief appointments with a clinician at the VA to discuss pharmacotherapy options and to receive smoking cessation medications. At the end of the study, 46% of the participants reported being abstinent on their quit date and 37% of

the veterans reported being abstinent two months after their quit date. Although this study demonstrated some promise in helping soldiers to quit very early after returning from active duty and combat, it is important to note that of the soldiers that the researchers attempted to contact, those who actually responded, participated in the program, and stayed abstinent through two months constituted only 0.6% of the original number.

In a longitudinal study of male veterans, researchers have found that the average relapse rate for individuals who have been abstinent for a year or less is about 60-90% (Krall, Garvey & Garcia, 2002). This longitudinal study, which began in 1963, also showed that annual relapse rates ranged from 2-4% during the second year to the sixth year after quitting, and then declined to less than 1% after 10 years of abstinence from nicotine. Some of the risk factors that made it more difficult for veterans to stay abstinent from cigarettes included higher levels of caffeine consumption, higher levels of alcohol consumption, and the use of other tobacco products, such as cigars, pipes, or smokeless tobacco. They also found that smoking relapses became less common as the men aged, and that older men in the study were more likely to stay abstinent after the first and second years of abstinence than younger men who were trying to quit smoking.

Veteran populations are also at an increased risk for Posttraumatic Stress Disorder (PTSD) related to combat trauma. In one particular review, researchers looked at smoking habits among people diagnosed with PTSD, and found that individuals with PTSD smoke in response to many different cues including cravings, positive affect, negative affect, symptoms of PTSD including flashbacks and reexperiencing, and restlessness (Collie, Clancy, Yeatts, & Beckham, 2004). Individuals without PTSD,



however, reported triggers of smoking that in general were less related to emotion inducing stimuli, such as cravings, drinking coffee, not being with family, not working, and being around others who also smoked. These researchers also review a few studies that have shown that the standard treatment offered through the VA, including smoking cessation medications, telephone-based support programs, smoking cessation groups, and PTSD treatment with a focus on smoking cessation, has been shown to be useful in helping these veterans to quit smoking. However, these researchers also pointed out that in 2001, only 17% of veterans who were current smokers reported being offered any of these interventions. Once again, this research points to the fact that more research needs to be done, and more veterans need to be reached through smoking cessation programs at the VA. In the following section, the limited number of studies where researchers have actually used Motivational Interviewing to aid in smoking cessation will be reviewed.

*Smoking Cessation and Motivational Interviewing: A Rocky Relationship*

Motivational Interviewing has had good success with many substance abuse and dependence problems, which has already been discussed in a previous section. For some reason, however, MI has not had as much success with helping people to quit or to reduce their smoking as it has with other abused substances (Heckman, Egletson & Hoffman, 2010; Hetteema & Hendricks, 2010). As discussed in the previous section, it seems that most interventions work just as well as MI. It will be the goal of this research study to see if combining an MI-based Values Card Sort session with the standard psychoeducational smoking cessation program will be more useful for people than an advice-based Preskills Training session. It is hoped that a specific formula for using MI that will be particularly useful for smoking cessation will be discovered. It seems that all

of the right parts are there for other health-related behavior changes, so perhaps the techniques just need to be altered. Also, one of the goals of MI is to explore the discrepancy between a person's current behaviors and his or her most deeply held values, which is what was expected to be accomplished with the addition of the Values Card Sort to the current intervention.

In several research studies, MI did not perform particularly better than other standard care options for helping people to quit smoking (Colby et al., 1998; Okuyemi et al., 2007; Tappin et al., 2005). Interestingly though, in most studies of adult populations using MI to help people quit, MI worked better for people who had fewer past quit attempts (Brown et al., 2003). In the study by Tappin and colleagues, MI was used with a population of pregnant women to help them to quit smoking (Tappin et al., 2005). All women who participated were given standard health promotion information in the form of an advice session with a home health care nurse as well as a booklet about the dangers of smoking while pregnant that is given to all pregnant women in England. Some of the women were then randomly assigned to also receive 2-5 additional home visits that consisted of MI to motivate these women to quit smoking. In this particular study, the researchers did not find a significant difference in quitting smoking between the women who only received the standard health promotion information and those women who received a few MI home visits.

Okuyemi and colleagues (2007) looked specifically at participants from low-income housing developments. They randomly assigned individuals to either receive five MI sessions about smoking cessation as well as nicotine gum or to receive five MI sessions about fruit and vegetable intake. In this particular study, significant differences

in smoking cessation between the two groups were not found. Abstinence rates at 26 weeks post-treatment were 8% in the smoking cessation intervention group, and 9% in the comparison group. These researchers attributed this no difference finding to the fact that the average number of past quit attempts was high for both groups (four quit attempts on average for the MI smoking cessation group and five quit attempts on average for the MI fruits and vegetables intervention group).

In the study conducted by Colby and his colleagues, researchers found that an MI session was no better than a brief advice session at helping adolescents quit (Colby et al., 1998). These studies all demonstrate that MI-based interventions may just not be the most useful for helping people quit. It is important, however, to find something that will work since smoking cessation programs in general do not seem to be as effective as most health professionals would hope.

In the midst of what seems to be a lost cause, there are some small glimmers of hope that continue to encourage researchers to test the efficacy of MI with smoking cessation interventions. Researchers have recently looked at how well MI works to elicit change talk among individuals who were receiving treatment for smoking cessation (Boardman, Catley, Grobe, Little, & Ahluwalia, 2006; Catley et al., 2006). In Catley's study, researchers used the Motivational Interviewing Skills Code (MISC; Miller, 2000) to evaluate counselor adherence to MI and the correlation of adherence to client change talk within the session. Researchers found that MI adherence correlated with higher percentages of client change talk about smoking cessation. Unfortunately, the researchers did not investigate how this increase in change talk may have been related to smoking cessation rates among these individuals. In the study by Boardman and

colleagues, MI-consistent behaviors were significantly positively related to the therapeutic alliance in a smoking cessation session as well as to the person's engagement in the session (2006). These findings provide support for the current study and show why it is important to look at adherence to MI as well as how this may influence cessation rates among individuals who received an MI session as opposed to individuals who received a Preskills Training session.

Butler and colleagues (1999) examined the differences between using one session of motivational consulting or one session of brief advice for smoking cessation, both of which were 20 minutes in length. The sample was recruited from the general population of patients who were coming in for health check-ups with their physicians, and all were encouraged to participate in the study, even if they had not been thinking about quitting. These investigators discovered that the one session of motivational consulting seemed to have the most success with patients who were in the pre-contemplation stage of change. This is quite consistent with many of the other research studies examining MI-based interventions. They also found that patients in the motivational consulting condition reported significantly more delaying of the first cigarette in the morning and significantly more quit attempts lasting at least a week after follow-up than individuals in the brief advice condition. Even though they did not see a significant difference in quit rates between the two interventions (quit rates were 2.2% for the brief advice condition and 5.6% for the brief motivational consulting condition), it is promising that there were some differences in smoking attitudes among the patients who received the motivational consultation. These researchers also point out that there may be a significant dose-

response relationship when it comes to smoking cessation, so perhaps a few more sessions of motivational consulting would have had a greater effect.

Researchers have also seen some promising outcomes using Motivational Enhancement Therapy (MET), which is a modification of MI therapy, with smoking cessation. In one study, home health care nurses either provided MET to their patients who elected to participate in the research, or standard care for smoking cessation, as identified by national healthcare guidelines. They found that for the MET group, patients reported more quit attempts and significantly greater reductions in the number of cigarettes smoked per day at all follow-ups through 12 months of post-treatment (Borrelli et al., 2005, p. 815). There were some differences between the two treatments, however, that seem important to note. First of all, the MET intervention was delivered over three home visits (average of 30 minutes for each session) whereas the standard care intervention was delivered in only one home visit of about 5-15 minutes. In other studies that have been reviewed, it seems that the more intensive a treatment is, regardless of the type of treatment, the more likely a person is to quit smoking. This is something that was taken into consideration for the current study.

In a preliminary study of college students, one session of MI was more effective at helping college students to quit smoking than was no treatment at all (Herman & Fahnlander, 2003). In this study, 15% of the students who received the MI session were abstinent at a 6-month follow-up as compared to 0% of the students in the no treatment control group. It would have been interesting to see how this brief session of MI held up against another intervention, but it does seem that even just one session of MI can be really helpful for college students.

Two recent meta-analyses aimed specifically at reviewing studies that used Motivational Interviewing for smoking cessation reported greater support for MI than earlier smoking cessation studies (Heckman, Egleston & Hoffman, 2010; Hettema & Hendricks, 2010). Hettema and Hendricks posit that their findings show the greatest support for using MI with: adolescents and those with medical comorbidities; for individuals with low tobacco dependence and motivation to quit; and when it is applied for a total of less than 1 hr and when the MI protocol includes training or fidelity practices. Both of these meta-analyses reported similar findings for MI used in smoking cessation studies. The more authoritative review (Hettema & Hendricks, 2010), based on the rigorous standards of *The Journal of Consulting and Clinical Psychology*, reported a combined effect size of  $d_c = 0.17$ . However, even in the other meta-analysis (Heckman, Egleston & Hoffman, 2010), the combined effect size, estimated from a reported odds ratio, would be  $d_c = 0.21$ , which is quite similar. It is evident, however, that the effect sizes are still not nearly as strong as they are for using MI with other substance use disorders (i.e., alcohol). For example, the combined effect size of MI has been reported in a widely cited meta-analysis (Hettema, Steele, & Miller, 2005), for follow-up of three months or less, as being  $d_c = 0.41$  for treatment of alcohol abuse and  $d_c = 0.51$  for treatment of other drugs. In contrast, the smaller effect size in Hettema and Hendricks (2010) meta-analysis of MI for smoking cessation corresponded to a difference in the mean abstinence rate for short-term follow-up periods of less than 3%, with the rate for MI conditions being 13.8% as opposed to 11.2% for comparison conditions. It is interesting to note, however, that Motivational Interviewing does seem to work best for

the population it was originally created to work for— individuals who have low motivation to quit.

*Motivational Interviewing Used for Smoking Cessation and Comorbid Disorders*

A recent study looked at smoking cessation among the homeless population in Kansas (Okuyemi et al., 2006). For this research, participants were randomly assigned to either an MI-based intervention addressing only smoking cessation or to an MI-based intervention addressing smoking cessation as well as other substance abuse problems. Both of the interventions included five individual sessions for the participants, as well as nicotine replacement therapy for participants who elected to use it. These researchers did not see any significant difference in cessation rates between the two different interventions, however they did see substantial quit rates in both groups (13% for the smoking only group and 17% for the smoking and other substance abuse problems group). Researchers note that homeless populations are often difficult to treat in standard health care programs because of the high attrition rate. However for this particular study they found that greater than 60% of the participants followed through with the entire study. This suggests that smoking cessation is something that should be studied more thoroughly among homeless populations. It would have been interesting for these investigators to have a control condition that included some other intervention besides MI, and hopefully future research will explore this.

Another promising study looked at nurses using MI to help patients who were diagnosed with diabetes mellitus to quit smoking in Sweden (Persson & Hjalmarson, 2006). The MI condition consisted of eight group sessions that patients attended over the course of two months. The control condition included a packet that was mailed to

participants advising them to quit smoking and provided information about the dangers of smoking as well as the benefits of quitting. At a one-year follow-up, a significantly higher proportion of patients in the MI intervention had quit smoking (20%) as compared to patients in the control condition (7%).

There has also been some research involving smoking cessation among patients who were admitted to a hospital for chest pain (Bock et al., 2008). In this particular study, the researchers randomly assigned admitted patients who were willing to participate into either a treatment as usual session, or to one session of motivational interviewing. All patients who volunteered to participate were offered nicotine replacement therapy. In the treatment as usual condition, the patients received information about quitlines and a pamphlet about the reasons to quit smoking. In the MI condition, the patients received one 30-minute session of MI, which consisted of addressing and examining the patient's motivation to quit smoking, use of a decision-balance tool, and if the patient had decided to quit, looking at goals and how to successfully accomplish those goals. The patients in the MI condition were then followed up twice by telephone for added support. At one-month follow-up, significantly more of the patients in the MI condition were abstinent as opposed to the patients in the treatment as usual condition (27% versus 16%, respectively). When attempting to identify the reason that these patients were able to quit smoking, the researchers found that those who were older, were more motivated to quit, and who believed their chest pain was directly related to smoking were the ones who were more likely to be abstinent at all three of the follow-ups (one-month, three-months, and six-months).



