Fidelity of Motivational Interviewing with Behavioral

Interventions for Smokers Who are Not Ready to Quit

BY

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DISSERTATION

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LIST OF ABBREVIATIONS

ANCOVA	Analysis of covariance
AO	Action orientation
A/S	Autonomy and support
β	Standardized beta
BI	Behavioral intervention
BL	Baseline
COLL	Collaboration
CR	Complex reflections
DIR	Direction
EMP	Empathy
EVOC	Evocation
F	F-statistic
ICC	Intraclass correlation coefficient
M	Mean
MI	Motivational Interviewing
MIA	Motivational Interviewing adherent
MISC	Motivational Interviewing Skills Code
MITI	Motivational Interviewing Treatment Integrity Scale
n	Number subgroup
NRT	Nicotine replacement therapy
ns	Nonsignificant
OR	Odds ratio

LIST OF ABBREVIATIONS (CONTINUED)

OQ	Open questions
p	p-value
R^2	Pearson's bivariate correlation coefficient
R-Q	Reflection-to-question ratio
SD	Standard deviation
t	T-statistic
TTM	Trans-theoretical model
χ^2	Chi-square statistic

SUMMARY

Motivational Interviewing (MI) and behavioral interventions are effective treatments for smoking cessation, and MI is increasingly being integrated into behavioral interventions in smoking cessation programs—especially with smokers who are not ready to quit. Moreover, these programs often utilize bachelor's-level counselors with minimal training in MI or counseling in general, which may lead to concerns about fidelity of MI. The current study examined whether 15 bachelor's-level counselors adhered to MI principles and techniques while delivering three smoking cessation interventions: MI, BI, and MI plus BI. Smoker participants were 344 individuals recruited through primary care clinics and enrolled in a larger clinical trial of counseling and nicotine replacement therapies for smokers who were not ready to quit. For each smoker participant, one randomly selected counseling session was coded using the Motivational Interviewing Treatment Integrity Scale (Moyers et al., 2010), a coding system that assesses for global ratings of MI quality (e.g., evocativeness) and specific MI-related counseling behaviors (e.g., complex reflections). Compared to MI only, MI plus BI was associated with lower levels of empathy, but was not associated with lower levels of evocation, collaboration, or support of autonomy, other core characteristics of MI. MI plus BI was also associated with a smaller proportion of complex-to-simple reflections, and a smaller percentage of open-ended (compared to closed-ended) questions, compared to MI only. Lastly, greater empathy and MI fidelity were associated with smoker participants being more likely to report during follow-up that they intend to quit in the future. Limitations and future directions are discussed.

I.   INTRODUCTION

Motivational Interviewing (MI) is a type of psychotherapy for increasing motivation to change (Miller & Rollnick, 2002; Rollnick & Miller, 1995). Good quality MI is an evocative and collaborative discussion that resolves ambivalence about a particular behavior, such as cigarette smoking with the goal of moving smokers closer to stopping smoking. The core principles of MI include empathy, support of client autonomy, and "rolling with resistance," meaning a non-confrontational counseling response to client resistance to change. These principles are supported by technique: MI counseling behaviors include reflections, affirmations, and open-ended questions intended to elicit "change talk," or progressive statements about change.

A. Motivational Interviewing for Smoking Cessation

1. Efficacy of Motivational Interviewing for smoking cessation

MI has received empirical support for variety of problems, including gambling and alcohol abuse, when compared to control conditions such as treatment-as-usual or no treatment (Hettema, Steele, & Miller, 2005). MI has also received empirical support for treating smoking. One meta-analysis of clinical trials with a variety of types of control conditions found that MI is efficacious for reducing smoking, especially when compared to no-treatment (Hettema & Hendricks, 2010). An additional meta-analysis comparing MI, minimal-advice, and psychoeducation control conditions also indicated that MI is efficacious for reducing smoking (Heckman, Egleston, & Hofmann, 2010).

Despite the established efficacy of MI for smoking, questions remain about the implementation of MI in certain contexts: it is unknown how MI might change when combined with other interventions and delivered to smokers who are not ready to quit by

minimally trained counselors. To address this gap in knowledge, the current study examined treatment fidelity and smoker outcomes of MI in combination with a behavioral intervention for smokers who were not ready to quit, with the interventions being delivered by bachelors-level counselors with little or no prior experience with MI or other counseling techniques.

2. Motivational Interviewing with smokers who are not ready to quit

Only 10% of smokers report being ready to quit within the next month, and only 30% report being ready within the next 6 months (Etter, Perneger, & Ronchi, 1997). Given that MI is designed to benefit ambivalent clients, it may be particularly useful for motivating smokers to become ready to quit. Interventions that assume smokers are ready to quit may not be effective for those who are ambivalent or not ready to make the effort that is required to quit, whereas MI is accepting of "resistance" and is designed to help individuals work through ambivalence and cultivate their own reasons for making effortful changes.

Despite good fit of MI with smokers who are not ready to quit, relatively few studies have examined its efficacy in this population of smokers. One study of smokers with no immediate plans to quit found that "motivational advice" (which was based on MI) was associated with a greater likelihood of a quit attempt compared to no intervention (Carpenter, Hughes, Solomon, & Callas, 2004). Similarly, in a study of quit-resistant pregnant smokers, MI-based phone counseling was associated with higher rates of cessation at early follow-up assessments compared to treatment as usual (Stotts, DiClemente, & Dolan-Mullen, 2002). A meta-analysis of studies testing MI for smoking cessation indicated that smokers lower in motivation to quit benefit more from MI

compared to smokers higher in motivation to quit (Hettema et al., 2005). The empirical support for MI with unmotivated smokers prompted the inclusion of MI-related principles in clinical practice guidelines of the United State Public Health Service (Fiore et al., 2008).

B. Fidelity of Motivational Interviewing

1. Fidelity of stand-alone Motivational Interviewing for smoking cessation

Practicing MI with fidelity could facilitate MI processes (e.g., evocation of change talk) and good treatment outcomes (e.g., smoking reduction). Indeed, quality and fidelity of MI for unmotivated smokers can impact treatment processes and smoker outcomes (Gaume, Bertholet, Faouzi, Gmel, & Daeppen, 2010; Hettema & Hendricks, 2010; Moyers, Miller, & Hendrickson, 2005; Schoener, Madeja, Henderson, Ondersma, & Janisse, 2006). In a meta-analysis of MI for smoking cessation, studies that demonstrated higher levels of fidelity were associated with larger effect sizes compared to studies with lower levels of fidelity (Hettema & Hendricks, 2010). In a study of the process of MI, master's-level psychologists were trained to conduct MI and the sessions were coded (Gaume et al., 2010). This study examined the temporal, within-session relationships between counselor and client behaviors. Counselor behaviors that were consistent with MI, such as emphasizing the client's control of their decision making, were more likely to be immediately followed by client change talk than by client counter-change talk or change-neutral statements. A similar study examined MI technique in a variety of types of licensed health professionals (Moyers, Miller et al., 2005). This study also examined counselor and client behaviors, and found that positive client involvement in the session was related to counselor MI skill, which in turn was related to adherence to

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the principles of MI such as egalitarianism. These studies suggest that the mechanisms of change in MI may be dependent on fidelity to MI principles and techniques.

Studies that have examined MI fidelity have used a variety of coding systems (Madso et al., 2009). These coding systems include the Motivational Interviewing Treatment Integrity scale (MITI; Moyers, Martin, Manuel, Hendrickson, & Miller, 2010) and the Motivational Interviewing Skills Code (MISC; Moyers, Martin, Catley, Harris, & Ahluwalia, 2003). The MITI and MISC are both completed by trained raters who listen to counseling sessions. Raters make global ratings of adherence to MI principles, such as evocativeness (i.e., how well the counselor evoked change talk). Raters also record the frequency of various counseling behaviors that are consistent and inconsistent with MI, such as asking open-ended questions and making affirmations.

2. **Improving fidelity of Motivational Interviewing**

Training programs for health care professionals can improve fidelity to MI. One study examined the efficacy of different types of MI training programs with a variety of types of licensed health professionals (Miller, Yahne, Moyers, Martinez, & Pirritano, 2004). The training conditions were comprised of workshops, feedback, and coaching, and were compared to a waiting list control group. All interventions were effective at teaching MI, especially those that included feedback and coaching. An effectiveness study of MI training programs evaluated a workshop-plus-coaching intervention for addictions counselors with high caseloads and diverse clients (Schoener et al., 2006). Counselors attended a 2-day training workshop followed by 8 small-group supervision sessions. Proficiency in a variety of MI counseling behaviors increased compared to baseline. Client change talk also increased compared to baseline, suggesting that the

increase in MI proficiency was associated with positive client response. MI training has also been tested in a variety of other lengths and formats (Madson, Loignon, & Lane, 2009), indicating that researchers and practitioners are eager to learn and apply MI.

Despite evidence that MI training leads to improved treatment fidelity and smoker outcomes, MI may be difficult to learn and implement with fidelity in real-world settings. MI training consists of a number of stages (Miller & Moyers, 2006), and it may be difficult for some counselors to learn and retain the principles and techniques that are included in each stage. Some stages are broad and could represent potential challenges for some counselors. For example, one stage of learning MI is to develop skills in client-centered counseling, such as reflective listening and accurate empathy. This could be easier for some counselors to learn because of personal or professional background; a counseling psychologist with extensive therapy training might have more experience with a client-centered approach, and thus learn it more readily, compared to a medical resident with minimal therapy training. Another stage in learning MI is to learn "rolling with resistance." This skill of not pushing back or arguing against counter-change talk may be contrary to some abstinence-based interventions that would only accept abstinence as a goal, and thus learning MI may be more difficult for a counselor who is philosophically rooted in abstinence-based approaches. Fidelity of MI could depend on previous training or education level of the counselor, although no studies have identified differences in fidelity based on these variables. Nonetheless, investigating the fidelity and efficacy of MI among counselors with varied professional educational backgrounds is important because of how frequently MI is applied among a broad range of types of health professionals (Madson et al., 2009).

A factor that is related to counselor education is the treatment setting, given that types of health care providers can vary based on setting (e.g., a primary care clinic that employs a medical assistant with minimal counseling training compared to an addictions treatment center that employs a counseling psychologist). MI may be a feasible and useful intervention for smokers who are unmotivated to quit who present to health care settings for regular, non-smoking-related clinic visits (Fiore & Baker, 2011), and clinicians with a variety of professional backgrounds have the potential to effectively deliver MI with relatively brief interventions. Yet the success of these interventions could depend on whether the clinicians can adequately deliver MI with fidelity.

C. Fidelity of Motivational Interviewing in Combination with Other Interventions

1. Considerations in Combining Motivational Interviewing with Other Interventions

As a stand-alone treatment, MI requires flexibility in switching between MI and other treatment approaches (Miller & Moyers, 2006). For example, a counselor could evoke from a client a commitment to change using MI principles and techniques, and then present behavioral strategies to enhance the likelihood that the quit attempt will succeed. MI-based interventions with unmotivated smokers can lead to increased quit attempts (Fiore et al., 2008), but they may be limited in terms of enhancing the quit attempt. This highlights the importance of MI counselors being able to apply multiple treatment approaches. Combination interventions may also be important because the goals of treatment can change within and between counseling interactions, especially as client motivation changes. A longitudinal study of smokers found that motivation to quit can change over periods of a week or less, and that it is more likely to change over longer

periods of time (Hughes, Keely, Fagerstrom, & Callas, 2005). This further highlights the importance of counselors being able to apply MI with other techniques.

The flexible approach employed in MI is consistent with the transtheoretical model of change (TTM; Prochaska & DiClementa, 1983). The TTM suggests that the change process is comprised of various stages based in part on levels of motivation and awareness. This model also suggests that smokers move through the stages over time. Smokers can move forward through the stages of change and decide to make a quit attempt as they become more motivated to quit, and they can move backwards through the stages and decide to abandon a quit attempt as they become less motivated to quit. In the latter case, a counselor could switch from a behavioral approach focused on enhancing the quit attempt to a motivational approach focused on motivation and reasons for change. Combination interventions could be more helpful than interventions that are matched with client stage of change. In a study of young adult smokers, interventions matched with client stage of change did not provide additional benefit compared to mismatched interventions (Quinlan & McCaul, 2000). This may indicate that flexible intervention packages should be used in unmotivated smokers, such as combined motivational and behavioral approaches and other evidence-based intervention packages (Fiore et al., 2008).

Despite the potential utility of combining MI with other interventions for smokers who are not ready to quit, it is unclear whether minimally trained counselors can deliver the interventions with fidelity. Studies have demonstrated positive effects of MI training on MI-related skills, but these studies did not focus on combined treatments (Madson et al., 2009). Combining MI with other treatments could impact adherence to MI principles

in a number of ways. For example, MI is based on a client-centered and evocative approach by the clinician (Miller & Rollnick, 2002). A counselor could misunderstand how these principles are applied, such that attempts at evocation are overly directive and non-client-centered (e.g., overly-persistent questioning about the lack of desire to quit). Another example is that MI requires the counselor to support and bolster the client's sense of autonomy, which prescribes that the counselor should genuinely accept the client's independence in decision-making (i.e., respect the client's right to determine his/her goals and behaviors). This approach could be inconsistent with abstinence-based programs, or even reduction-based programs with inflexible goals.

Researchers have expressed concern over the fidelity of MI that is employed in research and clinical settings (Moyers et al., 2003). However, most of this research has not focused on MI combined with other interventions, and it is unknown whether MI is affected by the inclusion of other approaches such as behavioral strategies. MI with behavioral interventions may be an effective combination, yet switching back and forth and practicing with fidelity may be difficult in practice. Given that counseling behaviors associated with MI can enhance outcomes, whereas counseling behaviors opposed to MI can worsen outcomes (Gaume et al., 2010), it is important to determine whether fidelity to MI is maintained when it is practiced with other interventions, and further, to investigate whether any such effects on fidelity are associated with changes in smoker outcomes.

