

2-8-2011

DEVELOPMENT OF A QUANTITATIVE, SELF-REPORT MEASURE OF AMBIVALENCE ABOUT REDUCING PROBLEM DRINKING

Samara Lloyd

Follow this and additional works at: https://digitalrepository.unm.edu/psy_etds

Recommended Citation

Lloyd, Samara. "DEVELOPMENT OF A QUANTITATIVE, SELF-REPORT MEASURE OF AMBIVALENCE ABOUT REDUCING PROBLEM DRINKING." (2011). https://digitalrepository.unm.edu/psy_etds/82

This Thesis is brought to you for free and open access by the Electronic Theses and Dissertations at UNM Digital Repository. It has been accepted for inclusion in Psychology ETDs by an authorized administrator of UNM Digital Repository. For more information, please contact disc@unm.edu.

Samara Lloyd

Candidate

Psychology

Department

This thesis is approved, and it is acceptable in quality and form for publication:

Approved by the Thesis Committee:

Harold Delaney

,Chairperson

Imogen

Bruce Jones

**DEVELOPMENT OF A QUANTITATIVE, SELF-REPORT
MEASURE OF AMBIVALENCE ABOUT REDUCING
PROBLEM DRINKING**

BY

SAMARA LLOYD RICE

B.A., Psychology, University of New Mexico, 2006

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Master of Science
Psychology**

The University of New Mexico
Albuquerque, New Mexico

December, 2010

© 2010, Samara Lloyd Rice

DEDICATION

To Jim and Alex, my love and inspiration in life

ACKNOWLEDGMENTS

I gratefully acknowledge everyone who made this project possible, especially Dr. Harold Delaney. I am continually impressed with your brilliance and kindness, and am very fortunate to have you as my primary mentor. Thank you also to Dr. Theresa Moyers, whose intellectual and financial support made Experiment Two much more interesting and informative, and to Dr. Bruce Smith, for his thoughtful comments and for serving on my master's thesis committee.

This project also would not have been possible without the many participants who generously gave their time and effort. Thank you for helping me understand more about ambivalence and its relationship to problem drinking. Thank you also to Lisa Hagen Glynn for her hard work conducting the parent study of Experiment One. I also would like to express gratitude to Dr. Scott Tonigan for his many hours of mentoring and support.

Finally, thank you to my family. I would never have been able to finish this project without the unfailing love and support of my husband, James Rice, who was always willing to do some extra babysitting so that I could write. Thank you also to Marie and Jerry Rice for moving to Albuquerque to support our dual parenting and educational goals. Your help is deeply appreciated. Thank you also to my own parents and all of my family in Canada.

**DEVELOPMENT OF A QUANTITATIVE, SELF-REPORT
MEASURE OF AMBIVALENCE ABOUT REDUCING
PROBLEM DRINKING**

BY

SAMARA LLOYD RICE

ABSTRACT OF THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Master of Science
Psychology**

The University of New Mexico
Albuquerque, New Mexico

December, 2010

**DEVELOPMENT OF A QUANTITATIVE, SELF-REPORT MEASURE OF
AMBIVALENCE ABOUT REDUCING PROBLEM DRINKING**

by

Samara Lloyd Rice

B.A., Psychology, University of New Mexico, 2006

M.S., Psychology, University of New Mexico, 2010

ABSTRACT

Ambivalence about changing drinking is a theoretically and clinically significant construct in the treatment of alcohol abuse and dependence. The exploration and resolution of ambivalence is embedded in the *stages of change model*, and the reduction of ambivalence is theorized to be a mechanism of change in motivational interviewing. There has been little quantitative evidence in the literature to demonstrate the theoretical or clinical significance of ambivalence to date, owing to the lack of a quantitative, self-report measure specifically for ambivalence. Two experiments were conducted to aid in the development of a measure of ambivalence. Fifty-one undergraduates concerned about their drinking were administered the initial version of the instrument in Experiment 1. Experiment 1 pilot-tested two methods of measuring ambivalence, and explored the reliability, factor structure, and convergent validity of the measure. The analysis of the difference scores from the Change and Sustain items demonstrated their high reliability, resulted in an interpretable factor structure of cognitive and emotional ambivalence, and a strong relationship between the ambivalence score and the difference between Change and Counter-change talk statements elicited during therapy ($r = .41, p < .01$). Experiment

2 developed the construct validity of the instrument further by questioning 70 Motivational Interviewing Network of Trainers about their perspectives on ambivalence, and their opinions about how well version 2 of the instrument measured ambivalence. The primary benefit of this survey was the improvement of the content validity of the measure by including more items about the emotional experience of ambivalence. Results also suggested additional improvements, insights into the nature of ambivalence and its relationship to other relevant constructs, and the clinical as well as research utility of the instrument.

TABLE OF CONTENTS

ABSTRACT	vii
LIST OF FIGURES	xi
LIST OF TABLES	xii
INTRODUCTION.....	1
EXPERIMENT 1	14
Method	15
Results.....	25
Discussion.....	30
EXPERIMENT 2	34
Method	35
Results.....	40
Quantitative.....	40
Qualitative	41
Discussion	86
SUMMARY AND CONCLUDING DISCUSSION	93
FIGURES	101
TABLES	102
LIST OF APPENDICES	114
Appendix A. Ambivalence Measure version 1.0	115
Appendix B. Measuring Ambivalence Survey.....	122
Appendix C. Ambivalence Measure version 3.0	130

REFERENCES.....139

LIST OF FIGURES

<i>Figure 1. Ambivalence score and Change minus Sustain talk</i>	<i>101</i>
--	------------

LIST OF TABLES

<i>Table 1.</i> Participant Characteristics	102
<i>Table 2.</i> Participant Scores from the Ambivalence instrument	104
<i>Table 3.</i> Factor loadings, communalities (h^2), and percents of variances.....	107
<i>Table 4.</i> Scale Inter-correlations.	110
<i>Table 5.</i> Demographic Characteristics of Included Participants in Experiment 2	111
<i>Table 6.</i> Educational Level of Included and Excluded Participants	113

Measuring Ambivalence

The cost associated with alcohol use disorders is both economic and intangible, affecting individuals, their families, and society as a whole (Harwood, Fountain, & Livermore, 1998). The severity of the problem is magnified by the observation that alcohol abuse and dependency are often comorbid with mood, anxiety, or personality disorders (Stinson, Grant, Dawson, Ruan, Huang, & Saha, 2005). Comorbidity is associated with increased negative treatment outcomes for most disorders, compounding the difficulty of treating problem drinking.

Ambivalence is theorized to be an important construct in the process of recovery from addiction (Miller & Rollnick, 2002). There is little empirical support for the importance of ambivalence as it has been very difficult to measure quantitatively. Ambivalence about making the change to end problem drinking is a common theme in substance abuse treatment and theory. A specific measure of ambivalence would make two important contributions to the area of alcohol treatment research. First, an ambivalence measure would allow for the theoretical importance of ambivalence to be tested empirically. If the exploration and resolution of ambivalence is responsible for individuals making a lasting change around their drinking, then ambivalence levels should be high when first entering treatment, and lower or minimal once treatment is completed. If clients demonstrate this pattern, and are also successful at ending their problem drinking, then empirical support for the importance of the resolution of ambivalence would be demonstrated. An important causal mechanism of motivational interviewing would also be empirically validated. Secondly, an ambivalence measure would aid in the treatment of alcohol abuse and dependence by identifying individuals

who are more ambivalent about making a change. Factors contributing to a particular client's overall level of ambivalence might also be identified. This would allow for therapy to be specifically focused on the exploration and resolution of the client's ambivalence in order to encourage behavior change.

This paper begins with an introduction to the theoretical importance of ambivalence about changing drinking by describing the Stages of Change model and the theoretical background of Motivational Interviewing. Next, three instruments that measure readiness to change are discussed in relation to measuring ambivalence about change. Two experiments to aid in the development of a measure of ambivalence are then presented. Experiment one outlined the structure of the instrument, and pilot-tested the initial version of the instrument with 51 undergraduates concerned about their drinking. This study tested two different methods for measuring ambivalence, and explored the reliability and validity of the instrument for measuring ambivalence about changing drinking. The second experiment further explored the validity of the measure by thoroughly questioning experts about the content validity of the items, about the nature of the construct of ambivalence, and about how well they thought the instrument measured ambivalence.

The theoretical significance of ambivalence in addiction recovery

Ambivalence can be defined as uncertainty about what action to take because of conflicting ideas or feelings. The importance of the contemplation and resolution of ambivalence as a necessary step in overcoming addiction has face validity. In the beginning stages of recovery from alcohol addiction, an individual may have little awareness of the problem. Gradually, the individual becomes aware that continuing

alcohol use may be a problem, as evidence for the pros and cons of continued use accumulates. Ambivalence arises and is contemplated during this part of the process. Although addiction is often conceptualized as an irrational behavior, there are perceived benefits of continued alcohol use. An individual experiences ambivalence as being pushed and pulled between the perceived benefits and negative consequences of excessive alcohol consumption. Eventually, abstinence or the cessation of problem drinking is accomplished when the individual realizes that the cons of continuing the behavior outweigh the pros. This is conceptualized as the resolution of ambivalence, and as a necessary step in overcoming addiction.

Both *the stages of change model* and the philosophical foundation of motivational interviewing recognize the importance of ambivalence in the process of overcoming addiction (Connors, Donovan, & DiClemente, 2001; Miller & Rollnick, 2002). These perspectives emphasize the conceptualization of client behavior and attitudes against the direction of change as ambivalence, as opposed to other theoretical orientations that conceptualize ambivalence as resistance, or even sometimes, denial (Engle & Arkowitz, 2006). Theoretical orientations and interventions that conceptualize client ambivalence about change as resistance or denial often employ confrontational techniques.

Confrontation has been shown to be associated with negative treatment outcomes (Engle & Arkowitz, 2006). Thus, this paper will conceptualize behavior against the direction of change as ambivalence, which is consistent with the philosophy underlying many interventions that have been empirically supported.

The stages of change model

The *stages of change model*, also known as the *transtheoretical model*, was developed by Prochaska and DiClemente (Prochaska & DiClemente, 1986). An individual who engages in problem drinking is theorized to progress through various stages of change before abstinence or the cessation of problem drinking occurs. In the first stage, *precontemplation*, clients either do not see their excessive drinking as a problem, or feel that the advantages of drinking outweigh the disadvantages. The second stage is the *contemplation* stage, when clients begin to become aware that their drinking may be a problem, but they are not yet prepared to quit. Common features of this stage are considering making a change and thinking about the advantages and disadvantages of doing so, or searching for objective information about treatment options or the deleterious effects of excessive drinking.

The third stage in the *stages of change model* is the *preparation* stage in which individuals are preparing to make the change. They may begin to lessen the amount of alcohol they consume, or mentally prepare themselves for a lifestyle change. The fourth stage is the *action* stage. Clients actually quit drinking alcohol, or at least cease their *problem* drinking if harm reduction is their goal instead of abstinence. They are also involved in finding alternatives to drinking alcohol and in developing coping mechanisms for when they are tempted to return to problematic drinking. The fifth stage is the *maintenance* stage, when clients must remain vigilant and persevere in their efforts to make a lasting behavior change.

It is important to remember that the *stages of change model* is not an invariant sequence (Connors et al., 2001). For instance, people may present for treatment already in the *preparation* stage, yet return to the *contemplation* stage as pressures to change their

behavior compete with the reinforcing aspects of drinking. Also, relapse is a common phenomenon, thus individuals may progress to the *maintenance* stage, but then find that they must return to one of the previous stages depending on their individual attributes and life circumstances. Thus, ambivalence about making a change may surface at any stage, but is featured prominently in the precontemplation, and contemplation stages (Engle & Arkowitz, 2006). Theoretically, ambivalence must be resolved in order to progress to the preparation and action stages, and must be guarded against in the maintenance stage.

Measuring ambivalence in the stages of change model

There are three quantitative measures that may be used to classify clients into particular stages of change. They are the University of Rhode Island Change Assessment Scale (URICA), the Readiness to Change Questionnaire (RCQ), and the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) (Connors et al., 2001). These measures identify a client as being in a particular stage of change, but the first two do not measure ambivalence by itself. The exception is the SOCRATES, which includes ambivalence as one of three subscales within the measure (Miller & Tonigan, 1996).

The URICA is a 32-item questionnaire that identifies the stage of change a client is demonstrating at a particular time, and is relevant for use with a variety of addictive and health behaviors. It has also been used to successfully predict treatment outcome (Connors et al., 2001). The stages most associated with ambivalence are the *precontemplation* and *contemplation* stages. However, the *precontemplation* stage is when the client denies the need to make a change. To qualify for this stage a client must endorse statements such as, “As far as I’m concerned, I don’t have any problems that need changing” and “I guess I have faults, but there is nothing I really need to change”

(Connors et al., 2001). These questions do not adequately capture the whole construct of ambivalence.

The *contemplation* stage, as assessed by the URICA, targets ambivalence more specifically, yet it too is problematic. In the contemplation stage, individuals do weigh the pros and cons of changing. Progression out of this stage is accomplished when the client realizes that the disadvantages of continuing the behavior outweigh the advantages (Engle & Arkowitz, 2006). This process can also be conceptualized as the contemplation and resolution of ambivalence. Typical statements that measure this stage are “I think I might be ready for some self-improvement” and “I wish I had more ideas on how to solve my problem”. Again, ambivalence is a more dramatic interplay of complex feelings and reasons for change, and it could be captured more thoroughly with the creation of a measure specifically for ambivalence.

Although the URICA has been used successfully to predict dropout rates and treatment outcome, it has also been subject to criticism (Engle & Arkowitz, 2006). The URICA often places clients in more than one stage of change, and clients may endorse statements that represent nonadjacent stages. Interestingly, being in more than one nonadjacent stage at a time may be indicative of ambivalence in itself. However, although the *stages of change model* does allow for bi-directional movement through the stages, the observation that the URICA can place clients in more than one stage of change at a time does not add certainty to the measure. An exception to this is the precontemplation stage, which has been found to be discrete (Engle & Arkowitz, 2006).

A second measure of stage of change is the Readiness to Change Questionnaire (RCQ), developed by Rollnick, Heather, Gold, and Hall (1992). It was specifically

designed for use in medical settings and to be a brief, 12-item measure of patients' ideas about their alcohol consumption. It supports the *stages of change model* by identifying an individual's stage of change, and is particularly useful for predicting future alcohol consumption based on an individual's stage of change (Heather, Rollnick, & Bell, 1993). Although the Readiness to Change Questionnaire has good psychometric properties (Rollnick, Heather, Gold, & Hall, 1992), it suffers from the same disadvantage as the URICA in terms of measuring ambivalence. That is, it is measuring stages of change, not specifically ambivalence.

A third measure is The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), developed by Miller and Tonigan (1996). It was designed in accordance with the *stages of change model* and contains similar items, but is specifically for the treatment of problem drinking. It has empirically demonstrated the ability to delineate the stages of change (Miller & Tonigan, 1996; Hewes & Janikowski, 1998). The original version contains 39 items; however, the 19-item version is recommended for use by the authors (Miller & Tonigan, 1996).

The SOCRATES is currently the only quantitative measure of ambivalence, as it measures ambivalence as one of three factors within the questionnaire. The other factors of the SOCRATES are problem recognition and taking steps. The ambivalence scale of the SOCRATES was demonstrated to have good test-retest reliability ($r = .83$), although the Cronbach's alpha for the ambivalence scale in the original development sample ($N = 1672$) was .60 (Miller & Tonigan, 1996). The SOCRATES has been used repeatedly in the scientific literature for a variety of applications (e.g., Demmel, Beck, Richter & Reker, 2004; Maisto, Chung, Cornelius, & Martin, 2003), but may not be measuring all

aspects of the construct. For example, the items of the SOCRATES were developed to measure the contemplation stage and to measure the motivation of those presenting for treatment, not necessarily ambivalence as it may manifest in other stages or situations. It is hoped that the newly-developed ambivalence measure described in this thesis will surpass the utility of the ambivalence scale of the SOCRATES by expanding the measurement of ambivalence to include the full variety of ways that ambivalence may manifest during changing problem drinking, and allow for levels of ambivalence to vary throughout the stages of change. This expansion is a necessary prerequisite in order to be able to investigate if the reduction of ambivalence is a mechanism of change in the successful treatment of alcohol use disorders.

The four questions used by the SOCRATES to assess ambivalence are: “There are times when I wonder if I drink too much”, “Sometimes I wonder if I am an alcoholic”, “Sometimes I wonder if I am in control of my drinking”, and “Sometimes I wonder if my drinking is hurting other people”. The items of the SOCRATES may not sample the full domain of ambivalence towards ending problem drinking because of the following two considerations. First, these items all address ambivalence through the endorsement of statements containing the word *wonder*. They appear to measure the *uncertainty* aspect of ambivalence, particularly as it relates to knowledge about the severity or impact of one’s drinking problem, but not necessarily other aspects of ambivalence relevant to actually making a change in drinking behavior, such as the simultaneous coexistence of both wanting and not wanting to quit using alcohol.

Second, they appear to measure ambivalence that manifests at the beginning of recovery from problem drinking when a problem drinker is considering entering

treatment, not necessarily ambivalence that arises during the progression through other stages of change, particularly the action and maintenance stages. For example, endorsement of these four items would be relevant for someone ambivalent about admitting to having a problem with alcohol or ambivalent about needing to enter treatment, not necessarily ambivalent about actually making a change in problem drinking behavior. Furthermore, the endorsement of these four items do not allow for ambivalence levels to vary over time. For example, if a client positively endorsed these four items at the beginning of treatment, there would be a ceiling effect that would not allow for the detection of a reduction of ambivalence being associated with positive treatment outcome.

It is hoped that this new measure of ambivalence will measure the dynamic interplay of thoughts, feelings, and unwanted restrictions that compose ambivalent statements about making a change in alcohol use and will eventually provide empirical support for the role of ambivalence in the recovery process. For example, motivational interviewing, which will be discussed next, is hypothesized to work by allowing clients to explore and resolve their own ambivalence about making a behavior change (Hettema, Steele, & Miller, 2005; Miller & Rollnick, 2002).

Motivational interviewing and ambivalence

Motivational interviewing is an empirically supported intervention originally used for the treatment of alcohol abuse and dependence, but since its inception, has been extended to a wide array of substance abuse and health-related behaviors (Hettema et al., 2005). Motivational interviewing is defined as a “client-centered, directive method for enhancing intrinsic motivation for change by exploring and resolving ambivalence”

(Miller & Rollnick, 2002). It facilitates clients being ready, willing, and able for behavior change by encouraging therapists to manifest unconditional, positive regard for the client while at the same time utilizing techniques to elicit change talk: client statements of reasons for changing or maintaining the status quo, as well as statements of commitment in favor of behavior change.

Motivational interviewing has become a popular intervention for the treatment of alcohol abuse and dependence, as well as other harmful health behaviors. Although Hettema and colleagues (2005) have summarized empirical support for motivational interviewing in a recent meta-analysis, a theoretical rationale for how motivational interviewing works remains unsupported. This is partly due to the absence of a quantitative measure of ambivalence, which is needed to test the hypothesis that motivational interviewing enhances client intrinsic motivation for change by exploring and resolving ambivalence.

Although this assertion has face validity, it is necessary to support it empirically. If the resolution of ambivalence is a causal mechanism by which motivational interviewing works, then clients who present for treatment in the *precontemplation* and *contemplation* stages of change will also present with high levels of ambivalence. After the completion of treatment, ambivalence levels should be reduced. The theoretical significance of ambivalence in addiction recovery would be evidenced by clients who have demonstrated a decrease in ambivalence, and at the same time have made lasting changes in their alcohol consumption at follow-up assessments.

Difficulties in measuring ambivalence

Measuring ambivalence is problematic because of its ambiguity and varying meaning for different individuals. For example, ambivalence may concern the recognition of an alcohol problem for some (problem recognition), or the necessity of excessive alcohol use as a coping mechanism for others (coping). Ambivalence about making a behavior change may also manifest as a dynamic interplay of the pros and cons of alcohol use, accompanied by alternating decisions to continue or quit alcohol use, depending on if the pro or con side is weighted more heavily at a particular time.

An important consideration is also that readiness for change is different than readiness for treatment, as clients may be prepared to seek help, but not actually prepared to commit to quitting problematic drinking (Freyer, Tonigan, Keller, Rumpf, John, & Hapke, 2005). Self-efficacy may also play a role in the resolution of ambivalence, as some individuals may be ambivalent about making a behavior change simply because they believe that they are not capable of quitting alcohol consumption. These considerations were taken into account in the creation of items for the ambivalence measure.

