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Predicting Treatment Seekers Readiness to Change their Drinking Behavior in the COMBINE Study

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Abstract

Background—Initial motivation and readiness to change are complex constructs and have been important but inconsistent predictors of treatment attendance and drinking outcomes in studies of alcoholism treatment. Motivation can be described in multiple ways as simply the accumulation of consequences that push change, a shift in intentions, or engagement in various tasks that are part of a larger process of change.

Method—Using baseline data from participants in the COMBINE Study, this study re-evaluated the psychometric properties of a 24-item, measure of motivation derived from the URICA that yielded four subscales representing attitudes and experiences related to tasks of stages of Precontemplation, Contemplation, Action, and Maintenance Striving as well as a second order factor score representing a multidimensional view of readiness to change drinking. A variety of hypothesized predictors of readiness and the stage subscales were examined using multiple regression analyses in order to better understand the nature of this measure of motivation.

Results—Findings supported the basic subscale structure and the overall motivational readiness score derived from this measure. Readiness to change drinking behavior was predicted by baseline measures of perceived stress, drinking severity, psychiatric co-morbidity, self-efficacy, craving, and with positive treatment outcome expectancies. However, absolute values were small indicating that readiness for change is not explained simply by demographic, drinking severity, treatment, change process, or contextual variables.

Conclusion—This measure demonstrated good psychometric properties and results supported the independence as well as convergent and divergent validity of the measured constructs. Predictors of overall readiness and subscale scores indicate that a variety of personal and contextual factors contribute to treatment seekers motivation to change in an understandable but complex manner.

Keywords

Stages of Change; Alcohol Treatment; Motivation; Readiness

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Introduction

Motivation and readiness for change are critical concepts that represent complex, dynamic elements that extend throughout the process of stopping or modifying excessive drinking and other addictive behaviors (Miller, 1985; 2006). Traditional views conceptualize motivation to change problem drinking as driven by accumulating consequences in line with the view that alcoholics need to "hit bottom" before they become "motivated" to change. More recent perspectives contend that motivation is better characterized as a series of tasks represented by stages of change (DiClemente, 2003; Prochaska et al., 1992) or as driven by the confluence of specific client attitudes, intentions and expectancies (Bandura, 1997; Fishbein et al., 2001; Rollnick et al., 1999). Research studies indicate that individuals entering treatment for alcohol or drug problems differ significantly in their levels of intentions and motivation to change drinking or drug use behavior (Blanchard, Morgenstern, Morgan, Labouvie & Bux, 2003; Carney and Kivlahan, 1995; DiClemente and Hughes, 1990; Freyer et.al., 2005; Isenhart, 1994; Project MATCH Research Group, 1997a, 1998). Moreover, there seems to be a growing consensus that motivation involves multiple constructs including intentions, beliefs, expectancies, decisional considerations, commitment, implementation intentions, efficacy, and self-regulation (Ajzen, 2002; Bandura, 1986; Baumeister & Muraven, 2000; Gollwitzer, 1999; Hall, Havassy, & Wasserman, 1991; Miller, 2006; Miller & Rollnick, 2002)

One way to view and assess motivation and readiness to change is to conceptualize motivation as a multidimensional series of tasks or stages that are part of a larger process of intentional behavior change (DiClemente and Prochaska, 1998; DiClemente, 2003). The proposed path through this change process involves accomplishment of critical tasks in order to create sustained change. The five stages proposed by the Transtheoretical Model (Prochaska and DiClemente 1984; Prochaska et al., 1992) begin with the Precontemplation stage, where the motivational task is for addicted individuals to become interested in considering change. Once concern and a sense of vulnerability reaches a certain level, these individuals have to manage the challenges of the Contemplation stage where the task is a risk-reward analysis leading to decision-making. Then they become involved in the Preparation stage tasks where they need to create commitment and develop a viable plan, and then the Action stage where they initiate specific steps to implement and revise the plan before arriving at the Maintenance stage. Here, the task of sustaining the behavior change over time enabling the new behavior to become normative is hopefully accomplished. Stages are states that represent tasks that can be more or less accomplished and are relevant throughout the process of change and not completely distinct, non overlapping or trait-like categories (DiClemente, 2003; 2005). According to the model movement back and forth, as well as recycling through the stages, represents a recursive learning process and the individual continues to redo the tasks of various stages in order to achieve a level of successful completion that would support sustained change of the addictive behavior (Connors et al., 2001; DiClemente, 2003; 2005). There are differing perspectives on whether a stage-based or more continuous view of motivation is more accurate (Sutton 1996; West, 2005; DiClemente, 2005) and whether stages can be measured in an accurate and consistent manner (Carey, Purine, Maisto, & Carey, 1999; Joseph, Breslin & Skinner, 1999). This study used a measure of motivation and readiness based on the concept of stages but did not assign or evaluate stage status to participants.