Schizophrenia is another difficult population to treat for smoking cessation. A very high percentage of people diagnosed with schizophrenia also are tobacco users (58-88% versus 20% of the general population), primarily because tobacco seems to help alleviate some of the side effects from many of the antipsychotic medications (Steinberg, Ziedonis, Krejci, & Brandon, 2004). Steinberg and his colleagues wanted to see if MI would have any greater effect among a sample of patients with schizophrenia than other typical interventions. In this study, patients were randomly assigned to one session of MI, one session of standard psychoeducational counseling, or one session of advice only. Steinberg and his researchers found that MI was significantly more effective at helping people with schizophrenia quit smoking than were the other two interventions. They were not interested in how many patients had actually quit smoking, but rather at how many of the patients were motivated to contact a smoking cessation program or to ask for assistance in quitting smoking. In this respect, more patients who received the MI session contacted a health provider and also a greater percentage in the MI condition went to at least one session of a smoking cessation program that was offered to them.

In another very similar study, researchers recruited individuals with a psychotic disorder to receive smoking cessation treatment (Baker et al., 2006). Participants in this study were randomly assigned to receive either an eight-session intervention that included MI, nicotine replacement therapy, and cognitive behavior therapy, or a standard care smoking cessation intervention. These investigators found that there were no significant differences between these two different interventions in helping people quit; however they did find that a significant number of individuals in both interventions quit smoking. Once again, there seem to be inconsistent findings about whether or not MI is

actually better at helping people to quit smoking. Another interesting finding from this particular study that seems to correspond with what other studies have found is that individuals who attended more sessions of either intervention were more successful at quitting smoking than individuals who did not complete all of the sessions. However, this difference in attendance of sessions was not part of the experimental manipulation, but rather reflects self-selection of participants. As a result, this finding may only reflect differences in motivation between participants who attended more sessions and participants who attended fewer sessions and does not necessarily suggest that more intensive treatment works better than brief treatment. There was also a substantial percentage of individuals who reduced their cigarette intake per day by more than 50%. In smoking cessation research, reduction has not often been reflected as a success, but this should probably change in future research. It is something that is reported in the current study.

#### *Motivational Interviewing Within the Context of the Values Card Sort*

One area in which the current study will add to the breadth of knowledge and research in the area of Motivational Interviewing will be in the inclusion of the Values Card Sort (Miller et al., 2001). The Values Card Sort was created in 2001 as an assessment tool to help facilitate a discussion between the therapist and the client about important values and goals in the client's life. The Values Card Sort is based on continuing research indicating that certain discrepancies between values and current behaviors can be effective motivators towards health behavior change (Allcock, Sandelowski, DeVellis, & Campbell, 2008; Jacob & Brinkerhoff, 1999; Maio & Olson, 1998; Nordin et al., 2001; Torelli & Kaikati, 2009).

The task itself is relatively simple. Clients are given a group of 83 cards with a different value listed on each and are asked to sort these cards into three piles: Not Important, Somewhat Important, and Very Important. The values listed on these cards range from "World Peace" and "Virtue" to "Wealth" and "Pleasure." Once finished with this task, the client is asked to once again sort through the Very Important values stack, and decide on between five and ten values that he or she would say are absolutely the most important values in his or her life. At this point, the therapist then asks a series of open-ended questions to explore with clients what each value means to them, how they know the value is important to them, and how the value is related to the target behavior (i.e., smoking cessation). In this sense, the spirit of Motivational Interviewing is embedded in this simple task.

#### *Research on Values and Behavior Change*

The research on values is extensive and dates back to early studies in the 1960s and 70s by Milton Rokeach (1968, 1973). One of the earliest studies that Rokeach conducted on values and attitudes was a social psychological study, which attempted to change college students' values (Rokeach, 1971). As part of this experiment conducted at Michigan State University, Rokeach attempted to create dissonance and "self-dissatisfaction" by showing a group of college students in the experimental condition the differences between their self-reported importance of values of equality and freedom and their own lack of involvement with several civil rights groups and activities. These researchers also told the experimental group that on average, students at Michigan State University were not concerned with equality as a value. Students in the control condition only gave a rating of their values and were not told such information about their values.

At several follow-up points over 2 years, the students in the experimental condition slowly started ranking equality higher on their list of values whereas students in the control condition did not change their values over time. Also, students in the experimental condition were significantly more likely to join the National Association for the Advancement of Colored People (NAACP) than were students in the control condition. This study suggests that enduring changes in important values, attitudes, and behaviors are possible as a result of highlighting certain kinds of inconsistent relations within the value-attitude system. The purpose of the current study is certainly not to attempt to change anyone's values, but rather to use veterans' currently held values as motivation to quit smoking.

In more recent research, Schwartz and his colleagues have investigated different categories of values, generally identifying ten types of values that are consistent cross-culturally in over 20 countries (Davidov, Schmidt & Schwartz, 2008; Schwartz, 1992). [This theory] derives 10 motivationally distinct, broad and basic values from three universal requirements of the human condition: needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups (Davidov, Schmidt & Schwartz, 2008, p. 423). Several value types have been identified in Schwartz's Value Theory: (1) power (values of social status, prestige and ability to control others); (2) achievement (values of setting goals and achieving them according to social standards); (3) hedonism (value of seeking pleasure and gratification); (4) stimulation (values of pleasure from excitement and novelty); (5) self-direction (values of autonomy in thought and action and being outside the control of others); (6) universalism (values of social justice and tolerance for all, as well as promoting peace

and equality); (7) benevolence (values of giving and providing help to others); (8) tradition (values of maintaining the status quo and respecting customs, traditional culture, or religion); (9) conformity (values of obedience to social expectations or norms); and (10) security (values of safety, harmony, and stability of self and others) (Schwartz, 1992). These particular value types have held up throughout several years of research, and are still being researched today (Davidov, Schmidt & Schwartz, 2008; Lee, Soutar, Daly, & Louviere, 2011; Schwartz, 1992, 1999, 2001; Vauclair, Hanke, Fischer, & Fontaine, 2011). These value types are also all included in the Values Card Sort task.

Another study based on Schwartz's Value Theory suggests that when a person has an increase in importance in one value or a value change in life, it generally coincides with an increase in other very similar values and decreases in conflicting or incompatible values (Bardi, Lee, Hoffman-Towfigh, & Soutar, 2009). This study supports the concept that people most often have "value hierarchies," meaning that at all times, individuals esteem some values more highly than others, but that this hierarchy can change over the lifetime. This study also found that these shifts in values generally co-occur with life-changing events. In general, the more life-changing the event is, the greater the value change. It is also important to note that even within the context of shifting value hierarchies, these researchers found that values tend to be reasonably stable across the lifespan, suggesting that there are certain values that a person may always identify as important.

In a test of the hypothesis that such stable values can have a significant impact on behavior, researchers found that contemplating reasons for a particular value can increase a person's value-congruent behaviors (Maio, Olson, Allen, & Bernard, 2001). In this

study, the researchers asked participants to contemplate their reasons for identifying with the strongly held values of equality and helpfulness. For the participants who were asked to think about their reasons for valuing equality, they then acted in a more egalitarian manner than control participants. For example, the participants who contemplated reasons for valuing equality were more likely to give an advantage to individuals in another group rather than their own group in a 20-questions game. For the participants who were asked to contemplate their reasons for valuing helpfulness, they then acted in a more helpful manner than other control participants. This more helpful behavior was measured by whether these individuals agreed to participate in a second research project, and, if so, for how long. For individuals who were contemplating their reasons for valuing helpfulness, they were more likely than control participants to agree to participate in another research project and also willing to devote more time to it.

In other areas of research on values, there have been some studies that have suggested that the value of health can influence other values and behaviors as well (Allicock et al., 2008). In this particular study, researchers were primarily interested in how different people described their value of "health" and how it was related to other deeply held values in their lives. These researchers also indicated that the value of "health" was the most frequently chosen value by individuals enrolled in their study. There was not necessarily a consistent subset of values that correlated highly with the value of "health," but these researchers did find several different values that individuals identified as strongly related to "health." These included: independence, responsibility, strength, God's will, family, and helpfulness. It was hoped that through this

understanding of core values and the meaning of the value of "health," future researchers would be able to optimize values as a motivator for behavior change.

In two different, but related studies investigating life satisfaction in both cancer survivors and in chronic pain patients, researchers found that satisfaction in life was strongly correlated with whether or not the person felt that they were living in accordance with their individual values (McCracken & Yang, 2006; Nordin, Wasteson, Hoffman, Glimelius, & Sjoden, 2001). In both studies, the larger the discrepancy between current behaviors and deeply held values, the more depressed and anxious the person was. These studies also both highlighted that the highest importance was placed on values related to family and health. Again, this shows that a discrepancy in current health behaviors and life values can have a significant effect on a person's well-being, and may also be a strong motivator towards health behavior change.

In a recent study which used a values clarification task and intervention to help change values over time, researchers were able to show that interventions directed at values can help to change maladaptive values about using alcohol and drugs, the appreciation of work, the appreciation of family, honesty, and approval of violence (Edwards & Allen, 2008). In this study, researchers were targeting pregnant adolescents and young mothers in an urban neighborhood. It was hypothesized that: "erratic, inconsistent, irrational, destructive, and/or self-deprecating behaviors are related to the absence of a well-defined value system. Therefore, if a coherent value system is developed, behavioral patterns will be expected to become consistent." Over time, counselors worked with these young women to flesh out their identified values, and through this process, they noted a steady change in identified values. At the end of the

intervention, these young women had changed their values about using drugs and alcohol, family, honesty, violence, appreciation of education, and willingness to trust.

### *Research on Values and Smoking*

A few research studies have examined the role of values in smoking and views about people who smoke (Chang, 2005; Grube, Rokeach, & Getzlaf, 1990; Kropp, Lavack, & Holden, 1999). In one of these studies, researchers asked participants to rank a list of values based on how they thought smokers, ex-smokers, and nonsmokers would rank them (Grube, Rokeach & Getzlaf, 1990). Participants in this study, by and large, believed that current smokers would value more highly personal enjoyment and autonomy. They more often ranked smokers as valuing hedonistic values of pleasure and excitement. Participants also generally ranked nonsmokers as being more conventional and valuing religion, relationships, and family. One interesting finding regarding the ex-smokers was that while people perceived them as valuing things more closely associated with nonsmokers (i.e., religion and family), they were also perceived as valuing self-control more highly than either nonsmokers or smokers. They were also perceived as putting more importance on values of accomplishments.

In another related study, researchers asked individuals who were themselves either smokers or beer drinkers what they valued (Kropp, Lavack & Holden, 1999). These researchers found that smokers generally placed less importance on values of safety, respect, and belonging to a group than non-smokers. They also found that beer drinkers generally rated excitement as a more important value than non-drinkers, but found security to be a less important value for drinkers than for non-drinkers. It was also found that non-smokers were more susceptible to interpersonal influence about smoking



behaviors than were smokers. In other words, the choice to be a non-smoker was strongly influenced by the family and friends' values that smoking had negative consequences. Current smokers reported that it did not matter to them what family and friends believed about smoking; it would not influence their decision to either keep smoking or to quit.

In a study that looked at the values of current adolescent smokers in Taiwan, it was found that smokers placed greater importance on hedonic gratification values (Chang, 2005). Current smokers also placed less emphasis on values of idealism, which is basically the value implicated in realizing your 'ideal self.' Also, in line with this same finding, hedonic values predicted more favorable attitudes towards smoking whereas idealistic values predicted less favorable attitudes towards smoking. It was also indicated that adolescents who are more prone towards a hedonic value system were more influenced by advertisements for cigarettes and smoking. Those who valued gratification were more influenced to start smoking based on these advertisements. In summary, it is important to note that there may be certain value systems in play for individuals who are more likely to begin smoking, however it is also important to remember that values can be changed over time, and that values are often a strong motivator towards behavior change.

Having reviewed the literature on a variety of issues related to smoking cessation research as well as values, research relating to fidelity of implementation of MI will now be reviewed.