Steps in developing an instrument

Various texts serve as guidelines for the valid development of scales for research purposes (Nunnally & Bernstein, 1994; DeVellis, 2003; Streiner & Norman, 2003; Shultz & Whitney, 2005). The following are a summary of important steps outlined in the literature, and a brief description of how they were employed:

Step 1: Literature search. The first step in test construction is to search the literature for comparable measures of the construct of interest (Nunnally & Bernstein, 1994). Such a search has revealed that scales used to measure ambivalence do not

adequately measure the construct of interest, especially for the purposes of providing evidence for the theoretical significance of ambivalence in the treatment of problem drinking.

Step 2: Construct explication. Once it has been determined that a new measure is necessary, it is important to clearly describe the construct of interest (DeVellis, 2003; Streiner & Norman, 2003). A specific definition of the construct will aid in developing the content of the items, thereby reducing error and improving the internal consistency of the test (Shultz & Whitney, 2005). It is also important to consider how the construct is different from other related constructs, and whether it has one or more dimensions.

The initial items for the ambivalence measure were developed according to the following definition of ambivalence:

Ambivalence about ending problem drinking can be defined as feeling two ways about the decision to quit. On one hand, a client may be aware of some negative consequences of continuing to drink. On the other hand, there are conflicting desires, reasons, or behavior patterns in favor of drinking. Furthermore, the decision to quit is not a purely cognitive process. Emotions and coping patterns play a role, as well as the demands of the client's social and employment environment. Thus, a measure of ambivalence must contain items that reflect the dualistic nature of the construct, as well as represent a broad array of statements that may elicit client ambivalence.

A primary aim of the second study was to question experts in the area of motivational interviewing about their definition of ambivalence, both theoretically and as it manifested in their own clinical practice. It was hoped that this step would ensure that the whole domain of ambivalence was sampled when creating items for the measure, as well as to elucidate how ambivalence is differentiated from other similar constructs. Questioning a representative sample of experts was an essential step to ensure that the ambivalence measure covered the full domain of the construct and was not developed in an idiosyncratic manner.

Step 3: Develop the item pool. Items should be carefully written. Some of the more important considerations are clarity, brevity, specificity, and appropriate reading level (Shultz & Whitney, 2005). Ambiguity can also be reduced by eliminating items that contain multiple negatives, vague pronouns, or two or more ideas (DeVellis, 2003).

Forty-nine items were written for the initial version of this instrument and were pilot tested in Experiment 1 (see Appendix A). Experts reviewed existing items in Experiment 2, and suggested the rephrasing, inclusion, or exclusion of items. Experiment 2 primarily resulted in the inclusion of additional items about the emotional experience of ambivalence, which are reported in Appendix C.

Step 4: Review of items by experts. Expert review of the initial item pool provides evidence of content and construct validity. It is essential that test items “sample the whole domain” of the construct of interest (Nunnally & Bernstein, 1994). An assumption of classical test theory is that each test item is randomly sampled from a universe of all possible test items. Thus, all test items must correspond to the construct of interest or a facet of that construct, and all facets of the construct must be represented

(DeVellis, 2003). The opinions of experts are consulted to ensure that this has been accomplished.

Items in the initial version of the measure were reviewed by experts as part of Experiment 2. Specifically, experts were asked to describe their definition of ambivalence. They were also asked about the relationship of ambivalence to other related constructs, about how ambivalence manifested in their own clinical practice, to suggest additional items or facets that should be included, and to give additional comments at their discretion.

Additional recommended steps for test construction are to administer the test to a development sample, statistically evaluate the items, and then decide which items to include in the final version of the measure (DeVellis, 2003). These steps are planned for the near future and are described as directions for further research in the discussion section of this thesis, but for now are outside of the scope of this master's thesis project.

Two experiments were conducted to aid in the development of an ambivalence measure for use in the treatment of alcohol abuse or dependence. In Experiment 1, the initial version of the ambivalence questionnaire was developed and administered to a development sample and preliminary statistical analyses were conducted on the results. In Experiment 2, experts in motivational interviewing were consulted about the construct of ambivalence about changing problem drinking and about how appropriate the initial version of the instrument was for measuring ambivalence.

Experiment 1: Administration of instrument to a development sample

The data for Experiment 1 were derived from the initial version of the instrument (see Appendix A). It was administered as part of a larger study by Dr. Theresa Moyers

and Lisa Hagen Glynn, M.S. of the University of New Mexico (UNM), which investigated the effects of therapeutic methods on client statements about changing their drinking (change talk; Glynn & Moyers, in press). The purpose of Experiment 1 was to test two competing methods for measuring ambivalence, to provide initial information about the psychometric properties of the measure, and to provide evidence of its validity for its intended purpose.

Method

Participants

Participants were 51 undergraduates from the University of New Mexico and Central New Mexico Community College (CNM). Their ages ranged from 18 to 56, with a mean age of 23.6 and a standard deviation of 7.0. Approximately 43.1% of the sample was female. The majority of participants were from minority ethnic groups in the United States; the specific breakdown of ethnicity was: 51.0% Hispanic; 35.3% White, non-Hispanic; 7.8% American Indian; 3.9% African-American; and 2.0% Asian. The ethnic composition of the sample differed somewhat from the student population of UNM. In 2007, the ethnic composition of enrolled students was: 31.6% Hispanic; 43.8% non-Hispanic White; 11.8% American Indian; 2.5% African-American; and 3.3% Asian (2007-2008 UNM Factbook, Office of Institutional Research).

Recruitment

Subjects were recruited by asking if they were concerned about their alcohol use and if they would like to speak with a trained listener. Inclusion criteria for the study were that participants: drank alcohol, were currently concerned about their alcohol use,

were undergraduates, and were eighteen years of age or older. Participants were given \$20 in exchange for the two hours it took to complete the study.

Procedure

Participants completed four assessment measures and then took part in an hour long therapy session to discuss the participant's concerns about his or her alcohol use with a trained listener. After the session subjects completed the short form of the Working Alliance Inventory (WAI-S).

Assessments

The following five questionnaires were administered: a demographics form, the Check-Up To Go (e.g., Walters, Vader, & Harris, 2007), the initial version of the ambivalence measure, the Scale of Ethnic Experience (Malcarne, Chavira, Fernandez, & Liu, 2006), and the short form of the Working Alliance Inventory (Tracey & Kokotovic, 1989).

Coding for Change and Sustain Talk

Each statement given by a client during the session with a trained listener was coded for occurrences of change (CT) or sustain talk (ST) according to the protocols of MISC 1.1 (http://casaa.unm.edu/download/MISC_1.1_Manual.pdf). The MISC version 1.1 was adapted specifically for this study from the original MISC 1.0 version. It differs from the original coding system in that only non-neutral client language is coded, and client utterances are not divided into categories beyond change or sustain talk.

Instrument structure

Double-barreled items method. There were two methods of measuring ambivalence proposed in the initial version of the ambivalence measure. The first was to

use double-barreled items that directly measured the “simultaneous coexistence of opposing attitudes” aspect of ambivalence towards problem drinking. Although the use of double-barreled items is problematic and not recommended for instrument development (Rust & Golombok, 2009), they appeared perfect for measuring ambivalence. The following six double-barreled items were developed for initial testing:

Item #5. *Don't want to stop*: I know that I drink too much, but I just don't want to stop.

Item #15. *Change impossible*: I really want to quit drinking, but every time I try something happens that makes it impossible.

Item #17. *Unstable need to change*: Sometimes I think that I should cut down on my drinking, but other times I think that I don't need to.

Item #19. *Desire for but no change*: I always say that I want to change my drinking, but then I just do things as I've always done.

Item #37. *Feeling happy and bad*: Sometimes drinking makes me feel really happy, and other times drinking makes me feel really bad.

Item #44. *Unknown why no change*: I really want to change my drinking, I just don't know why I don't stop.

Sum of Change and Sustain items method. The second method of measuring ambivalence was to develop two separate scales of items. The first scale was called the Change scale, and contained items that measured the level of agreement with reasons, feelings, or situations that reflected the desire to change drinking. The Sustain scale contained items that were the exact opposite of the Change scale, both in content and direction. A specific example is the pair of two items: “I need to quit drinking because I've made a lot of mistakes when I'm drunk” and “I don't usually do things that I regret

when I'm drunk". The first item belongs to the Change scale as it would be a reason to change drinking, and the second belongs to the Sustain scale as it would not be. Items in the Sustain scale were negatively weighted and summed with those in the Change scale, and scores near zero indicated the presence of ambivalence. This method also measured the simultaneous coexistence of opposing desires, but did so without using problematic double-barreled items.

Instrument Scoring

The initial version of the instrument (version 1.0) yielded several different scores for each individual, each measuring different aspects of ambivalence towards ending problem drinking. These scores were designed to be used for either clinical or research purposes and were as follows: *the Double-barreled ambivalence score, the Sustain score, the Change score, Ambivalence score*, and twelve different *ambivalence category* scores. Items appeared in random order in the instrument and are shown in Appendix A.

Ambivalence score calculated from double-barreled items. The double-barreled ambivalence score was the simple sum of the six non-directional items. These items were developed to directly reflect the coexistence of opposing feelings about alcohol that are common in someone wanting to make a change in his/her drinking. They followed the pattern of: "I want to make a change in my drinking because of *x*, but I want to continue drinking because of *y*".

In version 1.0, the double-barreled items were numbers 5, 15, 17, 19, 37, and 44. The sum of responses to these items yielded a total score that ranged from 6 to 54, with higher scores representing higher levels of ambivalence.

Sustain score. The second score was the sum of the items that reflected the desire to maintain current drinking patterns. This was the Sustain score, and was comprised of 21 items that reflect: reasons why the client does not see a problem with current drinking behaviors, powerful feelings or situations that may influence a client to drink, or other reasons why the client may want to continue to drink. These items were numbers 1, 3, 7, 9, 10, 12, 13, 16, 21, 22, 24, 25, 29, 32, 33, 38, 39, 40, 42, 43, and 47. The responses to these items were assigned a negative score and summed. The Sustain score ranged from -21 to -189, with lower scores indicating higher levels of wanting to maintain the status quo. That is, the client was less ambivalent and more decided about not wanting to make a change. She/he either felt comfortable with the impact that alcohol was currently having on her/his life or did not see reasons to make a change.

Change score. The change score measured how much the client wanted to make a change in his/her drinking, and the magnitude of the perceived negative impact of continuing to drink. This score was comprised of items 2, 6, 8, 11, 14, 18, 20, 23, 26, 27, 28, 30, 31, 34, 35, 36, 41, 45, 46, 48, and 49. These 21 items were assigned a positive value and summed. This score ranged from 21 to 189, with higher scores indicating higher levels of wanting to make a change.

Ambivalence score. Once the Sustain and Change scores were calculated, they were summed to calculate the Ambivalence score. This score ranged from negative 168 to positive 168. Scores of zero or close to zero indicated high levels of ambivalence. Conversely, a score closer to negative 168 indicated that the client was not very ambivalent but rather felt decided that she would prefer to not make a change in her drinking at that time or did not perceive her drinking to be a problem. A score closer to

positive 168 indicated that the client was not ambivalent, but rather felt motivated to make a change or was able to maintain the changes she had already made in developing a healthy relationship with alcohol.

Ambivalence category scores. The ambivalence category scores were designed to give the therapist or researcher an idea about whether the client felt motivated, unmotivated, or ambivalent about changing his or her drinking behavior with regards to twelve important areas in the individual's life. They were also intended to help a therapist encourage change talk specific to these areas and/or develop or resolve ambivalence about these topics. The twelve areas were chosen by listening through many hours of actual therapy sessions and targeting topics that were commonly discussed as a person was struggling to end his/her problematic relationship with alcohol. The twelve categories were: ability to end problem drinking, awareness/problem recognition, coping, desire, emotions, family/social relationships, goal orientation, legal, leisure, physical health, responsibility, and self-concept. The items that correspond to these categories are listed later in this section.

Each item in the Change or Sustain scales a) corresponded to a particular area in a client's life that influenced a client's ambivalence or motivation to end problem drinking (the ambivalence category), b) was assigned a positive or negative value and c) was paired with another item in the same category that was its opposite. The ambivalence category for each item was determined by the content of the item. The positive or negative value of the item referred to its direction and place along the continuum of change that was implied by the endorsement of the item. The positive items were those that contributed to the Change score, and reflected reasons, feelings, or situations in favor

of change. The negative items were those that contributed to the Sustain score, and their endorsement reflected a client's preference to maintain current drinking behaviors or a client's perspective that there was no need to change. Each item was paired with its opposite so that their sum reflected ambivalence surrounding the topic to which both items referred.

A concrete example to illustrate how the ambivalence category scores operated is as follows: item number 48, "I want to change my drinking because it doesn't fit with who I really am"; and item number 3, "My drinking doesn't keep me from being the person I want to be"; comprised the self-concept category. Both items referred to an individual's self-concept and drinking. Item 48 was a reason to change one's drinking, was assigned a positive value, and was part of the *Change* scale. Item 3 was assigned a negative value and was part of the *Sustain* scale. Clients who agreed with item 3 either did not perceive their self-concept to be a reason to quit drinking or did not feel that their drinking was having a negative impact on their self concept. The sum of these items reflected how ambivalent a client felt about making a change in his or her drinking because of his or her self-concept.

Items in the original measure were developed to represent the following twelve categories that may influence an individual's level of ambivalence about ending problem drinking. Items labeled *a* corresponded to the Change scale, and items labeled *b* corresponded to the Sustain scale. The ambivalence categories were as follows:

1. Coping:

Drink to feel better difference score

1a) Item #27: I don't use drinking as a way to feel better (+).

1b) Item #32: Whenever I feel bad, I know that drinking will make me feel better (-).

Manage stress difference score

2a) Item #6: I don't find myself drinking to relieve my stress (+).

2b) Item #1: I drink to deal with my stress (-).

Solution to problems difference score

3a) Item #30: Drinking rarely solves my problems (+).

3b) Item #42: No matter what happens, I know that having a drink will make it all right.

2. Desire

4a) Item #46: I don't really like drinking (+).

4b) Item #9: Drinking is one of my favorite things to do (-).

3. Emotions

Happiness difference score

5a) Item #31: I can see myself being happy without alcohol (+).

5b) Item #40: I don't know if I'd be happy if I quit drinking (-).

Drink to deal with life difference score

6a) Item #20: I feel confident I could manage my life without drinking (+).

6b) Item #38: I don't feel that I have the strength to deal with my life right now if I
quit drinking (-).

Change scary/imaginable

7a) Item #49: Quitting or cutting down doesn't scare me (+).

7b) Item #12: I can't imagine my life without drinking (-).

4. Goal orientation

Ideal life difference score

8a) Item #18: I'll never have the kind of life that I want if I continue to drink (+).

8b) Item #25: Drinking doesn't keep me from accomplishing what I want in life (-).

Getting ahead difference score

9a) Item #35: The main thing that is holding me back in life is continuing to drink (+).

9b) Item #13: Drinking isn't keeping me from getting ahead (-).

5. Health problems

10a) Item #28: I need to cut down or quit drinking because it is hurting my health (+).

10b) Item #21: My health is not a reason for me to quit or cut down (-).

6. Legal Problems

11a) Item #36: I have legal problems because of my drinking (+).

11b) Item #22: Drinking hasn't gotten me into any trouble with the law (-).

7. Leisure

Relaxation difference score

12a) Item #26: Alcohol doesn't calm me down that much (+).

12b) Item #7: Drinking alcohol is one of my favorite ways to relax (-).

Fun difference score

13a) Item #23: My life would still be fun if I didn't drink (+).

13b) Item #10: Life wouldn't be as much fun if I didn't drink (-).

8. Social relationships

Friends difference score

14a) Item #14: I could still hang out with my friends if I quit drinking (+).

14b) Item #39: If I didn't drink, I wouldn't be able to socialize with most of my friends (-).

Family difference score

15a) Item #34: My family is upset about my drinking (+).

15b) Item #33: My drinking has not caused me any problems with my family (-).

Alcohol social lubricant difference score

16a) Item #41: I don't use alcohol as a way to feel more comfortable around people (+).

16b) Item #29: I'd be more shy and awkward around people if I didn't drink (-).

9. Personal responsibility

17a) Item #8: I've disappointed others or myself because of my drinking (+).

17b) Item #47: My drinking has not brought disappointment to myself or others (-).

10. Problem recognition

Having drinking problem difference score

18a) Item #2: My drinking is a problem (+).

18b) Item #24: I don't really have a problem with alcohol (-).

Drunken mistakes difference score

19a) Item #11: I need to quit drinking because I've made a lot of mistakes when I'm drunk (+).

19b) Item #16: I don't usually do things that I regret when I'm drunk (-).

11. Self-concept

20a) Item #48: I want to change my drinking because it doesn't fit with who I really am (+).

20b) Item #3: My drinking doesn't keep me from being the person I want to be (-).

12. Self-efficacy for change

21a) Item #45: I could quit drinking if I really wanted to (+).

21b) Item #43: I'm not confident that I could quit drinking if I wanted to (-).

Results

Participant characteristics

The sample was diverse. Forty-three percent of participants were female and only thirty-five percent of the sample identified as White, non-Hispanic. Demographic characteristics and average values for variables included in analyses are listed in Table 1. Calculated scores from the ambivalence measure are listed in Table 2.

Assumption evaluation

An exploratory factor analysis (EFA) was conducted on the double-barreled items and the difference scores for each Change/Sustain pair to assess dimensionality of the measure. Data were first examined for skew, kurtosis, and the presence of univariate and multivariate outliers as EFA is sensitive to violations of normality (Tabachnik & Fidell, 2007). The *deal with life* and *solution to problems* difference scores were identified as negatively-skewed, -0.999 and -0.793, respectively. The *getting ahead* difference score was positively skewed, 1.093. Kurtosis was -1.474 for the double-barreled item #19, *desire for but no change*, at a criterion alpha of .05. Variables were normally-distributed when evaluated with a less conservative alpha level, $\alpha = .001$, as is customary with small samples (Tabachnik & Fidell, 2007). They were not transformed due to the exploratory purpose of the analysis.

Histograms were visually inspected for univariate outliers. The detection of outliers was obscured due to the small sample size; however, there was one participant three points away from the rest of the sample for the *self-efficacy for change* and *fun* difference scores. No univariate outliers were detected when standardized scores were

compared to a critical z of 3.29 ($p < .001$, two-tailed). No multivariate outliers were identified by Mahalanobis distance using a critical $\chi^2 = 55.48$, $p < .001$. There was some evidence for multicollinearity. Squared Multiple Correlations (SMCs) of each variable with all other variables as predictors in the model were inspected for values close to one. The *getting ahead*, *ideal life*, and *drunken mistakes* difference scores had SMCs greater than .90. These variables were not deleted so that the EFA would be conducted on all proposed items.

Exploratory factor analysis (EFA)

Maximum likelihood was chosen for the estimation method. The process of choosing either orthogonal or oblique rotation was iterative. It was initially expected that the factors of ambivalence about changing drinking, if more than one, would be correlated. Thus, oblique rotation was chosen first. Two and three factor solutions were tried to determine if there was a high correlation among factors. Results of the scree test, as well as the small percentage of variance accounted for by the third factor and weak factor loadings on the third factor, indicated that a two-factor solution was best. Factors were correlated at -.084 when direct oblimin with Kaiser normalization was used as the rotation method, and at -.153 with promax rotation. The small correlation between factors, and the potential use of factor scores, led to the decision to use orthogonal rotation. An investigation of the similarity of factor loadings was then attempted among the various orthogonal rotation techniques.

The most commonly-used orthogonal rotation technique is Varimax (Tabachnik & Fidell, 2007). Thus, this was the first technique used to assess the appropriate number of factors. A two-factor solution was first interpreted. They accounted for 48.48% of the

total variance, and the double-barreled items and five of the change/sustain items loaded on one factor. All other items loaded on the first factor. Most factor loadings ranged from .5 to .9, and only a few variables loaded on more than one factor. Next, a factor solution incorporating all eigenvalues over 1 was attempted, but failed to converge after 25 iterations. A forced three-factor solution was then inspected, with surprising results. The number of variables loading on more than one factor increased, but when the highest loadings were chosen for each factor, an interpretable solution emerged. The more cognitive-focused difference scores loaded on the first factor, the emotion-focused difference scores loaded on the second, and the double-barreled items all loaded on the third. The interpretability of the three-factor solution led to assessing the replicability of three factors with various rotation techniques.

The same variables loaded on the same three factors with equamax rotation, but quartimax rotation indicated that a two-factor solution was best. Only one item loaded on the third factor, and the first factor was comprised of most of the difference scores and the second of the double-barreled items. An unrotated solution was then examined. Mixed results were difficult to interpret, but favored a two-factor solution.