Across behaviors and studies many different methods have been used to measure motivation and the attitudes, beliefs and intentions associated with the tasks of the stages and the multidimensional aspects of motivation and to classify individuals along these stage dimensions. Algorithms that ask a series of questions and classify individuals have been used with cigarette smoking and other health behaviors. These measures segment the

population based on task related items, like “Are you seriously considering quitting smoking in the next 6 months”. These measures, however, are less reliable in clinical settings where demand characteristics may skew responding. In order to minimize the social desirability demands of these settings continuous measures assessing stage-related attitudes and experiences have been developed including the University of Rhode Island Change Assessment Scale (URICA), the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), and a Readiness To Change (RTC) questionnaire (See Carey et al., 1999; DiClemente et al., 2004). These continuous and more complex measures assess stage tasks in slightly different ways with similar types of items (Miller and Tonigan, 1996). A recent analysis of these three measures with drug abusing patients (Napper, Wood, Jaffe, Fisher, Reynolds & Klahn, 2008) confirmed the basic structure of the URICA and significant overlap between the URICA and the RCQ factors with the SOCRATES appearing not to measure the same constructs. There was moderate agreement in stage assignment although the study used an assignment strategy that has been criticized (DiClemente et al., 2004). This study also found some support for construct validity examining concurrent and prior drug use behaviors. In this and other studies the URICA has demonstrated good psychometric properties but there continue to be questions about stage assignment and prediction of outcomes (Blanchard et al., 2003; Carey et al., 1999; DiClemente, Schlundt & Gemmell, 2004; Nidecker, DiClemente, Bennett & Bellack, 2008). Studies have also reported that individual URICA subscales as predictors or combinations of subscales could be used as predictors of outcomes (Carbonari & DiClemente, 2000; DiClemente et al., 2004; Field, Duncan, Washington & Adinoff, 2007; Pantalon, Nich, Frankforter & Carroll, 2002). A better understanding of this measure, its subscales, and its unique and shared variance with other potential predictors and barriers to success could advance our understanding of motivation and readiness among drug and alcohol abusers.

The URICA was constructed to reflect attitudes, beliefs, and experiences conceptually related to tasks of four specific stages (Precontemplation, Contemplation, Action, and Maintenance Striving)[1] and designed to assess these in individuals entering treatment. Early studies used a method of clustering individuals based on their patterns of scores across the four subscales to create stage-related subgroups. A modified 28-item version of the URICA that targeted abstinence from alcohol identified 5 cluster subgroups of patients in an initial study based on standardized subscale scores (DiClemente and Hughes, 1990). Carney and Kivlahan (1995) found similar patterns and identified 4 cluster groups. In both studies the three largest groups seemed to align conceptually with descriptions of individuals in the stages of Precontemplation, Contemplation, and Preparation/Action but there was overlap of endorsement of subscales so classifying participants into specific stages was difficult based simply on subscale scores. Several studies examined motivation in drug and alcohol dependent patients using this measure and found that stage-based subgroups related in expected ways to other change variables (processes of change, decisional balance, and self-efficacy) (Belding et al., 1996;DiClemente and Hughes, 1990;Pantalon et al., 2002;Greenstein et al,, 1999). However, determining the numbers of cluster profiles is inexact and other studies have found only two profiles and limited predictive ability for them (Blanchard et al., 2003) Reviews of this measure has revealed promise and problems (Carey, et al.1999;DiClemente et al., 2004).

In Project MATCH the URICA was a primary measure of motivation and a matching variable. Because assessment of motivation and stage assignment by cluster analysis was imprecise and cumbersome, investigators created a single readiness to change score to measure motivation that reflected the second order factor structure of the URICA by

[1]This measure does not include a subscale for preparation since items reflecting this stage did not form a separate factor in the original analyses (McConnaughy et al. 1989).

summing the means of scores on Contemplation, Action and Maintenance Striving subscales and subtracting the mean Precontemplation score (Carbonari et al., 1994; DiClemente et al, 2001; DiClemente et al., 2004). Since mean subscale scores of the 4 factors ranged from 1 to 5, the readiness to change score had a potential range of minus 2 to plus 14, with higher scores indicating greater readiness to change that paralleled previously identified cluster profiles (Carbonari et al., 1994). Baseline readiness scores in Project MATCH calculated in this manner predicted frequency and intensity of drinking during the one-year and at the three-year post treatment follow-ups among outpatients (Project MATCH Research Group, 1997a, 1998), predicted working alliance rated by participants (Connors et al., 2000), and predicted processes of change reported by patients (DiClemente et al., 2001). Of all the patient characteristics measured, motivational readiness appeared as one of the strongest predictors of post treatment drinking frequency and intensity outcomes for outpatients (DiClemente et al., 2003). Subscale scores on the URICA changed significantly from pre- to post-treatment and were related to abstinent and non-abstinent post treatment outcomes (Carbonari and DiClemente, 2000; DiClemente et al., 2001). However, subscale scores post-treatment shifted differentially over time with action scores increasing and maintenance striving scores decreasing making the pre to post assessments of readiness problematic and indicating more importantly that subscale changes over time are related to successful outcomes (DiClemente et al., 2001; 2004; Carbonari et al, 2000). An alternate measure of alcohol specific readiness to change derived from the SOCRATES in that study also yielded significant prediction of drinking outcomes (Project MATCH Research Group, 1997b) for outpatients. However, among aftercare participants who had received intensive treatment prior to entering the study and completing these measures, pretreatment readiness assessed by either measure did not predict drinking outcomes (PMRG, 1997a,b).