*Motivational Interviewing Treatment Integrity (MITI) Coding System*

The Motivational Interviewing Treatment Integrity (MITI) coding system was created to try and produce higher reliability between coders while making a coding system that was less time consuming than other coding systems that had been developed for MI, such as the Motivational Interviewing Skills Code (MISC; Moyers, Martin, Manuel, Hendrickson & Miller, 2005; Moyers, Martin, Manuel, & Miller, manual in progress; Moyers, Martin, Manuel, Miller & Ernst, manual in progress). For an extended review of the MISC, readers are directed to a study that was conducted by Moyers and her colleagues (2003). The MITI was developed empirically by using a factor analysis of the MISC codes (Moyers et al., 2005). The current study utilized the third version of the MITI, the MITI-3. In this new coding system, there are only five global ratings, which are assessed on a scale of 1-5 (one being low in each of these areas and five being high in each of these areas): (1) empathy, which is the extent to which the therapist makes an effort to grasp and understand the client's perspective; (2) evocation, which evaluates the evocative quality of the questions and reflections that the therapist asks or offers; (3) collaboration, which looks at the relationship between the therapist and client and how well they work together; (4) autonomy/support, which evaluates the therapist's encouragement of autonomy and support for the client's decisions; and (5) direction, which is an evaluation of whether or not the therapist subtly directed the client to discuss topics relevant to the target behavior.

The MITI-3 has fewer distinct therapist behaviors to tally than the MISC and it uses categories that collapse several of those used in the MISC. These broader behavioral categories include MI adherent statements (which include support,

affirmation, and emphasizing client's control) and MI non-adherent statements (which include confronting, directing, and giving advice without permission from the client), as well as giving general information, asking closed questions, asking open questions, making simple reflections, and making complex reflections.

Another advantage of the MITI-3 over the MISC is that there is only one pass that the coder must make of the taped therapy session, rather than three passes. A twenty-minute segment is randomly selected from the tape and then the therapist behaviors are tallied. Within the MITI-3, as compared to the MISC, the client counts of behavior and global scores are omitted entirely.

Inter-rater reliability of these categories did increase over those of the MISC, showing only minimal weakness in the coding of the global behaviors of empathy and collaboration and in the behavior count of complex reflections, which all had intraclass correlations (ICCs) in the fair range. The reliability of all other behavior counts was in the good to excellent range, showing that the MITI-3 seemed to be an adequate measure of at least certain therapist behaviors used in MI (Moyers et al., 2005). For the purpose of this study, the MITI-3 will be used, since it is a more efficient coding system than the MISC.

Now that much of the relevant literature in the areas of Motivational Interviewing, smoking cessation, and values have been reviewed, the basic premises of the current study will be introduced. Again, this study compared a Values-Based MI condition (which used the Values Card Sort as the primary task) to a Preskills Training condition (which was an advice-based psychoeducational condition), expecting that the Values-Based MI condition would help veterans reduce their smoking significantly more than the

Preskills Training condition. Prior to testing the primary hypotheses, analyses will be conducted to confirm, as a manipulation check, that in fact the therapists in the MI condition exhibited more MI consistent behaviors than the therapists in the Preskills Training condition. That is, it was expected that there would be significant differences between the MI-based values card sort intervention and the Preskills Training intervention on the use of MI skills as indicated by the Motivational Interviewing Treatment Integrity (MITI-3) Coding form based on global scales of empathy, evocation, collaboration, autonomy/support, and direction. It was also expected that therapists in the MI condition would have higher tallies of simple and complex reflections, open questions, and MI-consistent behaviors such as affirming, emphasizing control, and support.

#### *Overview of Hypotheses*

In the present study, our hypotheses were as follows:

1. First, it was predicted that number of cigarettes per day, which was assessed with the Fagerstrom Test for Nicotine Dependence, would be significantly lower at one-month and three-month follow-ups for veterans who received the Values-Based MI session than those veterans who received the Preskills Training session before entering the smoking cessation program.
2. Second, it was predicted that ratings on the Stages of Change, Readiness and Treatment Eagerness Scale (SOCRATES) would be significantly higher on the subscales of Recognition, Ambivalence and Taking Steps at one-month follow-ups for those veterans who received the Values-Based MI session than veterans who received the Preskills Training session before entering the smoking cessation

program (the SOCRATES was only administered twice throughout the course of the study at pre-assessment and at the first follow-up time point).

3. Third, it was predicted that veterans who attended two sessions or less of the smoking cessation program at the VA hospital would have significantly higher cigarettes smoked per day at one-month and three-month follow-ups as compared to veterans who attended all three sessions, regardless of the intervention they were randomly assigned to. Potential differences across groups at baseline were assessed to be certain that there were no differences in motivation before intervention that may account for differences in the number of sessions attended. Motivation was assessed using the SOCRATES subscales as well as the number of quit attempts in the past month.
4. It was also predicted that veterans who attended two sessions or less of the smoking cessation program at the VA hospital would have significantly lower scores on the SOCRATES subscales of Recognition, Ambivalence and Taking Steps at the one-month follow-up as compared to veterans who attended all three sessions, regardless of the intervention to which they were randomly assigned. Again, potential differences were assessed for all individuals to be certain there were no differences in motivation before intervention. Motivation was assessed using the SOCRATES subscales as well as the number of quit attempts in the past month.
5. It was predicted that the more discrepancies a participant identified between his or her most strongly held values and his or her smoking behaviors, the more likely the participant would be to quit smoking or reduce smoking by the end of the

study. It was also predicted that conversely, if a participant does not identify discrepancies between his or her most deeply held values and his or her smoking, then the participant would be less likely to quit at the end of the study or reduce smoking. Discrepancies were identified while coding each of the tapes and were coded as "discrepant" or "nondiscrepant."

## METHOD

### *Participants*

The participants for this study came from the population of veterans associated with the New Mexico Veterans Affairs Healthcare System in Albuquerque, NM. The veterans were recruited over a two-year period through consults from Primary Care Providers, brochures, and phone calls based on expressed interest in quitting smoking, which were initiated by the research staff from this study. A total of 62 veterans were recruited for the study. The veterans were not compensated for participation, however participation in the individual session as well as participation in the smoking cessation group intervention were offered to the veterans with no charge. Veterans were also offered nicotine replacement therapy as well as medications to help them quit. The three forms of medical assistance that were offered included nicotine replacement therapy (nicotine patches, nicotine gum, and nicotine lozenges), bupropion, and varenicline. Varenicline was considered a second tier medication because of concerns about serious side effects, such as increased or new depression and suicidal ideation. As such, veterans were only offered varenicline if they had failed both nicotine replacement therapy as well as bupropion, and did not have risk factors for suicidal ideation. Dr. Brian Kersh, the director of the Smoking Cessation program at the New Mexico VA, estimates (personal communication, June 24, 2011) that the vast majority of the veterans who participate in the Smoking Cessation program through the VA utilize nicotine replacement or medications to help them quit (about 90-95%). Specific percentages were not available for the population in this study, but it can be assumed that the percentages would be quite high.

Some demographic information was obtained during the initial assessment. From this, it was determined that the sample was 10% women and 90% men. 65% of the sample were Caucasian, 22% were Hispanic, 5% were African American, and 8% did not identify their ethnicity.

### *Therapists*

For this study, two therapists were recruited from the community around Albuquerque, New Mexico to participate and meet with the randomly selected set of veterans for both the Values-Based MI sessions as well as for the Preskills Training sessions. The Principal Investigator, Dr. Brian Kersh, recruited the current author, then a Masters level student, to be one of the therapists, and Dr. Kersh also met with a subset of the veteran participants himself. Therapists underwent training in MI with Dr. Brian Kersh, Dr. William Miller, and Dr. Theresa Moyers. All of the therapists attended more than three two-hour training sessions with Drs. Miller, Kersh, and Moyers. Dr. Kersh also became a trainer and member of the Motivational Interviewing Network of Trainers (MINT).

### *Assessment Instruments*

All veterans filled out the following assessment instruments at the initial assessment:

- Fagerstrom Test for Nicotine Dependence: This questionnaire assesses how many cigarettes per day a person smokes, as well as how significant the person's addiction is by asking questions such as: Is it difficult for you to refrain from smoking in places where it is prohibited, and do you smoke even when you are ill? This questionnaire was developed by Karl Fagerstrom and has been used with



reasonable reliability (Cronbach's alpha ranging from 0.48-0.65 in several studies) and validity (Concordance and Kappa values for the items ranged from 50.0% to 95.0%) in many studies of smoking cessation (e.g., Fagerstrom, 1989; Huang, Lin, & Wang, 2006).

- **Stages of Change, Readiness and Treatment Eagerness Scale (SOCRATES):** This questionnaire assesses three different subscales including Recognition, Ambivalence, and Taking Steps. Recognition is how much the person recognizes smoking as a behavior problem that needs to be changed; Ambivalence assesses how ambivalent the person is about changing his or her smoking behaviors and how ready the person is to change; and Taking Steps assesses how much the person is already doing towards changing his or her smoking behavior. This instrument has been used with reliability and validity in studies to assess drinking behavior, but has not been used as consistently with changing smoking behaviors (Miller & Tonigan, 1996). Internal consistency coefficients for this scale have been found to be 0.93 for the Recognition subscale, 0.84 for the Taking Steps subscale, and 0.71 for the Ambivalence subscale (Mitchell, Francis, & Tafrate, 2005). Others have reported Cronbach's alpha ranged from 0.71-0.94 for each of these subscales as well (Mitchell & Angelone, 2006).
- **Smoking Cessation Pharmacology Assessment:** This instrument was created specifically for use in the current study, and was used as a standard assessment in the general smoking cessation program at the New Mexico VA Healthcare System. It is a simple, 7-question assessment of the number of cigarettes per day that the person smokes, how many times they have tried to quit in the past, how

many years they have smoked, what brand of cigarettes they currently smoke, and any other tobacco products they may currently use on a regular basis (cigars, chewing tobacco, etc.).

- **Tobacco Cessation Assessment:** This instrument was created specifically for use in the current study as well. It is also a simple assessment with six questions that ask about quit date, how many cigarettes the person is currently smoking, how many times the person has attempted to quit in the past month, and the person's average use of cigarettes during the past week (including if the person has smoked even a single puff in the past week).

### *Procedure*

After veterans filled out the initial assessment, they were then randomly assigned to either a treatment condition in which they received one session of a Values-Based MI intervention and three sessions of the standard smoking cessation group at the VA, or to a control condition in which they received one session of a Preskills Training educational intervention and three sessions of the standard smoking cessation group at the VA.

Assignment was done by alternating assignment of veterans who decided to participate between the two conditions. For example, the first person who agreed to participate was assigned to the Values-Based MI session and the second person who agreed to participate was assigned to the Preskills Training educational session. There were 31 veterans who were then randomly assigned using this method to the Values-Based MI session while 31 veterans were assigned to the control condition of the Preskills Training.

For veterans who were assigned to the Values-Based MI session, the initial individual session started with the veterans sorting through 83 cards with different values

listed on each. The veteran then divided these values into three piles: values that he or she found to be very important, values that he or she found to be somewhat important, and values that he or she found to be not important at all. The therapist would then focus on the values that the veteran selected as the most important to him or her, with most participants averaging 5-10 most deeply held values. Throughout the session, the therapist would ask about each of the values, what each value meant to the veteran, how the veteran knew that value was important, and how each value was related to the veteran's smoking behaviors.

For veterans who were assigned to the Preskills Training education session, the initial individual session began by asking if the veteran had been through groups in the past. The therapist, explaining how psychoeducational groups generally work, then described the procedures for the smoking cessation group at the VA. The next part of the session focused on education about how to take notes throughout the smoking cessation group and how to actively participate in the group in order to get the most out of it that was possible. These suggestions included being on time and attending all of the sessions, respecting other group members, being honest and open in the group, participating actively and sharing experiences, and using "active listening." Active listening was then described in further detail. Veterans in the Preskills Training were also encouraged to use skills from the group as soon as possible to make sure that they remembered certain strategies throughout the week and to talk about these experiences in the following group session.

After participating in the individual session, every veteran was then asked to come to three sessions of the smoking cessation group at the VA, which occurred on a

weekly basis for three weeks. These group sessions focused on helping veterans receive medications or nicotine replacement to help them quit, strategies to use to help them cut back or quit, and setting goals and rewards for reaching these goals. As part of the discussion about goals, veterans were encouraged to set a quit date in order to start preparing for this date. It is also important to note that, although the standard smoking cessation group at the VA was not specifically focused on utilizing Motivational Interviewing in the delivery of the information, the providers of the group may have been giving the information in a way that was consistent with the spirit of MI. Since there were not enough resources in place for this study to have a separate smoking cessation group for veterans participating in the study, the group sessions included both a minority of study participants and a majority of others and were conducted in a way that was clinically relevant for all veterans, not just study participants. Veterans in the study were asked to attend all three sessions and then were assessed for post-treatment changes during the last group session as well as at one-month after finishing the group and three-months after finishing the group.