Two-factor solutions with various rotation techniques were tried next. The exact same variables loaded on the same two factors with Varimax, Quartimax, and Equamax rotation techniques. The two factor solution was less interpretable than the three factor solution. The double-barreled items and six of the difference scores loaded on the second factor. Five of the six difference scores were more emotion-focused, but there were other emotion-focused difference scores that loaded on the first factor.

The three-factor solution was the most interpretable because the cognitive and emotion difference scores loaded on separate factors. The third factor was comprised of only double-barreled items. An EFA was next conducted on only the difference scores to confirm that the same items loaded on the same factors. The exact same variables had their highest loadings on the same factors with Varimax and Equamax rotation, and only the *ability* difference score loaded on a different factor with Quartimax rotation.

Finally, results are reported in detail for an exploratory factor analysis using a maximum likelihood extraction with varimax rotation. It was performed in SPSS on the ambivalence items for a sample of 51 students concerned about their drinking. Data were randomly missing (one page of the questionnaire was skipped by one participant) resulting in one missing value each for 7 of the difference scores. These missing values were replaced by the mean for that difference score. Preliminary analyses identified no univariate or multivariate outliers and indicated that the data were normally distributed enough to meet the assumptions of EFA.

Three factors were extracted that accounted for 52.35% of the total variance. The cutoff value for inclusion of a variable for interpretation of a factor was 0.32. Although a factor loading this low indicated only a 10% overlap in variance between an item and its factor, most loadings were significantly higher (see Table 3). If a cutoff of .45 had been used (20% variance), three items would not have loaded on any factor, but multiple factor loadings would have been reduced. This analysis found that the initial version of the ambivalence measure contained three factors. The double-barreled items loaded onto their own factor, and the difference scores were separate factors depending on their cognitive or emotional focus.

Item Analyses

Item analyses were conducted within each of the three factors yielded by the exploratory factor analysis. All scales demonstrated high internal consistency, and only a few problematic items were identified for each scale. Generally, items or difference scores with low factor loadings also displayed unsatisfactory results with regards to the item analyses. They had low or non-significant inter-item and item-scale correlations, low variances, and means not centered in the middle of the range of values. In contrast, items that generally loaded highly on only one factor also had high or acceptable inter-item and item-scale correlations, large variances, and means at the center of the range of possible values.

The cognitive scale contained 10 items. Cronbach's alpha for this factor was 0.84 before any item deletions. Item analyses indicated that the items comprising the *self-efficacy for change* and *health problems* difference scores should be eliminated from the measure. The *self-efficacy for change* difference score was negatively correlated, $r = -.50$, with all other items in the scale and Cronbach's alpha would have increased to 0.91 if deleted. The *health problems* difference score was only significantly correlated with the *ideal life* and *getting ahead* difference scores, and its squared multiple correlation was 0.22. Not including these two difference scores, inter-item correlations ranged from +0.33 to +0.85. The corrected item-total correlation for the *legal problems* difference score was 0.49. All other corrected item-total correlations ranged from 0.62 to 0.87.

Almost all of the 11 items of the emotion factor exhibited significant inter-item correlations ranging from +0.30 to +0.70. Cronbach's alpha was 0.89. Poorly-performing difference scores were *friends* and *alcohol social lubricant*. They displayed a

corrected item-total correlation of 0.48 and 0.41 respectively, but deletion of these items would not have improved Cronbach's alpha. All other corrected item-total correlations ranged from 0.41 to 0.75.

Cronbach's alpha for the 6 double-barreled items was 0.83. Item 17 was a good candidate for elimination as it displayed low, sometimes non-significant correlations with the other items of this scale. Its corrected item-total correlation was 0.39, and deleting it from the measure would have increased Cronbach's alpha to 0.85. The inter-item correlations for all other items ranged from 0.29 to 0.83, and the corrected item-total correlations ranged from 0.55 to 0.83.

Convergent validity

The ambivalence score produced by the change and sustain items correlated with actual counts of change talk minus sustain talk spoken by participants in the MI components of the therapy session at $r = 0.41, p < .01$ (see Figure 1). In contrast, the sum of the double-barreled items was not correlated with this important validity criterion, nor was it correlated with other scales in the measure (see Table 4). The ambivalence score was also related to ratings on a scale of 1-10 about how important making a change was for participants, $r = 0.30, p < .05$, but was unrelated to how confident they were in their ability to make a change. Item 4, "I'm really sure I should quit drinking", was included in the instrument for validity purposes. It correlated with the absolute value of the ambivalence score, $r = 0.44, p = .001$, indicating that the further away from the absolute ambivalence value of zero, the more certain the client was that they should change, or, the more ambivalent a client was, the less sure they were that they should change.

Experiment 1 Discussion

Experiment 1 provided useful and promising results about the structure, reliability, and convergent validity of the first version of the instrument. First, it tested two methods of measuring ambivalence about changing problem drinking, the double-barreled items method and the Change-Sustain difference scores method. Double-barreled items appeared perfect for measuring ambivalence levels as they directly assessed an important aspect of ambivalence—the simultaneous presence of opposing attitudes. These items had good internal consistency ($\alpha = 0.83$), and results of the exploratory factor analysis indicated that they were their own factor when tested in combination with the Change and Sustain items. They were also difficult to rationally interpret due to their dualistic nature, which is one reason for warnings against the use of double-barreled items being included in texts about instrument development (DeVellis, 2003). Furthermore, the score produced from these items did not correlate with the measure of Change minus Sustain talk, an important validity criterion for the instrument since ambivalent clients would also be expected to offer approximately equal amounts of Change and Sustain talk during therapy. For these reasons, it was decided to eliminate the double-barreled items from version 2.0 of the instrument in favor of the Change and Sustain difference scores method.

The method of measuring ambivalence by negatively-weighting responses to the Sustain items and summing them with the Change items was more interpretable. It also assessed ambivalence as the simultaneous presence of opposing attitudes, and demonstrated good convergent validity with the difference between actual Change and Sustain talk elicited from participants during an MI therapy session ($r = 0.41, p < .01$). These items separated into two interpretable factors, one measuring cognitive aspects of

ambivalence, and the other measuring emotional aspects of ambivalence. The internal consistency of each factor of the difference scores was high ($\alpha = 0.84$ and 0.89 , respectively). The use of difference scores raises questions about their reliability, both concurrently and across time, which remain to be addressed in future studies.

Item analyses highlighted aspects of ambivalence that may potentially be excluded from the measure. Poor results for the *self-efficacy for change* difference score indicated that personal feelings about one's ability to quit alcohol if one desired to may be such a candidate. Alternatively, it could be that these items should be reworded to more directly relate to ambivalence, such as: "I don't want to change my drinking because I feel like I can't", "I would still try to change my drinking even though it would be hard for me to do" or "Feeling like I couldn't quit alcohol if I wanted to is a reason for me not to try."

Close inspection of the *change scary/imaginable* difference score (calculated from items 12 and 49) revealed that these two items were incorrectly paired as opposites. This resulted in the creation of two new items. "The idea of not drinking as much alcohol as I want scares me" was created to measure the opposite of "Quitting or cutting down doesn't scare me" and, "I can see that my life would be better if I didn't drink so much" was created to measure the opposite of "I can't imagine my life without drinking." Item 4, "I'm really sure that I should quit drinking" was included to serve as a validity check. The inclusion of the previously mentioned items and the exclusion of item 4 and the double-barreled items resulted in version 2.0 of the instrument. This version was part of the Measuring Ambivalence survey and is attached in Appendix B.

Poor results for the *health problems*, *legal problems*, *friends* and *alcohol social lubricant* difference scores may be due to sample-specific characteristics, and these items may perform differently when tested on the clinical population of interest. The mean age of participants in Experiment 1 was 24. It is likely that they have not engaged in problem drinking long enough for excessive alcohol consumption to contribute to chronic illnesses, and they may not feel old enough for health problems to even be a relevant consideration for changing. Similarly, although legal problems may be strong external motivators for change, they may not have been relevant for this sample. The *alcohol social lubricant* difference score assessed the degree to which participants used alcohol to overcome shyness and feel comfortable socializing with others, and the *friends* score assessed the extent to which changing one's drinking would affect the need to change one's social network. These may be unnecessary items; however, a sample of 51 participants was not large enough to produce reliable population estimates for these variables.

The development of a scale is an iterative process. The data from this study were analyzed as an initial attempt to determine the characteristics of the instrument and if its method of measuring ambivalence by summing two scales with opposite valences was a feasible method of measuring ambivalence about changing problem drinking. A weakness of the analyses was that they were severely underpowered. Nunnally and Bernstein (1994) suggested that tests be administered to a development sample of no less than 300 subjects in order for participant variance to be eliminated as a major concern. Although some test developers suggest that instruments can be reliably developed with fewer subjects, it is difficult to give a set number that will be sufficient across all tests

and samples (Devellis, 2003). Shultz and Whitney (2005) suggested that development samples should contain between 5-10 participants per item.

Given that there were 49 items in the measure, even the most liberal estimate suggested that approximately 250 subjects should have been used for Experiment 1. The results from this experiment await replication with a larger sample. Any decisions about the final version of the instrument from the results of this study would be premature. Once decisions about item content have been finalized based on results from a future study, the ambivalence category scores will also be revised and reduced.

The results of Experiment 1 were useful as they provided an initial assessment of the ambivalence measure in terms of its statistical properties and validity evidence towards its intended purpose. Additionally, results from the exploratory factor analysis will be available for confirmation in a factor analysis conducted on data from a future study. A strength of this study, however, was the inclusion of measurements of each participant's change and sustain talk. These measures of actual verbal behavior from each participant provided a compelling source of validity evidence for the instrument.

This experiment empirically assessed the instrument's structure, reliability, and validity as a measure of ambivalence, but a rational assessment of these properties was ignored. Given the ambiguity associated with ambivalence, the construct validity of the instrument would be strengthened by expert evaluation. Furthermore, it was unknown if expert consensus about the definition, components, and individual manifestation of ambivalence even existed. Experiment 2 was conducted to rationally investigate these considerations from an expert perspective for the purpose of improving the measure.

Experiment 2: Expert consultation about measuring ambivalence

towards changing problem drinking

“Ambivalence is when a person both wants to make a change AND wants to sustain the status quo, with approximately equal valence at a given point in time.”

-Motivational Interviewing Network of Trainers (MINT) member

The primary aim of the second study was to question experts in the area of motivational interviewing about their perspective on ambivalence towards changing problem drinking. Expert consultation can provide evidence of construct validity by thoroughly explicating the construct and its relationship to relevant constructs, and by expert review of the initial item pool of the ambivalence measure. Test developers are cautioned that experts must be consulted to ensure that test items are grounded in theory, clearly correspond to the intended construct, and sample the whole domain of the construct (DeVellis, 2003; Nunnally & Bernstein, 1994; Shultz & Whitney, 2005; Streiner & Norman, 2003).

Members of the Motivational Interviewing Network of Trainers (MINT) were chosen as the prospective sample because they represent the highest level of expertise in the field of motivational interviewing and are a diverse group of MI practitioners. Participants were asked to answer survey questions from the perspective of an expert MI trainer and based on their experience as a practicing clinician. It was hoped that this step would provide a diverse and balanced set of perspectives about how ambivalence operates in an MI context. Questioning a representative sample of experts helped guard against the development of the ambivalence measure in an idiosyncratic manner.

Study 2 Method

Procedure

An e-mail inviting members of the MINT listserv to complete the Measuring Ambivalence survey was posted to the listserv by Dr. Theresa Moyers, an MI trainer and researcher well known to members of the MINT community. The recruitment e-mail contained a link to the survey monkey website. Participants who wished to give their views about ambivalence clicked on this link and completed a questionnaire that asked no private or identifying questions and took about twenty minutes to complete. The questions about ambivalence were similar to those that are normally discussed on the listserv; this study asked them in a systematic manner for research and reporting purposes. At the end of the questionnaire, participants were invited to e-mail the author for a \$10 gift certificate for Starbucks as a thank you. This required them to give their names and addresses, but their names were never associated with individual answers on the questionnaire. Data were downloaded from the survey monkey website, with no identifying information, and loaded into Microsoft Excel and/or SPSS.

A waiver of documentation of consent was approved by UNM's Institutional Review Board (IRB) as this was a web-based survey only. All other aspects of the study protocol were similarly approved. The questions asked in the Measuring Ambivalence survey were of a non-personal, scholarly nature, and a formal consent process would have been inconvenient to and identifying of the participants.

Instrument

The Measuring Ambivalence survey was created for this study and is attached in Appendix B. In addition to the consent page, it was composed of two parts. Briefly, part I was called *Your Thoughts on Ambivalence*, and asked six open-ended questions about the nature of ambivalence towards ending problem drinking and its relationship to other

constructs. Part II was titled *Your Thoughts about This Attempt to Measure Ambivalence*. It showed MI experts version 2.0 of the ambivalence measure and contained seven open-ended questions designed to elicit comments about how well they thought the instrument measured ambivalence. A detailed description of the survey, as well as the purpose for asking each survey question, is reported in the Results section below.

Participants

The only inclusion criterion for this study was simply to be on the MINT electronic mailing list. This listserv was comprised of those who have been certified to teach motivational interviewing and were therefore, by definition, experts in motivational interviewing. We anticipated needing no more than 70 participants. MINT members are a heterogeneous group of professors, researchers, parole officers, clinicians, and other health care providers. They have varying levels of years of experience with MI, work with diverse populations, and also help people prepare to change a variety of health behaviors besides problem drinking. A large number of expert raters allowed the detection of expert suggestions that may be outliers (Haynes, Richard & Kubany, 1995).

Membership in MINT is limited to those who have completed a three- or four-day Training of Trainers program at a site recognized by the MINT community. MINT is an international organization of diverse members who share a common goal of improving the quality of counseling clients about making a behavior change and has been in existence since 1997 (<http://motivationalinterview.org/training/mint.htm>).

Qualitative analysis plan

Several traditions exist for the analysis of qualitative data, including, but not limited to, thematic analysis, ethnography, phenomenology, grounded theory, and the

case study (Creswell, 1998; Neale, Allen & Coombes, 2005). After investigating various approaches, thematic analysis and aspects of grounded theory were chosen as the qualitative techniques that best suited the purposes of this study, but there was not one approach alone that was the most useful for analyzing all survey questions. Thus, the analytic approach taken to each survey question was unique, and varied depending on what information the question was designed to elicit and the least complicated method of answering it.

The procedure for analyzing each individual survey question began with carefully thinking about how the expert responses would be used to inform instrument development and reading through the participant responses several times. The next step considered the most efficient and parsimonious method of categorizing and reporting the data in a way that would also be useful for instrument development. For some survey questions, thematic analysis was used. Thematic analysis is a method of categorizing and quantifying qualitative information. It is a process of developing codes by searching for recurrent themes in the data (Boyatzis, 1998). This study utilized codes that were often developed inductively by reading through participant suggestions and categorizing responses based on similar characteristics. Characteristics of useful codes for this study were that each code had a label that clearly defined the theme or category, had accompanying positive and negative examples that indicated the presence of the theme, and had decision rules that indicated how to code vague or complex responses given by participants (Boyatzis, 1998).

For other survey questions, the use of *in vivo* codes was borrowed from grounded theory. *In vivo* codes are derived from concepts using the actual words of the participants

(Corbin & Strauss, 2008). This was the most accurate method of answering some survey questions, such as A5, “Are there other concepts that you think are often confused with ambivalence, but are different from ambivalence?” Use of *in vivo* coding for some survey questions preserved the original answers given by participants and guarded against a misinterpretation of the data. For other survey questions, responses were simply coded into categories such as *yes*, *no*, or *both*, when these codes represented the most direct way of answering the survey question.

It was helpful to break down the analysis of question A1 (“How do you define ambivalence?”) into five aims, as there were several purposes associated with asking experts the definition of the central construct to be measured. The analysis of complex survey questions necessitated borrowing from another aspect of grounded theory. Part of utilizing grounded theory for qualitative analysis requires that the researcher describe the process of generating codes for the data (Creswell, 1998; Neale et al., 2005). This description was included in analyses when this would aid in clarifying results. For other survey questions, the purpose and question were straightforward enough to not require the analysis to be reduced into several aims. Each analysis of the survey questions also included a statement about how many participants answered the question. No word limit was placed on the length of participant responses.

Qualitative researchers are advised to use quotations sparingly, as they often summarize the subjective experience of participants better than the researcher, but an over reliance on quotations can substitute for an in-depth analysis by the researcher (Neale et al., 2005). Quotations were used in this analysis as exemplars to define categories of expert suggestions or to quickly summarize common expert responses.

Quotations were also used to communicate unique or insightful expert suggestions, so as not to miss this valuable aspect of qualitative data. Sometimes data were important due to the unique insight they provided, and not just because they constituted a common response that could be easily quantified.

Results

Quantitative Results

Exactly 100 participants began the survey, and 70 participants commented on enough of the questions to be included in the analysis of the results; however, only 61 participants fully completed the survey. This much missing data was likely due to the study method. Participants were blind to the contents of the survey before beginning it. The first page was the waiver of documentation of consent form, and then participants anonymously answered the demographic questions. After those had been completed, the participants then viewed part I of the survey. Thirty experts chose to not answer any questions beyond the five demographic ones. Thus, data were available for analysis from seventy participants. The demographic characteristics of these 70 participants who answered the substantive portion of the questionnaire are listed in Table 4. A comparison of demographic characteristics of the included and excluded participants was conducted to investigate if there were any systematic differences between these two groups, which may bias the results.

Comparison of Included and Excluded Participants. Chi-square tests and a *t*-test were performed on the demographic data, depending on which test was appropriate for the scale of the variable. A multiple-comparison technique was not employed, as in this case, the more conservative approach for testing for significant differences between

participants would be to not attempt to control for alpha inflation. Personal information was collected from the participants about their level of education, profession, gender, ethnicity, and the number of years experience they had with Motivational Interviewing.

An independent groups *t*-test was first performed to investigate if those who answered only demographic questions ($n = 30$) were significantly lower in years of experience with MI than those who answered questions from the substantive portion of the survey ($n = 70$). Years experience with MI ranged from 0 to 27. Although the included group was slightly higher in years of experience with MI ($M = 10.59$, $SD = 5.71$) compared to the excluded group ($M = 9.17$, $SD = 3.61$), this difference was non-significant $t(83.9) = 1.50$, $p = .14$, $d = 0.27$. Chi-square tests revealed that there were also no significant differences between the included and excluded groups on gender, ethnicity or profession. There was a significant difference in the level of education, however, Pearson's $\chi^2(3, N = 100) = 8.72$, $p = < .05$. Four cells had an expected count of less than five, thus a Fisher's Exact test was the most appropriate test for this analysis. A two-sided Fisher's Exact test was also significant, $p = 0.026$. The significant result was due to there being more participants who had an educational level of PhD/MD in the included group, and lower levels of education were more represented in the excluded group. The exact distribution of education level by group is listed in Table 5. The consequence of this significant difference for the qualitative analysis of this study was that the answers given by experts in this study came from a more educated segment of those initially responding to this study on the MINT listserv.

Qualitative results from the Measuring Ambivalence survey

Part A: Your thoughts on Ambivalence.

Question A1: How do you define ambivalence? The primary psychometric purpose of this question was to elicit responses to assist in constructing a complete description of the construct of ambivalence. This item was first used to determine if the definition of ambivalence used in generating items for the instrument's Experiment 1 version corresponded to those given by the experts. If so, this would be evidence that the instrument "sampled the whole domain" of the construct, and no further analysis would be required (Nunnally & Bernstein, 1994). If there was not a correspondence, then the next step would be to identify which aspects of ambivalence were not represented in the initial measure to serve as a guide for developing the next version of the item pool (Haynes et al., 1995).

Thus, experts were consulted about the definition of ambivalence to ensure that the instrument would measure all important aspects of ambivalence. Five more specific aims for the qualitative analysis of this question were seen as relevant to this general purpose. It was first determined if the definitions given by the experts corresponded with the one used to develop the initial item pool. There were unique definitions given by the experts, thus the second aim was to sort these definitions into mutually-exclusive categories as a first step in identifying which aspects of ambivalence were not present in the initial definition. The third aim was then to parse each definition elicited by experts into basic elements. Commonly occurring themes were developed, and counts of how often these basic themes occurred were generated. The fourth aim sought to simplify the novel elements of the definitions and decisions were made about which unique aspects of ambivalence would be incorporated into version 3.0 of the instrument. The fifth aim was

to incorporate the expert responses into a revised definition of ambivalence to be used to guide item development for the third version of the ambivalence measure.