An extensive analysis of this measure can shed some light on the nature of these complex motivational considerations and on the variety of perspectives used to conceptualize motivation. One perspective on readiness views it primarily as the result of “hitting bottom”, the cumulative influence of being overwhelmed by craving, consequences, and drinking quantity, frequency and history. If this were the case then any readiness measure should be highly correlated with and could be predicted by drinking severity variables. Readiness could also be viewed as reflecting a single, more continuous dimension like an individual’s confidence in his or her ability to change (Bandura, 1997; Rollnick et al., 1999). In this case motivation and readiness should be highly related to self-efficacy. Motivation also seems to be influenced by contextual problems so stress and other psychiatric conditions should be very influential in participants’ assessment of readiness change if this is the case. Few studies have examined in depth predictors and correlates of an overall measure of client readiness for change or have been large enough to examine these conceptualizations. This study used data from the COMBINE Study to examine the impact on baseline readiness for change of several sets of variables that represent 1) drinking severity and consequences, 2) expectancies (efficacy and treatment), and 3) complicating/supportive personal (stress and psychiatric symptoms) and environmental (number of drinkers in environment, quality of environment) factors. The purpose of this study was to evaluate the psychometric properties of the URICA and explore the contributions of theoretically interesting predictors of motivation on stage subscale scores and overall readiness to change among alcohol dependent participants in the COMBINE Study, a multi-site trial evaluating the relative efficacy of different pharmacotherapy agents (naltrexone and acamprosate) administered individually and in combination along with two intensities of behavior therapies (Anton et al., 2006; Miller, 2004; Pettinati et al., 2004).

METHOD

Participants

Participants were recruited from within participating treatment study sites, outside community treatment agencies, and via public advertisements at 11 clinical research sites across the continental United States. The overall COMBINE sample consisted of 1,383 adult participants (428 women and 955 men) who met the American Psychiatric Association's Diagnostic and Statistical Manual Fourth Addition (DSM-IV) criteria for alcohol dependence based on the Structured Clinical Interview for DSM-IV (First, et al., 1995). See the COMBINE trial results paper for a complete description of the study (Anton et al., 2006).

Of the 1,383 potential respondents from in the COMBINE study, 1,375 subjects (99.42%; 949 males, 426 females) had usable responses on the URICA for inclusion in the present analyses. This sample had a mean age of 44.4 (SD = 10.21) and a mean education of 14.6 years (SD = 2.73). The majority of the sample was non-Hispanic white race/ethnicity (76.60%); married (42.07%), single (27.87%) or divorced (20.74%); and currently working full time (61.07%) and only 14.97% unemployed; and 43.8% having total annual incomes of $60,000 or more, another 29.91% with income between $30,000 and $59,999, and only 10.27% with annual incomes less than $15,000. The sample reported a mean age of onset of alcohol dependence of 30.32 years (SD=11.33) and an average of 13.85 years (SD=10.78) for the duration of their alcohol problem. Almost half of the sample (49.19%) reported having had some previous involvement in treatment for their alcohol or other problems.

Measures

Screening—The Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993) was administered as part of the initial brief eligibility screening of all individuals in the COMBINE study. Individuals who passed this initial screen were consented and then participated in a comprehensive baseline assessment (COMBINE Study Research Group, 2003; Gastfriend et al. 2005). Participants completed the baseline assessment prior to randomization to treatment conditions. In addition to the AUDIT the following measures were included in this study.

Readiness to Change—The primary measure of stage-based readiness to change to be evaluated was a 24 item alcohol specific version of the URICA. Six items measures each of the four subscales, Precontemplation, Contemplation, Action and Maintenance Striving (struggling to maintain). A continuous overall readiness score based on a second order factor analysis of the subscales was calculated by adding subscale means of Contemplation, Action and Maintenance Striving and subtracting the subscale mean of Precontemplation (DiClemente et al., 2001).

Demographic variables used as control variables in the analyses included gender (1=male, 0=female), age, minority status (1=minority, 0=non-minority), educational level in years, marital status (1=married, 0=non married), employment status (1=working full or part time, 0= not working), and income level (1=$60,000 and over, 0=less than $60,000).