In the assessments, the veterans' levels of smoking behaviors and dependence were measured according to the Fagerstrom Test for Nicotine Dependence as well as on the Tobacco Cessation Assessment. Their motivation and readiness to change was assessed according to the SOCRATES, but only for the pre-assessment and post-assessment time points. Since the third and fourth assessments were conducted over the telephone, it was decided that the SOCRATES would be cumbersome to ask and answer through a telephone conversation. The veterans were assessed initially before they participated in the individual session, and after going through the informed consent

process. A second assessment was then conducted at the end of the smoking cessation group (about one month after the initial individual session), a third assessment by telephone one month after they had finished the smoking cessation group (about two months after the initial individual session), and a fourth assessment by telephone three months after they had finished the smoking cessation group (about four months after the initial individual session). For the second assessment, 47 of the veterans were available to participate (78%), for the third assessment, 41 were available to participate (68%), and for the fourth assessment, 43 to participate were available (71%).

In order to evaluate more effectively the discrepancy levels for veterans between their smoking behaviors and their most deeply held values, a novel coding system was utilized. In this coding system, the discussions around each individual value that a veteran ranked was coded subjectively by raters as being either "discrepant" with the smoking behavior or "not discrepant" with the smoking behavior. These ratings were all based on the veterans' answers to the question: "How is this value related to your smoking?" If the veteran answered that it was not related, or positively related to their smoking, then the value was considered "not discrepant." If the veteran answered that it was opposed or contradictory to the smoking behavior, then the value was considered "discrepant."

### *Session Selection*

Using randomized selection, 50% of the taped sessions of the Values-Based MI sessions were coded for therapist competence in MI using the MITI-3. Half (50%) of the taped sessions of the Preskills Training condition were chosen to be coded as well, to be sure there was actually a difference in treatment conditions. It was decided that two

students would code a subset of the tapes in order to determine the reliability of the measures being coded. Two undergraduate students in the psychology department of the University of New Mexico were trained on how to code the MITI-3 by an experienced individual who had been trained on several different coding instruments used at CASAA (Center on Alcoholism, Substance Abuse, and Addictions), including the MITI-3. This trainer was highly recommended by Dr. William Miller, the director of CASAA at the time. A total of 31 tapes were coded, with a little more than 30% (a total of 10) of these being double coded to assess inter-rater reliability between the two coders.

The protocol for the current study was reviewed and approved by the appropriate Institutional Review Boards, both at the New Mexico Veterans Affairs Healthcare System and at the University of New Mexico.

## RESULTS

### *Descriptive Statistics of the Sample*

The sample that participated in this study at the New Mexico VA Health Care System were all veterans, and were largely male (90% male, as mentioned above). The average age of the veterans was 55.15 years ( $SD = 9.10$ ). The average number of years of education was almost 14 years ( $M = 13.94$ ,  $SD = 2.35$ ), so our sample had on average at least 2 years of college-level education. On average, veterans in the sample had been smoking for 36.81 years ( $SD = 11.00$ ). Also, the majority of our sample had tried to quit smoking multiple times in their lives, with the mean being 11.55 times ( $SD = 12.71$ ). The average number of cigarettes per day that our sample was smoking upon entering the study was 20.89 per day ( $SD = 9.20$ ).

### *Inter-rater Reliability*

Intraclass correlation coefficients (ICCs) of the two trained coders who coded the tapes for the MITI-3 were used to assess whether or not all of the global therapist characteristics and measures of therapist behaviors, such as closed or open questions, simple or complex reflections, and MI adherent or MI nonadherent behaviors, were rated reliably. The ICCs for the global scores were as follows: for Evocation, the ICC was .724 (good); for Collaboration the ICC was .741 (good); for Autonomy/Support the ICC was .653 (good); for Direction the ICC was .813 (excellent); and for Empathy the ICC was .692 (good). In summary, all of the ICCs for the global scores were in the good to excellent range, based on the categorization system proposed by Cichetti (1994). Cichetti's categorization system proposed the following: an ICC below .40 should be considered poor inter-rater reliability; an ICC between .40 and .59 should be considered a

fair inter-rater reliability; an ICC between .60 and .74 should be considered good inter-rater reliability; and an ICC between .75 and 1.00 should be considered excellent inter-rater reliability (1994).

For most of the therapist behavior counts and ratios (i.e., ratio of open questions to closed questions, ratio of complex reflections to simple reflections), the ICCs were also in the good to excellent range, however there was one count that fell into the poor range (the behavior count of MI adherent statements). Based on previous research involving the MITI-3, it is not surprising that the MI adherent statements were not coded similarly. Statements of support, affirmation, asking permission, and emphasizing control are often very difficult for coders to distinguish from simple and complex reflections (Brueck et al., 2009; Forsberg et al., 2007; Moyers et al., 2003; Moyers et al., 2005).

For the therapist behavior count of Giving Information, the ICC was .961, which is in the excellent range. For the therapist behavior count of Closed Questions, the ICC was .931, which is also in the excellent range. For the therapist behavior count of Open Questions, the ICC was .983, which again is in the excellent range. For the therapist behavior count of Complex Reflections, the ICC was .946, which is in the excellent range. For the therapist behavior count of Total Reflections, the ICC was .855, which is in the excellent range. For the ratio of Open Questions to Closed Questions, the ICC was .899, which also is in the excellent range. For the therapist behavior count of MI nonadherent statements, the ICC was .667, which is in the good range. For the ratio of Complex Reflections to Simple Reflections, the ICC was .716, which is in the good range. For the therapist behavior count of Simple Reflections, the ICC was .416, which



is in the fair range. For the therapist behavior count of MI adherent statements, the ICC was .305, which is in the poor range.

*Treatment Fidelity: Analyses of Therapist Behaviors*

With the use of the MITI-3, it was determined that there was appropriate treatment integrity of the coded tapes. In other words, the Values intervention was distinctly different from the Preskills intervention based on therapist behaviors of open questions, simple and complex reflections, giving information, and MI adherent or MI nonadherent behaviors (see Table 1). The mean of the effect sizes for the therapist behavior counts noted in Table 1 was  $d = 0.75$ , which is approaching the cutoff for a large effect size. It was also determined that the overall global feel for the sessions in the two conditions was distinctly different as indicated by ratings of Evocation, Collaboration, and Empathy—three of the five global scores rated on the MITI-3 coding system (see Table 2). The mean of the effect sizes for the global ratings noted in Table 2 was  $d = 0.96$ , which is clearly a large effect size. For the global rating of Evocation, the Values-Based MI therapists were scored significantly higher than the Preskills Training therapists,  $t(27) = 3.77, p = .001$ . For the global rating of Collaboration, the Values-Based MI therapists were scored significantly higher than the Preskills Training therapists as well,  $t(27) = 4.06, p < .001$ . For the global rating of Empathy, arguably the most important global score to distinguish Motivational Interviewing from any other intervention, the Values-Based MI therapists again scored significantly higher than the Preskills Training therapists,  $t(27) = 3.80, p = .001$ . Another area that came through as significantly different between the Values-Based MI therapists and the Preskills Training therapists was the ratio of open questions to closed questions—the ratio was significantly

higher for the MI condition than the Preskills condition (see Table 1). Overall, the analyses of therapist behaviors indicated that the current study represented a valid implementation of an MI condition.

*Independent Samples t test: Values-Based MI vs. Preskills on Pre-Measures*

Prior to conducting the analyses relevant to the hypotheses, preliminary analyses were conducted to determine if there were any significant differences pre-intervention between the two groups (Values-Based MI condition versus Preskills Training condition) on smoking behaviors, gender, ethnicity, or incoming motivation. Descriptive statistics are reported in Table 3, along with the results of independent samples *t* tests for continuous variables. Fisher's exact test analyses for discrete variables are reported in Table 4.

From these analyses, it was determined that there were no group differences pre-intervention on most measures, however it was noted that there was a significant difference between groups on whether or not another form of tobacco was used besides cigarettes as well as levels of ambivalence pre-intervention between the groups. Specifically, significantly more veterans in the Preskills Training condition were using other forms of tobacco as well as cigarettes (i.e., cigars, pipes, and chewing tobacco), as compared to veterans in the Values-Based MI condition,  $p = .006$ , Fisher's Exact Test. It is important to note that this highly significant difference was due to there being 10 veterans in the Preskills Training condition using other forms of tobacco as compared to only one veteran in the Values-Based condition. Given veterans were randomly assigned to conditions, it is unclear why this discrepancy between the two groups existed, as this information on "other forms of tobacco" was obtained through the initial assessment in a

self-report format. Also, it would seem that for veterans who were using other forms of tobacco, quitting would be more difficult. Analyses conducted to see whether other forms of tobacco were being used indicated no significant main effect or interaction involving this factor. Nonetheless, the trend in the Preskills Training condition did in fact suggest that veterans who were using multiple tobacco products tended to start out smoking more and appeared to be slower to change their smoking behaviors than veterans who were not using other forms of tobacco. In other words, these veterans tended to stay at a higher level of cigarettes per day throughout most of the early assessment time points, but then had a sharp decrease in usage at the final 3-month follow-up (see Figure 1). Despite the Preskills Training condition having this disadvantage of a disproportionately large number of smokers using other forms of tobacco, as will be seen in the analyses reported below, the Preskills group overall did not have worse outcomes than the Values group.

Another difference that was identified on the pre-measures was that veterans who were randomly assigned to the Values-Based MI condition appeared to be significantly more ambivalent (as measured by the SOCRATES) than veterans assigned to the Preskills Training condition,  $t(60) = 2.32, p = .024$  (see Table 3). This will be commented on in the Discussion section.

Finally, there was evidence that the Values condition resulted in a higher rate of completion of the follow-up assessments. Participants could complete 0, 1, 2 or all 3 of the post-treatment assessments. The mean number completed by participants in the Values condition, 2.45, was significantly higher than the mean number, 1.87, completed by participants in the Preskills condition,  $t(60) = 2.07, p = .043$ . Thus, in the two

following sections examining effects of the conditions, comparisons will be made between baseline assessments of those included or excluded from the analysis.

*Repeated Measures ANOVA: Condition x Time*

The primary hypotheses were initially evaluated by conducting a repeated measures analysis of variance using the multivariate approach. For the first hypothesis concerning number of cigarettes smoked per day, the analysis included a between-subjects factor of Group with 2 levels and a within-subject factor of Time with 4 levels. Results of this repeated measures analysis are shown in Table 5. The main effect of Time was highly significant,  $F(3, 32) = 30.15, p < .001$ , indicating that the groups were improving over time as shown in Figure 2. Follow-up tests indicated that the improvement from baseline was highly significant for each of the three later assessments,  $F_{\text{ts}} > 30, p < .001$ . The Condition x Time interaction was also significant,  $F(3, 32) = 3.53, p = .026$ . However, contrary to Hypothesis 1, there was no difference in the amount of improvement from baseline to the average of the post assessments,  $F < 1$ . As suggested by Figure 2, the locus of the interaction seemed to be that between the one-month and three-month assessments, the Values group was relapsing somewhat whereas the Preskills group was continuing to improve. A test of an interaction contrast assessing the amount of change from one month to three months was significant,  $F(1, 34) = 6.84, p = .013$ , with the difference favoring the Preskills condition.

The repeated measures ANOVA just described required veterans to have no missing data. This analysis thus included only the 36 veterans with complete data. However, as shown in Table 4, data was available on 62 veterans at pre-test, 49 at initial post-test, 42 at one-month follow-up, and 43 at three-month follow-up. Although the rate

of participants having complete data in the Values condition (21 of 31, or 67%) was somewhat higher than that in the Preskills condition (15 of 31, or 48%), this difference in follow-up rates was not significant,  $p = .198$  by Fisher's Exact Test. Nonetheless, differences at baseline between those included and those excluded from this analysis were examined to determine possible limitations of the generalizability of these results. Although no differences in baseline smoking behaviors emerged, it was the case that participants with complete data had a higher mean number of years of education, 14.4, than that (13.2) of those without complete post-treatment data,  $t(60) = 2.00$ ,  $p = .05$ .

To incorporate additional participants into analyses relevant to the primary hypothesis concerning differences between conditions, two additional sets of analyses were conducted to examine all the data obtained: separate independent samples  $t$  tests of change from pre to each of the subsequent assessments, and a mixed model approach that incorporated all available data into a single analysis. Given the lack of evidence for the predicted greater improvement in the Values condition, these additional analyses were conducted with no adjustment for multiple tests so that the failure to reject the null hypothesis would be less likely due to a Type II error.