Aim 1: Did the various definitions of ambivalence elicited by the MI experts correspond with the one used to develop items for version 1? The first version of the item pool, the one used to create the ambivalence measure tested in Experiment 1, was developed according to the following definition:

Ambivalence about ending problem drinking can be defined as feeling two ways about the decision to quit. On one hand, a client may be aware of some negative consequences of continuing to drink. On the other hand, there may be conflicting desires, reasons, or behavior patterns in favor of drinking. Furthermore, the decision to quit is not a purely cognitive process. Emotions and coping patterns play a role, as well as the demands of the client's social and employment environment. Thus, a measure of ambivalence must contain items that reflect the dualistic nature of the construct, as well as represent a broad array of statements that may elicit client ambivalence.

The option of simply asking the participants if they agreed with the above definition in a closed-question format was considered when this study was originally being designed. It was decided, however, that framing the question in that way may have appeared simplest on a surface level, but may not have elicited or clarified the actual definitions held by participants. For instance, it may have been annoying to the experts as they would likely have approved of a definition given in their own words, compared to one asserted by an

outside source. It also may have been difficult to isolate problematic aspects of the definition if participants simply gave a *yes* or *no* answer. Further, seeing the above definition may have primed participant responses if they were then asked to define ambivalence in an open-ended manner. Thus, in order to not prime participants' responses, the open-ended question "How do you define ambivalence?" was asked as opposed to asking if participants agreed with an existing definition. This was to promote the elicitation of novel aspects of ambivalence, necessary for 'sampling the whole domain' of the construct when devising items (Nunnally & Bernstein, 1994).

A primary purpose of the overall study was to answer the question of aim 1 and to develop new items to correspond to the aspects of ambivalence not formerly included in the initial version of the measure. Each definition given by the experts was sorted into the categories of *yes*, *partially*, or *no*. Definitions that were categorized as *yes* contained descriptions that added no new information to the initial definition. An example of an expert definition that fell into the *yes* category was:

"It is a kind of push-pull state where some factors are maintaining status quo and other factors are pulling for change."

The *partial* category was added for expert definitions that repeated some aspects of ambivalence already present in the definition but also either emphasized or added new elements. It also contributed to understanding how far off the original definition was compared to those offered by the participants. Definitions were included in this category even if they repeated the same ideas as the original definition but were worded in a manner that inspired the creation of new items, such as:

“I think of ambivalence as being torn between two opposing feelings/ thoughts; usually ambivalence includes feelings of anxiety around what making a change would mean in one’s life.”

Although the overarching idea of this definition is not novel (i.e., two opposing feelings/thoughts), the words *torn* and *anxiety* suggest aspects of ambivalence not represented in the original item pool. It is interesting that this definition also refers to the affective component of ambivalence. The *partial* code was also the default option when a definition was similar to the original but offered some new insight into the nature of ambivalence or how it should be measured, such as the following definition:

“Feeling two ways about something. This can be a paradox if you believe that people are rational actors. People should weigh the pros and cons and make up their minds, but quite a lot of people either persist in ruminating (maybe hoping that things will get better, or new information will come in), or simply refuse to make up their minds (maybe someone else will choose for them). There is a degree of finality/ownership in making up one's mind that can be worse than never having chosen at all, which is the main reason, I think, why people get stuck.”

An example of a definition that was coded as *no* was:

“a feeling of reluctance, uncertainty, - because of not knowing what to choose to do in a certain area or not feeling able to decide.”

The above definition highlighted aspects of ambivalence described as uncertainty and indecision. These aspects were not explicitly stated in the initial definition, and provided

inspiration for the creation of new items. There was a bias for including expert definitions into the *no* or *partial* categories compared to the *yes* category. The purpose of this study was to provide as comprehensive a definition of ambivalence as possible to improve the instrument. Diverse or novel definitions were useful for generating items that may have initially been overlooked when creating the first version of the instrument.

Seventy participants answered this survey question. Definitions were variable, yet often similar across participants. The modal response was to give a definition similar to the one used to develop the initial version of the instrument. Twenty-five (35.7%) gave definitions that matched the one used to create version 1.0 of the ambivalence measure. Ten participants (14.3%) gave definitions that did not correspond to the initial definition, and thirty-five (50%) gave definitions that generally corresponded to the original definition, but added some new and useful information.

Aim 2: What were the primary mutually exclusive categories of the definitions given by experts? Since the expert consultation about ambivalence resulted in highlighting additional aspects of ambivalence, the definitions given by experts were again categorized according to the major theme of each definition. This allowed for a thematic analysis of the major categories of responses to demonstrate which general aspects of ambivalence were missed in the original definition. The mutually exclusive categories were decided upon in a data-driven manner. Close inspection of the responses revealed that the definitions reduced into five related but mutually exclusive categories, and a sixth category was added for definitions that did not fit neatly into one of these categories.

The 70 responses were categorized into five themes. First, 26 (37.1%) MI experts literally described ambivalence as ‘feeling two ways’. Next, the major themes of competing or conflicting feelings and thoughts were primarily present in 16 (22.9%) responses. Thirteen participants (18.6%) characterized ambivalence loosely in a pro/con, change/sustain, or cost/benefit manner. Uncertainty was the dominant theme for nine (12.9%) definitions, while four others (5.7%) spoke of ambivalence as composed of mixed or multiple feelings or thoughts. Only two definitions (2.8%) did not fit neatly into these categories.

The method of categorizing definitions into mutually exclusive groups revealed important information about the correspondence between the ambivalence definition utilized for Experiment 1 and the definitions given by experts. The concept of “feeling two ways” was explicitly included in the version 1 definition. Mention of the conflict between the pros and cons of change was implicitly present in the initial definition. This aspect of ambivalence was also present in the instrument’s structure due to the Change and Sustain scales. Conflicting desires, reasons, or behavior patterns was mentioned in the initial definition, but the experience of conflict in itself was not. Similarly, the Experiment 1 version did not explicitly include the element of uncertainty. Also, the element of mixed feelings and/or thoughts and the conflict that surrounds them was partially present in the initial definition. However, the older definition did not explicitly tap the rich affective component of ambivalence in terms of the emotional experience of uncertainty or conflict. New items specifically designed to measure these themes were developed for version 3.0 of the instrument.

Categorizing definitions into themes reduced the definitions into more manageable labels for aspects of ambivalence. It highlighted that the themes of uncertainty, conflict, and mixed feelings or thoughts needed to be included in the item pool, but ignored the rich qualitative presentation of other aspects of ambivalence present in the definitions. The next decision for the analysis of question A1 was to choose the most efficient way of understanding which novel additions to the definition of ambivalence should be incorporated into the combined definition. This was accomplished by consideration of the third and fourth aims.

With regards to the first analysis of whether participant responses corresponded to the initial definition of ambivalence, definitions classified as *no* were automatically considered for inclusion in the revised definition of ambivalence. Definitions in the *partial* category needed their novel aspects to be separated from the repeated aspects. The decision to parse and categorize all 70 definitions was reached. This way, counts of repeated definitions could also be made. In a sense, the final analysis of this survey question would then represent the ‘universe’ of definitions about ambivalence, and items could then be created to represent both the commonality of definitions and the novel additions. Thus, the proportion of items for a particular aspect of ambivalence present in the next version of the measure could then match the number of times that aspect was mentioned by different experts.

Aim 3: What were the basic elements of the definitions? All seventy definitions given by experts were first broken down into 118 basic elements; they were parsed into separate but complete phrases or ideas. The phrases ranged from a few words to several sentences, depending on how much detail or repeated information was given by the

participant. This process was necessarily influenced by the subjectivity of the researcher (Boyatzis, 1998), but was also systematic. Repeated or detailed phrases about the same aspect of ambivalence were parsed into one count for each participant. This was done to ensure that common definitions were not oversampled due to a thorough or verbose participant.

The 118 separate elements of the definitions of ambivalence were then grouped according to similar content. Fifteen categories emerged from the data, usually representing separate but related aspects of ambivalence. For example, the concepts of conflicting or competing thoughts or feelings are the same in a general sense, but this redundancy is desirable for the purpose of developing an instrument. The assessment of internal consistency and reduction of construct-irrelevant variance relies on it (DeVellis, 2003). Furthermore, the subtle variations in meaning embedded in similar words provided additional detail for item development. Incorporating a detailed description of ambivalence into the revised definition also provided evidence that the full domain of the construct was sampled for the final version of the item pool (Nunnally & Bernstein, 1994).

Concepts such as uncertainty and indecision are likewise similar, but they represent two distinct aspects of the experience of ambivalence. Uncertainty arises from not knowing what to do, but indecision more specifically relates to a matter of will rather than knowledge, that is, not being able to decide. Elements of definitions that mentioned uncertainty or indecision were kept separate, but they could have been combined if not for the rather subtle and specific purpose of this analysis. Instead, the decision was made

to keep distinct but subtle differences in the meaning of words separate, even though this resulted in 15 categories.

A surprising result of reducing the expert definitions into elements and then grouping them into similar themes was that a sense of expert consensus emerged along with the primary concepts of the definition of ambivalence. During the initial analyses of aim 1 and 2, the expert definitions appeared diverse. The perspective taken when analyzing aim 3 was more comprehensive. When differences among experts emerged, they seemed to be more due to a different emphasis being put on specific aspects of the definition of ambivalence by individual experts, rather than disagreement about the central characteristics of ambivalence.

The most commonly occurring definition of ambivalence was “feeling two ways about something”. The phrase *feeling two ways* appeared in 27 (22.9%) of the elements. The next most common definition was to describe ambivalence in a *change versus status quo* manner. An example of one of the 15 (12.7%) elements that fell into this category was:

Ambivalence is the feeling/recognition that an individual has when he/she has reasons for staying the same and reasons for changing a specific aspect of his/her life.

Indecision was mentioned in 11 (9.3%) of the phrases, and uncertainty was mentioned in 9 (7.6%) of them. Sometimes it was difficult to differentiate between these two categories. Eleven elements (9.3%) were really explanations of how ambivalence operates rather than definitions. They offered insight into the role of ambivalence in the process of change, but did not contribute definitions of ambivalence for the revised

version. The theme of internal conflict was mentioned 9 times (7.6%), and the theme of competing beliefs or feelings about change was mentioned 6 times (5.1%). The concept of mixed feelings or thoughts is similar to the concept of competing or conflicting feelings about change, but it was specifically mentioned by 3 (2.5%) participants. The decision to categorize it separately was made to add diversity to the item pool. Similarly, *desire* and *feeling pulled in different directions* could have been categorized into the *change versus status quo* code, but separate categories were retained to add detail. An example of a definition that was categorized as desire was:

“A desire to change which exists simultaneous to a penchant for the status quo.”

Only 3 (2.5%) elements highlighted desire, but the word *desire* was used to partly describe other aspects of the definition of ambivalence, such as in other elements that were categorized as *change versus status quo*. Desire is often coded as a category of change talk in studies investigating the efficacy of MI (Moyers, Martin, Christopher, Houck, Tonigan, & Amrhein 2007), and ignoring the prevalence of the word *desire* in the data seemed unwise.

Likewise, ambivalence was described as the push/pull of the change process by 6 experts (5.1%). A characteristic definition that fell into this category was:

“Feeling that if you had to make a choice about this thing/person, you are being pulled in two directions”.

This definition repeats the same general theme as other aspects of ambivalence that emerged into codes, such as a feeling of internal conflict. The description of being

pulled in different directions is highly salient and describes the experience of ambivalence with a high level of emotion. It was retained as a category so that it would contribute to the revised definition.

The next category that emerged from the data was *emotion*. This was a very interesting category comprised of 7 diverse elements (5.9%) which highlighted different emotional aspects of ambivalence. The only emotion mentioned by more than one expert was anxiety. Two experts commented on how the affective component of ambivalence is anxiety or that usually ambivalence is accompanied by anxiety surrounding what making a change would mean in one's life. A more thorough consideration of this category is described in the next aim.

Five experts (4.2%) mentioned that ambivalence is a normal experience when one is considering a change. Two elements (1.7%) could have been merged into the *explanation* category as they were not really definitions of ambivalence but evidence of a common debate on the MINT listserv: Is ambivalence cognitive or emotional? One expert asserted that the basis of ambivalence is feeling rather than thought or action, and another described the indecision that ambivalence provokes as not always causing an emotional response. One definition (0.8%) was coded as unclear, although it probably could have been put into one of the categories described above had the opportunity to ask the expert for clarity been available. Only three definitions (2.5%) were coded as unique/other, and they will be discussed in the next aim to reduce repetition.

Aim 4: What were the novel aspects of the definitions given by experts? The novel aspects of the definitions elicited by experts were generally about the emotional experience of ambivalence, or about the uncertainty and indecision that often accompany

ambivalence. Although emotions, desire, and conflict were mentioned in the original definition, the direct experience of them was not reflected in the item pool. A state similar to mixed or competing feelings and thoughts was mentioned in the original definition, but these characteristics were not emphasized. The experience of uncertainty and indecision, as well as many of the elements listed in the emotion category of the previous analysis, were not listed in the original definition and will be added to the revised version.

Three elements were listed in the unique/other category. The first described ambivalence as a dynamic and fluid process that includes movement and tension. The second described responses to ambivalence such as vacillation, hesitation, feeling stuck, and the presence of these conditions despite definite movement in one direction or the other. The third element was a classic definition of someone in the *contemplation* stage of the Stages of Change model (Prochaska & DiClemente, 1986)

“The state of a person who has at least a slight interest in changing a particular behavior or status, but has not yet committed to making that change”.

Items for the *ambivalence scale* of the SOCRATES were also created to correspond to the contemplation stage (Miller & Tonigan, 1996). Thus, a comprehensive definition of ambivalence must also include the state of someone contemplating making a change in his or her drinking.

Aim 5: What was the new revised definition of ambivalence generated from the results of this study that will be used to develop the next version of the instrument?

The revised definition of ambivalence developed based on analyses relevant to Question A1 is as follows:

Ambivalence about ending problem drinking is feeling two ways about changing drinking. It is a normal experience that manifests when one is considering a change, but also has compelling desires, reasons or feelings to not make a change. Ambivalence often feels like there are mixed or competing thoughts and feelings that pull one in different directions about the decision to change. Both the advantages and disadvantages of change seem equally weighted. This can result in an experience of inner conflict and leave one uncertain or indecisive about what to do.

Question A2: Do you think that the ambivalence measure should have subscales, and if so, what should they be? The purpose of this question was to determine if the participants thought that ambivalence towards changing problem drinking was a uni-dimensional or multi-dimensional construct. Although this question will also eventually be answered empirically by performing an exploratory and/or confirmatory factor analysis on future samples, asking experts before that step allowed for a determination to be made on rational grounds. This aided in the development of the instrument by allowing an *a priori* prediction to be made before conducting an exploratory factor analysis, by using data from experts to aid in the decision of appropriate factors based on the perspectives of the experts, and also by determining if there is even a consensus among experts about the uni- or multi-dimensional nature of ambivalence.

This survey question was answered by 68 participants. Responses were first divided into four mutually-exclusive categories to answer the first part of the question, “Do you think that the ambivalence measure should have subscales?” Forty-one (60.3%) experts answered *yes*, five (7.4%) answer *no*, and fifteen (22.1%) answered *maybe*. If participants answered with uncertainty, but then gave suggestions for possible scales, they were put into the *yes* category. The remaining seven (10.3%) expert answers were combined into a category labeled *other*. These responses gave comments such as ‘no opinion’, or responded that the question was unimportant. Two of these responses; however, were that it is impossible to measure ambivalence with a paper-and-pencil questionnaire and that the instrument would have no utility.

Thirty-seven of the 47 experts who answered *yes* to this survey question also commented on the content and number of scales that would be required to measure ambivalence. Participants either gave a specific amount of scales, or gave a range of numbers. When the latter occurred, the average of the range was taken. The distribution of number of scales was positively skewed, with a range from two to seven and a median of three. Fourteen (18.2%) experts answered that the instrument should have 2 scales, eleven (14.3%) said 3, seven (9.1%) suggested 4 scales, two (2.6%) suggested 5, two (2.6%) suggested 6, and one (1.3%) participant suggested 7 scales.

More difficult to report is what the content of those scales should be. There were only two instances of the same set of scales being suggested by different experts. Six participants (15.8%) independently suggested that an ambivalence measure should have two scales, one scale to measure desire and reasons for change, and one to measure the desire and reasons for the status quo. Two (5.4%) other experts mentioned the

change/sustain scales and added a third dimension, emotional valence or strength of inner conflict about change and sustain items. The other duplicated set of scales was provided by the two participants (5.4%) who suggested that the two subscales of the instrument should be importance and confidence. Two (5.4%) more added a third dimension to these, either value or readiness.

A set of cognition and emotion scales was mentioned by one (2.7%) participant, but five (13.5%) others included these scales in combination with a few others. A few other participants suggested scales that are also coded categories of change talk such as need, desire, reason, and ability to change. Every other set of scales suggested by participants excluding those already mentioned was unique, although a few other general themes emerged. Themes of importance, confidence/ability, change/sustain, readiness to change, intrinsic versus extrinsic factors, self-efficacy, and the four quadrants of a decisional matrix were suggested by more than one expert. Individual subscale suggestions also highlighted constructs that may be related to ambivalence, such as denial/resistance, rationalization, risk-awareness, distress, and helplessness.

The purpose of this survey question was to provide a theoretical rationale for interpreting dimensions that may emerge when conducting a factor analysis. A secondary purpose was to explore scale suggestions as constructs related to ambivalence that could also be used to demonstrate convergent or discriminant validity. For example, a future study could assess whether suggested scales were correlated with the ambivalence instrument to either relate or differentiate ambivalence from other related constructs (Cronbach & Meehl, 1955). A different survey question (A6), however, more directly collects information for this purpose.

What are the subscales of ambivalence? If a general consensus was reported by the experts, then the scales could be determined rationally. Only six participants (15.8%) independently agreed on a set of scales; this was not a large enough proportion to indicate expert consensus. It was encouraging though, that the most common suggestion mirrored the original design of the ambivalence instrument. A quantitative method exists for answering this question, exploratory factor analysis (EFA; Tabachnick & Fidell, 2007). EFA would determine the dimensions of ambivalence statistically, but also may provide a more conclusive answer since there was not a general consensus among experts.

The repetition of the “change and sustain” scales by six experts (15.8%), and the mention of it by several more, was encouraging for continuing to develop these scales for the instrument. If the analysis of this survey question involved a conclusion being made about the scales of ambivalence based on expert opinions alone, then a variation of ‘reasons to change versus reasons to stay the same’ would be it. Importance and confidence were also mentioned more than once. These constructs are also inquired about during the decisional balance exercise of MI. Continued consideration of these constructs as potential scales was warranted by the expert data, but may not emerge during an exploratory factor analysis.

This survey question also inquired about the definition of ambivalence through a different perspective. Asking about the scales of an instrument is another way of asking, “What are the components of ambivalence?” The scales suggested by individual experts contributed insight into what ambivalence is, what its causes are, or how it manifests. For example, a scale suggestion was to differentiate feelings problem drinkers have about their own alcohol use from feelings other people in their lives have about their alcohol

use. A similar suggestion was to differentiate between an individual's own reasons to change drinking rather than the reasons given by his family or the legal system.

Suggestions such as these added detail for developing or editing items for version 3, even though they were suggested by only one participant.

Question A3: Do you believe that ambivalence is cognitive, emotional, or both? Or do you think that it doesn't matter? Please explain. The purpose of this question was to investigate whether the distinction between cognitive versus emotional ambivalence was clinically relevant. This question also asked about the uni- or multi-dimensional nature of ambivalence from another perspective. Some participants had suggested in response to a previous question that possible dimensions of ambivalence were cognitive and emotional. Affect was an often cited aspect of ambivalence that sometimes gets overlooked. Answers to this question were used to further understanding of ambivalence, and to clarify the relationship between cognitions and emotions as they relate to ambivalence. This question has also been the subject of heated debate on the MINT listserv, and answers were used to quantify the amount of agreement or disagreement among MI trainers.

Of the 70 participants who answered this question, 63 (90%) said that ambivalence was both cognitive and emotional. Many mentioned that emotion and cognition were false dichotomies. Some attempted to clarify the interrelationship of cognitions and emotions in the manifestation of ambivalence, such as:

I believe it is both. The actual internal conflict is perhaps experienced on an emotional level, but the emotions arise from conflicting beliefs (cognitions) and values.

Two experts (2.9%) said that ambivalence was primarily emotional, and five (7.1%) answered that it was cognitive.

The consensus among 90% of the MI trainers in this study was that ambivalence is both cognitive and emotional, but did they include that in their definitions of ambivalence? A secondary analysis of question A1 was conducted to assess the relationship between expert answers given for survey questions A1 and A3. Definitions were coded a second time to determine whether they included explicit mention of either thoughts/thinking/cognitions, feelings/affect/emotions, both, or not specified. Five (7.1%) expert definitions described ambivalence in cognitive terms only, whereas 29 (41.4%) described ambivalence as primarily an affective experience. However, 23 (32.9%) experts described ambivalence as comprised of both, and 13 (18.6%) didn't specify. Although the majority of experts believed that ambivalence is both, they highlighted the emotional experience of ambivalence more than the cognitive in their definitions. It was interesting to consider the question of the affective versus cognitive experience of ambivalence when experts were not primed to explicitly address this issue.