Measures of alcohol consumption were derived from the Form-90 (Miller and Del Boca 1994; Miller 1996), a calendar-based assessment of drinking over the 90-days prior to the baseline assessment. These variables included the Percent of Days Abstinent (PDA) and the Drinks per Drinking Day (DDD), both referenced to the most recent 30 days of drinking out of the 90 day pre-baseline assessment window. **Withdrawal** and **craving** were assessed by the withdrawal scale from the revised Clinical Institute Withdrawal Assessment for Alcohol

scale (CIWA-Ar) (Sullivan et al., 1989) and the Craving, Interference and Obsessive subscales of the Obsessive-Compulsive Drinking Scale (OCDS) (Anton et al., 1995.; Anton et al., 1996). **Drinking consequences** were measures with the subscale and total scores of the Drinker Inventory of Consequences (DrInC) (Miller et al., 1995). The final set of drinking-related variables were the measures of **alcohol problems** that included the AUDIT total score as well as the subscales of Consumption, Dependence and Consequences (Bohn et al, 1995; Saunders et al., 1993), the alcohol dependence subscale of the Structured Clinical Interview for DSM-IV Disorders (SCID) (First et al. 1995), and the total dependence score from the Alcohol Dependence Scale (ADS) (Skinner and Allen 1982; Skinner and Horn 1984)

Several psychosocial variables were also included: **social support**, defined as the number of drinkers in the environment, as assessed by the Important People and Activities (IPA) (Clifford and Longabaugh, 1991); **perceived stress** as assessed by the Perceived Stress Scale (Cohen et al., 1983); and **psychiatric symptoms** as assessed by the global severity T score of the Brief Symptom Inventory (BSI) (Derogatis, 1993) as well as the 9 BSI subscale T scores (anxiety, depression, hostility, interpersonal sensitivity, obsessive-compulsive, paranoid ideation, phobic anxiety, psychoticism and somatization). The **quality of life** of the individual's environment was assessed by the Environment Domain Score of the World Health Organization's abbreviated Quality of Life scale (WHOQOL Group, 1998).

Treatment expectancy was measured using three items that assessed how helpful individuals anticipated that medications, the therapist, and medications plus the therapist would be to change their drinking behavior. Preliminary analyses indicate that these items held together as a subscale with a Cronbach's Alpha of .70.

The Alcohol Abstinence Self-Efficacy Scale (AASE) (DiClemente et al., 1994) evaluated both **temptation to drink** and **confidence to abstain** across 20 items representing cues in the 4 subscale areas of Negative Affect, Social, Physical, and Withdrawal/Urges.

Two categories of drug dependence were assessed using the SCID. The first category was a dichotomous variable indicating whether the individual met dependence criteria for cannabis dependence. The second, also dichotomous, indicated whether or not the patient had met dependence criteria for stimulants, opioids, or cocaine.

Analyses

Psychometric Properties of the URICA were assessed with a second-order confirmatory factor analysis, which allowed for the testing of hypotheses about the specified subset of items that properly define each pre-specified subscale, which in turn define one higher-order latent variable representing overall readiness to change. Indices of overall model fit included the χ^2 test with an associated p-value greater than .05, goodness-of-fit index (GFI>.90), adjusted-goodness-of-fit index (AGFI>.80), root-mean-square residual (RMR<.08), root-mean-square error of approximation (RMSEA<.06), the comparative fit index (CFI>.95) and non-normed fit index (NNI>.90). (Bentler and Bonett, 1980; Hu and Bentler, 1999; Mulaik et al., 1989).

RESULTS

Overall Sample Responses to Measures

Table 1 describes the means and standard deviations as well as the data array for the variables used as control or predictor variables in the analyses. This is a group of heavy drinking individuals, drinking 75% of the days and averaging over 12 standard drinks per drinking day. AUDIT scores are in the moderate to high range, withdrawal scores are low,

and on the other measures they appear to be in the mid to upper range of the scales. The sample represents a range of drinking dependence and severity reflective of individuals seeking outpatient treatment in the community with less representation from homeless and seriously mentally ill populations found in public programs.

Psychometric Properties of the URICA Stages and Readiness Score

Factor loadings from extensive psychometric analyses of the URICA using both confirmatory and exploratory factor analysis (SAS (2001) CALIS and FACTOR procedures) are presented in Table 2. Absolute fit indices generally indicated a good fit to the data: GFI = 0.91, AGFI = 0.89, RMR = 0.07 and RMSEA = 0.06, with less desirable incremental fit indices, CFI = 0.85 and NNI = 0.85. In combination, the fit indices indicate a moderately good fit to the data. Although the chi-square test for the second-order confirmatory measurement model did not indicate a good fit (χ^2 (248) = 1554.45, $p < .0001$), this test is not a very good fit index with large samples, especially under violation of multivariate normality and this data demonstrated significant departure from multivariate normality and excess kurtosis. Mardia's (1970) multivariate kurtosis measure was 283.17. Confirmatory factor analyses on data transformed to improve normality or by using an unweighted least squares solution did not significantly differ from the maximum-likelihood-based analysis and supported the proposed factor structure.