*Independent Samples  $t$  test: MI Values Condition vs. Preskills Training*

An independent samples  $t$  test was run to explore the differences between the group of veterans who received the Values-Based MI session and the group of veterans who received the Preskills Training session for several difference measures of cigarettes smoked and scores of the SOCRATES at each available time point. Several different variables were reported, most of which were not significantly different between the two conditions (Table 7). This analysis examined changes in cigarettes smoked per day,

changes in days smoked during the past week, all changes in scores on the subscales of the SOCRATES (Ambivalence, Recognition, and Taking Steps), and changes in scores on the Fagerstrom Test for Nicotine Dependence. For all these variables, a difference score was computed by subtracting the pre-score from the appropriate later score.

Improvement thus was indicated by negative difference scores for changes in cigarettes smoked per day, changes in days smoked during the past week, and changes in scores on the Fagerstrom Test for Nicotine Dependence. In contrast, positive difference scores on the SOCRATES subscales were indicative of improvement. One of these 10 difference scores, the difference between average cigarettes smoked pre-intervention and at the three-month follow-up, indicated that there were significant differences between the veterans in the Preskills Training condition and the Values-Based MI condition.

However, this between group difference was not in the hypothesized direction, because veterans in the Preskills Training condition had dropped significantly more in cigarettes smoked by the three-month follow-up than veterans in the Values-Based MI condition,  $t(41) = 2.11, p = .041$  (see Table 7). The mean improvement in the Preskills group was a decline of 18.6 cigarettes whereas the comparable figure for the Values groups was only 11.2. The overall mean of the effect sizes for these differences reported in Table 7 was  $d = 0.01$ , indicating there was overall essentially no difference between the two treatments on change in these variables.

#### *Mixed Model Analysis: Condition x Time*

The mixed model analysis allowing for random intercepts was quite similar to the repeated measures analysis in terms of the effect of Time being highly significant,  $F(3, 134.6) = 33.70, p < .001$ . However, the Condition x Time interaction did not reach

significance in the mixed model approach,  $F(3, 134.6) = 2.36, p = .075$ . The estimated marginal means resulting from the mixed model analysis are shown in Figure 2. The improvement from baseline in both groups is again clear, and there is the same cross-over pattern between one month and three months seen previously, with the Preskills group tending to improve more during that interval than the Values-Based MI group.

One important point to note, as seen in the Repeated Measures ANOVA as well as the mixed model analysis, is that there were significant decreases in cigarettes per day, regardless of the condition (see Table 5, Figure 2 & Figure 3).

Once again, some participants could not be included in the assessment of treatment effectiveness. In the mixed model analysis, only those without any post-assessments were effectively excluded. As was the case in the repeated measures analysis, the trend was for the Values condition to have a somewhat higher rate (93%) of participants with at least one post-treatment assessment than that seen in the Preskills condition (77%), but this difference was non-significant,  $p = .147$  by Fisher's Exact Test. There were no significant differences between those with at least one post-treatment assessment and those with none on any of the baseline variables examined.

#### *Abstinence Rates*

Although hypotheses were stated in terms of number of cigarettes smoked rather than proportion of a group abstinent, it might be of interest to some readers to know what proportion had been successful at quitting smoking. Abstinence was assessed in the current study by asking the veterans if they had smoked at all, even a single puff, in the past week. As might be expected based on the various analyses just reported showing a lack of significant difference in number of cigarettes smoked, similarly there were no

significant differences between the two conditions in abstinence rates at any of the assessment periods. The Values group and the Preskills group had abstinence rates of 3% and 3%, respectively, at baseline; 15% and 18%, respectively, at the post assessment; 40% and 24%, respectively, at 1 month; and 50% and 58%, respectively, at 3 months.

*Independent Samples t test: More Sessions vs. Fewer Sessions Attended*

An independent samples *t* test was performed to see if there were any differences between those veterans who attended two or fewer Smoking Cessation Group sessions after the individual session, and those veterans who attended all three of the Smoking Cessation Group sessions. It is important to note that while investigating these differences, that there were very few veterans who attended between zero and two sessions who continued through the follow-up assessments. At the post-assessment time point, there were 11 veterans who had attended between zero and two sessions, and there were 38 veterans who had attended all three sessions. At the one-month assessment time point, there were 9 veterans who had attended between zero and two sessions, and there were 33 veterans who had attended all three sessions. Finally, at the three-month assessment time point, there were 9 veterans who had attended between zero and two sessions, and there were 34 veterans who had attended all three sessions. As such, these analyses have low power, and so once again analyses were conducted without an adjustment of alpha levels for multiple tests. Another important point to note is that, although there were not significant differences between the Values group and the Preskills group on number of sessions attended, there appeared to be a trend towards the Values group attending more of the sessions in general,  $t(60) = 1.68, p = .098$ , with the



Values group attending a mean of 2.4 sessions whereas the Preskills Training group attended 2.1 sessions.

Based on these analyses, there were no significant differences between veterans who attended all three of the sessions and veterans who attended fewer (zero, one, or two) of the Smoking Cessation Group sessions (Table 8). As a reminder of the meaning of the difference scores, the comparison examining difference in cigarettes per day from the pre-assessment to the post-assessment showed that veterans who attended all three of the smoking cessation group sessions had a (non-significantly) larger mean decrease in cigarettes per day than veterans who attended zero to two sessions ( $M = -8.4$  and  $M = -4.8$ , respectively). The mean effect size for the differences noted in Table 8 between those who attended all three sessions and those who attended zero to two sessions, was  $d = 0.05$ , indicating a slightly greater increase among those who attended more sessions, but one which does not even approach the level of a small effect size.

Positive mean change scores on the subscale scores of the SOCRATES for Ambivalence, Recognition, and Taking Steps indicate improvement over time. Differences in Ambivalence, thus, indicated (non-significantly) greater improvement for the veterans who attended zero to two sessions of the group than for veterans who attended all three sessions of the group. Higher scores on the Ambivalence subscale of the SOCRATES may in fact be indicative of less motivation to change. This will be discussed further in the Discussion section.

#### *Analyses of Discrepancies Between Values and Smoking Behaviors*

For the final hypothesis, it was predicted that the more discrepancies a veteran identified between his or her most strongly held values and his or her smoking behaviors,

the more likely the veteran would be to quit smoking or reduce smoking by the end of the study. It was also predicted that conversely, if a veteran did not identify discrepancies between his or her most deeply held values and his or her smoking, then the veteran would be less likely to quit at the end of the study or reduce smoking. Discrepancies were identified while coding each of the tapes and were coded as discrepant or nondiscrepant. Based on this hypothesis, analyses were run to examine percentages of discrepant values identified within the context of multiple change measures, including changes in cigarettes smoked per day, days smoked during the past week, all changes in scores on the subscales of the SOCRATES (Ambivalence, Recognition, and Taking Steps), and changes in scores on the Fagerstrom Test for Nicotine Dependence. For this analysis, the most frequently rated values were examined for this veteran population, and it was found that the top three values matched up with some of the research discussed above in the section on Values— Family, Honesty, and Health, in that order. The top three values were determined by counting how many veterans rated each of the different values in their lists of “very important” values. The value of Family was, by far, the top-most rated value by veterans (11 veterans listed Family in their top values) in the Values-Based MI condition, followed by Honesty (10 veterans) and Health (9 veterans).

An independent samples *t* test was run using a median split of “Highly Discrepant” versus “Not Discrepant.” This was then used to explore several different change measures, as described above. From this analysis, it was found that the results were almost in exactly the opposite direction of what was predicted. Veterans who found their values to be highly discrepant with their smoking behaviors tended to have smaller changes in smoking whereas veterans who found their values to be nondiscrepant with

their smoking behaviors tended to have significantly greater changes in smoking throughout the study (see Table 9). In looking at the effect sizes for the differences on the  $t$  tests for those who were "Highly Discrepant" and those who were "Not Discrepant," noted in Table 9, the overall mean was  $d = -1.07$ , which is considered a large effect size, but in the opposite direction from the prediction. Differences in change across groups defined by an attribute such as value discrepancy clearly could arise either because of differences between groups at baseline or at one of the follow-ups. On the critical variable of cigarettes per day, the difference across groups at baseline (15.3 for the Highly Discrepant group vs. 23.6 for the Not Discrepant group) were more pronounced than at the first two follow-up periods (16.9 for the Highly Discrepant group vs. 10.3 for the Not Discrepant group at Post, and 7.7 for the Highly Discrepant group vs. 3.2 for the Not Discrepant group at One Month). To examine these provocative findings more closely, it was decided to conduct an analysis incorporating all assessments. A conventional repeated measurement analysis would have very little power because only 11 veterans total had complete data. Thus, a mixed model analysis was conducted.

#### *Mixed Model Analysis of Discrepancies Between Values and Smoking Behaviors*

The mixed model analysis allowing for random intercepts revealed, as might be expected based on previous analyses, the effect of Time was highly significant,  $F(3, 43.8) = 10.97, p < .001$ . The test for main effects of the Value Discrepancy Group was not significant,  $F(1, 18.3) = 1.36, p = .259$ . Most importantly, however, the Condition  $\times$  Time interaction was significant in the mixed model approach,  $F(3, 43.8) = 4.99, p = .005$ . The estimated marginal means resulting from the mixed model analysis are shown in Figure 4. The improvement from baseline is much more obvious in the group that did

not find their smoking to be discrepant with their values, and it appears that veterans who labeled their smoking as discrepant with their values, improved somewhat at first, but then returned to close to their baseline smoking.

It was important to follow-up these findings in the mixed model analysis to look more in depth at the significant interaction. First, an interaction contrast was analyzed to see whether the linear trend over time was significantly different between the two Value Discrepancy Groups. It was found that it was indeed significant,  $F(1, 43.8) = 8.17$ ,  $p = .007$ . Then the linear trend within each group was examined separately. There was no linear trend over time for the "Highly Discrepant" group,  $F(1, 43.8) = 1.26$ ,  $p > .20$ . However, the linear trend over time for the "Not Discrepant" group was highly significant,  $F(1, 43.8) = 23.11$ ,  $p < .001$ . The implication of these analyses will be examined further in the discussion.

## DISCUSSION

Throughout the entirety of this study, it was determined that there were not significant differences in outcomes between the veterans who were randomly assigned to the Values-Based MI condition and the veterans who were randomly assigned to the Preskills Training condition. In short, the hypotheses could not be accepted that the Values-Based MI condition was significantly more effective than the Preskills Training condition in helping New Mexico veterans to quit smoking. However, even amidst this failed conclusion, significant numbers in both conditions achieved a significant reduction in cigarettes smoked per day, and some were even able to quit completely. Also, our abstinence rates (50% for the Preskills group and 58% for the Values group) at the end of this study were quite significant when compared to many of the general smoking cessation intervention studies (11-14%; Hettema & Hendricks, 2010; 12-24%; Levy et al., 2010). In other words, these quit rates were quite impressive. However, one cannot conclude from the current study that the psychosocial treatments, either the three standard group sessions or the added Values or Preskills Training, were responsible for the difference. One plausible rival hypothesis to such an interpretation is that the medications given to help the clients quit were responsible for the change. But, for whatever reason, the final abstinence rates were impressive. In reality, this study was attempting to set the Values-Based MI condition apart from what would typically be considered "treatment as usual" for smoking cessation programs in the Veterans Affairs Health Care System nationwide. Instead, what was discovered was that it did not matter which specific intervention was used.

Before discussing each of the hypotheses for this study in detail, it will be important to discuss some of the discrepancies identified on a few of the pre-measures. First, with regards to the number of other tobacco products used, as was highlighted in the results section, there were 10 veterans in the Preskills Training group who were using other tobacco products, but only one veteran in the Values-Based MI group. In this particular situation, it might be assumed that someone who has multiple tobacco product addictions (i.e., cigarettes, cigars, and chewing tobacco), would have a much more difficult time quitting smoking than a veteran who only has one tobacco product addiction (i.e., cigarettes). As was noticed in the results of a preliminary analysis of the Preskills Training group, there was some non-significant evidence in this direction. Despite this disadvantage, it seems that the Preskills Training group did just as well as the Values-Based MI group overall, even given the fact that several of the veterans in the Preskills group were using multiple forms of tobacco. Another important thing to note about this discrepancy is that there were only 11 veterans total who identified as using other forms of tobacco besides cigarettes (18% of the total sample size). This is certainly something that should be examined more thoroughly in future research in the area of smoking cessation. It would be interesting to see what other differences might exist between veterans who are using multiple forms of tobacco versus veterans who are only using one form of tobacco.