Only 12 (17.1%) of the experts responded to the issue of whether it matters if ambivalence is cognitive, emotional, or both. Ten (83.3%) of the 12 experts said that it does matter, and 2 (16.7%) said that it does not and gave no explanation. Of the ten participants who said it does, only two did not give an explanation. Six explanations discussed how a therapist or clinician behaves to directly help a client make a change, and two spoke to how clients differ in their own experience of ambivalence, and how that can affect the change process. The conclusion from this analysis is that the consideration

of the cognitive and emotional expressions of ambivalence is clinically relevant. A participant response that exemplified this perspective is:

Both. I believe that it matters very much. When the individual can articulate more reasons to change than to stay the same...but is more comfortable not changing and feels little discomfort from the ambivalence, the person is less likely to change?

Question A4: Does it matter if a client presents with a little or a lot of ambivalence? That is, is the amount of ambivalence important, or is it simply the presence of ambivalence that is important? The purpose of this question was two-fold. First, this question was debated on the MINT listserv, and asked in this study to summarize and report the views of MI trainers. Second, the reduction of ambivalence is theorized to be a causal mechanism to explain the efficacy of motivational interviewing (Arkowitz, Miller, Westra, & Rollnick, 2008). It is hoped that the final version of the ambivalence instrument would be used to test this hypothesis. This question also asked whether the participants thought that ambivalence operated in a dose-response manner. That is, is more ambivalence better or worse? If a client has more ambivalence, will that be associated with a better outcome, or is it the resolution of ambivalence, no matter how much is present, which aids in behavior change? Thus, expert views were explored to determine if there was consensus among MI trainers about the optimal amount of ambivalence required for behavior change.

Sixty-nine participants answered this survey question. Initially, responses were sorted into two categories: those who said that the amount was important, and those who said that it was simply the presence that was important. Careful consideration of expert

responses revealed, however, that these categories were too simplistic to accurately reflect the depth of expert perspectives. Consequently, a few other codes were developed.

Thirty-nine participants (56.5%) said that the amount of ambivalence was important, and 15 (21.7%) said that only the presence was important. Six participants (8.7%) felt that both were important, and four (5.8%) said that neither were and instead suggested what they thought was more necessary or important. Themes of these responses were that the direction of change, the personal meaning of ambivalence for the client, or simply what choice the client wanted to make about her drinking, were more important. Five participants (7.2%) gave responses that addressed ambivalence, but did not directly answer the question.

The majority of MI trainers commented on the amount of ambivalence as important, but there was diversity among the specific reasons given. A secondary analysis of these participant responses was conducted for more information. Of these 39 experts, 28 (40.6% of the total sample) specifically mentioned that it was important for enabling the client to make a change. Five (7.2%) also said that the amount was important, but their explanations focused on how it was important for guiding clinician behavior. It may be misleading to separate these experts from the others, as implicit in discussing the impact on clinician behavior is the assumption that the clinician is helping the client to make a change. Five (7.2%) other experts did not cite a specific reason for why the amount was important; however, their reasoning most likely was similar to the previously mentioned experts. Only one participant (1.4%) specifically mentioned that

although the amount was more important than the presence, he or she was not sure if the amount may actually influence changes in behavior.

This debate will hopefully be addressed empirically in future studies. The results of the current study indicated that there was variation in expert perspectives, although the majority felt that there was a tipping point for ambivalence, and once ambivalence was resolved, an actual behavior change can be made. These experts often mentioned that clients with more ambivalence were easier to work with. A small minority of experts described clients with high ambivalence as potentially problematic. These experts felt that a moderate amount of ambivalence was optimal for enabling change. Their reasons were that some clients may have adapted to the emotional distress or indecision caused by the ambivalence, making them stuck for prolonged amounts of time. Also, clients may be highly ambivalent due to the change not being that important to them, or to having more reasons to continue to drink than to change.

Although these experts revealed the complexity and idiosyncratic manifestation of ambivalence for their clients, it may be that this variation is not relevant for providing empirical evidence for the reduction of ambivalence being associated with successful change efforts. It may be that what an ambivalence instrument measures will not capture in aggregate form the detail provided by expert experience in working with clients. At any rate, empirical resolution of this issue must be postponed until the ambivalence measure is fully developed and administered in a well-designed study.

A5: Are there other concepts that you think are often confused with ambivalence, but are different from ambivalence? Please explain. The purpose of this question was to differentiate ambivalence from other related constructs. Identifying

constructs similar to, but different from, ambivalence helped eliminate construct irrelevant variance from the instrument. Items were analyzed to ensure that they did not appear to measure constructs other than ambivalence. The results of this question also identified constructs that could be measured with ambivalence in the next round of data collection. Constructs that were related to ambivalence in theoretically-consistent ways could be used to assess convergent and discriminant validity, and shared variance would indicate measurement of the same construct (Campbell & Fiske, 1959).

Sixty-four participants answered this question. Nine experts (14.1%) answered either *none* or that they were not sure. The 55 remaining participants generated 68 concepts that they thought were often confused with ambivalence. Data analysis was first conducted by grouping common constructs together. There were 10 concepts that were suggested by more than one participant. Resistance was the most cited similar construct. Many of the 12 experts who suggested resistance also conceptualized the difference between resistance and ambivalence as:

Ambivalence is often confused with resistance. It is perfectly normal for clinician advocacy for change to be met with client argument for status quo, but historically the latter has been viewed as resistance or a manifestation of defense mechanisms.

Seven suggestions (10.3%) cited denial, five (7.4%) were discrepancy, and five (7.4%) were confusion. There were four (5.9%) mentions of ambiguity as commonly confused with ambivalence, and three (4.4%) each of readiness for change, motivation, and precontemplation/contemplation. Only two (2.9%) experts mentioned either apathy or cognitive dissonance.

These commonly-suggested constructs were related to ambivalence in that they either could be argued to be similar to ambivalence on a theoretical level, or that ambivalent clients could be incorrectly assessed by the clinician as manifesting these particular characteristics. First, clients who argue for the reasons to maintain the status quo have historically been assessed by clinicians as resistant to treatment, and in denial about their problem and its negative impact on their lives. Engles and Arkowitz (2008) have written extensively on this issue. Within the context of motivational interviewing, some experts suggested that clients who do this are sometimes mistaken as being in the precontemplation or contemplation stage, as opposed to simply being ambivalent. They suggested that these clients could be in the preparatory or action stages, but need to resolve their remaining ambivalence about change. Critics of the Stages of Change model also argue that the goal of changing actual drinking behavior should be preferred to assessing a particular stage of change and/or assisting a client to progress to the next stage of change (West, 2005).

MI therapists are encouraged to develop discrepancy when a client is arguing for the status quo (Miller & Rollnick, 2002), and becoming aware of discrepancy is part of the exploration and resolution of ambivalence within the process of MI. Discrepancy may be confused with ambivalence clinically, but the measure of discrepancy within a therapy session is different from the measurement technique employed by this instrument. It may be interesting to correlate these measures with ambivalence scores in the future, but the genuine confusion of these two constructs from the perspective of developing an instrument may not be relevant.

Festinger's cognitive dissonance was also cited as being confused with ambivalence. Cognitive dissonance is essentially an intellectual phenomenon, and the affective component of ambivalence is neglected when it is confused with cognitive dissonance. Experts also suggested that an ambivalent client may seem instead to be simply confused, apathetic, or ambiguous about their drinking to the clinician. This confusion is important for assessment or for directing clinician behavior, but similarly is not relevant for instrument construction.

Readiness for change and motivation are more difficult constructs to separate from ambivalence. They are all used to describe similar aspects of the change process. For example, readiness for change and motivation are sometimes used interchangeably when a client is in the process of behavior change. However, motivation subsumes situations where an individual may want to sustain the status quo as well as where an individual wants to change. Additionally, extrinsic pressure to change (i.e. court-mandated change) may also be described as motivation to change, but the phrase 'readiness for change' is used to describe an intrinsic state only. Ambivalence is when a client is motivated or ready to change, and also feels two ways about changing. Alternatively, it may be a more inclusive perspective of the client's complete experience. Ambivalence incorporates both aspects of the change process: what I will be getting and what I will be giving up, what will be easy and what will be difficult. It may be possible to empirically distinguish among these three constructs by administering instruments that measure all three in a future study. Plans for this will be described in the Discussion section. Given the diverse opinions of the MI trainers in this study, the rational distinction between the three may always be subject to debate.

The remaining 22 suggestions (32.4%) were mentioned by only one participant. Many of them were unique, and not easily categorized into similar themes. They were generally reflective of client attitudes or behaviors that may be misdiagnosed as ambivalence due to the complexities surrounding the change process. Experts suggested that the consequences of physical dependence or negative symptomology may be confused with ambivalence. Clients who question a specific treatment approach or need more time to consider a specific change plan, may be incorrectly labeled as ambivalent. Also, clients who feel two ways about change but are not emotionally struggling it, or, who like a psychopath, exhibit an unemotional assessment of risk, may also be incorrectly assessed as being ambivalent. Four other suggestions highlighted that clients may be unwilling to change, uncertain how to change, or lack confidence in their ability to change, and may likewise appear ambivalent. Other experts suggested that ambivalent clients may also be viewed as wishy-washy, avoidant, indifferent, indecisive, lazy, irrational, or not intending to change.

Every suggestion provided insight into the complex and variable manifestation of ambivalence, and thus provided ideas for how to contribute detail and diversity to the item pool. For example, a planned item for inclusion in the next version of the measure is, “I am confused about what to do about my drinking”. Confusion in itself is not necessarily ambivalence, but an ambivalent client may also feel confused. It was also suggested in other parts of the survey that confusion was part of the affective experience of ambivalence. The development of new items must also include considerations of overlap with other constructs. Thus, the new item must not simply be “I feel confused” but must also contain a clause directly relating that emotion to drinking. The most

important issue raised by this analysis was how the ambivalence measure will be differentiated from motivation or readiness to change, a likely concern of potential consumers of this instrument. This will be considered in the Discussion section.

Part B: Your thoughts about this attempt to measure ambivalence

The participants were first shown version 2.0 of the ambivalence measure and then asked a series of questions about it (see Appendix B).

Question B1: What do you think about the ambivalence measure? Are you convinced that it really measures ambivalence? Would you use it with clients? Would it be helpful to you? These four questions were asked to casually elicit opinions about the validity of the ambivalence measure without priming participant responses. The intention was to elicit genuine responses by asking these open-ended questions. The first and second questions asked about whether the experts thought that the instrument measured ambivalence. The third and fourth questions asked about whether the instrument would have practical significance for them.

The procedure for analyzing this question was to first read through responses several times. Answers ranged from one sentence to many, and covered only one topic or several. Responses were first parsed into separate phrases or sentences that seemed to answer the first, second, third, or fourth question asked in B1. Then, codes were developed in a data-driven manner. Categories were chosen to capture the majority of responses with the fewest categories. Codes for each of the four questions were developed in a sequential manner, resulting in approximately 12 different codes to capture all responses. Next, the decision to code each expert answer four separate times was made so that each question could be individually answered. Approximately 10

different passes were made to confirm that the correct codes were assigned to answer each of the four questions.

This process resulted in four categories to answer the first question, “What do you think about the ambivalence measure?” Forty (67.8%) of the 59 participants who answered question B1 gave a response that could be characterized as having liked the instrument as it was. They were specific about how they thought ambivalence was represented in the instrument, explicit about how they would use the measure, or were positive about the measure in general. Eight (13.6%) expert answers were characterized as having not liked the instrument. The most informative one was:

If ambivalence is itself a phenomenon, and not just a mixture of pros and cons, then I'm not sure this really gets at it. I could imagine items tapping confusion, uncertainty, feeling torn, stuck, etc.

Six (10.2%) experts commented that they didn't know, or gave a mixed review of the measure, and five (8.5%) expert answers did not relate to the first question asked.

The second question, “Are you convinced that it really measures ambivalence?” was one of the most important questions asked in this study. Codes needed to be detailed enough to be useful, while still summarizing the data honestly. Consequently, a new set of 8 codes emerged to answer the last three questions. Twenty-seven experts (45.8%) said or implied yes, and 10 (16.9%) said that they were not sure or that they didn't know. Six experts (10.2%) implied no, and 1 (1.7%) implied maybe. Two experts (3.4%) answered conditionally. Their answers were characterized as “yes, if...”, and four (6.8%) said that they needed more information to decide. One (1.7%) specifically answered that he or she did not think that measures were clinically useful, but would use the instrument

to facilitate reflection, clarification, and discussion of change. This participant did not directly refer to whether ambivalence was measured by it. Eight (13.6%) other comments also did not specifically address this question.

Expert answers were again coded to answer, “Would you use it with clients?” Eighteen (30.5%) answered yes, four (6.8%) answered maybe, and eight (13.6%) answered no. Two (3.4%) participants said that they would need more information, and two (3.4%) others specifically mentioned that they would use it if it were shorter. Notably, 8 (13.6%) participants said that they would not use it because they did not find measures clinically useful. A few did mention that they were useful for research. Seventeen (28.8%) participants did not directly address this question.

Eighteen participants (30.5%) either responded *yes* to the question of, “Would it be helpful to you?” or they gave a comment that could be characterized as *yes*. Eight (13.6%) comments were characterized as *no* and four (6.8%) as *maybe*. Two (3.4%) comments again were coded as helpful if the instrument were shorter, and two (3.4%) others as potentially helpful if they had more information. Six (10.2%) expert answers to this question were that they did not find measures clinically useful, and 19 (32.2%) did not directly respond to this question.

Answers to B1 as a whole were useful for either confirming that the instrument measured ambivalence, or for suggesting specific areas that needed improvement. Although the majority of experts were favorable to the instrument, the minority of those who were critical also provided useful information to improve it. These answers confirmed that the actual experience of ambivalence itself was not reflected in the item pool, and solidified the decision to add another scale to measure ambivalence in ways

other than what could be reflected by measuring only pros and cons. Thirteen participants also independently suggested that the instrument was too long. Although shortening the measure was already planned, answers generally confirmed that it would be necessary for the instrument to be shorter to be useful for clinicians. Perhaps a shorter version could be developed for clinical use, and a longer version could be used for research purposes.

Question B2: How would you improve the ambivalence measure? The purpose of this question was clear; in some ways this was one of the most important questions asked in the study. Fifty-nine participants answered this question, and it yielded many useful responses. In most cases, participants echoed the same suggestions for improvement, although interesting individual suggestions were also gathered, such as comparing the ambivalence instrument to a single- or double-item measure. The general categories for common suggestions were to reduce the number of items (17), include additional items (17), be cautious about the difficulty of interpreting negatively-worded items (8), and consider scaling options (3).

Shortening the instrument was already a planned step in the development of this instrument, but the frequency of this suggestion emphasizes its necessity. Question B6 (“Is this ambivalence questionnaire too long? If so, approximately how many questions would be the ideal length?”) focused specifically on this issue and will be addressed later.

The suggestion of additional items was provoked by this question and has also been reiterated throughout the results of this study. Question B3 (“Are there aspects of ambivalence that are not represented in the ambivalence measure, but should be?”) as well as B5 (“Are there questions that you think need to be included in this measure?”)

specifically asked about this issue and will be addressed later. However, 2 of the 17 participants who suggested additional items also included some double-barreled items in their responses, without any indication of their problematic nature. Another participant specifically suggested including double-barreled items in order to capture ambivalence, but indicated that he or she knew how problematic the inclusion of double-barreled items is for scale construction.

Double-barreled items appear perfect for tapping ambivalence as they directly ask about the ‘feeling both ways’ aspect of ambivalence. However, they are very difficult to interpret (DeVellis, 2003). A conclusion from Experiment 1 was to eliminate double-barreled items for the sake of clarity. It may be possible to pilot-test double-barreled items in a future study that also simultaneously tests the instrument for convergent and discriminant validity. If the double-barreled items empirically demonstrated theoretically-consistent relationships, then problems of interpretation would be reduced. The advantages of this option would be that it would not disregard expert suggestions and that double-barreled items would be available for use if preferred by clinicians or researchers. Without convergent or discriminant validity evidence, however, double-barreled items do not offer an acceptable amount of precision for measuring ambivalence.

The repeated warnings about the difficulties associated with interpreting negatively-worded items deserved attention. This issue was considered in the development of the initial item pool. Perhaps some participants would have been less concerned if they had been told about the procedure of negatively-weighting items in the Sustain Scale and summing them with the Change Scale to yield the Ambivalence Score. Still, a few participants mentioned that many alcohol-dependent clients have lower

cognitive functioning or decreased literacy skills. This combined with the stress of preparing for change or presenting for treatment could increase the likelihood of misinterpreting items when completing the questionnaire. The final version of the item pool will consider this issue and attempt to elicit motivation to sustain the status quo while also maintaining item clarity. Additionally, three of the eight participants who raised this concern also suggested the elimination of double-negatives. This will be an important first step to resolve this issue.

Two experts raised the specific concern that the nine-point Likert scale did not provide an accurate measure of ambivalence. They wondered if providing discrete options such as absolutely disagree = 1, disagree = 2, agree = 3, and absolutely agree = 4, would improve the instrument by measuring the level of ambivalence more precisely. An advantage of the 9-point Likert scale is that it allows for considerable variability, which is useful for quantitative analysis and other research purposes. It also may be more intuitive for the participant to endorse when the 9 options are only anchored at the ends and the middle, allowing for the participant to subjectively choose a level of agreement on a continuum. The argument for a 4-point Likert scale is that the scale is clearly labeled, discrete, and therefore more precise. This was a compelling suggestion. Perhaps asking problem drinkers what they thought would be most reflective of their experience would be best, or alternative versions of the instrument with either scaling option could be administered and their psychometric properties could be compared.

This question also yielded unique expert suggestions for improvement. One participant advised that actual clients be consulted to generate reasons for and against drinking. The most frequently cited reasons would then be the ones included in the

measure. This was also advised by Haynes and colleagues (1995), and will be considered for future research. In the current study, the last question of version 1.0 asks participants to list at least three reasons why they drink. The reasons in favor of drinking (Sustain scale) could be tallied for the sample in Experiment 1. However, this sample was small and specific to the portions of the undergraduate populations of the University of New Mexico and Central New Mexico Community College who were concerned about their drinking. An issue would be if the results from that analysis would generalize to other populations. If an additional item was included in the next version of the measure, such as “Please list at least three reasons why you want to change your drinking”, then this procedure could be attempted in the next round of data collection. There are instruments already in the literature that measure reasons to drink (Downey, Rosengren & Donovan, 2001; McBride, Curry, Stephens, Wells, Roffman & Hawkins, 1994). Reasons generated by problem drinkers themselves would come from the personal experience of ambivalence, rather than the theoretical perspective of a researcher. It would be interesting to assess the correspondence between the two.

A second interesting suggestion was related to items that may not apply to everyone, such as “I have had legal problems because of my drinking”. One participant suggested that a “does not apply” option should be added. If this suggestion is implemented, then the corresponding item in the opposite scale would also have to be dropped to preserve the integrity of the ambivalence score. This would make scoring of the instrument unnecessarily complicated. The intention behind the measurement structure of this instrument requires that if an item does not apply to a problem drinker, then she should mark “strongly disagree”, as the statement is not true for her. This

problem is common to many assessment instruments, but this issue could be avoided by adding to the instructions at the beginning of the instrument: “Some of these questions may ask about things that have not happened to you or do not apply to you. If that is the case, please mark: *strongly disagree*”. Alternatively, a simpler solution is to change the strongly disagree option to “strongly disagree/doesn’t apply to me”. Consideration of this revision was planned for version 3.0.

Question B3: Are there aspects of ambivalence that are not represented in the ambivalence measure, but should be? The purpose of this question was to ensure that the instrument contained items that covered the ‘full domain’ of ambivalence. Expert consultation about the thoroughness of items is an essential step for scale construction, and one that can only be evaluated rationally (DeVellis, 2003; Haynes et al., 1995). Sampling the full domain of ambivalence is an assumption of Classical Test Theory and is necessary for the interpretation of reliability as well. This question was answered by 50 participants. Answers were first evaluated by categorizing each response into the following discrete categories: yes, no, unsure, or no comment/other. Twenty-nine (58%) participants said yes, fourteen (28%) said no, four (8%) said that they were unsure, and three (6%) had no comment or gave answers that were not relevant to the question.