Since the confirmatory factor analysis supported but did not *strongly* indicate a good fit, an exploratory alpha factor analysis was performed, a psychometric factor extraction procedure that maximizes the alpha generalizability coefficient of the common factors. Both orthogonal and oblique rotation solutions were explored. The number of factors to extract was determined by simultaneously considering scree plots, magnitude of associated eigenvalues, percent of variance extracted, the proportion criteria, Alpha generalizability coefficients after rotation, and interpretation of factors. Both four and five-factor solutions with varimax rotation seemed plausible but the fifth factor was deemed an error factor and the rotated four factor solution was deemed the best fit. Factor loading coefficients defining each factor were moderate to moderately high in value, ranging from .45-.69 for Precontemplation, .30-.60 for Contemplation, .48-.71 for Action, and .46-.71 for Maintenance Striving subscales. Some Contemplation items demonstrated significant cross loadings reflecting interrelationships among subscales and the complex item construction. An exploratory four-factor solution with oblique rotation provided very similar results and is not reported. In summary, with this sample the URICA appears consistent with its intended subscale structure. For the second order factor the factor loadings were similar to those found in the Project MATCH data and supported the computation of a second order readiness factor.

As in previous studies, subscale scores were skewed and mean scores on the subscales differ in magnitude, with the mean of the Precontemplation scale (M=1.6, SD =.51) much lower than the scores for Contemplation (M=4.4, SD=.44), Action (M=4.1, SD=.57), and Maintenance Striving (M=3.7, SD=.67). Internal consistency estimates for each of the subscales measured by Cronbach's Alpha were in acceptable ranges: PC = .72; C = .70; A = .81; and MS = .77 with no indication that eliminating items would have increased alpha to any substantial degree. Correlations among the subscales were moderate with Precontemplation scores negatively correlated with Contemplation (r= -.37), Action (r= -.17), and Maintenance Striving (r = -.14) and positive correlations between Contemplation and both Action (r= .41) and Maintenance Striving (r= .43) as well as between Action and Maintenance Striving (r= .37).

The overall second order factor readiness scale was also supported psychometrically. The readiness composite score had high internal consistency (Cronbach's Alpha = .84) with an

average item to total correlation of .399. A composite reliability estimate for each latent factor (similar to alpha reliabilities for items) indicated solid factor reliability estimates ranging from .71 to .81. These analyses solidly supported the basic four factor structure of the URICA as well as the construct validity of the second order readiness score. The overall mean on the readiness measure was 10.5 with a standard deviation of 1.5 and the range of readiness scores extended from 5.6 to 14 out of a potential range of -2 to 14 when calculated by adding mean subscale scores of Contemplation, Action, and Maintenance Striving, and subtracting the mean of the Precontemplation subscale. This is calculated in the same way as motivational readiness measure that was used in all the analyses in Project MATCH.

Predictors of Overall Readiness to Change

A series of regression analyses were conducted to examine predictors and correlates of overall readiness to change. For the primary evaluation of predictors, five separate linear regression analyses were run: one for the overall readiness score, and one each for the four stage subscales that comprise readiness, while controlling for seven demographic variables. Given that some of the seventeen predictor variables would be expected to be correlated, a forward stepwise method was used for the selection of either inclusion to or exclusion from the model in a sequential fashion based on the statistical significance of the coefficient for each variable. For this study, statistical significance of a control variable is defined as a coefficient estimate with a resulting p-value of .05 or smaller, and for predictor variables is defined as any Wald test with a resulting p-value of .15 or smaller.

Since some missing data for almost every predictor variable would be expected, list wise deletion of missing data cases would result in a significant reduction in the sample size. Therefore, missing data was imputed by using the Markov Chain Monte Carlo (MCMC) method of multiple imputations for arbitrary missing data patterns (see Schafer, 1997 for a detailed discussion of this method). Five imputed data sets were derived and each data set subjected to the regression analyses, and the results combined to generate a single valid statistical inference of the parameter estimates based on the formal rules as described by Rubin (1987).

Results of the regression analyses on readiness and on each of the four subscales are presented in Table 3. Two of the covariates were statistically significant, indicating that being female and older were predictive of higher levels of readiness. Nine variables emerged as statistically significant predictors of Readiness to Change. Predictors were related to reported alcohol problems, alcohol dependence, psychiatric symptoms, quality of life, perceived stress, abstinence self-efficacy and positive expectations about treatment. However, the overall model R^2 is low, .20, indicating that these predictors account for a small portion of the variance of readiness. Most of the statistically significant regression coefficients are small in value with gender being the largest.

An examination of the average correlations and standardized regression coefficients indicated that being female, holding greater positive expectancies for treatment, higher levels of abstinence self efficacy, and dependence symptoms were most highly related to higher levels of participants' readiness to change drinking behaviors. Significant but smaller contributions to greater readiness also came from other baseline measures, i.e. greater self-reported consequences, drinking problems, and percentage of days abstinent. Higher levels of perceived stress, however, had a negative influence on readiness. Consequences related to drinking, abstinence self-efficacy and outcome expectations, which were all self-evaluations related to the patient's drinking problem and perceived potential for change, were most related to the patient's readiness to change drinking behavior. Since all these measures were evaluated in a cross sectional analysis, however, causal interpretations are not possible.