2. Combining Motivational Interviewing with behavioral interventions

Behavioral reduction techniques have received empirical support as a stand-alone intervention for smokers who are unmotivated to quit, and thus they are potentially

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efficacious as co-treatment with MI. Behavioral reduction techniques included eliminating certain cigarettes, delaying the time between cigarettes, setting reduction goals, smoking in different locations than usual, and other strategies. When combined with nicotine-replacement therapies (NRT), behavioral reduction techniques are as efficacious as MI for smokers who were unmotivated to quit (Carpenter et al., 2004). A similar study found that behavioral reduction techniques with NRT was more efficacious compared to a minimal control treatment among smokers who were not interested in quitting (Chan et al., 2011). Moreover, a review of interventions for smokers who are unmotivated to quit indicated that overall, evidence for efficacy of behavioral interventions is modest but positive (Asfar, Ebbert, Klesges, & Relyea, 2011).

In combination, MI and behavioral interventions may be complementary. MI can increase motivation and decrease ambivalence, while behavioral interventions can increase self-efficacy and confidence to quit through gradual reduction successes and learning to manage cravings. Behavioral techniques such as practice quit-attempts and gradual reduction strategies can also increase motivation to quit (Hughes & Carpenter, 2005). This suggests that MI and behavioral interventions share goals but may achieve them through different mechanisms. Because of this overlap in goals and independence of techniques, the combination of MI and behavioral interventions may be particularly efficacious with smokers who are unmotivated to quit.

The combination of MI with behavioral interventions could yield additive or synergistic effects on outcome, or each intervention alone could be equally efficacious compared to combined treatment. Alternatively, combining interventions could also reduce the efficacy of the individual interventions; an emphasis on behavioral reduction

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techniques could build resistance and undermine the principles of MI if smokers are not ready to take action, and likewise, an MI-based focus on motivation could detract from the effective implementation of reduction strategies.

D. Aims of the Current Study

The overall purpose of this study was to examine fidelity to MI and behavioral interventions among bachelor's-level counselors working with smokers who are not ready to quit smoking. The first specific goal was to examine how fidelity of MI changes when it is combined with a behavioral intervention (BI), and how fidelity to BI changes when it is combined with MI. The second specific goal was to examine whether fidelity is associated with smoker outcomes (motivation to quit and likelihood of a quit attempt). This study used data from a factorial experiment of counseling and nicotine replacement interventions among smokers not currently interested in quitting. Data from the subset of smokers who were assigned to conditions that included MI, BI, or MI and BI were included in this current study' analysis. Those smokers received up to 7 counseling sessions over the course of 6 weeks, and each session was structured to last between 10 and 30 minutes. A portion of the sessions were randomly selected and coded for adherence to MI using the MITI coding system (Moyers et al., 2010). Fidelity was examined at the group level, collapsing across counselors, to determine effects of combining interventions. As a secondary goal, the present study also addressed this question at the individual level because it is possible that some counselors are able to maintain fidelity of MI when BI is added, whereas other counselors are not. Importantly, if combining interventions negatively affects treatment fidelity at the group or individual level, participants might benefit less from treatment. Thus, this study also examined the

relationship between changes in fidelity and smoker outcomes.

1. Specific hypotheses

The combination of MI and BI will be associated with lower adherence to MI principles and techniques, as reflected by lower scores on measures of treatment adherence. It is difficult to predict the effects of adding BI to MI given that existing studies of MI fidelity have focused on MI-only interventions (e.g., Baer et al., 2004; Moyers, Miller et al., 2005; Schoener et al., 2006). Nonetheless, we predicted that BI would negatively impact the practice of MI because of the directiveness and relative inflexibility of BI in terms of goals and means, and how this could be misapplied when combined with MI, which requires more flexibility in these areas (Miller & Rollnick, 2002).

Combining MI and BI will be more difficult for some counselors compared to others. We predicted that some counselors would experience reductions in MI adherence when it is combined with BI, whereas other counselors will maintain adherence levels across conditions. Although this is also difficult to predict given the lack of MI and BI combination studies, we predicted that changes in fidelity would vary by counselor because of evidence that some counselors are more readily able to learn MI compared to others (Baer et al., 2004).

Finally, problems with MI fidelity will affect smoker outcomes, including motivation to quit smoking and the decision to make a quit attempt. We predict that fidelity will be associated with motivation to quit smoking and number of quit attempts, such that lower fidelity ratings will be associated with lower levels of motivation and fewer quit attempts. This hypothesis is based on evidence that lower quality of MI is

associated with worse outcomes for smokers (Gaume et al., 2010, Hettema & Hendricks, 2010; Schoener et al., 2006).

II.   METHOD

A. Background Study

Data for the current study were drawn from a larger study of interventions that included counseling and nicotine replacement therapies. The larger study was a randomized factorial experiment of MI, BI, nicotine patch, and nicotine gum. It used a fully crossed, 4-factor, 2 (MI: yes or no) X 2 (BI: yes or no) X 2 (nicotine patch: yes or no) X 2 (nicotine gum: yes or no) design that yielded 16 intervention conditions. Primary assessments occurred at baseline, Week 12 (following the primary 6-week intervention focused on reduction, plus an optional 6-week follow-up intervention that targeted reduction or quitting as determined by whether the smoker decided to make a serious quit attempt), and Week 26. Data for the current study include participants from the overall study who received MI, BI, or both.

B. Smoker Participants

Participants in the overall study of counseling and NRT were 511 adult smokers who smoked 5 or more cigarettes per day and were *not* interested in making a quit attempt in the next 30 days at the time of initial screening. Although a current quit attempt was exclusionary, smokers were not excluded based on past quit attempts. Participants in the current study were the subset (n = 344) who received MI, BI, or both, regardless of nicotine patch or gum.

Participants reported a mean age of 48.50 years (*SD* = 14.37). Most participants were female (62.4%), and the majority were not Hispanic or Latino (98.8%). In terms of race, 92.1% were Caucasian, 5% were African American, 0.9% were Asian, 0.9% were American Indian/Alaskan Native, and 1.2% were mixed race. Almost half of participants

were married (47.1%), 21.1% were never married, 18.7% were divorced, and the remaining participants 7% were living with a domestic partner, 4.1% were widowed, and 2.0% were separated. In terms of highest level of education achieved, 15.7% reported obtaining a 4-year college degree, almost half (45.8%) reported "some college," 32.4% reported obtaining a high school diploma or GED, 5% reported some high school only, and 0.6% reported only an elementary school level education. In terms of annual income, 18.0% reported earning more than $75,000, 20.3% reported earning between $50,000-74,999, 19.0% earned $35,000-49,999, 13.0% earned $25,000-34,999, 8.2% earned $20,000-24,999, 12.7% earned $10,000-19,999, and 8.9% earned less than $10,000.

Overall, the majority of smokers reported some goals for change in smoking behavior. When asked, "Which of the following describe your current goal?" 67.2% reported wanting to reduce their smoking, whereas only 21.2% reported wanting to quit smoking; 76.2% reported being interested in reducing, quitting, or both. Baseline motivation and intentions to quit and reduce smoking is presented below in the section on smoker outcomes.

C. Smoking Cessation Counselors

Counselors were 15 bachelor's-level smoking cessation telephone counselors based in south-central and southeastern Wisconsin. These counselors were employees within a smoking cessation research and treatment center and as such had caseloads of smokers in addition to participants in the current study (such as smokers in other intervention studies with different treatment components). For this study, counselors received specific training in MI and BI, and training in general smoking cessation techniques and principles. MI training consisted of a 1-day workshop followed by

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practice interviews that were supervised by a licensed clinical psychologist. Each week, one session per counselor was randomly selected and reviewed via audiotape. Each counselor then received written feedback on MI and/or BI. Counselors spoke as needed to a licensed clinical psychologist with extensive MI and smoking cessation experience to discuss MI and protocol implementation issues, as well as with their direct counseling supervisors to discuss general counseling issues and a licensed clinical psychologist with extensive experience with behavioral interventions for smoking cessation.

After full completion of the study, 9 of the 15 counselors completed a survey of confidence and previous experience in the interventions (6 counselors did not return the survey). Counselors reported how many smokers they had counseled for smoking cessation prior to the study, including general smoking cessation counseling, MI, and behavioral interventions. Response options were 1 ("None"), 2 ("Minimal, less than 10 smokers"), 3 ("Some, between 11 and 20 smokers"), 4 ("Substantial; between 21 and 99 smokers"), and 5 ("Extensive; 100 or more smokers"). Mean responses were 3.11 ($SD =$ 1.83) for general smoking cessation, 1.56 ($SD =$ 1.33) for MI, and 3.00 ($SD =$ 1.73) for behavioral interventions. These data indicate that on average, counselors had a moderate level of experience in behavioral interventions but minimal experience with MI. Counselors also reported their level of confidence in the study interventions and their ability to employ the interventions. Counselors were asked, "During the study, how confident were you in your own ability to effectively deliver the MI intervention (Behavioral Intervention)?" and "During the study, how confident were you that the MI intervention (Behavioral Intervention) was effective in general for smoking cessation?" Response options were 1 ("Not at all confident"), 2 ("A little confident"), 3 ("Somewhat

confident"), 4 ("Very confident"), and 5 ("Extremely confident"). Mean responses were 2.89 (SD = 1.27) for confidence in ability with MI, 4.22 (SD = .44) for confidence in ability with BI, 3.56 (SD = 1.13) for confidence in effectiveness of MI, and 3.89 (SD = .93) for confidence in effectiveness of BI. These data indicate that on average, counselors were less confident in their ability with MI and in the general effectiveness of MI than they were with the behavioral intervention.

D. Procedures

1. Smoker recruitment and randomization

Smokers were recruited in nine primary care and family medicine clinics at two healthcare systems in south-central and southeastern Wisconsin. Medical assistants or other clinic staff recruited potential participants via an automatic electronic referral system that was linked to the electronic health records of all smokers. An automated script prompted medical assistants to ask smokers if they were interested in smoking treatment options as part of a research study. If the smoker expressed interest in research, the medical assistant completed an automated electronic referral. Study staff then contacted the smoker and asked about preference for treatment options of quitting or cutting down: "Our research program has two tracks: one for smokers who are ready to quit in the next month, and one for smokers who are interested in cutting down. Are you interested in either of those tracks?" Smokers who were interested in cutting down were referred to this project and were randomly assigned to one of the sixteen possible conditions. Smokers assigned to conditions with MI, BI, or both, were included in the current study. Counselors were assigned to smokers based on scheduling availability

2. Counseling interventions

Each intervention lasted 7 sessions, including an initial in-person visit (Visit 1) followed by 6 phone sessions (Calls 1-6). Assessments occurred at baseline, end-of-treatment, and two follow-up periods (Week 12 and Week 26). Counselors followed structured, session-by-session protocols that included intervention-specific exercises. These protocols were computer-assisted with scripts for portions of the sessions. However, counselors were given permission to deviate from the protocol if the continuing discussion was consistent with the designated intervention. Sessions were structured to last between 10 and 30 minutes, depending on the session number and intervention condition. However, actual session length varied. The initial and final sessions were allotted more time than the other sessions. Sessions for MI plus BI were allotted more time than sessions for both individual interventions.

If a smoker decided to make a serious quit attempt during the intervention period, the smoker received a protocol-based cessation intervention with his/her same counselor. Information regarding this process was available to smokers upon request. Study clinicians did not discourage smokers who expressed interest in making a serious quit attempt.

In terms of protocol completion, the vast majority (86.6%) completed the study through to the Week 26 follow-up visit (although they did not necessarily attend all visits; only 38.4% of smokers attended every visit from Visit 1 to Week 26 follow-up). A minority (14.2%) of the sample decided to repeat the protocol after completing the first 6 weeks, and a majority of those smokers (11.0% of the total sample) completed the final visit of the repetition (7.3% completed all visits of the repetition). An additional minority

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(18.3%) decided to make a serious quit attempt during the study and exited the current study protocol.

a.Motivational Interviewing

The MI intervention was based on the principles and techniques of MI as described by experts in the approach (Miller & Rollnick, 2002; Rollnick, Mason, & Butler, 1999). Study counselors were to be supportive and nonthreatening regardless of readiness to quit (i.e., meet the smokers "where they are at"). Counselors aimed to be evocative and collaborative, and to help smokers develop discrepancies between future goals and current smoking behaviors. Counselors also attempted to instill and reinforce "change talk." Change talk includes statements about the desire to change, ability to change, reasons for change, need to change, and commitment to change. The counselors also worked to reinforce intrinsic motivation, overcome ambivalence when it was identified, and provide psychoeducation about reduction and cessation as appropriate within the MI approach.

During the first session, counselors explained that the purpose of the program was to help smokers learn more about their smoking, sort through their feelings about smoking, and clarify short- and long-term goals related to smoking, and that these exercises will help them be better prepared to quit in the future when "[they] feel the time is right." Counselors also asked about smoking patterns and prompted the smoker to describe how smoking fits into his/her life. This was followed by a "costs and benefits" worksheet wherein smokers identified costs and benefits to both quitting and continuing to smoke.

During subsequent MI sessions, counselors and smokers discussed the previously

completed costs and benefits worksheet. In addition, counselors introduced a future goals exercise and a past quitting experiences exercise. In the future goals exercise, smokers identified how they would like their smoking to be in 1 year and 5 years from now. This can raise the discrepancy between future goals (i.e., to quit) and current behavior (i.e., smoking). In the past quitting experiences exercise, smoker were queried about past successes, helpful experiences, or techniques learned during past attempts. These exercises were also reviewed at subsequent visits. In the MI-only condition, the initial in-person visit was 20 minutes and each subsequent phone session was 10 minutes.

b.   Behavioral intervention

The BI-only condition consisted primarily of smoking reduction strategies. Reduction strategies were included based on evidence that they facilitate future quit attempts (Hughes & Carpenter, 2004). Reduction strategies included eliminating certain cigarettes, delaying cigarettes, changing the location of smoking, not smoking in certain locations, increasing the time between cigarettes, avoiding smoking situations, and using substitutions for cigarettes. These reduction strategies gradually reduce the amount of nicotine intake, which in turn can reduce levels of craving and facilitate quit attempts.