The second interesting discrepancy that was noted in the results on the pre-measures was that veterans in the Values group appeared to be significantly more ambivalent (as measured by the SOCRATES subscale of Ambivalence) than veterans in the Preskills group. There are a few important things to point out with regards to this

difference between the two groups. First, the Ambivalence subscale is measured by a total of only four items on the SOCRATES, whereas the other subscales of Recognition and Taking Steps are measured by seven items and eight items, respectively. Also, there have been some issues using the Ambivalence subscale to measure ambivalence in other studies as well (Chun, Cho & Shin, 2010; Maisto et al., 1999; Maisto et al., 2003; Miller & Tonigan, 1996; Mitchell, Francis, & Tafrate, 2005). According to Maisto: "One consideration is that the Ambivalence factor is less stable than the other two. It consisted of the fewest items (4) among the three factors and had the lowest coefficient alpha of their three factors" (Maisto et al., 2003, pg. 105). Basically, there is a split in the research between a conceivable 2-factor model of the SOCRATES (using only Taking Steps and Recognition) and the 3-factor model originally defined by Miller and Tonigan (1996).

Ambivalence is a difficult construct to define, in and of itself, and some of the wording of the statements may have been confusing to veterans in the study, which apparently is not that different from what has been found in other studies using the SOCRATES. For example, one of the statements: "Sometimes I wonder if I am a tobacco addict" can be interpreted readily in two different ways. The first way would be to see whether veterans who may have been denying that tobacco use was a problem for them might start to worry or become ambivalent about their smoking behaviors. In this case, this veteran would score highly on the subscale of Ambivalence, and it may be indicative of the veteran starting to wrestle with whether or not smoking was a problem. It was this interpretation that motivated the prediction in the current study that an increase in Ambivalence would be indicative of a positive outcome.

Another way in which this statement could be interpreted, and often was by veterans in this particular study, was that they felt that they had always known that they were tobacco addicts, and so they would disagree with this particular statement, and others like it. Veterans would often get confused about the Ambivalence items on the SOCRATES and would state things such as: "I cannot say I agree with this statement because I do not wonder if I am a tobacco addict, I *know* that I am." As such, these veterans who were certain of their addictions to tobacco would score much lower on the Ambivalence subscale. With this in mind, it is not clear whether a significant difference between the Preskills group and the Values group actually meant a difference in motivation to change or a difference in how these ambiguous questions were interpreted. However, once again, it will be important for future research to look at this more closely, especially in the context of using the SOCRATES for tobacco cessation research, as it is primarily used in alcohol abuse treatment research currently.

A final comment about differences between the groups that may have impacted results, despite the random assignment, was that the Values condition resulted in a higher rate of completion of follow-up assessments. Although those completing more assessments in general did not differ, except for having somewhat higher levels of education, from those completing fewer assessments it is conceivable that the Preskills group post-treatment assessments might have looked a bit less favorable had as high a proportion of participants been assessed in that condition as in the Values condition. While one can only speculate about what the outcomes would have been for participants with no follow-up assessments, it is possible that the initial disadvantage of the Preskills group having, by a fluke random assignment, many more participants using other forms



of tobacco was offset to some extent by the positive bias perhaps introduced by the lower follow-up rate in this condition.

Before continuing on to a discussion about each of the identified hypotheses, a brief comment on the analyses regarding treatment fidelity based on the Motivational Interviewing Treatment Integrity Coding Form (MITI-3) measure is appropriate. When the MITI-3 Coding Form was examined to make sure that there was treatment fidelity for our study (i.e. that there would be significant differences between the Values-Based MI therapists and the Preskills Training therapists on the use of MI skills), it was found that the MI therapists were indeed providing therapy in the spirit of MI whereas the Preskills therapists were not providing therapy in the spirit of MI at all. Basically, when analyzing treatment fidelity, it was expected that the therapists would be more MI-consistent in the MI condition as compared to the Preskills Training condition based on global scales of empathy, evocation, collaboration, autonomy/support, and direction. Also it was expected that the therapists in the MI condition would have higher tallies of simple and complex reflections, open questions, and MI-adherent behaviors (i.e., affirming, emphasizing control, and support). Nine of the 15 variables tested showed a significant difference in the predicted direction. The average effect size over all 15 variables was  $d = 0.82$ . It would appear that as such, therapists were doing something distinctly different in the MI condition versus the Preskills condition.

The MI condition was based much more on collaborating with the veterans and helping them to move in the direction of change based on where they were coming from and what was important to them. This was seen in significantly higher tallies of Open Questions, Complex Reflections, and Total Reflections for the therapists in the MI group

than the therapists in the Preskills group. This was also seen in significantly lower tallies of Giving Information and MI nonadherent behaviors for the therapists in the MI group than the therapists in the Preskills group. In the Preskills condition, it would appear that it was more "advice-based" and there was significantly more psychoeducation occurring in these sessions based on the averages of giving information and MI-nonadherent behaviors. Also, as was seen in the results, the overall "global" feel for the Values-Based MI condition was significantly different from the "global" feel for the Preskills Training condition on ratings of Evocation, Collaboration, and Empathy. Another significant finding was in the differences of ratios of Open Questions to Closed Questions. The ratio was significantly higher for the MI condition versus the Preskills condition. Based on these results, it appears that one can confidently state that the therapists in the Values-Based MI group were able to deliver a version of therapy appropriately based in the principles of MI. One is also able to confidently say that the Preskills Training condition was very different from Motivational Interviewing and looked more similar to an advice-based or psychoeducational intervention. This will help to frame the rest of the discussion of the primary hypotheses.

According to the results, hypotheses 1 and 2 were not upheld. Hypotheses 1 and 2 stated that it was expected that there would be significantly larger reductions in cigarettes per day and significantly higher scores on the SOCRATES for veterans who received the Values-Based MI condition than veterans who received the Preskills Training conditions. Basically, it was expected that the Values-Based MI session would be significantly more helpful in getting veterans closer to quitting and in a different mindset to reach that goal of quitting. It seems to be the case that for the veterans

enrolled in this particular study, either of the interventions offered were helpful. Throughout the entire study, there were significant reductions in cigarette usage over time as well as significant increases in subscale scores on the SOCRATES over time. It may have been the case that the reason there were not significant differences between the two groups was because if veterans are self-enrolling in a smoking cessation study (which was the case for this research), then they are at the point of being ready to quit smoking or to reduce significantly. It could have been that these veterans who self-selected only needed a small nudge in the direction that they were already heading, and that any intervention offered to them at that particular time would have helped them to reach their goal of reducing cigarette usage.

In hypotheses 3 and 4, it was expected that the more sessions a veteran attended of the three-session Smoking Cessation group, the more likely that veteran would be to reduce cigarette usage or to quit completely. Basically, through these hypotheses, it was predicted that there would be a dose-response relationship. Once again, the predictions were not upheld, as was seen in the results. One of the main problems with this particular prediction was that there was a large attrition rate for veterans who attended fewer than three sessions of the group. Of the 22 veterans who would end up attending anywhere from zero to two of the sessions, only 11 were available for the post-assessment follow-up. On the other hand, of the 40 veterans who would end up attending all three of the group sessions, 38 of these veterans were available for follow-up. From these numbers, it can be seen that only 50% of the veterans who did not continue with the group were available for follow-up assessments, whereas almost all of the veterans who attended all of the group sessions were available for follow-up (95%). This large discrepancy in

proportions of the two attendance groups available for follow-up (which is highly significant,  $p < .001$ , by Fisher's Exact Test) made it difficult to conduct a valid and powerful analysis. However, even with these numbers, there was not a significant impact of the dose-response relationship on reduction of cigarettes per day or subscale scores of the SOCRATES, which had been expected. It is also important to note that had there been a difference between those who frequently attended and those who did not frequently attend, it could have been attributed to greater motivation to quit smoking on the part of those who frequently attended rather than as an effect of the sessions per se.

According to the final hypothesis, it was predicted that the more discrepancies a veteran identified between his or her most strongly held values and his or her smoking behaviors, the more likely the veteran would be to reduce or quit smoking. Also, it was predicted that the converse would be true as well—the fewer discrepancies noted between values and smoking, the less likely the veteran would be to reduce or quit smoking. Based on the results of this prediction, it was found that veterans who were noticing more discrepancies between their deeply held values and their smoking behaviors were actually less likely to make changes in their smoking. The hypothesis was not upheld, and in fact, it appears that the converse of the hypothesis was true. This was seen in a variety of measures of cigarette usage, including significantly fewer reductions in cigarettes per day at the post-assessment follow-up, the one-month follow-up, and the three-month follow-up for veterans who identified more discrepancies.

This is certainly a surprising finding, and at first seems contradictory to theories related to not only smoking cessation strategies, but also to theories relevant to Motivational Interviewing. On the surface, it appears to make sense logically that a

person who finds smoking to be highly discrepant with their deeply held values in life would be more willing and concerned about changing that smoking behavior than a person who does not see these discrepancies. However, in this analysis, this was not what was revealed in the results. There, of course, may be several different reasons why this may have occurred. First of all, it could have been that veterans who noticed these discrepancies and were in the "Highly Discrepant" group, became more ambivalent about quitting smoking by the discussion about values, and instead of leaning towards changing the smoking behavior, decided to change the importance of the value in their lives. Another, perhaps more plausible reason this could have occurred was potentially that the group of veterans who came in to the study already realizing their smoking was discrepant with their values should not have been expected to change much as a result of the values discussion. However, the other group who came in maintaining that their smoking and values were less discrepant, or not discrepant at all, might have, as a result of the Values Card Sort discussion, come to realize that their smoking was, in fact, inconsistent with what they truly valued. If this were indeed the case, it may not have been detected that there was this growing recognition of the discrepancies in the single Values-Based MI session, which is the only time at which veterans were evaluated on how discrepant the values were with their smoking. It might have been later on in the study (perhaps even some days after the initial discussion) that the veteran would have begun the shift in seeing their smoking as somewhat discrepant with their deeply held values. This second interpretation of the data seems to fit what was actually seen in the analysis (see Figure 3). It could be that those who fail to recognize a discrepancy between values and smoking might be a subgroup for whom MI is a particularly appropriate

treatment. Certainly, more work needs to be done in this area to truly begin to understand how values might be a useful tool in treatment.

Another important point to note with regards to the Values Card Sort task was that most of the veterans responded quite positively to the Values discussion. For example, several of the veterans wanted copies of their top rated values to take home with them, and others verbally expressed appreciation for the discussion about their values and how they related to smoking. Several of the veterans also commented on how they found the discussion to be more relevant to helping them quit smoking than they had originally anticipated when they volunteered for the study.

In summary, both the Values-Based MI group and the Preskills Training group showed significant decreases over time in smoking. However, the Values group did not do significantly better than the Preskills group, as had been predicted. As such, there may be several different factors that affected this non-difference. First of all, it may be that since veterans self-selected to participate in this study, that those who self-selected were already more motivated to quit smoking than the population at large. In looking more at this, it has been supported in recent meta-analyses (as discussed earlier) that interventions based in MI work best for helping people to quit smoking when they have low motivation to quit (Heckman, Egleston & Hoffman, 2010; Hettema & Hendricks, 2010). As such, it may not have been the best match for our particular population. A second potential conclusion could be that there in fact is no difference between an intervention based on values and Motivational Interviewing versus an intervention based on advice-giving and psychoeducation. In support of this conclusion, there has even been a recent meta-analysis that has examined the efficacy of psychoeducational smoking

cessation interventions, and found similar efficacy to what was found in the MI meta-analyses (Huttunen-Lenz, Song & Poland, 2010).

Another potential conclusion could be that even the Preskills condition was delivered in such a way as to be very similar to the Motivational Interviewing condition. This does not seem plausible since there were indeed measurable differences between the deliveries of the two conditions using the MITI-3 coding system. It does seem that the Values-Based MI condition was distinctly different from the Preskills Training condition. The bottom line is that there does not seem to be a clear-cut explanation for why both interventions worked equally well to help veterans reduce or quit smoking. It was also not obvious in our results what was affecting this, so certainly more research needs to be conducted in this area.

Also of importance is the fact that there was not a dose-response relationship. It seems surprising that a dose-response relationship was not found, since most of the research on smoking cessation interventions has found a recognizable difference between individuals who receive more sessions and individuals who receive fewer sessions. Again, as explained previously, this could also be due to the attrition rates at follow-up, which were much higher for those who attended fewer sessions.

Overall, there have been a few doorways opened into continued research in the fields of both smoking cessation and Motivational Interviewing techniques. It is hoped that more research can be done to address the limitations of this study in order to have a clearer understanding of the role of values in addictions research. The results of the study did not match with what was expected, based on theory and previous research, but it is at least hopeful to see such significant decreases in smoking over time in the veteran

population. Overall, the goal will be to continue both in research and practice, to motivate veterans to reduce and quit smoking in order to reduce the costs associated with cigarettes. Eventually, it is hoped that researchers may discover the best and most efficient therapeutic method for helping people to quit.