Fourteen participants (28%) gave responses that could be summarized as no. Most of the 14 *no* answers were confident, such as “No, I thought it was very comprehensive!” However, five of them were qualified by comments such as “None that I can think of”. The content of these five responses was such that it appeared as if these participants would have answered no if this question were asked in a forced-choice

manner. The qualification of these comments perhaps points to the vague definition of ambivalence itself, its idiosyncratic manifestation, or the lack of empirical work in this area. However, the majority of participants gave answers with at least one suggestion about a topic that also should be covered. In some cases, specific items were suggested, in others, only a vague description was listed.

Forty different suggestions were given by the participants whose suggestions were categorized as *yes*. Only four of them were mentioned by more than one participant. Most of the suggestions were useful and used to generate additional items for the next version of the instrument; however, a few were disregarded due to unfeasibility. For example, one participant said that the measure only asked about the pros of drinking of which the client was consciously aware. This was an interesting observation, but the ambivalence measure was designed to be a self-report instrument and as such is limited by its format, although it is difficult to conceive of a self-report questionnaire that measures unconscious motivations. Perhaps this suggestion was influenced by Freudian theory.

Another suggestion was to use double-barreled items. This suggestion was elicited by other survey questions as well. Although the inclusion of double-barreled questions was problematic for interpretation, perhaps they could be included in a different format. For instance, one participant suggested that a potential item could ask if the client had an experience of thinking that she should cut down but that she did not want to. Potential items could ask about the simultaneous coexistence of opposites while still presenting only one statement to endorse, thereby measuring the dualistic aspect of ambivalence without sacrificing clarity of interpretation.

Three different participants mentioned that the importance of the reasons for changing or not changing needed to be included and differentiated importance from agreement. For example, a problem drinker may strongly agree that his health is a reason to quit drinking, but his health may not be important to him and thus would not really motivate him to quit. These three participants used several different words or phrases to describe the same concept. Wording such as “matters to me”, “invested in”, “weight”, or “importance” were all good suggestions for potential new items.

The majority of the remaining suggestions fell into three categories: emotions (16), reasons (12), or self-efficacy (2). Two participants simply mentioned that emotion needed to be included more. Two different participants mentioned that the conflict associated with ambivalence needed to be included, and two others spoke of the discomfort associated with ambivalence. Other than these aspects of the emotional experience or expression of ambivalence, the remaining suggestions about possible emotions were as follows: confusion, uncertainty, doubt, feeling torn, stuck, vacillating, despair over the lack of ability to decide what to do or to stick with the decision, how “anxiously ambivalent” a client is, love or hate towards alcohol, intensity of suffering, the experience of mastery, being OK with where one is, feeling two ways, and the use of alcohol to emotionally cope with trauma or violence.

There were twelve unique suggestions of additional reasons to be included in the instrument. Health and legal pressures were suggested, however, these items were already in the item pool. The remaining suggestions were incorporated in the revised item pool and were as follows: ambivalence about readiness, commitment to change, or options and steps; economic or religious/spiritual conflicts; having the resources, social

support or community support to quit; the opinion of loved ones; one's identity as a drinker; and that one's relationships with others would improve with the cessation of problem drinking.

The only other suggestion common to more than one participant was the inclusion of self-efficacy. Participants had forty-four items to review, and sometimes they mentioned topics for inclusion that were already present in the measure. It was unclear whether this was an oversight on their part, if they felt that these items were not clear, or if they meant something slightly different than what was already present in the measure. However, the items already present that measure ability were, "I could quit drinking if I really wanted to" and "I'm not confident that I could quit drinking if I wanted to". However, the concept that the lack of self-efficacy to quit was a reason for ambivalence appeared in answers to other survey questions as well. Thus, it seemed important to either reword the self-efficacy items already in the item pool or to develop new ones to measure this concept. In sum, question B3 yielded many interesting and useful suggestions, and the majority of these suggestions were used to generate additional items for consideration in the measure.

Question B4: How do you think the ambivalence questionnaire would be useful to you in your practice? The purpose of this question was to attempt to bridge the research to practice gulf by incorporating the opinions of those practicing MI into the development of the instrument. If opinions by the participants were favorable towards the measure, it was hoped that the instrument could then be used for clinical as well as research purposes. This question was answered by 55 participants, and proposed many interesting uses for the developed instrument.

The analysis first began by categorizing answers into four types of responses (yes, no, not sure, and other), but the prevalence of comments about how instruments are useful for research but not for clinical practice necessitated a fifth category. The seven (12.7%) experts who suggested this were countered by 33 (60.0%) others who answered affirmatively to the measure being useful to them in their practice. Three (5.5%) experts gave comments that were characterized as *no* and nine (16.4%) as either *maybe or unsure*. Three (5.5%) responses were coded as *other* because they did not address the question.

An advantage of asking an open-ended question is the variety and detail of the answers. The 33 experts who said that the instrument would be useful to them in their practice also suggested between one and four distinct purposes for it. The specific frequency of suggested uses was: 17 experts suggested one purpose, 10 suggested two, 5 suggested three, and 1 suggested four. This resulted in 56 propositions.

These purposes were reviewed for themes. Each purpose was ultimately about specific elements of treatment and/or enhancing the potential for change. Nine descriptive codes were developed from the data to characterize proposed purposes in the words of those who suggested them. Sometimes the codes reflected only minor differences between concepts, but they retained more detail when kept separate.

The most commonly cited purpose for the instrument was to generally facilitate the practice of MI. These 10 purposes (17.9%) described how the instrument could be used to enhance a MI-consistent conversation about change. A related purpose was the 8 suggestions (14.3%) that it could be used to help the therapist facilitate change. Eight others (14.3%) were that the instrument could increase client awareness about their

drinking, and four (7.1%) specifically mentioned to increase awareness of the pros and cons of change. Five suggestions (8.9%) were to assist with screening, and four (7.1%) were to assist with treatment planning. Four other experts (7.1%) said that the instrument could be used to gauge a client's level of ambivalence, and six (10.7%) proposed that it could be used to measure client progress. Only seven other purposes (12.5%) did not fit into these 9 categories. This survey question yielded exciting propositions. Whether they come to fruition depends on many factors, not the least of which will be how well the instrument measures ambivalence once it has been thoroughly developed and tested.

Question B5: Which questions would you exclude from the ambivalence measure? Are there questions that you think need to be included in this measure?

These questions were asked to help determine the relevance of the item pool. Items mentioned by experts were candidates for inclusion or elimination from the measure. Expert consultation is explicitly recommended for this step in developing an instrument (Haynes et al., 1995). Each expert response was coded twice to separate answers given to either question. The development of codes was determined by the content of the answers, and a *comment does not address* category was added as some experts only responded to one of the questions, not both.

Forty-five participants answered B5. Responses were first coded to answer the first question, "Which questions would you exclude from the ambivalence measure?" Nine (20.0%) experts answered *yes* or *some*, ten (22.2%) said none, and six (13.3%) said that they were unsure. Seven (15.6%) suggested that the data should determine, depending on the results of item or factor analyses. There were three (6.7%) specific

suggestions of rephrasing, not eliminating particular items, and ten (22.2%) answers that did not address this question.

The majority answer to this question was to either say that no items should be excluded from the instrument, or to not address the question (and instead suggest possible additions or give general advice). It was encouraging that only 20% of the respondents had suggestions of what to exclude, as this was partial evidence that the items were generally not perceived as superfluous. The comments from the nine experts who suggested deletions were carefully reviewed because incorporating their suggestions was important for improving the instrument.

Many of the suggestions of what to exclude were general, and reflected concern about minimizing redundancy. Most were a result of the Change and Sustain scales asking about the same content, but from a Change or Sustain perspective. A specific example was the two items “I drink to deal with my stress” and “I don’t find myself drinking to relieve stress”. The content of these two items were the same; both refer to drinking to relieve stress. Experts were not told about the procedure of negatively weighting the Sustain items and summing them with the Change items. The decision was made that it would unnecessarily complicate the instructions for completing the survey and burden the participants. A similar suggestion was that there were too many items that reflected reasons to maintain the status quo. One expert warned that participants tend to get annoyed if you ask the same question too many times.

The content of particular items was also questioned. One participant said that the questions about family may irritate clients who have a lot of pressure from their families to change their drinking. A different concern was that some of the items were relevant

for American culture, but would not generalize for use in other countries. This was an important criticism. Given the complicated nature of ambivalence, it seemed best to first develop the instrument, and then adapt it for use in other countries. It may be that the questions that were associated with American culture may not appear in the final version; however, the expert did not mention specific items that reflected American culture. Another participant reiterated that the items with double-negatives should be removed, and two experts were specific about which items should be removed. Item 1, “No matter what happens, I know having a drink will make it all right” was suggested by two experts for elimination, but for different reasons. One expert said that it was “a bit over the top” and another said that it was too similar to its Change counter-part, item 20.

Another participant specifically mentioned that items 38 and 42 (see Appendix B) were too similar. These items were both part of the Sustain scale and reflect the impact problem drinking may have on a client’s goals or values. A different participant thought that there were too many items about goals/values/life. Item analyses on a future sample will determine which of these similar items will be included in the final version of the instrument.

A few experts suggested rewordings of items. Two specifically mentioned the item about legal problems due to drinking as not applying to everyone, and suggested that all items assessing external consequences of drinking be combined into one. Thus, a revised item could be “I have had problems with school/work/law because of my drinking”. Alternatively, instead of separate items asking about health or legal problems, one general item could be asked assessing all negative consequences of drinking combined. These suggestions will be tested in the next round of data collection.

Some expert suggestions were useful from a content or construct validity perspective, but were not useful from the perspective of developing an instrument. The suggestion about rewording the negative external consequences of drinking item was problematic. It required too high a reading level, and also assumed that each client would have the same concept of what “negative consequences” or “external consequences” meant. This potential item may not be measuring the same thing for everyone. Another problematic suggestion for rephrasing was to replace “Drinking is one of my favorite things to do” with “Drinking increases my degree of enjoyment in life.” This proposed item is more complex and too difficult to read for lower-functioning alcohol-dependent populations.

The experts answers were again coded to respond to the question “Are there questions that you think need to be included in this measure?” Thirteen (28.9%) participants said *yes*, nine (20.0%) said *none*, and six (13.3%) said that they were *unsure*. Four (8.9%) respondents said that it was an empirical question, two (4.4%) suggested rephrasing existing questions, and eleven (24.4%) comments did not address the second question.

Suggestions were generally useful, although incorporating a few would have introduced construct irrelevant variance into the measure. These suggestions were to evaluate physical dependence or to ask about how long the person has considered stopping drinking or about how many previous quit attempts. The latter two questions are sometimes used to assign a client’s Stage of Change, and suggest that some MI trainers view ambivalence as a *precontemplation* or *contemplation* stage experience, instead of one that may manifest across all of the Stages of Change. If ambivalence is a

possible reason for relapse, then it must also sometimes be present even in the *maintenance* Stage of Change.

Another suggestion was to include more items about familial and cultural values, exactly the opposite from the two experts that suggested eliminating these types of items. This situation highlighted the difficulty of integrating some of the contradictory expert suggestions, and that not all expert advice could or should have been adhered to. Responsibility for incorporating experts suggestions or not was ultimately left to the test developers.

Several excellent suggestions were considered for inclusion in version 3.0 of the instrument. These were: "My relationships would improve if I quit drinking", "I don't like feeling controlled by my drinking", "I spend more money on alcohol than I feel comfortable with", and "I spend too much time drinking". Another suggestion was "Please list three things that would be different if you did not drink" as an open-ended question at the end of the instrument. Inclusion of this item would give useful information to a clinician, and also would complement the existing question "Please list at least three reasons why you drink". Answers to this new item would elicit genuine reasons for change from clients. This may provide content validity evidence in the future by allowing for an assessment of the correspondence between the Change and Sustain items on the instrument and those given by problem drinkers to be made. A third participant suggested "I see no reason to quit drinking". This item and a few like it could possibly be reverse coded and added as a validity check to the new scale measuring the emotional experience of ambivalence.

Three different experts suggested that there should be items about the emotional experience of ambivalence. Specific recommendations were to include items about uncertainty, inner conflict, feeling two ways, struggling, or feeling uncomfortable, annoyed, or confused about why the client continues to drink. Similar suggestions were made throughout the survey, and were another reason to develop a scale to measure the emotional experience of ambivalence.

Question B6: Is this ambivalence questionnaire too long? If so, approximately how many questions would be the ideal length? Fifty-seven participants answered this survey question. For the first question, “Is this ambivalence questionnaire too long?” 35 participants (61.4%) answered yes, ten (17.5%) said no, and three (5.3%) said maybe or that they did not know. An additional four participants (7.0%) said that this question should be answered empirically; two (3.5%) mentioned that the instrument was redundant, and three (5.3%) gave responses that were coded as ‘other’, as they could not be placed in one of the above categories.

Of those who said that the instrument was too long, 34 participants gave the amount of items that would be the ideal length. If a participant suggested a range of acceptable numbers of items instead of a specific amount, then the average of the range was recorded as that participant’s response. Answers ranged from 11 to 34. The average ideal number of items given by the participants was approximately 22.

However, a few participants gave two different amounts, one each for clinical or research purposes. Generally, shorter measures were preferred for clinical use. A few others mentioned that different amounts of items were acceptable for different populations. It was suggested that populations with many cognitively-impaired, highly-

distressed, comorbid, or otherwise low-functioning members should be given shorter instruments. The actual number of items in version 3.0 of the instrument will be determined by item analyses from the next wave of data collection, but ideally would correspond to the results of this analysis: somewhere in the range of 11 to 34, optimally around the mean of 22.

Question B7: Please list any additional comments you would like to make.

Twenty-nine participants answered this question. The purpose of this question was to give participants an opportunity to offer any other insight about ambivalence that was not elicited by any of the previous questions. To this end, nine participants (31.0%) gave comments that were related to ambivalence or the instrument's development. An additional 13 participants (44.8%) gave encouraging or positive comments about the measure or its development, and seven (24.1%) gave comments that were unrelated to ambivalence and did not fit into the previous two categories.

The nine comments about ambivalence were insightful to varying degrees. One simply asked "What do you see this being used for?" whereas another participant said that they would be interested in the construct validation plans for this instrument. On the surface these comments were not particularly insightful, but they did raise two important questions for this instrument's next phase of development. First, the measurement of ambivalence is partially dictated by the purpose of the instrument. A quantitative instrument is most useful for research, but the results of this study suggest that a measure containing all open-ended questions would be acceptable or useful for clinical purposes. Second, part of the construct validation plans for this instrument have been fulfilled by the current study, as expert consultation about the content validity of an instrument is an

important part of construct validity evidence (DeVellis, 2003; Haynes et al., 1995).

Testing for convergent and discriminant validity is planned for the next study. An ideal study would be to assess construct validity through a multi-trait, multi-method matrix, which may be possible in the future.

Two other participants raised an important point: ambivalence levels may change as a function of answering the questionnaire. This may not be a consideration for a short 10-15 item measure, but may be relevant for a longer version. It is interesting to consider the study design that would be required to test this question, and it may never be possible to answer for certain because of the fluctuating nature of ambivalence. A related issue is whether or not levels of ambivalence fluctuate throughout the day, week, month, stage of change, or entire change process. Before this can be investigated, however, a reliable and valid measure of ambivalence must first be developed and tested on diverse samples.

One participant made the distinction between pre-ambivalence and resolved ambivalence. In the Stages of Change model, pre-ambivalence would be the ambivalence that surfaces in the contemplation stage, and resolved ambivalence is ambivalence that manifests in the preparation and action stages. This is an important distinction. Discussions about ambivalence towards ending problem drinking are often held in the context of treatment. Motivational interviewing was originally designed to motivate people to change in the context of formal treatment, often conceptualized within the Stages of Change model (Miller & Rollnick, 2002). Future research should investigate if ambivalence is different if it manifests before or after expression of a solid intention to change drinking behavior.

Discussion

MI trainers were consulted about the construct *ambivalence about reducing problem drinking* and asked to review version 2.0 of the instrument. Several insights were offered which resulted in a deeper understanding of the construct to be measured, and which resulted in several improvements being made to the measure. The most significant improvements were adding new items to measure the affective component of ambivalence and other aspects of ambivalence not represented in the second version of the measure, and reducing the scale of the instrument from 1 to 9 to 1 to 7.

Experts were first questioned about their definition of ambivalence. These definitions were analyzed to assess their similarity with the definition used to develop version 1.0 of the instrument. There was a general correspondence between the original definition and those given by experts; however, some expert views added new information to the definition, which led to a revised definition based on expert advice. The second survey question investigated if participants thought that ambivalence was uni- or multi-dimensional, and what they thought the dimensions of ambivalence would be. The majority of experts did not give similar answers about the specific dimensions of ambivalence, although a few common themes appeared. The most common suggestion was that ambivalence should have two subscales: pro and con, providing evidence for the validity of the structure of the instrument. A question about the cognitive or emotional nature of ambivalence was asked next. Among other insights, 90% of the experts felt that ambivalence was both cognitive and emotional. Results from the first three questions led to a major revision of the instrument: the addition of a new set of scales to measure the emotional experience of ambivalence.

This instrument is being developed to provide a measure for testing whether a reduction in ambivalence is associated with successful changes in drinking. The next survey question asked experts whether they thought it was the amount or simply the presence of ambivalence that was important. Their perspectives were evaluated in relation to the hypothesis above. A small majority said that it was the amount that was important, and generally described how the right amount of ambivalence, and its resolution, propels people to change. Less than a quarter of respondents felt that only the presence of ambivalence was important. Hopefully empirical evidence will be available to resolve this debate once the instrument is fully developed.

Experts were next asked to name concepts that they thought were often confused with ambivalence. These data provided insight into which constructs the ambivalence instrument would need to be differentiated from. Resistance and denial were the most commonly-cited similar constructs to ambivalence. They represent the reframing of a psychodynamic perspective into one more characteristic of MI, and were not a challenge to the validity of the ambivalence instrument. The suggested constructs of readiness to change, motivation, and the pre-contemplation or contemplation Stage of Change, were more difficult to differentiate from ambivalence. An enduring challenge from the results of this study was the question of how to separate the measurement of motivation from ambivalence, or if that is even possible. Tests of convergent or discriminant validity are planned to resolve this question, and are described in the General Discussion section.

Participants were then shown version 2.0 of the measure (see Appendix B) and asked a series of questions to evaluate their perspective of the instrument. The first set of questions asked about how well the experts thought version 2.0 measured ambivalence,

and if it would be helpful to them. The analysis of this question was difficult because each participant did not address every question, likely a function of how questions were asked. Expert opinions were generally favorable towards the measure (68%), and most criticisms were also mixed with positive comments or scholarly inquiry. Most criticisms were also constructive, and increased support for the creation of a third scale to measure the emotional experience of ambivalence.

Suggestions to improve the measure were also collected. The majority of advice was to shorten the instrument, revise negatively-worded items, change scaling options, or add specific items. Advice to both shorten the instrument and include more items was contradictory. Contradictory advice was given throughout the study, and sometimes by the same participant, but in relation to different questions. In fact, almost every suggestion was countered by its opposite. Every proposed improvement was considered, but tempered by what was realistically possible or rational. For example, there were numerous suggestions to change items, but often the proposed items were more complicated and required too high of a reading level to be incorporated. Many suggestions from the experts were used to improve the measure, such as consideration of a *does not apply to me* scale option and the elimination of double-negatives from the items.

Experts were then asked if there were any aspects of ambivalence that were not present in the instrument. Slightly more than half (58%) said yes, and results were analyzed for which aspects were missing. Each suggestion was considered and evaluated for plausibility. The majority of useful suggestions were related to emotions experienced with ambivalence, reasons for ambivalence already not included in the measure, and self-

efficacy. The inclusion of more items that measure emotions was already planned, but suggested reasons and self-efficacy, as they relate to ambivalence, were included in the third version of the item pool. Participants next described how the instrument would be useful to them in their practice. A minority of participants (13%) said that they did not find instruments useful for clinical practice, but the majority (60%) suggested many purposes for the instrument, usually related to treatment, facilitating the practice of MI, and enhancing the probability of change.

Participants were next asked about which items should be included or eliminated from the measure. Only 20% suggested any deletions from the instrument, and suggested eliminations were not due to any major aspect of ambivalence being unnecessarily represented in the instrument. Most suggestions were about reducing the redundancy of the measure, or about specific items that may be problematic. The elimination of items is planned in the next phase of development, based on the results of item and factor analyses. Consideration of specific expert suggestions will be taken into account at that time. It is likely that items suggested as problematic by experts will also empirically not perform as well as their more straight-forward counterparts, thus eliminating this issue. If quantitative results based on a large, representative sample are indeterminate, then rational consideration of expert comments will hopefully clarify the decision of which items to eliminate.

Suggestions of which items to add to the instrument were varied. As noted, the only major aspect of ambivalence that had been systematically neglected was the emotional experience of ambivalence. Specific recommendations were to include items about uncertainty, inner conflict, and feeling two ways. Other recommendations were to

include more details about specific reasons to change and advice that was consistent with measuring ambivalence from a Stages of Change perspective.