During the first BI visit, counselors explained that the purpose of the program was to help smokers learn more about their smoking and to learn reduction strategies so that they would be better prepared to quit in the future. Counselors also explained that smokers would be asked to keep track of their smoking and to practice reduction strategies. Counselors then initiated a discussion about current smoking patterns and introduced the smoking log. Smokers were asked to record the time, location, and frequency of their smoking. Counselors then introduced the reduction strategies and

facilitated the selection of strategies and cigarette reduction goals. During subsequent visits, counselors inquired about the previous week's strategies and goals, and facilitate new strategies and goals or help enhance the existing ones. In the BI-only condition, the initial in-person visit was 15 minutes and each subsequent phone visit was 10 minutes.

c. Combined intervention

The combined intervention included elements of both MI and BI. During the first visit, counselors presented a description of the combined intervention that was based on the descriptions of the individual interventions. Counselors then initiated the costs and benefits exercise, discussed smoking patterns, introduced the smoking log, and presented reduction strategies. At subsequent sessions, counselors initiated discussions about previous reduction strategies and goals, and introduced the future goals exercise and past quitting experiences exercises.

In the combined intervention, the initial in-person session (Visit 1) included MI and BI exercises. The following odd numbered sessions (Calls 1, 3, and 5) only included BI exercises, and the following even numbered sessions (Calls 2, 4, and 6) included MI and BI exercises. Visit 1 was 30 minutes, Calls 1, 3, and 5 were 10 minutes, and Calls 2, 4, and 6 were 20 minutes.

Because sessions in the combined interventions are longer than sessions in the individual interventions, this study cannot determine whether changes in fidelity are due to changes in session length vs. theoretical or technical challenges with combining MI and BI. Nonetheless, in applied settings the combination intervention of MI plus BI would present this challenge to clinicians regardless of cause, and thus it is important to investigate.

E. Measurement of Treatment Fidelity

    1. Fidelity of Motivational Interviewing

    To assess fidelity of MI, the coding team used the MITI (Moyers et al., 2010). The MITI was designed to evaluate clinician adherence to the principles and techniques of MI, and it is sensitive to changes following MI training. It has demonstrated reliability even when used by undergraduate raters (Pierson et al., 2007), which is relevant to the current study because two raters were advanced undergraduates. The MITI also distinguishes counselors who have and have not received training in MI, and can distinguish MI sessions from psychoeducation visits (Forsberg, Berman, Källmén, Hermansson, & Helgason, 2008). The MITI captures adherence to the principles of MI through five "global" (i.e., overall impression from the session) subjective rating scales. These global ratings cover core principles of MI: (1) Evocation, or the ability of the clinician to evoke the client's own thoughts and feelings about change, including reasons for change and means to change; (2) Collaboration, or the ability of the clinician to share power during the session and allow the client's ideas to substantially influence the session; (3) Autonomy/Support, or the clinician's ability to accept and expand the client's sense of choice and control (e.g., is accepting of the client's option to not change); (4); Direction, or the extent to which the clinician influences the session by focusing the discussion on the target behavior (i.e., smoking); and (5) Empathy, or the extent to which the clinician is curious about and attempts to explore the client's perspective, and how well that perspective is understood by the clinician. Each rating is made on a 1-to-5 scale with "5" meaning high adherence and "1" meaning low adherence. In addition to the five global rating scales, the MITI also contains a global composite score that assesses MI

Spirit. MI Spirit is the average of Evocation, Collaboration, and Autonomy/Support. These global scores are rated subjectively, based on the entire session. The MITI manual contains detailed summaries and examples of clinician behaviors for all ratings and each score (i.e., 1 through 5). The manual also includes prototypical descriptions of clinician behavior low on the scale and high on the scale.

In addition to the global scores, the MITI also includes behavioral counts, which are tallies of specific clinician behaviors. The categories of behaviors are Giving Information, MI Adherent and MI Non-adherent, Questions, and Reflections. Giving information is defined as providing feedback or educating a client. This includes feedback regarding assessment results, ideas that are important to the intervention, or education about smoking. MI Adherent statements include four specific clinician behaviors: (1) asking the client for permission before giving advice or information, or asking what the client already knows; (2) affirming the client with a positive or complimentary comment about their efforts or strengths; (3) emphasizing the client's sense of control and autonomy (i.e., their ability to decide about the target behavior); and (4) supporting the client with statements of compassion or sympathy. Questions are further categorized as being closed or open. Closed questions can be answered "yes" or "no," or with a limited range of responses, whereas open questions invite a wide range of responses. Reflections are further categorized as simple or complex. Simple Reflections demonstrate listening or a basic understanding of what the client has said, whereas Complex Reflections include emphasizing or adding meaning to something the client has said, or reflecting unspoken ideas or deeper meanings.

Summary scores are calculated using the behavior counts. Percent Complex

Reflections is the percentage of total reflections that are complex. Percent Open

Questions is the percentage of total questions that are open. For both of these summary

scores, higher percentages reflect higher quality MI; more complex reflections reflect a

deeper understanding of the client, or greater levels of empathy, and more open questions

reflect an interpersonal approach that is more open and inviting for the client to share

their thoughts and feelings about the target behavior. The Reflection-to-Question Ratio

and Percent MI Adherent are additional summary scores. A benchmark ratio of

reflections to questions for competent MI is 2:1. Too few reflections can indicate a lack

of empathy, whereas too few questions can indicate a lack of direction. Percent MI

Adherent represents the percentage of MI Adherent statements out of the total number of

MI Adherent and MI Non-adherent statements.

2. Fidelity of the behavioral intervention

The research team created a coding system to assess fidelity of BI. The BI coding

scheme is analogous to the MITI. It contains one global rating scale of Action

Orientation. This rating assesses the extent to which the clinician explored reduction

strategies, explained them in detail, helped to plan implementation of strategies, and

elicited specific reduction goals. The BI coding scheme also includes three behavioral

counts: Action Oriented, Reduction, and BI Adherent. The Action Oriented code includes

general statements and questions about reduction strategies, problem solving regarding

reduction strategies, and selection and planning of reduction strategies. The Reduction

code includes discussion of the smoking log and also specific cigarette reduction goals.

The BI Adherent code includes reinforcing success with or confidence in a reduction

plan, as well as reframing any unsuccessful reduction attempts as learning experiences

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that will facilitate future attempts at reduction or quitting. Average measure ICCs for the

BI coding scheme are presented in Table 1.

3. Selecting sessions for fidelity coding

All treatment sessions were audio recorded. Each of the 344 smokers had one

session randomly selected for coding. Of those sessions, 17 could not be coded; 11 did

not have audio files, and 6 audio files were inaudible. A total of 327 sessions were coded.

Of the 16 experimental conditions, all 13 that included MI or BI were selected for coding;

the conditions that did not include MI or BI were not selected. This selection was made

across NRT conditions such that some participants also received nicotine gum or patch.

Although some discussion of NRTs occurred during MI and BI, the initial instructional

component of NRT occurred outside of the MI and BI protocols.

After the sessions were selected based on condition number, they were further

screened based on visit number. The sessions that were available for random selection

included Visit 1 (initial visit), Call 2, Call 4, and Call 6. These sessions were selected

because they contained MI and BI content. Sessions were randomly selected across

session number, such that each session number (Visit 1, Call 2, Call 4, and Call 6)

constituted approximately 25% of all coded sessions. The entire length of each session

was coded. If a randomly selected session was not codeable because of audio or other

technical problems (recorder not turned on, garbled audio, file not saved, etc.), a coin flip

determined whether to select the previous or subsequent session for coding (e.g., if the

initially selected session was Week 4, whether to select Week 2 or Week 6 for coding). In

some cases, the second session selected for coding was also not codeable, in which case

the coin flip/session reselection process was repeated.

4. Types of fidelity coding

The coding team performed three types of coding: single coding, dual coding, and group coding. One rater coded single coded sessions and those values were used for analysis. Single coding was used during the later stages of the study, when supervising research staff had determined that individual coders were accurate and reliable. Two coders coded dual coded sessions, and the mean ratings and counts were used for analysis. Dual coding was used primarily during the earlier stages of the study while coders were in the early stages of developing inter-rater reliability. All three coders coded group coded sessions. During this group process, each coder listened to the session and made independent ratings, and immediately afterward all coders shared and discussed their codes until a consensus was reached for each rating and count and the consensus values were used for analysis. In most cases, coders agreed readily on the correct codes after the group discussion. In cases of disagreement, coders would take the average, seek additional consultation from supervising research staff, or use the majority rating. Group coding was used when global ratings between two coders for a dual coded session were substantially different (e.g., off by 2 or more on one of the 1-to-5 global ratings) and for discrepancies with the MI Non-adherent count, which suffered relatively low reliability because of the very low frequency of that code. Group coding was only completed for the global ratings and the MI Non-adherent count and it only occurred after a session was dual coded. Dual and group coding were used to increase the accuracy of the ratings. The global ratings are subjective by nature, and including multiple raters decreases the likelihood that ratings will be influenced by bias on the part of an individual rater.

Of the 327 sessions that were coded, 218 were dual coded and 109 were single

coded. In addition, 30 sessions were selected for group coding after dual coding was completed. Of these 30 sessions, 19 were group coded for global ratings only, 8 were group coded for the MI Non-adherent count only, and 3 were group coded for both global ratings and the MI Non-adherent count.

The audio file names used by the coders did indicate the session number and condition number of the coded sessions, and the session number was often apparent based on the protocol components in the session and the discussion between counselor and smoker. Although the coders were not aware of which condition corresponded to which type of counseling, the counseling condition was also often apparent based on content of the session. Thus, coders did view which session number they were coding, and they did not explicitly know which condition they were coding, although both were often readily apparent from listening to the session.

5. Coder characteristics

One graduate research assistant and two undergraduate research assistants completed all coding. The graduate research assistant (the author of this thesis) was an advanced doctoral student in clinical psychology and the undergraduate research assistants were senior applied psychology majors with extensive research experience. The graduate assistant was not part of the study design team prior to completing the coding, and thus he was not aware of the study hypotheses during coding. Likewise, the undergraduate assistants were not aware of the study hypotheses.

6. Coder training

To begin MI coding training, coders became familiar with the MITI coding manual (Moyers et al., 2010) and reviewed a guidebook for practitioners (Rosengren,

2009). Next, they listened to and practice coded a series of sessions, beginning with 7 training sessions supplied by the MITI authors. Each session included an uncoded transcript and a pre-coded transcript (5 of these interviews also included audio files). The coders independently coded each session, reviewing the manual in detail while doing so, and then discussed their own codes and the correct codes as a group. After completing the pre-coded practice interviews, the coders independently practice coded 5 sessions from the current study, and then discussed these sessions as a group. Following the 12 practice sessions, the coders began training on the Behavioral Intervention Treatment Integrity scale (BITI). After becoming familiar with the BITI manual, the coders used the BITI to practice code 3 sessions from the WI study, and then they discussed the sessions as a group. Because the BITI is much simpler than the MITI (the BITI consists of 1 global rating and 3 behavior counts), BITI training was relatively brief. After completing separate MITI and BITI training, the coders began practice-coding interviews using both MITI and BITI simultaneously. This was completed for 18 sessions from the WI study, including MI only, BI only, and MI plus BI sessions. Following the combined MITI/BITI practice coding practice, supervising research staff determined that inter-rater reliability was adequate to begin study coding. For some ratings and counts, this was indicated by an average-measures ICC around .6 or higher, although this statistic was lower for some ratings and counts due to the low number of practice interviews.

Inter-rater reliability was checked frequently during coding, and coders paid special attention to areas of low reliability. To maintain inter-rater reliability, coders met with one another weekly during the initial coding period, and as needed during later coding, to discuss questions and review audio clips as a group. Informally and between meetings,

the coders communicated regularly with one another and with supervising research staff about coding problems and questions. Final inter-rater reliabilities for all dual-coded sessions are presented in Table 1. In a previous study, the average measures intraclass correlation coefficient (ICC) was .52 for Empathy and .59 for MI Spirit, and reliability for behavior counts was generally higher, ranging from .75 to .97, except for complex reflections (.57) (Moyers, Miller et al., 2005). Thus, inter-rater reliability in the current study compared favorably a previous study, and overall appears to be adequate.

E. Measures

1. Smoker outcomes

a. Number of cigarettes

At baseline, participants reported the average number of cigarettes smoked per day. At Week 12 and Week 26, participants reported the average number of cigarettes smoked per day during the past week. At baseline, participants reported smoking an average of 17.39 ($SD = 7.98$) cigarettes per day.

b. Motivation and intention

Participants were asked, "How motivated are you to quit smoking?" and "How motivated are you to cut back/keep reduced the number of cigarettes you smoke?" Smokers responded on a 1-to-10 scale where 1 was "Not at All" and 10 was "Extremely". Intention to quit smoking was assessed with two yes-or-no questions about intentions to quit. These questions read, "Are you seriously considering quitting smoking in the next six months?" and "Are you planning to quit within the next 30 days?" These motivation and intention items were assessed at baseline, Week 12, and Week 26. At baseline, participants reported a mean of 6.06 ($SD = 2.19$) for motivation to quit smoking and 7.59

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(*SD* = 1.98) for motivation to cut back/keep reduced their smoking. Additionally, 83.9%

were seriously considering quitting within 6 months, whereas only 10.5% were planning

to quit within the next 30 days.

c. Quit attempts

At Week 12, participants were asked, "How many times in the last 3 months have

you made a serious attempt to quit smoking?" At Week 26, participants were asked about

serious quit attempts during the past 6 months. At baseline, participants reported having

made an average of 2.61 (*SD* = 2.30) serious quit attempts.