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**Appendix A: SOCRATES revised for Tobacco Cessation  
(Stages of Change, Readiness and Treatment Eagerness Scale)**

**INSTRUCTIONS:** Please read the following statements carefully. Each one describes a way that you might (or might not) feel *about your tobacco use*. For each statement, circle one number from 1 to 5, to indicate how much you agree or disagree with it *right now*. Please circle one and only one number for every statement.

	<b>NO!</b> Strongly Disagree	<b>No</b> Disagree	<b>?</b> Unsure	<b>Yes</b> Agree	<b>YES!</b> Strongly Agree
1. I really want to make changes in my tobacco use.	1	2	3	4	5
2. Sometimes I wonder if I am a tobacco addict.	1	2	3	4	5
3. If I don't change my tobacco use soon, my problems are going to get worse.	1	2	3	4	5
4. I have already started making some changes in my tobacco use.	1	2	3	4	5
5. I was using tobacco too much at one time, but I've managed to change my tobacco use.	1	2	3	4	5
6. Sometimes I wonder if my tobacco use is hurting other people.	1	2	3	4	5
7. I have a tobacco use problem.	1	2	3	4	5
8. I'm not just thinking about changing my use of tobacco, I'm already doing something about it.	1	2	3	4	5
9. I have already changed my tobacco use, and I am looking for ways to keep from slipping back to my old pattern.	1	2	3	4	5
10. I have serious problems with tobacco use.	1	2	3	4	5
11. Sometimes I wonder if I am in control of my tobacco use.	1	2	3	4	5
12. My tobacco use is causing a lot of harm.	1	2	3	4	5
13. I am actively doing things now to cut down or stop my tobacco use.	1	2	3	4	5
14. I want help to keep from going back to the tobacco use problems that I had before.	1	2	3	4	5
15. I know that I have a tobacco use problem.	1	2	3	4	5
16. There are times when I wonder if I use tobacco too much.	1	2	3	4	5
17. I am a tobacco addict.	1	2	3	4	5
18. I am working hard to change my tobacco use.	1	2	3	4	5
19. I have made some changes in my tobacco use, and I want some help to keep from going back to the way I used before.	1	2	3	4	5

**Appendix B: Fagerstrom Test for Nicotine Dependence**

<b>QUESTION:</b>	<b>ANSWERS:</b>	<b>SCORE:</b>
1. How soon after you wake up do you smoke your first cigarette? (circle appropriate number)	a. Within 5 minutes	3
	b. 6-30 minutes	2
	c. 31-60 minutes	1
	d. After 60 minutes	0
2. Do you find it difficult to refrain from smoking in places where it is forbidden (such as churches, theaters, libraries, etc.)?	a. Yes	1
	b. No	0
3. Which of all the cigarettes you smoke in a day is the most satisfying?	a. The first one in the morning	1
	b. Any other	0
4. How many cigarettes do you smoke a day?	a. 10 or less	0
	b. 11-20	1
	c. 21-30	2
	d. 31 or more	3
5. Do you smoke more in the morning than during the rest of the day?	a. Yes	1
	b. No	0
6. Do you smoke if you are so ill that you are in bed most of the day?	a. Yes	1
	b. No	0

**Your Score = \_\_\_\_\_**

**Appendix C: Tobacco Cessation Assessment**

1. When is/was your quit date? \_\_\_\_\_
2. How many cigarettes per day are you currently smoking? \_\_\_\_\_
3. During the past week, how many days did you smoke? \_\_\_\_\_ days
4. During the past week, what was the average number of cigarettes per day you smoked? \_\_\_\_\_ cigarettes
5. How many times have you tried to quit during the past month? \_\_\_\_\_
6. Have you smoked a cigarette, even a single puff, in the past 7 days?  
 Yes                       No



**Appendix D: Smoking Cessation Pharmacology Assessment  
(novel assessment created for the study)**

1. How old are you? \_\_\_\_\_ years
2. How many years of education have you completed? \_\_\_\_\_ years  
(if you have obtained your GED, enter the number %2+above)
3. How long have you smoked/used tobacco? \_\_\_\_\_ years
4. In an average day, how many cigarettes do you smoke? \_\_\_\_\_
5. How many times have you tried to quit in the past? \_\_\_\_\_
6. What brand of cigarettes do you smoke? \_\_\_\_\_
7. Check any of the following other forms of tobacco that you use one time or more per week:
  - Pipe
  - Chewing/Dipping Tobacco
  - Cigars
  - Other: \_\_\_\_\_

If you use this other form of tobacco, how much do you use in an average day? \_\_\_\_\_

**Table 1.**  
**Independent Samples *t* test of Differences between Values and Preskills Therapists on Behavior Counts of the Motivational Interviewing Treatment Integrity Coding System (MITI)**

	Conditions		<i>t</i>	<i>p</i>	effect size (Cohen's <i>d</i> )
	Values ( <i>n</i> = 14)	Preskills ( <i>n</i> = 15)			
Behavior Count: Giving Info.	8.64 (7.30)	13.67 (5.98)	-2.03	.05*	0.76
Behavior Count: MI Adherent	2.57 (2.14)	3.53 (3.81)	-0.83	.41	-0.31
Behavior Count: MI Nonadherent	0.00 (0.00)	0.73 (0.88)	-3.10	.004**	1.15
Behavior Count: Closed Questions	2.36 (3.34)	3.80 (2.57)	-1.31	.20	0.49
Behavior Count: Open Questions	4.71 (5.53)	0.80 (0.86)	2.71	.01*	1.01
Behavior Count: Simple Reflections	7.21 (7.66)	3.27 (3.69)	1.79	.09	0.66
Behavior Count: Complex Reflections	5.57 (4.52)	1.20 (1.15)	3.63	.001***	1.35
Behavior Count: Total Reflections	12.79 (10.84)	4.47 (3.83)	2.79	.009**	1.04
Ratio: Open to Closed Questions	2.99 (5.32)	0.22 (0.28)	2.02	.05*	0.75
Ratio: Complex to Simple Reflections	1.33 (1.37)	0.67 (0.77)	1.61	.12	0.60

*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means. Positive effect sizes reported are in the predicted or hypothesized direction.

**Table 2.**  
**Independent Samples *t* test of Differences between Values and Preskills Therapists on Global Scores of the Motivational Interviewing Treatment Integrity Coding System (MITI)**

	Conditions		<i>t</i>	<i>p</i>	effect size (Cohen's <i>d</i> )
	Values ( <i>n</i> = 14)	Preskills ( <i>n</i> = 15)			
Evocation Global Score	3.64 (1.08)	2.00 (1.25)	3.77	.001***	1.40
Collaboration Global Score	3.71 (1.14)	2.00 (1.13)	4.06	.000***	1.51
Autonomy/Support Global Score	3.43 (0.85)	3.00 (0.85)	1.36	.19	0.51
Direction Global Score	4.86 (0.36)	4.87 (0.35)	-0.07	.94	-0.03
Empathy Global Score	4.07 (1.21)	2.20 (1.42)	3.80	.001***	1.41

*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means. Positive effect sizes reported are in the predicted or hypothesized direction.

**Table 3.**  
**Independent Samples *t* test of Differences between Values and Preskills on Pre-Measures**

	Conditions		<i>t</i>	<i>p</i>
	Values ( <i>n</i> = 31)	Preskills ( <i>n</i> = 31)		
Number of Sessions Attended	2.39 (1.09)	2.10 (1.25)	0.98	.33
Age	54.61 (10.36)	55.68 (7.78)	-0.46	.65
Years of Education	14.24 (2.87)	13.63 (1.67)	1.03	.31
Years of Smoking	37.55 (11.01)	36.04 (11.12)	0.53	.60
Cigarettes Per Day	17.94 (8.60)	21.97 (10.98)	-1.61	.11
Number of Quit Attempts (Lifetime)	12.19 (12.71)	10.90 (12.90)	0.40	.70
Number of Quit Attempts (Past Month)	0.74 (1.12)	1.94 (5.52)	-1.18	.24
Scores on Recognition (Scale of SOCRATES)	31.21 (3.35)	32.13 (3.14)	-1.12	.27
Scores on Ambivalence (Scale of SOCRATES)	16.58 (2.42)	14.66 (3.92)	2.32*	.02
Scores on Taking Steps (Scale of SOCRATES)	29.22 (7.42)	27.35 (6.70)	1.04	.30
Scores on Fagerstrom Test for Nicotine Dependence	5.29 (1.92)	5.87 (1.80)	-1.23	.22

*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means.

**Table 4.**  
**Independent Samples *t* test of Differences between Values and Preskills on Pre-**  
**Measures (Categorical Variables)**

	Conditions		<i>p</i> value
	Values	Preskills	
Gender	Male	29 (94%)	.671, Fisher's Exact Test
	Female	2 (6%)	
Ethnicity	White	20 (65%)	.793, $\chi^2(1, N = 62) = 0.69$
	Other <sup>a</sup>	11 (35%)	
Other Tobacco	Yes	1 (3%)	.006, Fisher's Exact Test
	No	30 (97%)	

<sup>a</sup>The Other category for the Values condition included 2 African Americans, 4 Hispanics, and 5 other not specified; the Other category for Preskills condition included 1 African American and 11 Hispanics.

**Table 5.**  
**Repeated Measures ANOVA of Condition (Preskills vs. Values) x Time (Pre, Post, One Month and Three Months) on Cigarettes Per Day**

Effect	<i>df</i>	<i>F</i>	<i>p</i>
Time (Cigarettes Per Day)	3,32	30.15	<.001
Time (Cigarettes Per Day) x Condition (Preskills vs. Values)	3,32	3.53	.026

**Table 6.**  
**Number of Subjects Available for Each Assessment Point**

	Conditions	
	Values	Preskills
Pre-Assessment	31 (31)	31 (31)
Post-Assessment	27 (27)	22 (22)
One-Month Follow-Up	25 (23)	17 (16)
Three-Month Follow-Up	24 (21)	19 (15)

*Note.* Number of participants with complete data sets up through that assessment in parentheses next to sample sizes.

**Table 7.**  
**Independent Samples *t* Tests for Differences between Values and Preskills**  
**Conditions on Several Difference Measures**

	Condition		<i>t</i>	<i>df</i>	<i>p</i>	effect size (Cohen's <i>d</i> )
	Values	Preskills				
Difference in Cigs Per Day Pre-Post	-7.93 (9.34)	-7.14 (14.44)	-0.23	47	.82	0.07
Difference in Cigs Per Day Pre-1 Mo	-13.46 (9.72)	-11.18 (9.77)	-0.75	40	.46	0.26
Difference in Cigs Per Day Pre-3 Mo	-11.17 (12.59)	-18.55 (9.66)	2.11	41	.04*	-0.92
Difference in Days Smoked Pre-Post	-1.56 (2.86)	-1.84 (2.75)	0.35	47	.73	-0.15
Difference in Days Smoked Pre-1 Mo	-3.26 (3.44)	-2.06 (3.09)	-1.16	40	.26	0.53
Difference in Days Smoked Pre-3 Mo	-3.52 (3.53)	-4.21 (3.43)	0.65	41	.52	-0.28
Difference in Recog. Scores Pre-Post	0.33 (2.34)	-1.10 (2.95)	1.87	46	.07	0.40
Difference in Ambiv. Scores Pre-Post	0.31 (2.28)	0.62 (2.56)	-0.45	46	.66	-0.10
Difference in Taking Steps Pre-Post	6.81 (6.81)	5.00 (6.10)	0.96	46	.34	0.31
Difference in Fagerstrom Pre-Post	-1.81 (2.40)	-1.82 (2.54)	0.01	47	.99	0.00

*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means. Positive effect sizes reported are in the predicted or hypothesized direction.