Concerns about the length of the measure surfaced throughout the results of this study. This concern was partially unnecessary as it is common in instrument development to begin with a large pool of items, and decide which ones to eliminate based on quantitative results. Although this instrument was pilot-tested in Experiment 1, results were inconclusive because of the small sample size. Experts were specifically asked if they thought the measure was too long, and about how many items would be the ideal length. This survey question gave them the opportunity to directly respond to this issue. Sixty-one percent of participants said that the measure was too long, but 17.5% said that 42 items was not too many. The mean ideal number of items suggested was 22. Some experts suggested two ideal amounts, a smaller one for clinical use, and a longer version for research purposes. Future studies will investigate whether two different versions of the instrument would be ideal.

Several limitations to this study should be noted. First, qualitative analysis is necessarily biased by the subjectivity of the researcher (Boyatzis, 1998), and this problem was compounded by only one person analyzing the data. Thus, there were many possible approaches to data interpretation, and no estimate of reliability could be made. However, each survey question was asked to elicit information useful for a specific psychometric purpose, and the interpretation of the data used this same approach. Although searching for themes and categorizing data is a subjective process, data were used to answer questions specific to scale development. Many of the categories were *yes*, *no*, or *maybe*. There would have been some variability in assignment of categories had more than one

rater been used; however, categories of *yes* or *no* are more easy to discern than abstract categories generated from the data, such as discerning between uncertainty and indecision. Furthermore, categorization was completed in hopes of incorporating a possible second rater at a future date, thus decisions were made to be as replicable as possible.

Members of the MINT listserv were an excellent choice for this sample. They were certified to train others in the practice of MI and had an average of 11 years experience with MI. No higher authority on MI practice existed except for the developers of the therapy. Missing data were present for about 30% of participants. This was likely due to the survey method, but quantitative analyses were conducted to explore the similarity between the included and excluded participants. Results indicated that those who contributed data to the study were a representative proportion of those who expressed initial interest in the study, except that the contributors were a more educated segment of the MINT listserv population. This may have been a strength, as it may have enhanced the thoughtfulness and quality of expert suggestions.

Expert consultation is recommended for every instrument development project, but is rarely done (Haynes et al., 1995). When expert consultation is used, it often is done informally and with like-minded colleagues as participants. This study strengthened the instrument by systematically canvassing 70 diverse but related experts. Seventy is a large number of experts to be consulted for content validation (Haynes et al., 1995), and the amount and diversity of experts aided in sampling the whole domain of the construct. Several improvements would not have been made to the instrument had this study not been conducted. Constructive criticisms suggested how version 1.0 of the instrument

would have been received, and provided a mini peer-review of the instrument, allowing for changes to be made before refining it with a larger sample of problem drinkers.

Summary and Concluding Discussion

The two experiments described in this thesis represent a Mixed Methods (MM) approach to instrument development. Exploring both qualitative and quantitative methods to aid in the development of an instrument may result in an improved conceptualization of the construct being measured, and may provide evidence that the proposed items have construct validity (Clark, Creswell, Green, & Shope, 2008). The exploratory MM design for instrument development advocated by Clark and colleagues (2008) proposed that the aim of the qualitative study should be to describe the dimensions of the central phenomenon to be measured, and the quantitative experiment should investigate the prevalence of those stated dimensions. This approach has been used to develop instruments for constructs that are ambiguous yet relevant for investigating a particular research question, such as measuring “perceived mattering” in adolescent romantic relationships (Mak & Marshall, 2004). The Mixed Methods approach described in this thesis provided useful data to improve the quality and precision of the measure, particularly with regards to its construct validity.

Ambivalence has been conceptualized in the larger social psychological literature as approach-avoidance motivation (Elliot, 2008). Ambivalence about reducing problem drinking, however, is an important construct for the treatment of problem drinking that lacks an instrument specifically designed to measure it. Ambivalence is typical of people presenting for treatment for alcohol use disorders (Carroll, 2003; Keller, 2003). The experience of ambivalence is normalized from the perspective of the Transtheoretical

Model and MI, and is considered characteristic of the contemplation stage (Arkowitz & Miller, 2008). Its potential for contributing to the knowledge of how people change is yet untapped, and its measurement could theoretically improve treatment rates.

Two studies were conducted to aid in the development of a quantitative, self-report measure of ambivalence about reducing drinking. The first experiment pilot-tested the initial version of the instrument. Two alternative methods for measuring ambivalence were tested, and the method of calculating difference scores based on opposing Change and Sustain items was more interpretable. Experiment 1 also explored item characteristics, and the reliability and type of dimensions of the instrument. Results were inconclusive due to the small sample size, but promising evidence of convergent validity was found. Ambivalent clients are theoretically expected to offer approximately equal numbers of Change and Sustain talk. The correlation between the ambivalence score and the actual number of Change minus Sustain talk statements spoken by clients during therapy was $r = .41, p < .01$. The strong relationship between a paper-and-pencil measure and actual verbal behavior was encouraging.

A weakness of Experiment 1 was that all results await replication with a larger sample more representative of the clinical population of adults who do not attend college. An alternative explanation for the conclusions drawn from this study was that the sample was too specific to generalize from college students concerned about their drinking to the larger clinical population of adults of varied ages and life experiences. Additionally, the results of this study were based on unstable population estimates due to the minimal sample size. However, Experiment 1 was planned as a preliminary study to investigate

how to best measure an elusive construct, and as such provided much useful information to inform the next phase of instrument development.

Experiment 1 empirically tested the instrument, and would have provided conclusive results had the sample been larger. An attempt to publish the results may have been possible once it had been administered to a larger sample, but also may not have yielded the most precise measure of ambivalence. The construction of an instrument to measure an ambiguous construct such as ambivalence is not purely an empirical process. A rational analysis of the measure was also necessary. Both the development of items and the interpretation of factor solutions required expert judgment, and Experiment 2 was conducted to fulfill these purposes. It was also conducted to aid in the determination of the content and construct validity of the instrument. Given the ambiguity and controversy about ambivalence, it was unknown if there was even a consensus among experts about ambivalence.

Experiment 2 explored expert perspectives about ambivalence and analyzed expert evaluation of the second version of the instrument. The construct validity of the measure was improved by the addition of items to measure the emotional experience of ambivalence, among other suggestions. A strength of the study was that 70 experts contributed to the understanding of the construct of ambivalence. The Motivational Interviewing Network of Trainers is a recognized authority for the training of MI therapists. The sample was also representative of those experts in that approximately ten percent of all those on the MINT listserv participated in the study. Concerns arose about whether qualitative results were generalizable to the whole MINT listserv due to 30% of experts not answering the substantive portions of the survey. Quantitative analyses

conducted on the demographic characteristics of included and excluded participants revealed that there were no significant differences between groups except that included experts were more likely to hold Master, PhD, or MD degrees. This may not have been a limitation, but an advantage, if more educated experts provided more thoughtful or accurate suggestions.

Qualitative researchers are advised to continue data collection until data reach a ‘saturation point’, when the addition of more participants results in no new information being collected (Corbin & Strauss, 2008). Experiment 2 recruited participants in a manner more similar to the recruitment practices of quantitative studies using convenience samples. No saturation point was determined, instead all those willing to participate were included in the analysis of results, thus increasing generalizability to the whole MINT listserv.

A major limitation of this study was one inherent in all qualitative research, that it is necessarily subjective (Boyatzis, 1998). Subjectivity may increase the likelihood that findings may vary if the study were replicated. This was more of a concern for survey questions that were categorized into codes developed inductively, than for survey questions that were best answered by *yes*, *no*, or *maybe* categories. Reliability was also threatened by the use of only one qualitative analyst. The reliability of the results of Experiment 2 could be determined by including a second or third coder in the study and performing reliability analyses on the results.

Qualitative analysis is necessarily subjective, but an in depth analysis of a construct and its measurement is rarely done with the amount of detail considered in this study. Expert answers were often insightful, and more detail was given than could be

reported. Data will be available; however, for review throughout the next phase of development. This study also contributed to the literature by systematically surveying experts about the definition, components, and manifestation of ambivalence, and the instrument was greatly improved by their suggestions.

Some expert suggestions also provided insight into controversies about ambivalence within the addiction field and provided inspiration about how they could be empirically resolved. For example, an interesting difference in the conceptualization of ambivalence is between those who limit ambivalence to the contemplation stage, and those who perceive ambivalence to be a dynamic, changing force that is observed throughout the change process. If the presence of ambivalence is partially responsible for relapse, then ambivalence is relevant for everyone in recovery, as anyone has at least a remote possibility of relapse. In this way, unresolved ambivalence may be an issue for those in the action and maintenance stages as well.

An empirical resolution of this debate could be determined by first developing a psychometrically sound measure of ambivalence about reducing problem drinking. Once evidence of the reliability and validity of the final version of the instrument has been provided, then the instrument could be used to answer these important and interesting questions about the persistence of ambivalence across time. It also could be used to improve treatment rates if it is demonstrated that there is a relationship between higher levels of ambivalence and risk for relapse, and if empirically-supported treatments were individually-tailored for clients with varying levels of readiness for change. Finally, multi-method modeling could be used to determine the trajectory of ambivalence across time and assess its relationship to substance use and other relevant constructs. Many

participants in Experiment 2 suggested that ambivalence was a fluctuating construct, and that levels of ambivalence were expected to change with the resolution of problem drinking. These assertions correspond with the Stages of Change and decisional balance literature about how the movement from more cons of change to benefits of change is responsible for the progression into the maintenance stage of change (Prochaska, Velicer, Rossi, Goldstein, Marcus, Rakowski et al., 1994).

The next phase of instrument development is to administer the third version of the measure to a large, representative sample of problem drinkers. Several analyses will then be conducted. First, a confirmatory factor analysis (CFA) will be performed to assess replication of the results of the exploratory factor analysis. Items with no or low factor loadings will be eliminated from the measure, and estimates of the reliability of each factor will be assessed. Items with low inter-item and item-scale correlations will also be removed from the instrument. The results of the CFA and item analyses will be compared to assess convergence between these two methods of determining the elimination of items.

A second important aspect of the next phase of instrument development is the assessment of convergent and discriminant validity. Experiment 2 also revealed likely criticisms of the instrument, and an important one was the question of what the ambivalence measure adds to the field beyond the measures of motivation that already exist. One expert mentioned a three-item measure of motivation for change developed by Bill Miller. It is likely that he or she was referring to a natural language screening measure for motivation to change (Miller & Johnson, 2008). This three-item instrument has high reliability and was developed on large, representative samples. It also had high

ceiling effects, with 43% of participants scoring at the extreme end of the scale. It was developed to be a brief screening for clinicians to measure motivation for change, and does not include the detail assessed by the ambivalence measure. It is likely that the ambivalence instrument has some shared variance with the natural language screening instrument, but hopefully also measures other relevant characteristics of the construct beyond what the Miller instrument was originally designed to do. However, this assertion will be tested empirically by administering it concurrently with the ambivalence instrument.

A few experts suggested that the instrument be expanded to cover other target behaviors besides problem drinking. This suggestion will be considered for future research once the instrument has been validated as measure of ambivalence about reducing alcohol use.

Other instruments measuring constructs similar to ambivalence will also be administered in the next study. Correspondence between the ambivalence measure and the SOCRATES, and between the ambivalence measure and the Reasons for Quitting Questionnaire will be assessed (Downey et al., 2001; Miller & Tonigan, 1996). The Alcohol and Drugs Consequences Questionnaire (ADCQ; Cunningham, Sobell, Gavin, Sobell, & Breslin, 1997) measures the perceived costs and benefits of changing alcohol use, and all four of the previously-mentioned instruments will be used to assess convergent and discriminant validity.

It would be useful to administer the ambivalence measure in a study that also measures Change and Sustain talk elicited during therapy to replicate the correlation between the ambivalence score and individual measures of Change minus Sustain talk.

An additional study design would be to administer the ambivalence measure at multiple time points to prospectively assess if the reduction of ambivalence predicts successful change efforts. There are many possibilities for future research that would both confirm the validity of the proposed instrument for measuring ambivalence as well as investigate important research questions about how people make a change in their problematic alcohol use.

Figure 1. Ambivalence score and Change minus Sustain talk ($r = 0.41, p < .01$)

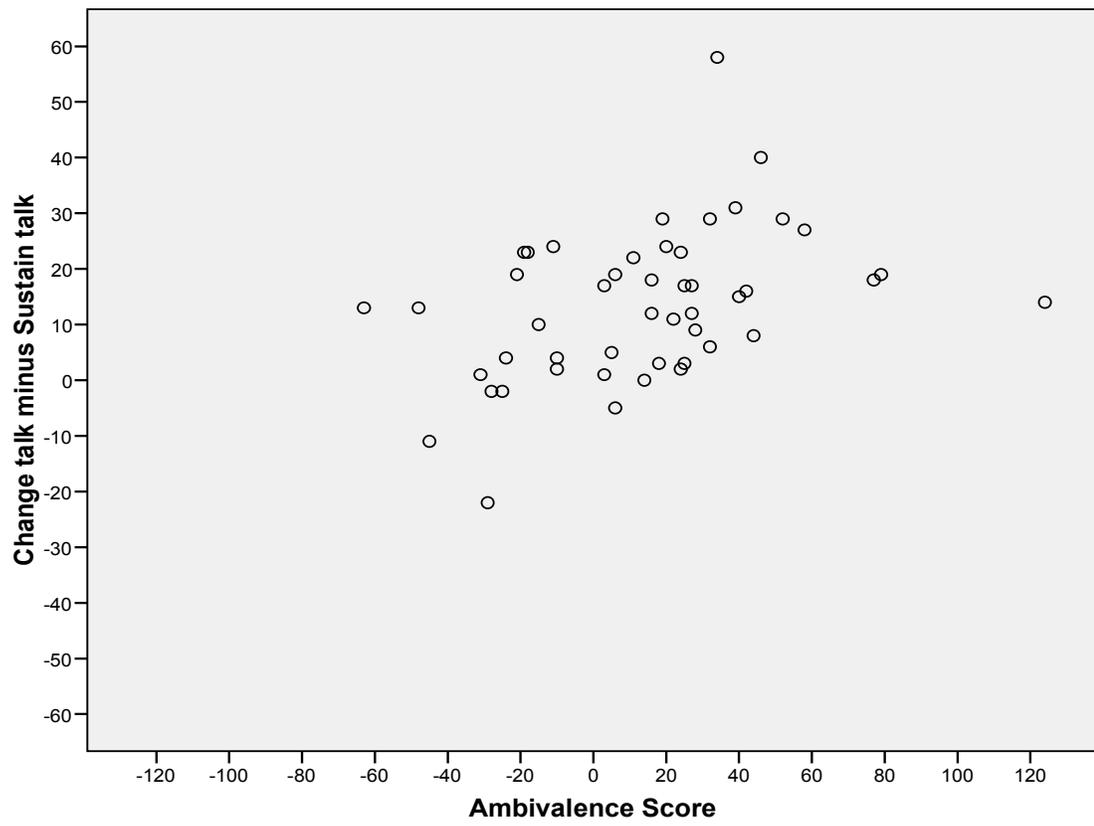


Table 1. Participant Characteristics ($N = 51$)

<i>Variables</i>	<i>Frequency (%)</i>
Female	22 (43.1%)
<i>Ethnicity</i>	
Hispanic	26 (51.0%)
White, non-Hispanic	18 (35.3%)
American Indian	4 (7.8%)
African-American	2 (3.9%)
Asian	1 (2.0%)
<i>Variables</i>	<i>Mean (SD)</i>
Age	23.61 (7.00)
Age of first drink	15.86 (2.03)
Standard drinks per week	25.41 (23.16)
Estimated typical BAC	0.162 (0.124)
Estimated highest BAC	0.249 (0.131)
Change talk minus sustain talk	13.50 (13.59)
How important is changing?	5.75 (3.00)
How confident you could change?	7.92 (2.13)

Note: The last two variables were measured on a Likert scale of 1-10, with 1 indicating not at all important or confident and 10 indicating very important or confident.

Table 2. Participant Scores from the Ambivalence instrument ($N = 51$)

<i>Description</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean (SD)</i>
<i>Total Scores</i>			
Double-barreled Ambivalence	6	44	28.16 (11.49)
Change/Sustain Ambivalence	-63	124	13.32 (34.69)
Absolute Change/Sustain	3	124	29.59 (22.25)
Change Scale	78	168	109.12 (16.96)
Sustain Scale	-141	-44	-95.80 (20.82)
<i>Ambivalence categories</i>			
<i>Difference scores</i>			
Coping	-16	24	5.64 (10.53)
Drink to feel better	-8	8	0.62 (4.37)
Manage stress	-8	8	0.69 (5.01)
Solution to problems	-4	8	4.36 (3.40)
Desire	-8	6	-1.73 (3.97)
Emotions	-14	24	12.04 (9.82)
Happiness	-6	8	3.64 (4.00)
Drink to deal with life	-5	8	4.84 (3.88)

Change scary/imaginable	-4	8	3.27 (3.71)
Goal Orientation	-16	16	-5.02 (10.44)
Ideal life	-8	8	-1.80 (5.67)
Getting ahead	-8	8	-3.22 (5.11)
Health problems	-8	8	-0.14 (4.44)
Legal problems	-8	8	-1.86 (5.76)
Leisure	-13	16	1.48 (7.19)
Relaxation	-8	8	-0.86 (4.22)
Fun	-8	8	2.14 (4.29)
Social relationships	-17	24	.86 (8.57)
Friends	-4	8	3.02 (3.91)
Family	-8	8	-1.32 (5.06)
Alcohol social lubricant	-8	8	-0.86 (4.74)
Personal responsibility	-8	8	1.43 (5.26)
Problem recognition	-16	16	-0.22 (9.89)
Having drinking problem	-8	8	-0.59 (5.13)
Drunken mistakes	-8	8	0.37 (5.34)
Self-concept	-8	8	-1.29 (4.60)

Self-efficacy for change	-8	8	2.71 (4.55)
---------------------------------	----	---	-------------

Note: The Absolute Change/Sustain score was computed by taking the absolute value of the Change/Sustain Ambivalence score.

Table 3. Factor loadings, communalities (h^2), and percents of variances

<i>Item</i>	<i>Item #s</i>	F_1^a	F_2	F_3	h^2
<i>Cognitive factor items</i>					
Ideal life	18, 25	.90			.92
Getting ahead	35, 13	.89			.84
Having drinking problem	2, 24	.80	-.42		.82
Family	34, 33	.69			.54
Self-concept	48, 3	.68			.47
Drunken mistakes	11, 16	.66	-.46		.66
Personal responsibility	8, 47	.57			.47
Self-efficacy to change	45, 43	-.50	.48		.48
Legal problems	36, 22	.48		.33	.36
Health problems	28, 21	.43	.34		.32
<i>Emotion factor items</i>					
Deal with life	20, 38		.77		.52
Fun	23, 10	-.44	.67		.69
Change scary,	49, 12	-.35	.65		.55

imaginable				
Happiness	31, 40		.64	.51
Drink to feel better	27, 32	-.33	.63	.52
Relaxation	26, 7	-.35	.57	.45
Desire	46, 9		.56	.40
Friends	14, 39		.52	.30
Manage stress	6, 1	-.45	.49	.46
Solution to problems	30, 42		.46	.30
Alcohol social lubricant	41, 29		.39	.36
<i>Double-barreled items</i>				
Desire for but no change	19		.95	.98
Unknown why no change	44		.83	.71
Change impossible	15		.61	.42
Don't want to stop	5	.33	.54	.46
Feeling happy and bad	37		.42	.48
Unstable need to change	17		.35	.13
Percent of variance		20.94%	19.03%	12.39%

^aFactor labels: F_1 = Cognitive, F_2 = Emotional, F_3 = Double-barreled items

Table 4. Scale Inter-correlations.