III.   RESULTS

A. Relationships Among Global Ratings and Behavior Count Summary Scores

Prior to examining the relationship between counseling condition and adherence, I examined the correlations between adherence measures to explore their relationships with one another (see Table 2). Evocation was highly correlated with Collaboration, $r = .61$, and Empathy, $r = .64$, and moderately correlated with Autonomy/Support, $r = .29$. Collaboration was highly correlated with Autonomy/Support, $r = .43$, and Empathy, $r = .61$, and Autonomy/Support was moderately correlated with Empathy, $r = .37$. The strength and variability of these correlations indicates that the core MI principles (Evocation, Collaboration, and Autonomy/Support) and Empathy are conceptually related, but also that they represent different constructs. Moreover, they were not correlated with Direction or Action Orientation, which reflects the lack of conceptual overlap with those constructs. In terms of behavioral count summary scores, MI Spirit was moderately correlated with Percent Complex Reflections, $r = .25$, Percent Open Questions, $r = .24$, Reflection-to-Question ratio, $r = .39$, and Percent MI Adherent, $r = .33$, which indicates that MI counseling behaviors are consistent with ratings of the core MI principles. Action Orientation was negatively correlated with Percent Complex Reflections, $p = -.18$, Percent Open Questions, $p = -.34$, and Question-to-Reflection ratio, $p = -.19$, which is consistent with difficulties using open-ended questions and complex reflections during BI.

B. Overall Levels of Treatment Fidelity

For means and standard deviations of adherence measures across counseling conditions, see Table 3. Overall, fidelity of MI was relatively high in terms of global

ratings. MI Spirit (mean of Evocation, Collaboration, and Autonomy/Support) was 3.96

(*SD* = .43) for MI only 4.01 (*SD* = .53) for MI plus BI, where 1 equals low adherence and

5 equals high adherence (Moyers et al., 2010). Fidelity of MI was lower in terms of

behavior count summary scores: percent complex reflections was 35% (*SD* = 19) for MI

and 31% (*SD* = 15) for MI plus BI, where 40% indicates beginning proficiency; percent

open questions was 50% (*SD* =19) for MI and 42% (*SD* =18) for MI plus BI, where 50%

indicates beginning proficiency; and reflection-to-question ratio was .80 (*SD* = .51) for

MI and .76 (*SD* = .50) for MI plus BI, where 1.00 indicates beginning proficiency.

Fidelity of the behavioral intervention was also relatively high in terms of global ratings.

Action-orientation was 3.61 (*SD* = .96) in BI only and 3.49 (*SD* = .92) in MI plus BI.

C. Relationship Between Counseling Condition and Counselor Adherence

1. Global ratings

To examine the effect of counseling condition on treatment adherence, I

conducted ANCOVAs with counseling condition (MI, BI, or MI/BI) as the independent

variable and adherence measures as the dependent variables. Covariates were session

length (in minutes), session number (Visit 1, Call 2, Call 4, or Call 6), session format (in

person vs. telephone), baseline motivation to reduce smoking, and baseline motivation to

quit smoking. For Evocation, the ANCOVA revealed an effect of counseling condition on

adherence, $F(2, 315) = 14.79$, $p < .001$, such that BI sessions were less evocative (*M* =

3.73, *SD* = .48) compared to MI sessions (*M* = 4.31, *SD* = .53), $p < .001$, and compared to

MI/BI sessions (*M* = 4.31, *SD* = .61), $p = .001$. There was no effect of counseling

condition on Collaboration or Autonomy/Support. For Direction, there was a significant

effect of counseling condition on adherence, $F(2, 315) = 5.22$, $p = .006$, such that MI/BI

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sessions ($M = 4.93$, $SD = .24$) were more directive compared to MI sessions ($M = 4.89$, $SD = .31$), $p = .005$, and compared to BI sessions ($M = 4.95$, $SD = .24$), $p = .004$. There was an effect of counseling condition on Empathy, $F(2, 315) = 5.11$, $p = .007$, such that counselors were more empathic during MI sessions ($M = 4.06$, $SD = .62$) compared to BI sessions ($M = 3.52$, $SD = .77$), $p = .003$, and compared to MI/BI sessions ($M = 4.01$, $SD = .78$) $p = .041$. The difference between MI and MI/BI is not apparent when examining mean levels of empathy; however, MI sessions were more empathic than MI/BI sessions after controlling for session length because MI/BI sessions on average were longer than MI sessions, and empathy was positively correlated with session length. For MI Spirit, there was no effect of counseling condition on adherence. Lastly, there was an effect of counseling condition on Action Orientation, $F(2, 315) = 262.64$, $p < .001$, such that MI sessions ($M = 1.35$, $SD = .59$) were less action oriented compared to BI sessions ($M = 3.61$, $SD = .96$), $p < .001$, and compared to MI/BI sessions ($M = 3.49$, $SD = .92$), $p < .001$.

2. **Behavior count summary scores**

For Percent Complex Reflections, the ANCOVA revealed an effect of counseling condition on adherence, $F(2, 312) = 3.81$, $p = .023$, such that MI sessions ($M = 35$, $SD = 19$) contained a greater proportion of complex reflections compared to BI sessions ($M = 25$, $SD = 23$), $p = .02$, and compared to MI/BI sessions, $p = .03$ ($M = 31$, $SD = 15$). For Percent Open Questions, there was an effect of counseling condition on adherence, $F(2, 315) = 19.27$, $p < .001$, such that MI sessions ($M = 50$, $SD = 19$) contained a greater proportion of open questions compared to MI/BI sessions ($M = 42$, $SD = 18$), $p = .001$, and MI/BI sessions contained a greater proportion of open questions compared to BI

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sessions ($M = 32$, $SD = 19$), $p = .015$. There was no effect of counseling condition on Reflection-to-Question or Percent MI Adherent. Sample size for Percent Complex Reflections and Percent MI Adherent differs because Percent Complex Reflections is only calculated when the session contains at least one reflection, and Percent MI Adherent is only calculated when the session contains at least one MI Adherent or MI Non-adherent statement.

D. Relationships between Session Variables and Treatment Fidelity

To examine the relationships between session variables (session length, session number, and session format) and adherence, I conducted a follow-up regression analysis for each session variable and adherence measure that was significantly associated with one another in the ANCOVA. Each regression equation included all covariates from the ANCOVA (session length, session number, session format, baseline motivation to quit, baseline motivation to cut back/keep reduced, and counseling condition) and thus replicated the model used in the ANCOVA, except that counseling condition was dummy coded for regression analyses.

1. Global ratings

For Evocation, the ANCOVA revealed effects of session length, $F(1, 315) = 39.43$, $p < .001$, and session format, $F(1, 315) = 4.35$, $p = .038$, on adherence, such that counselors were more evocative during lengthier sessions, $\beta = .44$, $p < .001$, and telephone sessions, $\beta = .15$, $p = .038$ (see Table 4). Likewise, Collaboration was related to session length, $F(1, 315) = 17.98$, $p < .001$, and session format, $F(1, 315) = 5.11$, $p = .025$, such that counselors were more collaborative during lengthier sessions, $\beta = .34$, $p < .001$, and telephone sessions, $\beta = .19$, $p = .025$ (see Table 5). Autonomy/Support was

related to session length, $F(1, 315) = 6.16$, $p = .014$, such that counselors were more supportive of autonomy during lengthier sessions, $\beta = .21$, $p = .014$ (see Table 6). Direction was related to session length, $F(1, 315) = 31.37$, $p < .001$, and session number, $F(1, 315) = 7.90$, $p = .005$, such that counselors were more directive during shorter sessions, $\beta = -.45$, $p < .001$, and earlier sessions, $\beta = -.22$, $p = .005$ (see Table 7). Empathy was related to session length, $F(1, 315) = 33.64$, $p < .001$, such that counselors were more empathic during lengthier sessions, $\beta = .45$, $p < .001$ (see Table 8). MI Spirit was also related to session length, $F(1, 315) = 29.39$, $p < .001$, such that counselors demonstrated greater MI Spirit during lengthier sessions, $\beta = .41$, $p < .001$ (see Table 9). Action Orientation was related to session number, $F(1, 315) = 15.74$, $p < .001$, such that counselors were more action-oriented during earlier sessions, $\beta = -.20$, $p < .001$ (see Table 10).

2. Behavior count summary scores

For Percent Complex Reflections, the overall ANCOVA revealed an effect of session length, $F(1, 312) = 7.07$, $p = .008$, and session number, $F(1, 312) = 6.73$, $p = .01$, on adherence, such that higher percentages were associated with longer sessions, $\beta = .22$, $p = .008$, and later sessions, $\beta = .21$, $p = .01$ (see Table 11). Percent Open Questions was related to session number, $F(1, 315) = 7.18$, $p = .008$, such that higher percentages were associated with later sessions, $\beta = .20$, $p = .008$ (see Table 12). Reflection-to-Question ratio was related to session length, $F(1, 315) = 26.35$, $p < .001$, such that larger ratios were associated with lengthier sessions, $\beta = .41$, $p < .001$ (see Table 13). Percent MIA-Adherent was related to session number, $F(1, 269) = 4.27$, $p = .04$, such that higher percentages were associated with later sessions, $\beta = .18$, $p = .04$ (see Table 14).

E. Relationships Between Smoker Motivation and Treatment Fidelity

To examine the relationship between counselor adherence and smoker motivation, I included baseline motivation to quit smoking and baseline motivation to cut back/keep reduced as covariates when conducting the ANCOVAs described above. The only relationship between motivation and counselor adherence was a borderline-significant effect of motivation to cut back/keep reduced on Evocation, $F(1, 315) = 3.06$, $p = .081$, such that counselors were more evocative with smokers who reported higher levels of baseline motivation to cut back/keep reduced, $\beta = .10$, $p = .081$ (see Table 15).

F. Relationships Between Treatment Fidelity and Smoker Outcomes

To examine the relationships between counselor adherence and smoker outcomes, I conducted regression analyses with MI Spirit, Action Orientation, and Empathy as predictors and smoker outcomes as criterion variables. Smoker outcomes included average number of cigarettes smoked per day during the past week, motivation to quit smoking, motivation to cut back/keep reduced, intention to quit within the next 30 days, intention to quit within the next 6 months, and number of serious quit attempts made during the study. Each outcome was assessed at Week 12 and Week 26, and separate regression analyses were conducted for each smoker outcome at each time point. For each regression analysis, average number of cigarettes per day at baseline, baseline motivation to quit smoking, baseline motivation to cut back/keep reduced, and dummy coded counseling condition variables were included in the regression model. For the regression analyses of intention to quit and intention to cut back/keep reduced, intention at baseline was also included in the model. Intention to quit was analyzed using logistic regression, and the remaining variables were analyzed using standard regression.

MI spirit was not associated at Week 12 or Week 26 with average number of cigarettes per day, motivation to quit smoking, motivation to cut back/stay reduced, or number of serious quit attempts made during the study. However, higher levels of MI Spirit were associated with an increased likelihood to report intention to quit within the next 6 months at Week 12, $\chi^2 = 6.67$, $p = .01$, and Week 26, $\chi^2 = 6.75$, $p = .009$ (see Table 16). Higher levels of empathy were also associated with an increased likelihood to report intention to quit within the next 6 months at Week 12, $\chi^2 = 5.53$, $p = .019$, and Week 26, $\chi^2 = 6.25$, $p = .012$ (see Table 17). There was a trend-level relationship between Empathy and motivation to quit smoking at Week 12, such that higher levels of empathy were associated with greater motivation, $\beta = .11$, $p = .078$ (see Table 18). No other relationships between Empathy and smoker outcomes emerged. Lastly, Action Orientation was not associated with any smoker outcomes at Week 12 or Week 26.

G. Individual Differences in Counselor Adherence

To explore individual differences in counselor adherence, I examined the range of mean ratings for individual counselors within each counseling condition. For each condition, I determined the lowest and highest mean rating from an individual counselor for MI Spirit, Empathy, and Action Orientation (see Table 19). For MI/BI sessions, the range for MI Spirit was 3.61 ($SD = .83$) to 4.70 ($SD = .26$), the range for Empathy was 3.21 ($SD = .64$) to 4.67 ($SD = .50$), and the range for Action Orientation was 2.83 ($SD = .98$) to 4.34 ($SD = .60$). These ranges indicate minimal overlap and substantial variability between the lowest and highest rated counselors for MI/BI sessions. For MI sessions, the range for MI Spirit was 3.69 ($SD = .41$) to 4.38 ($SD = .36$), 3.58 ($SD = .58$) to 4.75 ($SD = .42$) for Empathy, and 1.00 ($SD = .00$) to 2.17 ($SD = .98$) for Action Orientation. These

ranges also indicate minimal overlap between the lowest and highest rated counselors. For BI sessions, the range for MI Spirit was 3.42 (*SD* = .24) to 4.08 (*SD* = .38) and 2.94 (*SD* = .82) to 4.30 (*SD* = .48) for Empathy, indicating minimal overlap. However, the range for Action Orientation was 2.95 (*SD* = .64) to 4.00 (1.07), indicating substantial overlap and less variability among counselors. Notably, the ranges for both MI Spirit and Empathy were largest during MI/BI sessions, indicating that treatment fidelity was more variable in that condition compared to either individual intervention.

IV. DISCUSSION

The overall goal of this study was to examine fidelity of Motivational Interviewing counseling sessions when MI is delivered in combination with a behavioral intervention, and whether differences in fidelity would be associated with outcome. Secondary goals included examining the relationships between treatment fidelity and smoker motivation, and treatment fidelity and session variables (e.g., telephone vs. in-person format). This study also explored overall levels of fidelity of MI when delivered by bachelor's-level counselors to smokers who by and large were not interested in quitting. This discussion section reviews the following: overall adherence to MI; the relationship between counseling condition and MI fidelity, counseling condition and fidelity of the behavioral intervention, and counseling condition and session factors; the relationship between fidelity and smoker outcomes; counselor individual differences; and limitations and future directions.