Absolute values of the standardized regression coefficients were larger than the correlation of the predictor and the outcome variable for three variables: PSS Stress, WHO Environment Domain and Abstinence Self-Efficacy measures, indicating possible suppressor effects (MacKinnon et al., 2000). Psychiatric symptoms and drinking consequences seemed to increase the relationship of perceived stress and the WHO Environment Domain with readiness to change. Although interesting, these effects are small and probably not practically significant except to realize that suppression is a reality.

Although many measures of predictor variables had several subscales, the preceding analyses used only total/overall scores of these predictor measures. Therefore a series of follow-up regression analyses were conducted using the subscale rather than total scores of the various measured constructs that demonstrated significant relationships with readiness in the preceding regression analysis. This enabled us to examine how various subcomponents of the constructs interacted with both overall and subscale components of readiness to change. Interestingly, not all subscales of the predictor variables predicted in the same direction as their total scale scores (Table 4). For example, although higher overall abstinence self-efficacy predicted greater readiness, correlations and standardized regression coefficients indicated that subscales of the confidence measure of the AASE operated differently with greater abstinence self-efficacy in negative affect situations indicating less readiness to change and greater efficacy to abstain in the social pressure and physical discomfort situations predicting greater readiness to change. Although the overall DrInC consequences score was positively related to readiness, subscale regression coefficients suggested that greater endorsement of social and interpersonal consequences indicated greater readiness, but greater endorsement of physical consequences of drinking indicated less readiness to change drinking behavior. Similarly, regression coefficients for one of the subscales of the BSI also differed in direction of influence, with the greater endorsement of obsessive compulsive symptoms related to decreased readiness and greater endorsement of psychoticism related to more readiness to change. These patterns highlight the presence of important variables that have complex relationships with patient readiness to change (MacKinnon et al., 2000;MacKinnon et al., 2002). It appears that different types of cues, consequences, and conditions influence patient readiness to change differentially and in a complicated manner. Using only composite scores of these predictors may obscure some interesting and potentially important relationships.

Although these regression analyses indicate some interesting relationships among predictor variables and readiness to change, it is clear that, although significant, these influences are not strong. The six control variables have a range of first order correlations with the total readiness score of -.0918 to .0085, with an average of -.0440. Of all the predictor variables, both composite and subscale scores, correlations with readiness to change ranged from -.0599 to .3271, with an average of .1134. Readiness as assessed in this study seems to be a rather unique self-evaluation little common variance with problem dimensions, consequences, and expectations contrary to views that equate motivation with experiences of consequences or self-efficacy.

Predictors of URICA Subscale Scores

Readiness was the central focus of these analyses and because of its composite nature should demonstrate stronger relationships with potential predictors than any of the four URICA subscale scores. However, subscales seem to operate differently across time (DiClemente, et al. 2001) so evaluating relationships of predictors with each subscale offer a view of how drinking severity and other predictors interact with the different attitudes and tasks represented by the subscales. Thus, a parallel series of regressions were performed separately for each of the four subscales of the URICA using a strategy similar to the one for overall readiness of first using total scale scores and then subscale scores to predict the

Precontemplation, Contemplation, Action and Maintenance Striving subscales of the URICA. A summary of the results of these analyses are also found in Tables 3 and 4.

Covariates were mostly related to endorsement of the Precontemplation scale; older, nonminority males with less education tended to have higher Precontemplation scores. Several predictors had significant relationships with subscale scores but not with overall readiness. For example, the craving measure from the OCDS was related marginally to greater endorsement of both Contemplation and the Maintenance Striving subscales but not to overall readiness. Similarly temptation to drink across various situations, though not a predictor of readiness, did predict lower scores on the Action subscale which measures commitment and taking responsibility and action. Overall, the Action subscale demonstrated the most significant connections with predictor variables.

Looking across the columns in Table 3 it is clear that only a few variables have a modest impact on all subscales as well as overall readiness to change. URICA subscale scores and readiness are most consistently related to participants reporting more drinking consequences and having positive treatment expectancies. Many variables previously thought to impact motivation did not do so in this study. For example, amount of drinking is not related to readiness or any URICA subscales. However, frequency of drinking in terms of days abstinent over the past three months was related to the individual's struggling to maintain change and overall readiness, with more abstinent days related to greater endorsement on Maintenance Striving items supporting the interpretation of this subscale as indicating a struggle to maintain changes in drinking. Craving, dependence on other drugs, and temptations to drink are minimally related to overall readiness and URICA subscales. Males seem to be higher on Precontemplation and report lower levels on Contemplation and Action subscales as well as overall readiness compared to the female participants. Overall self-efficacy to abstain has a significant effect on readiness but little relationship with URICA subscale scores.