**Table 8.**  
**Independent Samples *t* Tests for Differences between “0 – 2 Sessions Attended” and “All Sessions Attended” on Several Measures**

	Number of Sessions		<i>t</i>	<i>df</i>	<i>p</i>	effect size (Cohen's <i>d</i> )
	0-2 Sessions	3 Sessions				
Difference in Cigarettes Per Day Pre-Post	-4.86 (17.31)	-8.36 (9.80)	0.86	47	.39	0.33
Difference in Cigarettes Per Day Pre-1 Month	-13.94 (12.45)	-12.15 (8.98)	-0.49	40	.63	-0.20
Difference in Cigarettes Per Day Pre-3 Month	-15.61 (18.37)	-14.12 (9.83)	-0.33	41	.74	-0.18
Difference in Days Smoked Pre-Post	-1.09 (2.21)	-1.86 (2.93)	0.80	47	.43	0.40
Difference in Days Smoked Pre-1 Month	-2.28 (3.01)	-2.91 (3.43)	0.50	40	.62	0.27
Difference in Days Smoked Pre-3 Month	-2.67 (3.71)	-4.11 (3.38)	1.13	41	.26	0.61
Difference in Recog. Scores Pre-Post	0.50 (2.07)	-0.50 (2.82)	1.05	46	.30	-0.27
Difference in Ambiv. Scores Pre-Post	1.60 (2.55)	0.14 (2.28)	1.76	46	.09	-0.47
Difference in Taking Steps Pre-Post	5.60 (6.92)	6.13 (6.48)	-0.23	46	.82	0.09
Difference Fagerstrom Pre-Post	-2.00 (2.05)	-1.76 (2.56)	-0.28	47	.78	-0.11

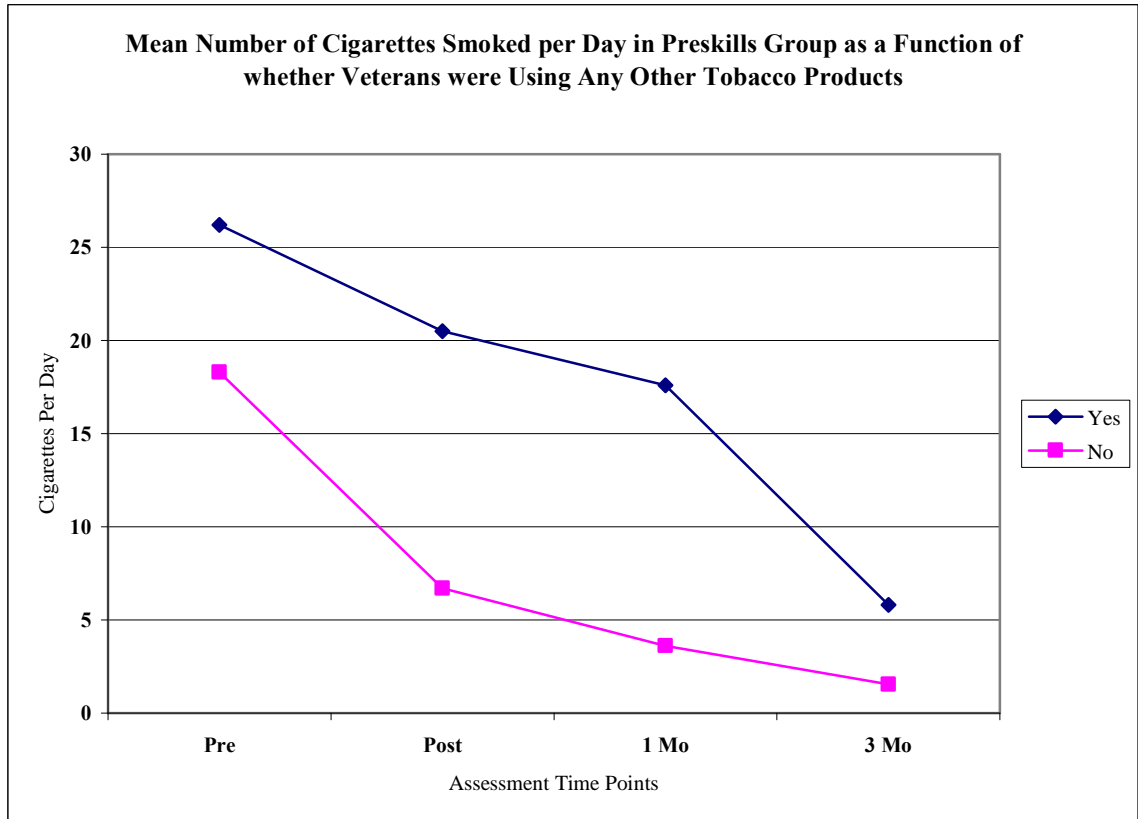
*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means. Positive effect sizes reported are in the predicted or hypothesized direction.

**Table 9.**  
**Independent Samples *t* Tests for Differences between “Highly Discrepant” and “Not Discrepant” on Several Difference Measures**

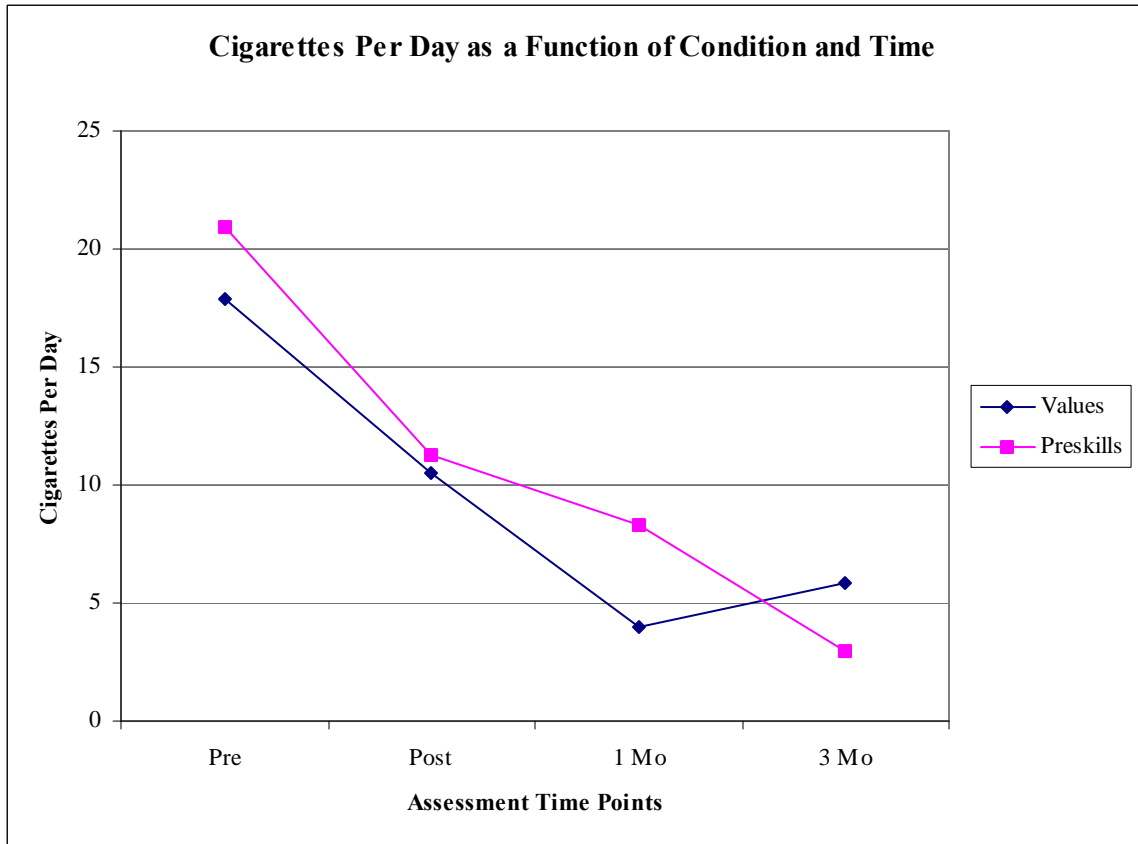
	Median Split Discrepancies		<i>t</i>	<i>df</i>	<i>p</i>	effect size ( <i>Cohen's d</i> )
	Highly Discrepant	Not Discrepant				
Difference in Cigs Per Day Pre-Post	-0.69 (3.93)	-13.33 (12.11)	2.82	15	.01**	-1.31
Difference in Cigs Per Day Pre-1 Mo	-7.11 (11.17)	-21.00 (7.49)	2.66	13	.02*	-1.67
Difference in Cigs Per Day Pre-3 Mo	-2.00 (17.30)	-18.67 (7.56)	2.19	12	.05*	-1.89
Difference in Days Smoked Pre-Post	0.00 (2.33)	-2.22 (3.03)	1.68	15	.11	-1.19
Difference in Days Smoked Pre-1 Mo	-0.78 (3.19)	-4.00 (3.46)	1.85	13	.09	-1.34
Difference in Days Smoked Pre-3 Mo	-0.81 (2.85)	-4.50 (3.51)	2.17	12	.05*	-1.71
Difference in Recog. Scores Pre-Post	0.13 (2.95)	-0.11 (2.67)	0.17	15	.87	0.06
Difference in Ambiv. Scores Pre-Post	0.25 (2.92)	0.11 (2.32)	0.11	15	.91	0.06
Difference in Taking Steps Pre-Post	3.38 (8.16)	9.00 (5.83)	-1.65	15	.12	-0.91
Difference in Fagerstrom Pre-Post	-0.38 (1.60)	-2.00 (2.74)	1.47	15	.16	-0.75

*Note.* \* =  $p \leq .05$ , \*\*\* =  $p \leq .001$ . Standard Deviations appear in parentheses below means. Positive effect sizes reported are in the predicted or hypothesized direction.

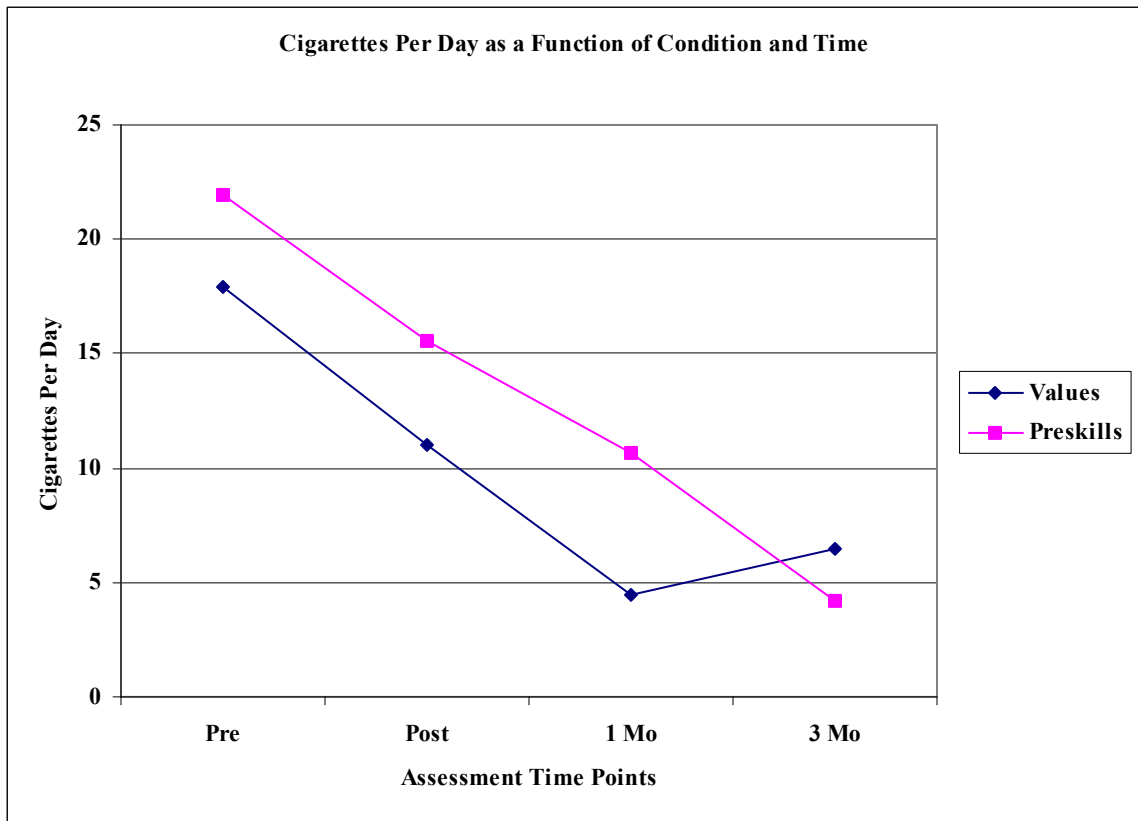
**Figure 1.**  
**Mean Number of Cigarettes per Day in Preskills Group as a Function of whether Veterans were Using Any Other Tobacco Products**



**Figure 2.**  
**Means indicated in the repeated measures ANOVA of average number of cigarettes per day as a function of Group and Time**



**Figure 3.**  
**Estimated means from the mixed model analysis of average number of cigarettes per day as a function of Group and Time**



**Figure 4.**  
**Estimated means from the mixed model analysis of average number of cigarettes per day as a function of Values Discrepancy Group and Time**