A. Overall Fidelity of Motivational Interviewing

Global ratings indicated relatively high levels of adherence to MI in both MI conditions, with MI Spirit in the moderately high range. Counselors demonstrated relative strengths in evocation and collaboration, suggesting that demonstrating support of autonomy was more difficult. Although there was no difference between MI Spirit across conditions, counselors demonstrated higher evocation and collaboration in MI conditions compared to BI only, suggesting that counselors were successful in delivering MI that was distinguishable from BI in terms of the demonstration of MI principles. Behavior count summary scores highlight difficulties in counselor adherence. Counselors did not reach "competency" (Moyers et al., 2010) levels in terms of question-to-reflection

ratio, percent open questions, and percent complex reflections. Counselors were at "beginning proficiency" for percent open questions, but below beginning proficiency for percent complex reflections and flection-to-question ratio. Overall, these findings suggest that counselors had more difficulty with these specific MI behaviors than they did conveying the general MI principles.

B. Counseling Condition and Fidelity of Motivational Interviewing

The main finding regarding fidelity of MI this study is that some aspects of MI fidelity varied by counseling condition, while others did not. First, counselors were more empathic during MI only compared to BI only. This finding likely reflects the greater emphasis that the MI protocol placed on understanding the unique contextual factors, thoughts, and feelings of the client. For example, the MI protocol included discussions about past quit attempts, pros and cons of quitting (or reducing) and continuing to smoke, and hypothetical future scenarios related to smoking. These exercises likely demonstrated counselor empathy, given the focus on understanding the client's experience in depth. The BI protocol, on the other hand, emphasized the implementation of concrete strategies and goals, and inquiry about the client's perspective was limited to asking about smoking patterns, goals, and strategies, and these discussions were mostly oriented around present goals. Although it is possible to strategize and set goals with a client in a highly empathic manner, they were not instructed to do so; empathic behaviors were not built into the BI protocol as they were in the MI protocol. Given the limited counseling training background of the counselors (i.e., bachelor's-level education plus professional training), the relatively short duration of the sessions, and the possibility that BI session content was more difficult to deliver while demonstrating empathy, it is not surprising that

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counselors demonstrated less empathy in BI conditions.

Critically, counselors were also more empathic in MI only compared to MI plus BI. This finding is especially interesting given that the MI plus BI protocol included all of the MI exercises and prescribed counselor behaviors that may have demonstrated empathy during MI only (e.g., asking about pros and cons). This suggests that, during MI plus BI sessions, aspects of BI may have negatively impacted or detracted from the empathic qualities of MI. For instance, an emphasis on setting and maintaining a current reduction goal could reduce the depth or quality of inquiry into past quit attempts because of a shift in focus of the counselor (i.e., reduction-focused vs. exploratory). Relatedly, it is possible that the exercises and protocol components (e.g., time for open-ended discussion of thoughts and feelings about smoking) of MI were not the cause of greater empathy in MI only compared to BI only, but rather empathy in MI only was conveyed through general behaviors or attitudes not described in the protocol. Indeed, the maximum rating for empathy indicates that the counselor has demonstrated and communicated a deep understanding of what the client has said, and this aspect of empathy is not prescribed or indicated through any specific elements of the protocol. These more abstract or general aspects of empathy that are demonstrated in MI only may have been diluted by the relatively superficial content of the BI protocol in MI plus BI. This could have occurred because of the previously discussed shift in counselor focus during the MI exercises because he or she had previously completed, or was focusing on, upcoming, BI exercises. In addition, it also is possible that the MI content was no different in MI only compared to MI plus BI, but that the gestalt impression left by counselors in MI plus BI was one of less empathy, simply because a large portion of the

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session (i.e., the BI content) was independently less empathic. In other words, the MI content may have been equally empathic in MI only and MI plus BI, while the overall impression of individual session was that of less empathy in MI plus BI, because MI content fostered more empathy than BI content.

It is also possible that, although the MI plus BI protocol included the full MI protocol, counselors did not complete the MI portion in its entirety during MI plus BI sessions. This would indicate that MI plus BI did not include all of the exercises that would demonstrate empathy that were completed more often in MI only. In other words, smokers in MI plus BI may have received less MI compared to smokers in MI only, which could reduce empathy. Indeed, mean session times (collapsed across session number) were 12.9 ($SD = 6.8$) minutes for MI only, 7.9 ($SD = 3.9$) minutes for BI only, but only 16.8 ($SD = 8.8$) minutes for MI plus BI, indicating that either or both components of the combined intervention were abbreviated by the counselors. If the MI portions of combined session were shortened, that could indeed contribute to lower empathy compared to MI only (however, it could also have led to lower evocation, but did not).

Addressing aspects of combining treatment that negatively impact empathy, such as reduced attention to or quality of MI components, may be important in optimizing outcomes. For example, a separate study defined MI Spirit as the average of Empathy, Collaboration, and "Egalitarianism," and found that higher MI Spirit was associated with stronger working alliances and great client involvement in the session, where all measures were assessed via observer report (Boardman, Catley, Grobe, Little, & Ahluwalia, 2006). Nonetheless, a study of a single-session MI intervention for underage

college drinkers found the empathy was not associated with reductions in binge drinking, indicating that empathy may not always critical, perhaps especially for short interventions (Feldstein & Forcehimes, 2007). Empathy may be more important with more difficult problems, however, or those that require greater distress tolerance from the client such as reducing substance on which the client is dependent, or confronting other anxiety-related stimuli. For example, a qualitative analysis of a single case study indicated that empathy was critical in fostering client confidence to confront excessive worry in the context of generalized anxiety disorder (Angus & Kagan, 2009), which ostensibly is a more persistent and distressing mental health problem compared to occasional recreational alcohol use among college students.

The results for evocation were similar to those for empathy in that counselors were more evocative in MI only compared to BI only. One explanation for this finding is that the BI content was more difficult to deliver in an evocative manner. Although it is possible to deliver BI in a highly evocative manner (e.g., prompting the client to generate strategies and reasons for choosing those strategies), it would likely be more difficult than in MI because counselors in BI are directly focused on behavioral techniques rather the process of evocation. Thus, a highly evocative delivery of BI would require a greater degree of proficiency with the interventions than was possible for the minimally trained counselors in the current study. Moreover, BI may be more difficult to deliver with evocation because a significant component of BI is to present and select reduction strategies, and this process is largely psychoeducational for many smokers (i.e., they are not necessarily already aware of reduction strategies). Similarly, these techniques may be less evocative in nature in that they are less abstract (and more concretely change-

focused), requiring less exploration than the content in MI. For instance, the costs and benefits exercise in MI is explicitly evocative (counselors ask about reasons for change), whereas evocation in BI is mostly limited to asking about ideas for reduction strategies and goals.

The findings for evocation contrasted with those for empathy, however, in that counselors were able to maintain as high of a level of evocation during MI plus BI as they could during MI only; adding BI to MI was not associated with lowered evocation, whereas it was associated with lowered empathy. One explanation for this finding is that aspects of BI that are associated with reduced empathy are less important for evocation. For example, empathy may be more sensitive to changes in the overall approach by the counselor (i.e., empathy during MI is reduced because half of the session is spent delivering the less empathic behavioral intervention), whereas evocation may be more independent than empathy from other qualities of the session. In other words, spending time on behavioral exercises may affect the overall impression of empathy because they are less empathic, and additively the session is perceived as less empathic. Whereas MI is perceived as similarly evocative regardless of whether the session also contains BI, because a lack of evocation during one portion of the session does not impact the evocativeness in another part of the session in the same way that a lack of empathy during a portion of a session might taint the rest of the session. In other words, the perception of empathy may be more diffuse across a session, and more sensitive to disruption by non-empathic exchanges, compared to evocation, which in contrast may be relatively independent from non-evocative exchanges. Indeed, one criterion for a high evocation rating was that the counselor sought to evoke means *and* reasons for change.

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Thus, a counselor could receive high ratings for evocation by asking about these and it would still be considered evocative even if BI occurred before or after evocative exchanges.

The findings for evocation are promising in that adding BI to MI does not appear to reduce the evocativeness of counseling. Viewed another away, BI can be delivered in the context of an evocative session when it is paired with MI. This finding is especially important given that evocation is such a critical component of MI (Hettema et al., 2005). The emphasis on eliciting change talk and drawing out thoughts and feeling from the client, including reasons and means for change, is a fundamental distinction between MI and other substance abuse interventions that rely on the counselor taking the expert role, ignoring the client's perspective, and indiscriminately providing reasons for change (Rollnick & Allison, 2004). Thus, the results of the current study indicate that MI can preserve the core principle of evocation when it is combined with a more concrete behavioral intervention. Importantly, counselors in the current study were using structured MI protocols that included exercises that facilitated evocation. This may have made it easier for counselors to remain evocative during sessions that included MI and BI. Without protocols that include those exercises—or other repeated directions to emphasize evocation—counselors may stray further from the evocative stance when delivering MI with BI, perhaps in part because they have more experience with and confidence in behavioral interventions.

In contrast to the results for empathy and evocation, there were no differences across counseling condition in collaboration or support of client autonomy. Counselors were no less collaborative or supportive of autonomy during BI only compared to MI

only, and combining the interventions was not associated with lowered fidelity. One explanation for why collaboration did not differ across condition is that both interventions were similarly compatible with a collaborative approach. For example, counselors should have been able to work collaboratively with a smoker to develop a reduction plan in BI and a pros and cons list in MI. In both contexts, the counselors may have able to maintain the collaborative stance that the smoker is the "expert," while still offering substantial guidance, such as how to optimize the reduction plan in BI, or appreciating the importance of the benefits of smoking in MI. In contrast, MI only and BI only differed in terms of evocation, presumably because it was more difficult to emphasize behavioral elements, like offering a menu of reduction strategies or choosing a reduction goal, while maintaining a high degree of evocation. In other words, BI may be inherently similar to MI in terms of collaboration and support of autonomy, but less evocative. On the other hand, support of autonomy may be similarly low across all conditions, and counselors were simply not able to demonstrate it even in MI only.

The counselors worked in collaboration with the client, rather than acting as the expert, to an equal degree in both MI and BI. On the one hand, this could indicate good clinical skills in delivering the behavioral intervention, which was more directive and focused on change, without acting as the expert or forcing change. The ability to maintain a collaborative stance during BI may especially reflect good clinical skill given that many behavioral strategies are not intuitive, meaning the counselor often needs to explain them to the client. These didactic moments in counseling could have the potential to cause the counselor to act as an expert, which would be non-collaborative. On the other hand, this group of smokers was willing to engage in smoking cessation counseling,

and enrollment in the study required interest on their part in some degree of change (i.e., cutting back). This motivation on the part of the smokers could have made it easier to be collaborative given that they could be less likely to challenge the counselor out of resistance to the behavior change altogether. Moreover, counselors may have encountered few opportunities to threaten a smoker's autonomy, given that the smokers had already chosen a path of behavior change.

Similar to collaboration, counselors were able to support autonomy equally in both individual interventions. This is not surprising given the emphasis on autonomy in both interventions; both BI and MI emphasized client choice in setting goals and selecting means for change. Importantly, mean levels of autonomy and support were lower than those for evocation and empathy. Although the scales for each global rating do not contain the same anchors, qualitative descriptions of the mean levels suggest lower levels of fidelity for autonomy and support. The mean ratings collapsed across counseling conditions were 4.10 ($SD = .61$) for Evocation and 4.06 ($SD = .67$) for Collaboration, but only 3.47 for Autonomy/Support. For the autonomy and support, a rating of "3" indicates neutrality regarding client autonomy, whereas "4" indicates acceptance but not marked support of client autonomy. This raises the possibility that MI and BI were associated with similar levels of autonomy and support not because counselors were especially supportive in BI, but because counselors were not able to strongly demonstrate support of autonomy in any of the counseling conditions, even in MI only when it was expected to be the highest. Thus, it is possible that, if counselors were able to show more support of autonomy in the context of MI, this rating would then be lowered with the addition of BI. In other words, although BI was supportive of autonomy to some degree, the counselors

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in this study may not have practiced MI in such a way that strongly fostered support of autonomy, even when they were focused exclusively on MI. This, in turn, precluded the possibility for BI to reduce support of autonomy in MI. This consideration may be important given that advocating for reduction goals and strategies, even after a client has agreed on a goal or strategy, could be perceived by a client as controlling if not discussed in an MI-Adherent way, such as by using language that emphasizes client autonomy (e.g., "I'd like to review some reduction strategies, but it is up to you whether you try any of them" compared to "I'd like to review some reduction strategies, and I want you to pick a few to try"). Future studies on combined interventions should carefully examine the effects of adding a behavioral intervention to MI that is more strongly supportive of client autonomy. Lastly, similar to collaboration and support of autonomy, overall MI spirit (the average of Evocation, Collaboration, and Autonomy/Support) also did not differ across condition. This was not surprising given that only Evocation differed across counseling condition.

C. Counseling Condition and Fidelity of the Behavioral Intervention

In terms of fidelity of the behavioral intervention, counselors delivering BI only were more action oriented compared to counselors delivering MI only. This finding suggests that counselors adhered to the treatment protocols, in that BI included more action-oriented content, such setting and measured concrete reduction goals or optimizing reduction strategies, than did MI. Importantly, counselors were no less action oriented during MI plus BI compared to MI only. Thus, just as counselors did not sacrifice the evocation of MI when combining it with BI, they also maintained a high degree of action orientation in BI when combining it with MI. Counselor directiveness also varied across

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condition such that counselors were more directive during MI plus BI sessions compared to BI or MI alone, which were equivalent. One explanation for this finding is that following a greater number of protocol components (i.e., delivering both MI and BI) was perceived as more directive than following fewer protocol components simply because counselors introduced more tasks and ideas during those sessions.