Similar to the analyses for overall readiness another set of regression analyses evaluated how the multiple subscales of predictor variables interacted with URICA subscales (Table 4). Intrapersonal consequences from the DrInC had the strongest negative correlation with Precontemplation with more internal consequences decreasing precontemplation scores. However, interpersonal and impulse control consequences were related to greater endorsement of Precontemplation items. More alcohol dependence symptoms and positive treatment expectancy also corresponded with less endorsement of Precontemplation. Interestingly, a number of variables predicted greater contemplation activity. The obsessive subscale of the craving measure (OCDS) and both the DrInC intrapersonal and social responsibility subscales related to greater contemplation. The only subscales that were related to less contemplation activity were the BSI phobic anxiety and the DrInC Physical consequences subscales. Action subscale attitudes and experiences reflecting commitment and taking responsibility were decreased by perceived stress, temptation to drink in social situations, and modestly by efficacy to abstain in negative affect situations. On the other hand, increases in Action scores were related to alcohol dependence symptoms, social responsibility consequences (DrInC) and self-efficacy in the face of withdrawal and craving cues. Higher endorsement of the items reflecting the struggle to maintain change was related to a greater percent of abstinent days, more DrInC interpersonal consequences, psychoticism symptoms, and positive treatment expectancies. Obsessive compulsive symptoms from the BSI decreased maintenance striving scores. Although there is some consistency or relationships across predictors, there appear to be some unique contributions of predictor subscales to specific stage attitudes and tasks that could meaningfully be explored in greater depth in future studies and longititudinal research.

Discussion

This study examined a stage of change-based measure of motivational readiness to change drinking behavior with a large, heterogeneous sample of alcohol dependent individuals seeking outpatient treatment in a research trial that included medication as a potential treatment option offers an in depth view of this measure of patient motivation for change. Psychometric analysis of the 24-item stage-based measure of motivation replicated findings in Project MATCH and supported the structure of subscale scores and of the calculation of an overall readiness to change score. The four subscale scores appeared as separate but correlated factors in these analyses indicating that the attitudes, intentions and experiences in the four stage-based subscales represent separable but not completely distinct sets of related tasks. The emergence of the second order factor also indicates that some linear combination of these subscale scores can be used, at least at intake, to create a more general factor that we have called readiness. This analysis replicates the psychometric analyses of participants in project MATCH and supports the basic structure of the measure that has also been replicated with drug users (Napper et al., 2008). Initial indications are that the baseline readiness score is an overall predictor of Percent Days Abstinent at the end of treatment in the COMBINE study (Donovan for the COMBINE Study Research Group, 2008).

In these analyses readiness emerges as a rather independent variable that nevertheless is related in some logical manner with other drinking and drinking related self-evaluation variables. However, the variance in readiness accounted for by these other variables is modest at best. Patient readiness to change at baseline was related to other drinking and psychosocial variables in ways that both confirm and challenge current views of motivation among treatment seekers. There were significant but modest influences on higher levels of motivation to change drinking behavior from greater patient perceived severity of alcohol dependence and reported drinking consequences, less stress and some psychiatric complications, better environmental quality of life, and more positive treatment expectancies. However, since all the regression predictor measures were collected at the same time as the motivational measure, the influence of variables that were not clearly preexisting, like drinking in prior three months, consequences, and dependence, is best viewed as co-occurring and possibly reciprocal in causality.

The results support both personal and environmental influences on motivation that interact with stage-based attitudes and tasks in interesting ways. Greater overall motivation to change reflects to some degree patient recognition and admission of mounting consequences and symptoms of dependence as well as some small increase in abstinent days reflecting some effort to modify drinking. The view that “hitting bottom” is the key motivation for change seems consistent with how consequences and dependence symptoms influence readiness. However, some types of consequences, like physical consequences, appeared to decrease some stage subscale scores and overall motivation to change and overall contribution to readiness was modest at best. Thus readiness does not simply reflect a count of consequences and is certainly not substantially accounted for by reported consequences. However, an individual’s recognition of the presence of specific types of consequences attributable to their drinking did influence readiness to change. Motivation as envisioned in the “hitting bottom” analogy does not appear to be an automatic reaction to increasing numbers of consequences and consequences are not the only or strongest determinant of motivation at entry to treatment. These findings are consistent with the findings in Project MATCH (DiClemente, Carroll, Miller, Connors, & Donovan, 2003) but somewhat contrary to the interpretations of the findings of Field and colleagues (2007) with a sample of substance abusers.

It is interesting to note that stress, psychiatric symptoms, and environmental resources influence readiness to change in different ways. Consistent with postulates from social cognitive theory (Bandura, 1986), perceived stress is one of the few variables in this analysis that lowers readiness for change and, in this case, seems to decrease commitment as well as efficacy to abstain. Although the weights are quite small, psychiatric symptoms of psychoticism and a more positive environment are related to an increased readiness in this sample. However, it is important to note that this is not a dually diagnosed population. Psychoticism seems to increase scores on Maintenance Striving and Contemplation and thus influence readiness. The environment domain of the WHO Quality of Life Scale represents a multidimensional array of physical safety and security, home and physical environment, financial and healthcare resources, opportunity for learning new skills, and availability of transportation. As such this variable seems to represent important patient resources that increase Contemplation and Action attitudes and experiences and decrease Precontemplation ones, thus increasing readiness and motivation as measured in this study.