<i>Scale</i>	<i>Double-barreled</i>	<i>Change</i>	<i>Sustain</i>	<i>Ambivalence</i>
Double-barreled items scale	1			
Change scale ^a	0.187	1		
Sustain scale ^b	-0.041	0.683***	1	
Ambivalence (change/sustain)	0.067	0.899***	0.934***	1

*** $p < .001$

^aChange scores ranged from 78 to 168 with higher scores indicating more motivation to change

^bSustain scores ranged from -144 to -44 with higher scores (that is, scores lower in absolute value) indicating less motivation to sustain

Table 5. Demographic Characteristics of Included Participants in Experiment 2 ($N = 70$)

	<i>Frequency</i>	<i>Percent</i>
Gender		
Male	39	55.7
Female	31	44.3
Profession		
Psychologist	18	25.7
Therapist/Counselor	12	17.1
Social Work	10	14.3
Professor	8	11.4
Corrections	6	8.6
MD/Psychiatrist	6	8.6
Nursing	3	4.3
Consultant	2	2.9
Other	5	7.1
White, non-Hispanic		
Yes	65	92.9
No	5	7.1

Education		
PhD/MD	40	57.1
Master's	27	38.6
Bachelor's	2	2.9
Other	1	1.4

Table 6. Educational Level of Included and Excluded Participants

<i>Educational Level</i>	<i>Included group</i> (<i>n</i> = 70)	<i>Excluded group</i> (<i>n</i> = 30)	Total (<i>N</i> = 100)
PhD/MD	40 (57.1%)	10 (33.3%)	50 (50.0%)
MA/MS	27 (38.6%)	14 (46.7%)	41 (41.0%)
BA/BS	2 (2.9%)	3 (10.0%)	5 (5.0%)
Other	1 (1.4%)	3 (10.0%)	4 (4.0%)

LIST OF APPENDICES

<i>Appendix A.</i> Ambivalence Measure version 1.0	115
<i>Appendix B.</i> Measuring Ambivalence Survey	122
<i>Appendix C</i> Measuring Ambivalence Survey	130

Appendix A: AMBIVALENCE MEASURE 1.0

Thank you in advance for taking the time to complete this questionnaire. Please answer the following questions as carefully and honestly as possible. Space will be provided at the end of the questionnaire for any feedback you may have.

Circle the number that best matches how much you agree with the following statements. Mark how true each statement is for you on a scale of 1 to 9, with 1 indicating absolute disagreement, and 9 indicating absolute agreement.

1. I drink to deal with my stress.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

2. My drinking is a problem.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

3. My drinking doesn't keep me from being the person I want to be.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

4. I'm really sure that I should quit drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

5. I know that I drink too much, but I just don't want to stop.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

6. I don't find myself drinking to relieve my stress.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

7. Drinking alcohol is one of my favorite ways to relax.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

17. Sometimes I think that I should cut down on my drinking, but other times I think that I don't need to.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

18. I'll never have the kind of life that I want if I continue to drink.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

19. I always say that I want to change my drinking, but then I just do things as I've always done.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

20. I feel confident I could manage my life without drinking.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

21. My health is not a reason for me to quit or cut down.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

22. Drinking hasn't gotten me into any trouble with the law.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

23. My life would still be fun if I didn't drink.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

24. I don't really have a problem with alcohol.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

25. Drinking doesn't keep me from accomplishing what I want in life.

1	2	3	4	5	6	7	8	9
Absolutely Disagree				Half Agree				Absolutely Agree

35. The main thing that is holding me back in life is continuing to drink.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

36. I have legal problems because of my drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

37. Sometimes drinking makes me feel really happy, and other times drinking makes me feel really bad.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

38. I don't feel that I have the strength to deal with my life right now if I quit drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

39. If I didn't drink, I wouldn't be able to socialize with most of my friends.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

40. I don't know if I'd be happy if I quit drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

41. I don't use alcohol as a way to feel more comfortable around people.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

42. No matter what happens, I know that having a drink will make it all right.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

43. I'm not confident that I could quit drinking if I wanted to.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

Additional comments:

Appendix B: Measuring Ambivalence Survey

Thank you in advance for your time and expertise. Your answers will help inform the development of a questionnaire to measure ambivalence. Completing and submitting this questionnaire serves as consent to participate in this research.

Personal Information

Years experience with motivational interviewing:

Profession:

Gender:

Ethnicity:

Education:

Part I: Your thoughts about Ambivalence

1. How do you define ambivalence?
2. Do you think that the ambivalence measure should have subscales, and if so, what should the subscales be?
3. Do you believe that ambivalence is cognitive, emotional, or both? Or do you think that it doesn't matter? Please explain.
4. Does it matter if a client presents with a little or a lot of ambivalence? That is, is the amount of ambivalence important, or is it simply the presence of ambivalence that is important?
5. Are there other concepts that you think are often confused with ambivalence, but are different from ambivalence? Please explain.

Part II: Your thoughts about this attempt to measure Ambivalence

We would like your opinion about the following questionnaire that has been designed to measure ambivalence towards ending problem drinking. It is called the Change, Ambivalence, and Sustain Experiences Scale (CASES). Please read this attempt to measure ambivalence, and answer the questions listed at the end of the questionnaire.

Change, Ambivalence, and Sustain Experiences Scale (CASES)

Directions: Thank you in advance for taking the time to complete this questionnaire. Please answer the following questions as carefully and honestly as possible. Space will be provided at the end of the questionnaire for any feedback you may have.

Circle the number that best matches how much you agree with the following statements. Mark how true each statement is for you on a scale of 1 to 9, with 1 indicating absolute disagreement, and 9 indicating absolute agreement.

1. No matter what happens, I know that having a drink will make it all right.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

2. I can't imagine my life without drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

3. Life wouldn't be as much fun if I didn't drink.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

4. I feel confident I could manage my life without drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

5. I'd be more shy and awkward around people if I didn't drink.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

6. I can see myself being happy without alcohol.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

7. My drinking has not brought disappointment to myself or others.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

8. I don't find myself drinking to relieve my stress.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely

Disagree

Agree

9. I want to change my drinking because it doesn't fit with who I really am.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

10. I could quit drinking if I really wanted to.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

11. My family is upset about my drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

12. I drink to deal with my stress.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

13. Drinking hasn't gotten me into any trouble with the law.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

14. My drinking is a problem.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

15. I don't use drinking as a way to make myself feel better.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

16. My health is not a reason for me to quit or cut down.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely
Disagree								Agree

17. I don't really like drinking.

1	2	3	4	5	6	7	8	9
Absolutely				Half Agree				Absolutely

Disagree Agree

18. Drinking alcohol is one of my favorite ways to relax.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

19. I have legal problems because of my drinking.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

20. Whenever I feel bad, I know that drinking will make me feel better.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

21. I need to cut down or quit drinking because it is hurting my health.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

22. If I didn't drink, I wouldn't be able to socialize with most of my friends.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

23. Not having the option of drinking alcohol scares me.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

24. I can imagine a new life without alcohol.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

25. I don't usually do things that I regret when I'm drunk.

1 2 3 4 5 6 7 8 9
Absolutely Disagree Half Agree Absolutely Agree

26. Alcohol doesn't calm me down that much.

1 2 3 4 5 6 7 8 9

Disagree

Agree

Please list at least three reasons why you drink:

1. _____

2. _____

3. _____

4. _____

5. _____

Part II: Your thoughts about this attempt to measure Ambivalence (Continued)

We would like your opinion about this questionnaire that has been designed to measure ambivalence towards ending problem drinking.

1. What do you think about the ambivalence measure? Are you convinced that it really measures ambivalence? Would you use it with clients? Would it be helpful to you?
2. How would you improve the ambivalence measure?
3. Are there aspects of ambivalence that are not represented in the ambivalence measure, but should be?
4. How do you think the ambivalence questionnaire would be useful to you in your practice?
5. Which questions would you exclude from the ambivalence measure? Are there questions that you think need to be included in this measure?
6. Is this ambivalence questionnaire too long? If so, approximately how many questions would be the ideal length?

7. Please list any additional comments you would like to make.

8. Thank you very much for completing this questionnaire. We would like to send you a \$10 Starbucks gift card as a thank you for your time and effort. However, your name is not associated with your answers to this questionnaire. Please e-mail Samara Lloyd Rice at samlloyd@unm.edu and give us your name and address so we can send you your Starbucks gift card.

9. Additional questions or concerns may also be sent to Dr. Theresa Moyers at tmoyers@unm.edu.

Appendix C: Change, Ambivalence, and Sustain Emotion Scales (CASES) version 3.0

Directions: Thank you in advance for taking the time to complete this questionnaire. Please answer the following questions as carefully and honestly as possible.

Circle the number that best matches how much you agree with the following statements. Mark how true each statement is for you on a scale of 1 to 7, with 1 indicating absolute disagreement, and 7 indicating absolute agreement. If a question does not apply to you, please circle 1: Absolutely Disagree.

1. No matter what happens, I know that having a drink will make it all right.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

2. I can't imagine my life without drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

3. Life wouldn't be as much fun if I didn't drink.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

4. I feel confident I could manage my life without drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

5. I'd be more shy and awkward around people if I didn't drink.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

6. I can see myself being happy without alcohol.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

7. My drinking has not brought disappointment to myself or others.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

8. I don't find myself drinking to relieve my stress.

Disagree

Agree

27. Drinking rarely solves my problems.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

28. I could still hang out with my friends if I quit drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

29. I've disappointed others or myself because of my drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

30. My life would still be fun if I didn't drink.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

31. I'm not confident that I could quit drinking if I wanted to.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

32. I don't know if I'd be happy if I quit drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

33. Quitting or cutting down doesn't scare me.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

34. I need to quit drinking because I've made a lot of mistakes when I'm drunk.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely
Disagree			Agree			Agree

35. I don't feel that I have the strength to deal with my life right now if I quit drinking.

1	2	3	4	5	6	7
Absolutely			Half			Absolutely

Proposed Change/Sustain items related to topics suggested by experts

1. CHANGE: It bothers me that I drink when I think I shouldn't.
2. SUSTAIN: I don't care if my drinking is hurting myself or others.
3. CHANGE: It's important to me that I reduce my drinking.
4. SUSTAIN: Changing my drinking is not that important to me.
5. CHANGE: My relationships with others would improve if I didn't drink so much.
6. SUSTAIN: Alcohol doesn't hurt my relationships with others.
7. CHANGE: Alcohol helps me get along better with others.
8. SUSTAIN: My drinking causes problems for me with other people.

Proposed Emotion items related to topics suggested by experts

When I think about drinking less, I feel...

	Absolutely Disagree		Half Agree			Absolutely Agree	
	1	2	3	4	5	6	7
1. Torn	1	2	3	4	5	6	7
2. Stuck	1	2	3	4	5	6	7
3. Uncomfortable	1	2	3	4	5	6	7
4. Confused	1	2	3	4	5	6	7
5. Doubtful	1	2	3	4	5	6	7
6. Anxious	1	2	3	4	5	6	7
7. Annoyed	1	2	3	4	5	6	7

8. Conflicted	1	2	3	4	5	6	7
9. Uncomfortable	1	2	3	4	5	6	7
10. Scared	1	2	3	4	5	6	7
11. Unsure	1	2	3	4	5	6	7
12. Undecided	1	2	3	4	5	6	7
13. Like giving up	1	2	3	4	5	6	7
14. Despair over not being able to change	1	2	3	4	5	6	7
15. Uncertain about what to do	1	2	3	4	5	6	7
16. Pulled in different directions	1	2	3	4	5	6	7
17. Conflicted about what to do	1	2	3	4	5	6	7
18. Afraid of changing	1	2	3	4	5	6	7
19. Unable to decide what to do about my drinking	1	2	3	4	5	6	7
20. Scared about how to make the change	1	2	3	4	5	6	7
21. Unsure about what to do about my drinking	1	2	3	4	5	6	7
22. Like I want to change and not change my drinking at the same time	1	2	3	4	5	6	7
23. Mixed feelings about the decision to quit	1	2	3	4	5	6	7
24. Like there are good and bad things about drinking less	1	2	3	4	5	6	7

25. Like I waiver back and forth when I think about changing my drinking	1	2	3	4	5	6	7
26. Like giving up hope that I will ever change	1	2	3	4	5	6	7
27. A lot of suffering about what to do	1	2	3	4	5	6	7
28. Like I should cut down but I don't want to	1	2	3	4	5	6	7
29. Two ways about my drinking	1	2	3	4	5	6	7
30. Ambivalent about changing	1	2	3	4	5	6	7
31. Controlled by my drinking	1	2	3	4	5	6	7
32. Like I'm sure I should not quit drinking (validity check)	1	2	3	4	5	6	7
33. Like I waste too much money buying alcohol	1	2	3	4	5	6	7
34. Like I spend too much time drinking	1	2	3	4	5	6	7
35. Like I will always be a drinker	1	2	3	4	5	6	7

Please list at least three reasons why you drink:

1. _____

2. _____

3. _____

4. _____

5. _____

Please list at least three reasons why you want to drink less:

1. _____

2. _____

3. _____

4. _____

5. _____

References

- Arkowitz, H., & Miller, W. (2008). Learning, applying, and extending motivational interviewing. *Motivational interviewing in the treatment of psychological problems* (pp. 1-25). New York, NY US: Guilford Press.
- Arkowitz, H., Miller, W., Westra, H., & Rollnick, S. (2008). Motivational interviewing in the treatment of psychological problems: Conclusions and future directions. *Motivational interviewing in the treatment of psychological problems* (pp. 324-342). New York, NY US: Guilford Press.
- Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA US: Sage Publications, Inc.
- Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*(2), 81-105.
doi:10.1037/h0046016.
- Carroll, K. (2003). Integrating psychotherapy and pharmacotherapy in substance abuse treatment. *Treating substance abuse: Theory and technique (2nd ed.)* (pp. 314-342). New York, NY US: Guilford Press.
- Clark, V., Creswell, J., Green, D., & Shope, R. (2008). Mixing quantitative and qualitative approaches: An introduction to emergent mixed methods research. *Handbook of emergent methods* (pp. 363-387). New York, NY US: Guilford Press.
- Connors, G. J., Donovan, D. M., DiClemente, C. C. (2001). *Substance abuse treatment and the stages of change: Selecting and planning interventions*. New York, NY: Guilford Press.

- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory (3rd ed.)*. Thousand Oaks, CA US: Sage Publications, Inc.
- Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA US: Sage Publications, Inc.
- Cunningham, J., Sobell, L., Gavin, D., Sobell, M., & Breslin, F. (1997). Assessing motivation for change: Preliminary development and evaluation of a scale measuring the costs and benefits of changing alcohol or drug use. *Psychology of Addictive Behaviors, 11*(2), 107-114. doi:10.1037/0893-164X.11.2.107.
- Cronbach, L., & Meehl, P. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*(4), 281-302. doi:10.1037/h0040957.
- Demmel, R., Beck, B., Richter, D., & Reker, T. (2004). Readiness to change in a clinical sample of problem drinkers: Relation to alcohol use, self-efficacy, and treatment outcome. *European Addiction Research, 10*(3), 133-138. doi:10.1159/000077702.
- DeVellis, R. F. (2003). *Scale Development: Theory and applications*. Thousand Oaks, CA: Sage Publications, Inc.
- Downey, L., Rosengren, D., & Donovan, D. (2001). Sources of motivation for abstinence: A replication analysis of the Reasons for Quitting Questionnaire. *Addictive Behaviors, 26*(1), 79-89.
- Elliot, A. (2008). Approach and avoidance motivation. *Handbook of approach and avoidance motivation* (pp. 3-14). New York, NY US: Psychology Press.
- Engle, D.E., & Arkowitz, H. (2006). *Ambivalence in psychotherapy: Facilitating*

- readiness to change*. New York, NY: Guilford Press.
- Engle, D., & Arkowitz, H. (2008). Viewing resistance as ambivalence: Integrative strategies for working with resistant ambivalence. *Journal of Humanistic Psychology, 48*(3), 389-412.
- Freyer, J., Tonigan, J. S., Keller, S., Rumpf, H., John, U., & Hapke, U. (2005). Readiness for change and readiness for help-seeking: A composite assessment of client motivation. *Alcohol & Alcoholism, 40*, 540-544.
- Glynn, L. H., & Moyers, T. B. (in press). Chasing change talk: The clinician's role in evoking client language about change. *Journal of Substance Abuse Treatment*.
- Harwood, H.J., Fountain, D., & Livermore, G. (1998). The consequences of alcoholism: Medical neuropsychiatric economic cross-cultural. Galanter, Marc (Ed.), *Recent developments in alcoholism, Vol. 14* (pp. 307-330), New York, NY: Plenum Press
- Haynes, S., Richard, D., & Kubany, E. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment, 7*(3), 238-247.
- Heather, N., Rollnick, S., & Bell, A. (1993). Predictive validity of the readiness to change questionnaire. *Addiction, 88*, 1667-1677.
- Hettema, J., Steele, J., & Miller, W. R. (2005). Motivational Interviewing. *Annual Review of Clinical Psychology, 1*, 91-111.
- Hewes, R. L., & Janikowski, T. P. (1998). Readiness for change and treatment outcome among individuals with alcohol dependency. *Rehabilitation Counseling Bulletin, 42*, 76-93.
- Keller, D. (2003). Exploration in the service of relapse prevention: A psychoanalytic

contribution to substance abuse treatment. *Treating substance abuse: Theory and technique (2nd ed.)* (pp. 82-111). New York, NY US: Guilford Press.

Maisto, S., Chung, T., Cornelius, J., & Martin, C. (2003). Factor structure of the SOCRATES in a clinical sample of adolescents. *Psychology of Addictive Behaviors, 17*(2), 98-107.

Mak, L., & Marshall, S. (2004). Perceived mattering in young adults' romantic relationships. *Journal of Social and Personal Relationships, 21*(4), 469-486.
doi:10.1177/0265407504044842.

Malcarne, V. L., Chavira, D. A., Fernandez, S., & Liu, P. J. (2006). The scale of ethnic experience: Development and psychometric properties. *Journal of Personality Assessment, 86*(2), 150-161.

McBride, C., Curry, S., Stephens, R., Wells, E., Roffman, R., & Hawkins, J. (1994). Intrinsic and extrinsic motivation for change in cigarette smokers, marijuana smokers, and cocaine users. *Psychology of Addictive Behaviors, 8*(4), 243-250.

Miller, W., & Johnson, W. (2008). A natural language screening measure for motivation to change. *Addictive Behaviors, 33*(9), 1177-1182.
doi:10.1016/j.addbeh.2008.04.018.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change*. New York, NY: Guilford Press.

Miller, W. R., & Tonigan, J. S. (1996). Assessing drinkers' motivation for change: The stages of change readiness and treatment eagerness scale (SOCRATES). *Psychology of Addictive Behaviors, 10*, 81-89.

MISC 1.1 is available at http://casaa.unm.edu/download/MISC_1.1_Manual.pdf

Motivational Interviewing Network of Trainers website:

<http://motivationalinterview.org/training/mint.htm>

Moyers, T., Martin, T., Christopher, P., Houck, J., Tonigan, J., & Amrhein, P. (2007).

Client language as a mediator of motivational interviewing efficacy: Where is the evidence?. *Alcoholism: Clinical and Experimental Research*, 31(Suppl 3), 40S-47S.

Neale, J., Allen, D., & Coombes, L. (2005). Qualitative research methods within the addictions. *Addiction*, 100(11), 1584-1593. doi:10.1111/j.1360-0443.2005.01230.x.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). (pp. 293-337). McGraw-Hill.

Prochaska, J., & DiClemente, C. (1986). Toward a comprehensive model of change. *Treating addictive behaviors: Processes of change* (pp. 3-27). New York, NY, US: Plenum Press.

Prochaska, J., Velicer, W., Rossi, J., Goldstein, M., Marcus, B., Rakowski, W., et al. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*, 13(1), 39-46. doi:10.1037/0278-6133.13.1.39.

Rollnick, S., Heather, N., Gold, R., & Hall, W. (1992). Development of a short 'readiness to change' questionnaire for use in brief, opportunistic interventions among excessive drinkers. *British Journal of Addiction*, 87, 743-754.

Rust, J., & Golombok, S. (2009). *Modern psychometrics: The science of psychological Assessment* (3rd ed.). New York, NY US: Routledge/Taylor & Francis Group.

Stinson, F. S., Grant, B. F., Dawson, D. A., Ruan, W. J., Huang, B., & Saha, T. (2005).

Comorbidity between DSM-IV alcohol and specific drug use disorders in the United States: Results from the national epidemiologic survey on alcohol and related conditions. *Drug and Alcohol Dependence*, 80, 105-116.

Streiner, D. L., & Norman, G. R. (2003). *Health measurement scales: A practical guide to their development and use*. New York, NY: Oxford University Press.

Shultz, K. S., & Whitney, D. J. (2005). *Measurement theory in action: Case studies and exercises*. Thousand Oaks, CA: Sage Publications, Inc.

Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics (5th ed.)*. Boston, MA: Allyn & Bacon/Pearson Education.

Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the working alliance inventory. *Psychological Assessment*, 1, 207-210.

University of New Mexico Factbook: 2007-2008 UNM Factbook, Office of Institutional Research.

Walters, S., Vader, A., & Harris, T. (2007). A controlled trial of Web-based feedback for heavy drinking college students. *Prevention Science*, 8(1), 83-88.

West, R. (2005). Time for a change: Putting the Transtheoretical (Stages of Change) Model to rest. *Addiction*, 100(8), 1036-1039.