In addition to differences in global ratings, counseling condition was also associated with differences in the behavior count summary scores. First, counselors made a higher percentage of complex reflections during MI only sessions compared to BI sessions, which is consistent with differences in protocols. MI prescribed the exploration of topics such as reasons for change and allowed the counselor time in the session to listen and make reflections. This is also consistent with the general style of MI, which is to seek to understand the client and reflect content beyond what has been explicitly stated (Hettema et al., 2005). Importantly, when delivering MI plus BI, counselors made a lower proportion of complex reflections than they did during MI, and they made an equivalent proportion as they did during BI. This indicates that counselors struggled to maintain the relatively high ratio of complex reflections during MI when BI is delivered simultaneously. One explanation for this finding is that certain characteristics of the behavioral intervention interfered with the MI approach. For instance, the BI content was often more concrete and task-focused, which may have contributed to less depth of content and exploration, and thus lower proportion of complex reflections, during the MI portions of MI plus BI sessions. Being more task-focused during BI could affect the counselor's approach during the MI portion of the session, given the lack of experience with and confidence in MI and the difficulty combining approaches in a single session.

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Indeed, integrating technical and theoretical elements of multiple therapies could pose unique training challenges that were not necessarily addressed in this study (Garfield, 1994; Norcross & Thomas, 1988; Wolfe & Goldfried, 1998). Alternatively, MI plus BI could have been associated with a lower proportion of complex reflections simply because the BI content lowered the total proportion of complex reflections (without impacting that aspect of the MI portions of each session). In other words, the total proportion may have been lowered without affecting the proportion during MI components of the session.

D. Treatment Fidelity and Session Factors

Interestingly, some aspects of fidelity varied as a function of session variables, including session length. Longer sessions were associated with greater evocation, collaboration, autonomy and support, and empathy. These findings indicate that session duration may be related to quality of MI in that counselors have more difficulty cultivating the qualities of MI during shorter sessions. This is not surprising given that the exploratory, non-confrontational approach of MI may take more time than selecting and implementing behavioral strategies. These results support the hypothesis that some therapeutic processes require sufficient time to develop. These findings may be especially important given the known potential for dose-response relationships between counseling duration and outcomes (Hansen, Lambert, & Forman, 2006). Thus, it may be especially important for counselors to ensure that they do not abbreviate therapy sessions unnecessarily when delivering a combined intervention. This point may be of particular concern given the popularity and utility of using MI in a variety of settings that do not allow for protracted counseling, such as in primary care or specialty medical clinics

(Emmons & Rollnick, 2001; Rollnick, Heather, & Bell, 1992).

Additional relationships with session variables included greater direction during shorter sessions, and sessions that occurred earlier in the protocol (e.g., Visit 1 vs. Call 6). Counselors were also more action oriented during earlier sessions. These findings indicate that, during the behavioral intervention, counselors became less directive and action oriented over time. One explanation for this finding is that smokers took more control over the sessions as counseling progressed, perhaps because the initial sessions included prompts to explore reduction strategies and goals, and smokers learned to initiate these topics independently during later sessions.

E. Smoker Motivation and Counselor Adherence

One surprising result was the lack of statistically significant relationships between treatment fidelity and baseline smoker motivation to cut back or quit. Given that smokers who are less motivated to quit may be more difficult to engage in smoking cessation interventions (Ahluwalia et al., 2002), we expected that working with smokers who were willing to engage in smoking cessation counseling would be easier for counselors, and thus be associated with greater fidelity of MI. Nonetheless, there was no relationship between smoker motivation and counselor adherence, except for a trend-level association between evocation and baseline motivation to cut-back/keep reduced, such that counselors were less evocative with smokers who reported lower levels of motivation. If this finding reflects a significant and replicable relationship, it indicates that counselors may have greater difficulty eliciting reasons and means for change when smokers have lower motivation to change prior to counseling. This finding is not surprising, given that smokers who are not ready to quit tend to report lower levels of intrinsic motivation for

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smoking cessation (Curry, Grothaus, & McBride, 1997). This in turn could make it more difficult for a counselor, particularly one with less experience in MI, to evoke those thoughts and feelings from the smoker.

In terms of the lack of relationships between smoker motivation and other adherence measures, it is possible that the restricted range of smoker motivation in this study limited sensitivity to detect these relationships. As noted earlier, 76.2% of the sample reported being interested in reducing or quitting smoking, indicating that most participants were already willing to contemplate and discuss change in their smoking behaviors. This high degree of motivation could have precluded some difficulties with treatment fidelity, such as evoking change talk, maintaining a collaborative approach, and supporting autonomy. These three core qualities of MI could be more difficult to maintain with clients who are less motivated; smokers who are not interested in change could be less aware of reasons and means for change and be less responsive at attempts to generate them, be more likely to elicit a non-collaborative, persuasive approach on the part of the counselor, and be more likely to challenge a counselor's acceptance of smoker autonomy by steering away from change.

F. Counselor Adherence and Smoker Outcomes

Although the different counseling conditions were associated with different levels of treatment fidelity on some measures (e.g., empathy), the importance of these associations depends in part on whether fidelity is related to smoker outcomes. While the measure of adherence to the behavioral intervention was not related to any smoker outcomes, higher levels of global spirit and empathy were related to outcomes. At Week 12 and Week 26, higher levels of global spirit and empathy were associated with an

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increased likelihood of the smoker reporting the intention to quit within 6 months. Additionally, higher levels of empathy were associated at trend with a greater degree of motivation to quit at Week 12. Findings regarding fidelity of MI and outcomes are limited, but research does indicate that adherence to MI spirit encouraged client involvement in substance abuse counseling (Boardman et al., 2006; Moyers, Miller, & Hendrickson, 2005). Results from the current study indicate that fidelity is important for some outcomes, namely intention to quit in the future. This outcome may be especially important, given that the current goal at baseline for most smokers was not to quit (although the majority were planning to quit within the next 6 months). In sum, fidelity is associated with outcomes; counselors who adhere to the general principles of MI, and who demonstrate empathy, are better able to impact whether the smoker intends to quit eventually. Contrary to intention to quit within 6 months, intention to quit within 30 days was not associated with MI spirit or empathy. One possible explanation for this is the low base rate of smokers who intended to quit within the next 30 days; only 21.9% and 23.3% of smokers intended to quit within 30 days at Week 12 and Week 26, respectively, potentially making it difficult to detect statistical relationship with measures of treatment fidelity.

G. Individual Counselor Differences in Treatment Fidelity

Counseling condition was also associated with variability of treatment fidelity, such that counselors demonstrated greater variability in adherence during MI plus BI sessions compared to either individual intervention. This is not surprising, given the greater complexity in delivering a combined intervention; with a higher degree of difficulty, there may be more opportunity to demonstrate counseling skills (or lack

thereof) and separate the lower skilled counselors who might adhere less with a more challenging intervention from the higher skilled counselors who might adhere equally well with a more challenging intervention. However, theses differences were only descriptive and do not represent statistically significant differences. Moreover, these differences do not control for session length, which could impact fidelity independent of whether the intervention is individual or combined. It is possible that longer sessions, in addition to more difficult interventions, allow for greater separation of counselors based on skill, and thus greater variability in fidelity, compared to shorter sessions. During longer sessions, counselors may have more opportunities to demonstrate adherence (or lack thereof) to the principles and techniques of the intervention.

In addition to differences in the variability of fidelity, the absolute values of adherence also varied as a function of counseling condition. Levels of fidelity ranged from just greater than minimally adherent to highly adherent. As mentioned above, MI Spirit is the mean of Evocation, Collaboration, and Autonomy/Support, and for each of these measures a rating of 3 indicates minimal levels of adherence: for evocation, 3 indicates "…no particular interest in or awareness of client's own reasons for change or how change should occur"; for collaboration, "… incorporates client's goals, ideas, and values but does so in a lukewarm or erratic fashion"; and for Autonomy/Support, "neutral relative to client autonomy" (Moyers at al., 2010). Thus, a mean rating of 3 for MI Spirit does not indicate a particularly high level of fidelity, although neither is it directly opposed to MI (i.e., non-adherent). Ratings of 4 indicate moderate levels of adherence (e.g., interest in client's own reasons, fosters collaboration and power sharing, and actively supports client's autonomy). Thus, the lowest rated counselor was between

minimally and moderately adherent (but was not non-adherent) in terms of MI Spirit. The highest rated counselor, however, was near the maximum rating of 5, indicating high quality MI. Importantly, these low and high averages were similar in MI/BI and MI only, indicating that counselors were minimally to highly adherent regardless of whether MI was combined with BI. In addition, levels of empathy were roughly similar in MI/BI and MI in that the low average was above 3 ("actively trying to understand the client's perspective, with modest success") and the high average was near 5 ("shows evidence of deep understanding") in both conditions. This indicates that, despite significantly higher levels of empathy during MI only, counselors were still moderately empathic during MI/BI (and BI only). This finding is especially important given that one benefit of pairing MI with behavioral interventions is to encourage the resolution of ambivalence regarding strategies of experiential avoidance, such as that in anxiety disorders as well as substance use (Slagle & Gray, 2007). The current findings indicate that, even though empathy may be reduced when MI is combined with BI, it2 is still present to a moderate degree. However, it is unclear whether the level of empathy associated with MI/BI in this study was sufficient for behavior change. This question may be important to address, given the potential relationship between empathy and smoker outcomes.

H. Limitations and Future Directions

The current study has a number of limitations. First, coding global ratings is subjective by design (Moyers et al., 2010), which could reduce reliability and validity of the fidelity data. Indeed, data from the current study indicated that the global ratings were only moderately reliable across coders (ICCs ranged from .38 to .59 for global ratings of MI fidelity). In addition to reliability, validity is also a concern in that coders could

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achieve good inter-rater reliability while assigning invalid ratings. For example, coders in the current study tended to rate evocation as "5" if counselors explored reasons *and* means for change, whereas they tended to rate evocation as "4" if counselors explored one or the other. This approximation of evocation may have led coders astray in some cases, such as when rating sessions where the counselor asked about reasons and means, but did so with less depth. In this example, the counselor may have inappropriately received a rating of "5" when in fact the true rating was closer to "4." In this way, attaining reliability may have reduced validity to some extent. It is possible that true relationships among counseling condition, treatment fidelity, and treatment outcomes went undetected because of flaws inherent to the coding process. Nonetheless, reliability ratings were comparable to previous studies (Moyers, Martin et al., 2005), coders met frequently throughout the study to ensure reliability and validity, and indeed some measures of fidelity were related to outcome, indicated some degree of sensitivity to differences in counseling sessions. Perhaps most important, the MITI was sensitive enough to detect significant differences between MI and BI, indicating that it appropriately distinguished both the general approaches and specific techniques of each individual intervention.

Second, the current study examined a very specific area within the larger topic of MI for smoking cessation. For instance, the sample consisted of smokers who were not yet ready to quit, but who largely were interested in cutting back. As discussed above, the results may have differed if the sample was less motivated to change smoking behavior. In that case, counselors may have had greater difficulty combining interventions, or in delivering MI as an individual intervention. This study also examined counselors with

relatively little experience with MI, and the results may have differed if the counselors had more experience. For example, greater skill with MI could have allowed the counselors to demonstrate higher levels of empathy when delivering MI with BI, because adding BI would have been less challenging. Moreover, many of the core characteristics of MI are developed over time and in stages (Miller & Moyers, 2006), and thus novice counselors would likely demonstrate different levels of adherence than more experienced counselors. Lastly, these findings may apply only to smoking cessation counseling and not to other areas in which MI could be combined with behavioral interventions, such as to treat anxiety disorders (Silver & Gray, 2007).

Future directions for research include replicating the current findings with similar counselor and smoker samples. This would enhance the confidence in the current findings, especially related to concerns about subjective ratings. Importantly, this work should also be replicated with different counselor and smoker samples. As discussed above, fidelity and treatment outcomes may relate to counseling condition in different ways, depending on various counselor and smoker characteristics. Namely, studies should examine whether combining MI with BI is easier for counselors who are more skilled or experienced, and also for smokers who are less motivated for behavior change. Future research should also consider session length in issues of combing MI with BI. Clearly, longer sessions were associated with higher fidelity, and it is important to examine whether combining treatments is easier with extended sessions, perhaps because they allow for more time to deliver separate approaches in the same session. This may be especially important if counselors in real-world settings tend to abbreviate combined intervention sessions, as did the counselors in the current study.

TABLE I

Coding reliability estimates for dual-coded sessions (n = 218)

Measures	ICC	Lower	Upper
Global Ratings			
Evocation	.48	.31	.60
Collaboration	.46	.30	.58
Autonomy/Support	.38	.20	.53
Empathy	.59	.47	.69
Direction	.57	.44	.67
Action Orientation*	.93	.91	.95
Behavior Counts			
Giving Information	.79	.72	.84
Closed Question	.98	.97	.98
Open Question	.98	.97	.98
Simple Reflection	.92	.86	.95
Complex Reflection	.88	.84	.91
MI Adherent	.79	.69	.86
MI Non-adherent	.34	.14	.49
Action Oriented*	.91	.88	.93
Reduction*	.89	.85	.91
BI Adherent*	.80	.73	.85
Composite Global Rating			
MI Spirit	.51	.37	.63
Composite Behavior Counts			
Percent Open Questions	.92	.90	.94
Percent Complex Reflections (n = 213)**	.63	.52	.72
Percent MI-Adherent (n = 160)**	.41	.19	.57
Reflection-to-Question Ratio	.85	.80	.89

Note. *BI codes were derived for this study; the remaining codes are from the MITI (Moyers et al., 2005). **Sample size differs because some cases do not contain the necessary data to calculate a composite score (i.e., contain a numerator of zero). Lower refers to the lower 95 percent confidence interval and Upper refers to the upper 95 percent confidence interval.

TABLE II

Pearson Correlation Coefficients for Global Ratings and Behavior Count Summary Scores

Measure	1	2	3	4	5	6	7	8	9	10
1. Evoc	-									
2. Coll	.61**	-								
3. A/S	.29**	.43**	-							
4. Dir	.03	.05	-.04	-						
5. Emp	.64**	.61**	.37**	-.03	-					
6. AO	-.05	.05	.08	.16**	-.08	-				
7. Spirit	.80**	.87**	.71**	.02	.69**	.03	-			
8. %CR	.18**	.23**	.18**	-.08	.37**	-.18**	.25**	-		
9. %OQ	.29**	.26**	.02	-.04	.30**	-.34**	.24**	.27**	-	
10. R-Q	.35**	.34**	.24**	-.12*	.50**	-.19**	.39**	.37**	.38**	-
11. %MIA	.20**	.34**	.23**	.02	.30**	-.03	.33**	.14*	.11	.17**
	-									

Notes. *p < .05; **p < .01.

TABLE III

Means and Standard Deviations of Adherence Measures by Counseling Condition

	MI (n = 103)		BI (n = 118)		MI/BI (n = 105)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Global Ratings:						
Action Orientation*	1.35	.59	3.61	.96	3.49	.92
Evocation*	4.31	.53	3.73	.48	4.31	.61
Collaboration	4.15	.60	3.87	.70	4.18	.68
Autonomy/Support	3.42	.46	3.45	.62	3.55	.67
Direction*	4.89	.31	4.95	.24	4.93	.24
Empathy*[1]	4.06	.62	3.52	.77	4.01	.78
MI Spirit	3.96	.43	3.69	.46	4.01	.53
Behavior Count Summary Scores:						
% Complex Reflections*[2]	35	19	25	23	31	15
% Open Questions*	50	19	32	19	42	18
Reflection-to-Question Ratio	.80	.51	.58	.36	.76	.50
% MI Adherent[2]	94	14	87	28	89	23

Notes. The coding scale for global ratings ranges from 1 to 5, with higher ratings indicating greater adherence. * = Significant effect of counseling condition on adherence: for Action Orientation, MI < BI = MI/BI; for Evocation, BI < MI = MI/BI; for Direction, BI = MI < MI/BI; for Empathy and Percent Complex Reflections, BI = MI/BI < MI; for Percent Open Questions, BI < MI/BI < MI. [1] = The differences between MI and MI/BI in Empathy, Direction, and Percent Complex Reflections after controlling for session length are not reflected by mean levels. [2] = Sample size differs because Percent Complex Reflections is only calculated when the session contains at least one reflection, and Percent MI Adherent is only calculated when the session contains at least one MI Adherent or MI Non-adherent statement.

TABLE IV

Standard Regression Analysis of Evocation with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.10	-1.45	ns
Session Format	.15	2.09	.04
Session Length	.44	6.28	<.001
BL Mot. Cut Back	.10	1.75	.08
BL Mot. Quit	-.05	-.94	ns
MI Counseling	.22	3.29	.001
BI Counseling	-.09	-1.62	ns

Notes. R^2 = .35. Dependent variable is Evocation global rating. BL Mot. = Baseline Motivation.

TABLE V

Standard Regression Analysis of Collaboration with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.09	-1.07	ns
Session Format	.19	2.26	.03
Session Length	.34	4.24	<.001
BL Mot. Cut Back	-.05	-.76	ns
BL Mot. Quit	-.04	-.61	ns
MI Counseling	.02	.30	ns
BI Counseling	-.06	-.89	ns

Notes. R^2 = .12. Dependent variable is Collaboration global rating. BL Mot. = Baseline Motivation.

TABLE VI

Standard Regression Analysis of Autonomy/Support with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.03	-.31	ns
Session Format	-.04	-.51	ns
Session Length	.21	.21	.01
BL Mot. Cut Back	-.03	-.03	ns
BL Mot. Quit	.06	.06	ns
MI Counseling	-.03	-.03	ns
BI Counseling	. 05	.05	ns

Notes. R^2 = .06. Dependent variable is Autonomy/Support global rating. BL Mot. = Baseline Motivation.

TABLE VII

Standard Regression Analysis of Direction with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.22	-2.81	.005
Session Format	.02	.26	ns
Session Length	-.45	-5.60	<.001
BL Mot. Cut Back	.05	.72	ns
BL Mot. Quit	-.10	-1.57	ns
MI Counseling	.23	2.90	.004
BI Counseling	.19	2.84	.005

Notes. R^2 = .12. Dependent variable is Direction global rating. BL Mot. = Baseline Motivation.

TABLE VIII

Standard Regression Analysis of Empathy with Session and Motivation Variables

Predictor	β	t	p
Session Number	.11	1.44	ns
Session Format	.09	1.12	ns
Session Length	.45	5.80	<.001
BL Mot. Cut Back	.06	1.02	ns
BL Mot. Quit	-.03	-.52	ns
MI Counseling	.06	.81	ns
BI Counseling	-.13	-2.05	.04

Notes. $R^2 = .20$. Dependent variable is Empathy global rating. BL Mot. = Baseline Motivation.

TABLE IX

Standard Regression Analysis of MI Spirit with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.09	-1.18	ns
Session Format	.13	1.63	ns
Session Length	.41	5.42	<.001
BL Mot. Cut Back	.01	.11	ns
BL Mot. Quit	-.01	-.21	ns
MI Counseling	.09	1.19	ns
BI Counseling	-.04	-.71	ns

Notes. R^2 = .21. Dependent Predictor is MI spirit global rating. BL Mot. = Baseline Motivation.

TABLE X

Standard Regression Analysis of Action Orientation with Session and Motivation Variables

Predictor	β	t	p
Session Number	-.20	-3.97	<.001
Session Format	.08	1.59	ns
Session Length	.07	1.36	ns
BL Mot. Cut Back	.03	.74	ns
BL Mot. Quit	-.06	-1.45	ns
MI Counseling	-.08	-1.53	ns
BI Counseling	.75	17.75	<.001

Notes. R^2 = .64. Dependent variable is Action Orientation global rating. BL Mot. = Baseline Motivation.

TABLE XI

Standard Regression Analysis of Percent Complex Reflections with Session and Motivation Variables

Predictor	β	t	p
Session Number	.21	2.59	.01
Session Format	.11	1.26	ns
Session Length	.22	2.66	.008
BL Mot. Cut Back	-.10	-1.58	ns
BL Mot. Quit	.04	.66	ns
MI Counseling	.01	.14	ns
BI Counseling	-.14	-2.17	.03

Notes. R^2 = .10. Dependent variable is Percent Complex Reflections. BL Mot. = Baseline Motivation.

TABLE XII

Standard Regression Analysis of Percent Open Questions with Session and Motivation Variables

Predictor	β	*t*	*p*
Session Number	.20	2.68	.008
Session Format	.09	1.20	ns
Session Length	.13	1.63	ns
BL Mot. Cut Back	.05	.75	ns
BL Mot. Quit	-.03	-.42	ns
MI Counseling	.18	2.45	.015
BI Counseling	-.20	-3.23	.001

Notes. R^2 = .20. Dependent variable is Percent Open Questions. BL Mot. = Baseline Motivation.

TABLE XIII

Standard Regression Analysis of Reflection-to-Question Ratio with Session and Motivation Variables

Predictor	β	*t*	*p*
Session Number	.13	1.68	ns
Session Format	.02	.20	ns
Session Length	.41	5.13	<.001
BL Mot. Cut Back	-.01	-.10	ns
BL Mot. Quit	-.02	-.30	ns
MI Counseling	-.05	-.62	ns
BI Counseling	-.15	-2.25	.025

Notes. R^2 = .13. Dependent variable is Reflection-to-Question Ratio. BL Mot. = Baseline Motivation.

TABLE XIV

Standard Regression Analysis of Percent MI Adherent with Session and Motivation Variables

Predictor	β	t	p
Session Number	.18	2.07	.04
Session Format	.08	.89	ns
Session Length	.05	.60	ns
BL Mot. Cut Back	-.07	-.96	ns
BL Mot. Quit	-.05	-.77	ns
MI Counseling	-.03	-.37	ns
BI Counseling	-.12	-1.67	ns

Notes. $R^2 = .07$. Dependent variable is Percent MI Adherent. BL Mot. = Baseline Motivation.

TABLE XV

Logistic Regression Analysis of Intention to Quit within 6 Months
at Week 12 with MI Spirit

Predictor	χ^2	*p*	*OR*
MI Spirit	6.67	.01	2.53
BL Intention to Quit w/in 6 Months	25.34	<.001	9.59
BL Cigarettes per Day	.15	ns	.99
BL Motivation to Cut Back	4.19	.041	.80
BL Motivation to Quit	.85	ns	1.10
MI Counseling	.78	ns	.68
BI Counseling	.47	ns	.74

Notes. Dependent variable is Intention to Quit within 6 Months at Week 12. BL = Baseline.

TABLE XVI

Logistic Regression Analysis of Intention to Quit within 6 Months
at Week 12 with Empathy

Predictor	χ^2	p	OR
Empathy	5.53	.019	1.76
BL Intention to Quit w/in 6 Months	24.25	<.001	8.81
BL Cigarettes per Day	.01	ns	1.00
BL Motivation to Cut Back	4.40	.036	.80
BL Motivation to Quit	1.12	ns	1.11
MI Counseling	.60	ns	.71
BI Counseling	.23	ns	.81

Notes. Dependent variable is Intention to Quit within 6 Months at Week 12. BL = Baseline.

TABLE XVII

Standard Regression Analysis of Motivation to Quit at Week 12 with Empathy

Predictor	β	t	p
Empathy	.11	1.77	.078
BL Cigarettes per Day	-.03	-.55	ns
BL Motivation to Cut Back	-.12	-1.72	ns
BL Motivation to Quit	.42	6.04	<.001
MI Counseling	-.04	-.56	ns
BI Counseling	-.09	-1.30	ns

Notes. R^2 = .16. Dependent variable is Motivation to Quit at Week 12. BL = Baseline.

TABLE XVIII

Lowest and Highest Individual Health Counselor Means for MI Spirit, Empathy, and Action Orientation by Counseling Condition

		MI		BI		MI/BI	
		M	*SD*	*M*	*SD*	*M*	*SD*
MI Spirit	Lowest	3.69	.41	3.42	.24	3.61	.83
	Highest	4.38	.36	4.08	.38	4.70	.26
Empathy	Lowest	3.58	.58	2.94	.82	3.21	.64
	Highest	4.75	.42	4.30	.48	4.67	.50[1]
A.O.	Lowest	1.00	.00	2.95	.64	2.83	.98
	Highest	2.17	.98	4.00	1.07	4.34	.60

Notes. Each mean represents data from an individual counselor with the lowest (or Highest) mean rating for the corresponding adherence measure and counseling condition. Counselors were only included if they had 5 or more session in the corresponding Counseling condition. [1] = Two counselors tied for the highest mean Empathy rating for MI/BI sessions; the standard deviation listed corresponds to the counselor who completed more MI/BI sessions.

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Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390-395.

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Slagle, D. M., & Gray, M. J. (2007). The utility of motivational interviewing as an adjunct to exposure therapy in the treatment of anxiety disorders. *Professional Psychology: Science and Practice, 38*(4), 329-337.

Stotts, A. L., DiClemente, C. C., & Dolan-Mullen, P. (2002). One-to-one: A motivational intervention for resistant pregnant smokers. *Addictive Behaviors, 27*(2), 275-292.

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Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Approval Notice
Continuing Review

June 16, 2015

Robin J. Mermelstein, PhD
Psychology
1747 W Roosevelt
Room 558, M/C 275
Chicago, IL 60608
Phone: (312) 996-1469 / Fax: (312) 413-4750

RE: Protocol # 2010-0543
"Identifying Optimal Strategies for Increasing Smokers' Motivation to Quit"

Dear Dr. Mermelstein:

Your Continuing Review was reviewed and approved by the Expedited review process on June 11, 2015. You may now continue your research.

Please note the following information about your approved research protocol:

Protocol Approval Period: June 24, 2015 - June 23, 2016
Approved Subject Enrollment #:   36 (22 Enrolled to date)-Enrollment Closed
Additional Determinations for Research Involving Minors: These determinations have not been made for this study since it has not been approved for enrollment of minors.
Performance Sites: UIC, University of Wisconsin - Madison
Sponsor: None
Research Protocol(s):

   a)   Research Protocol for UIC IRB: "Identifying Optimal Strategies for Increasing Smokers' Motivation to Quit; Protocol Version Number: Focus Group, Version 2 (07/21/2011)
   b)   "Project 1: Identifying Optimal Strategies for Increasing Smokers' Motivation to Quit," Version 3, May 7, 2010

Recruitment Material(s):

   a)   None
Informed Consent(s):

   a)   N/A; Closed to Enrollment

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category:

(5) Research involving materials (data, documents, records, or specimens) that have been

collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).,

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.,

(7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Please note the Review History of this submission:

Receipt Date	Submission Type	Review Process	Review Date	Review Action
06/05/2015	Continuing Review	Expedited	06/11/2015	Approved

Please remember to:

→ Use your **research protocol number** (2010-0543) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure,
   "UIC Investigator Responsibilities, Protection of Human Research Subjects"
      (*http://tigger.uic.edu/depts/ovcr/research/protocolreview/irb/policies/0924.pdf*)

Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 413-1835. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

                                        Sincerely,

                                        Jonathan W. Leigh, MPH
                                        IRB Coordinator, IRB # 1
                                        Office for the Protection of Research
Subjects

cc: Michael E. Ragozzino, Psychology, M/C 285
        OVCR Administration, M/C 672

DANIEL CONYBEARE
Curriculum Vitae

Graduate Student
Department of Psychology, Clinical Division
University of Illinois at Chicago
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EDUCATION

2012 – Present
Ph.D., Clinical Psychology (Expected 2015)
University of Illinois at Chicago
Thesis: Fidelity of Motivational Interviewing with behavioral interventions for smokers who are not ready to quit
Committee: Robin Mermelstein, Ph.D. (Chair), Gloria Balague, Ph.D., Evelyn Behar, Ph.D., Jessica Cook, Ph.D., Ellen Herbener, Ph.D.

2009 – 2012
M.A., Clinical Psychology
University of Illinois at Chicago
Thesis: The effects of repetitive worry and rumination on state-based emotion regulation
Committee: Evelyn Behar, Ph.D. (Chair), Stewart A. Shankman, Ph.D., Douglas S. Mennin, Ph.D.

2001 – 2005
B.S., Psychology
University of Iowa
Dean's List: Fall 2004, Spring 2005

CLINICAL EXPERIENCE

2014 – Present
Psychology Intern
Minneapolis VA Health Care System
Major training rotations include PTSD Clinic, Primary Care Mental Health Integration, and Serious and Persistent Mental Illness. Minor rotations include Dialectical Behavior Therapy, Time-Limited Psychodynamic Therapy, and Family Therapy. Participating in year-round assessment clinic. Conducting research on personality as predictors of health care utilization among veterans. Completed multi-day trainings in DBT and PE. *Supervisors*: Ren Stinson, Ph.D., Linda Van Egeren, Ph.D., Emily Voller, Ph.D.

2013 – 2014
Clinical Psychology Externship
Mood and Anxiety Disorders Clinic, Department of Psychiatry, University of Illinois at Chicago
Conducted assessments and individual psychotherapy with clients who presented with a variety of anxiety disorders. Provided evidence-based treatments such as cognitive behavioral therapy for generalized anxiety disorder. *Supervisors*: Cheryl Carmin, Ph.D., Jennifer Francis, Ph.D.

2012 – 2013
Clinical Psychology Externship
PTSD Clinic and Addictions Treatment Program, Jessie Brown Veterans Affairs Medical Center
Conducted individual and group psychotherapy with veterans representing a diverse range of ages and cultural backgrounds. Addressed PTSD and related comorbid conditions through the use of manual-based evidence-based psychotherapies, including Cognitive Processing Therapy and Prolonged Exposure.
Supervisors: Jonathan Beyer, Ph.D., Justin Greenstein, Ph.D.

2010 – 2014
Practicum in Psychotherapy
Office of Applied Psychological Services, University of Illinois at Chicago
Conducted individual and couples psychotherapy with socio-economically and racially diverse clientele. Addressed a variety of psychological problems including major depressive disorder, dysthymia, panic disorder, erectile dysfunction, and relationship discord. Worked with collegiate athletes to address psychological problems that interfere with athletic performance.
Supervisors: Gloria Balague, Ph.D., Nancy Dassoff, Ph.D., Larry Grimm, Ph.D.

2010 – 2014
Practicum in Psychological Assessment
Office of Applied Psychological Services, University of Illinois at Chicago
Conducted psychological assessments (including neuropsychological and psychodiagnositic testing) for clients with a variety of psychiatric disorders, such as obsessive-compulsive disorder, social anxiety disorder, learning disorders, and ADHD.
Supervisor: Audrey Ruderman, Ph.D.

2010 – 2014
Graduate Research Assistant
Institute for Health Research and Policy, University of Illinois at Chicago
Supervised post-baccalaureate health counselors to ensure the quality of individual counseling sessions in a clinical trial of motivational interviewing and behavioral interventions for smoking cessation.
Supervisors: Kathleen Diviak, Ph.D., Robin Mermelstein, Ph.D.

2008 – 2009
Research Interviewer
Veterans Affairs Puget Sound Health Care System, Seattle, WA
Conducted structured diagnostic screening interviews and PTSD symptom assessments with veterans enrolled in a clinical trial of behavioral activation for PTSD.
Supervisor: Matthew Jakupcak, Ph.D.

2007 – 2009
Psychometry Technician
Alzheimer's Disease Research Center, University of Washington, Seattle, WA
Administered neuropsychological test batteries to patients with dementia and healthy older adults. Conducted symptom interviews with participant caregivers.
Supervisor: Elaine Peskind, M.D.

2005
Day Program Counselor
Mayor's Youth Empowerment Program, Iowa City, IA
Managed individual and group activities for youth with developmental disabilities during a summer recreation program designed to promote independence and social bonding.
Supervisor: Chris Bushman, M.S.W.

2004
Residential Technician
Midwestern Council on Chemical Abuse, Iowa City, IA
Supervised daily activities and monitored the behavior of clients in a residential substance abuse treatment program.
Supervisor: Julia Huffman

RESEARCH EXPERIENCE

2009 – 2014
Graduate Research Assistant
Institute for Health Research and Policy, University of Illinois at Chicago
Implemented a Motivational Interviewing coding system and designed a behavioral intervention coding system for a large clinical trial of smoking cessation therapies. Coded counseling sessions and supervised the coding team.
Supervisors: Robin Mermelstein, Ph.D., Kathleen Diviak, Ph.D.

2009 – 2014
Graduate Research Assistant
Laboratory for Anxiety Research, University of Illinois at Chicago
Designed and conducted experimental protocols to examine the emotional and cognitive characteristics of worry and rumination. Maintained study datasets, supervised undergraduate research assistants, and managed IRB protocols.
Supervisor: Evelyn Behar, Ph.D.

2008 – 2009
Research Study Coordinator
Veterans Affairs Puget Sound Health Care System, Seattle, WA
Managed recruitment, scheduling, data, personnel files, and IRB correspondence for the local site of a two-site clinical trial of behavioral activation for PTSD in OIF/OEF veterans.
Supervisor: Matthew Jakupcak, Ph.D.

2006 – 2008
Research Study Coordinator
Veterans Affairs Puget Sound Health Care System, Seattle, WA
Conducted study visits and coordinated multi-disciplinary teams of study staff for clinical trials of prazosin for nightmares in PTSD. Served as the first-line of contact for civilian, veteran, and active duty research participants.
Supervisor: Elaine Peskind, M.D.

2005 – 2006
Research Assistant
Veterans Affairs Puget Sound Health Care System, Seattle, WA
Managed data and assisted the study coordinator for clinical trials of prazosin for nightmares in PTSD. Provided the director of the Deployment Health Clinic with research and clinical data on the symptom patterns and demographics of clinic patients.
Supervisors: Elaine Peskind, M.D., Stephen Hunt, M.D.

2004 – 2005
Undergraduate Research Assistant
Cognitive Psychology Laboratory, University of Iowa, Iowa City, IA
Designed and conducted an independent research project that examined the durability of the contents of visual working memory.
Supervisors: Steven Luck, Ph.D.

2004
Undergraduate Research Assistant
Social Psychology Laboratory, University of Iowa, Iowa City, IA
Conducted research protocols investigating biases in the perceptions of in- and out-group members of polarized social groups.
Supervisor: Robert Baron, Ph.D.

2003 – 2005
Undergraduate Research Assistant
Cognitive Psychology Laboratory, University of Iowa, Iowa City, IA
Helped to design, program, and conduct a multi-study research project. Also served as the lab coordinator and supervised a team of undergraduate research assistants.
Supervisor: Paul Windschitl, Ph.D.

PEER-REVIEWED PUBLICATIONS

1. **Conybeare, D.**, Behar, E., Solomon, A., Newman, M. G., & Borkovec, T. D. (2012 press). The PTSD Checklist – Civilian Version: Reliability, validity and factor structure in a non-clinical sample. *Journal of Clinical Psychology, 68*, 699-713.

2. Windschitl, P., **Conybeare, D.**, & Krizan, Z. (2008). Direct-comparison judgments: When and why above- and below-average effects reverse. *Journal of Experimental Psychology: General, 137*, 182–200.

3. Jakupcak, M., Luterek, J., Hunt, S., **Conybeare, D.**, & McFall, M. (2008). Posttraumatic stress and its relationship to physical health functioning in a sample of Iraq and Afghanistan War veterans seeking postdeployment VA health care. *Journal of Nervous and Mental Disease, 196*, 425–428.

4. Jakupcak, M., **Conybeare, D.**, Phelps, L., Hunt, S., Felker, B., Klevens, M., Holmes, H., & McFall, M. (2007). Anger, hostility, and aggression in Iraq and Afghanistan War veterans reporting PTSD and subthreshold PTSD. *Journal of Traumatic Stress, 20*, 945–954.

BOOK CHAPTERS

1. **Conybeare, D.**, & Behar, E. (2012). Generalized anxiety disorder, posttraumatic stress disorder, and obsessive-compulsive disorder. In M. Hersen & D. Beidel (Eds.), *Adult Psychopathology and Diagnosis, 6th Edition* (pp. 433-469). Hoboken, NJ: John Wiley & Sons.

CONFERENCE PRESENTATIONS

1. **Conybeare, D.** (2012, November). *Worry and self- versus other-perceptions of interpersonal problems.* Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, National Harbor, MD.

2. **Conybeare, D.**, Davidson, C., Goldwin, M., Mills, A., Judah, M., Grant, D., & Behar, E. (2011, November). *The effects of worry on a subsequent period of social anxiety in individuals high in worry and/or social anxiety*. Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, Toronto, Canada.

3. **Conybeare, D.**, Jorgensen, I., & Behar, E. (2011, November). *An experimental examination of worry and rumination: the effects of negative repetitive thinking on self-reported emotion regulation*. Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, Toronto, Canada.

4. Goldwin, M., **Conybeare, D.**, Olsen, E., Jorgensen, I., Sibrava, N., & Behar, E. (2011, November). *Concreteness of idiographic periods of trauma-related and depressive rumination.* Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, Toronto, Canada.

5. **Conybeare, D.** (2011, May). *Emotional control: A moderator of the harmfulness of worry.* Poster session presented at the Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

6. **Conybeare, D.**, Davidson, C., Behar, E., Grant, D., Goldwin, M. (2010, November). *The effects of worry on a subsequent period of social anxiety.* Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

7. Goldwin, M., **Conybeare, D.**, Kearns, G., Stanfill, S., Behar, E. (2010, November). *The effects of relaxation on the abstractness of worry: can we make worry more concrete?* Poster session presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

8. Felker, B., Jakupcak, M., Stecker, T., Hedeen, A., Staves, P., **Conybeare, D.**, Li, E. (2008, February). *Providing care for OIF and OEF veteran with mental disorders: site manager survey results from 12 different VA medical centers.* Poster session presented at the Department of Veterans Affairs Health Services Research and Development Annual Meeting, Baltimore, MD.

9. Gross, C., Vitiello, M., Peskind, E., **Conybeare, D.**, Raskind, M. (2007, June). *Sleep disruption in combat veterans with chronic PTSD on and off prazosin.* Poster session presented at the Associated Professional Sleep Societies Annual Meeting, Minneapolis, MN.

10. **Conybeare, D.**, Jakupcak, M., Hunt, S., Klevens, M., Holmes, H. (2006, November). *Rates and symptoms of psychiatric illness in veterans of OIF and OEF.* Poster session presented at the Annual Meeting of the International Society for Traumatic Stress Studies, Los Angeles, CA.

INVITED TALKS

1. **Conybeare, D.** (2013, June). *Cognitive Processing Therapy and Prolonged Exposure for PTSD: A Case Presentation.* Invited talk delivered at the Jesse Brown Veterans Affairs Medical Center, Chicago, IL.

2. **Conybeare, D.** (2012, March). *The effects of repetitive worry and rumination on self-reported emotion regulation.* Invited talk delivered at the University of Illinois at Chicago.

3. **Conybeare, D.** (2006, December). *Differential patterns of psychiatric and physical symptom in OIF/OEF and Gulf War veterans.* Invited talk delivered at the Veterans Affairs Puget Sound Health Care System.

EDITORIAL EXPERIENCE

Ad Hoc Reviewer
- *Behavior Therapy* (supervised by Evelyn Behar, Ph.D. and Kathleen Diviak, Ph.D.)
- *Journal of Anxiety Disorders* (supervised by Dr. Evelyn Behar)

CONTINUING EDUCATION

Practicum in Teaching (Fall 2012, Spring 2013)
Advanced graduate training in teaching, including seminars and course preparation.

Beck Institute for Cognitive Behavior Therapy (2010)
Two-day workshop on cognitive behavior therapy.

Pearson WAIS-IV Workshop (2010)
Lecture on the administration and interpretation of the WAIS-IV.

Pearson MMPI-2-RF Workshop (2009)
Lecture on the administration and interpretation of the MMPI-2-RF.

TEACHING EXPERIENCE

2013 – 2014
Instructor
University of Illinois at Chicago
- Laboratory in Clinical Psychology (Spring 2014)
- Abnormal Psychology (Spring 2013)

2009 – 2014
Teaching Assistant
University of Illinois at Chicago
- Field Work in Applied Psychology (Fall 2011, Spring 2012, Fall 2012, Spring 2013)
- Sport Psychology (Summer 2011)
- Abnormal Psychology (Fall 2010, Spring 2011, Fall 2013)
- Introduction to Psychology (Fall 2009, Spring 2010)

Guest Lectures
- **Eating Disorders in Athletics**
  Lecture addressed to an undergraduate course in sports nutrition at DePaul University (Spring 2013, Summer 2014)
- **Eating Disorders (General)**
  Lecture addressed to an undergraduate course in abnormal psychology at the University of Illinois at Chicago (Fall 2012)
- **Writing Introduction and Methods Sections for Psychological Research Papers**
  Lecture addressed to an undergraduate course in applied psychology at the University of Illinois at Chicago (Fall 2011, Spring 2012, Fall 2012, Spring 2013).
- **Sensate-Focused Treatment for Psychogenic Erectile Dysfunction**
  Lecture addressed to a graduate-level seminar in psychological interventions at the University of Illinois at Chicago (Fall 2011).

Undergraduate Students Mentored
- Gretchen Kemner (Research Assistant, 2010 – 2013)
- Aaron Weisbrod (Research Assistant, 2010 – 2012)
- Julia Deggendorf (Research Assistant, 2009 – 2010)
- Ian Jorgensen (Research Assistant, 2009 – 2010)

AWARDS

Harry S. Upshaw Award for Excellence in Teaching
Department of Psychology, University of Illinois at Chicago
Graduate student award for performance in independent course instruction (2014)

Student Travel Award
Department of Psychology, University of Illinois at Chicago
Merit-based travel award to support conference presentation of research (2010, 2011, 2012)

PROFESSIONAL ORGANIZATIONS

2012 – Present
Student Member
Society for a Science of Clinical Psychology

2009 – Present
Student Member
Association for Behavioral and Cognitive Therapies