The relationship between positive treatment expectancies and motivational readiness to change is clearly significant and probably reciprocal. Since these are simultaneous assessments, readiness could be influencing expectancies as much as expectancies are influencing readiness. In previous studies this readiness to change measure has predicted a positive working alliance early in treatment (Connors et al. 1997) and has been related to dropout from treatment in some studies (Edens and Willoughby, 2000) but not reliably (Blanchard et al., 2003). An individual's evaluation of their readiness to change seems closely related to attitudes and activities that would provide a positive orientation toward treatment. It should be noted that although related, readiness for treatment is not the same as readiness to change drinking (DiClemente, 2003; DiClemente, et al. 2001; Donovan and Rosengren, 1999; Freyer et al., 2005) However, it is not surprising that there is some overlap since individuals more ready to change may have more positive expectations of help from whatever treatment they seek, see themselves as more aligned with the provider, and tend to stick with treatment to a greater degree than those who are less ready to change. This seems a logical and common sense relationship that is being confirmed by these analyses. However, the relationship between readiness and positive treatment expectancies in this study is small to moderate. Theories of motivation that equate motivation with outcome or efficacy expectations receive support for only a modest relationship in these findings.

A unique aspect of this study is that there are sufficient participants to analyze the relationships between the predictors and the stage subscales of the URICA. The fact that there are differences in types as well as direction of predictors for the different subscales support the assumption that there appear to be separable tasks and experiences related to readiness to change and that in some measure they are influenced somewhat uniquely by different factors. Although the data would not be sufficient to resolve the continuous versus discrete discussion about motivation and the stages of change (Joseph et al., 1999; Sutton, 1996; West, 2005), the findings do support heterogeneity in the patient perception of the process of change and that some linear combination of these subscales yields a measure of motivational readiness to change that has been a strong predictor of outcome among outpatients in the MATCH study and has shown some predictive relationships with drinking outcomes in initial evaluations in this COMBINE study (Donovan for the COMBINE Research Group, 2008). It is instructive to go through the varied stage subscales to examine predictors.

The Precontemplation subscale taps attitudes reflecting a failure to recognize drinking as a problem and the minimization of a need for change. Although the scores on this scale are skewed and most participants do not endorse these items very highly, there is enough variance to see some interesting relationships. Older Caucasian males with a bit more

education endorse these attitudes and items more than their counterparts. There is also a clear effect for patient reported problems, symptoms, and consequences. The more participants experience or report these, the less they endorse Precontemplation attitudes. Safer and more resource-filled environments are also supportive of less endorsement of Precontemplation. It is interesting that the issues that many treatment providers consider critical to denial and Precontemplation do not appear as predictors. Craving, drinking quantity and frequency, drug dependence (although low in this sample), stress, and self-efficacy do not appear related to Precontemplation attitudes and the failure to recognize the problem or the minimization of the need for change.

Contemplation tasks involve a risk/reward analysis and the willingness to consider the pros and cons of the problem and the need for change. Males tend to do a little less of this than females. Otherwise there is little influence of demographic variables. What is related to greater contemplation is greater endorsement of consequences and symptoms, a more resource filled environment, and positive treatment expectancies. Although not strongly related, there is some evidence that craving does increase endorsement of contemplation activities and attitudes.

The Action subscale of the URICA reflects the stage tasks of taking action and responsibility as well as making a commitment to change. Interestingly, many of the predictor variables are related in one way or another to this scale. Males seem to endorse these activities more than females and greater education seems to dampen endorsement in this sample. What contributes to greater endorsement for taking action are openness to acknowledging consequences from and dependence on drinking and, to a lesser extent, other drugs; greater efficacy or confidence in the ability to abstain from drinking; a safe and supportive environment, and positive treatment expectancies. Both levels of temptation to drink and greater perceived stress interfere with or lower endorsement of commitment and action items.

As has been mentioned, the Maintenance Striving subscale reflects the individual's striving and struggle to take action and maintain changes that they are trying to make. Items reflect worry about and the reality of not being able to sustain successful action, fear of slipping back, and struggling to continue to take action in the face of difficulties and prior defeats. The scale should be labeled Maintenance Striving or struggling to maintain rather than simply Maintenance (DiClemente et al., 2004). This is confirmed by relationships between this scale and the predictors. Greater endorsement of the struggle to maintain items is related to more pre-treatment abstinent days, greater endorsement of some consequences, and to a lesser extent, endorsement of dependence and psychiatric symptoms and craving experiences. Higher treatment expectations are also related to greater self-reported struggling to maintain change as seems logical.

There are some cautions and limitations that should be mentioned in the interpretation and generalization of the study results. This is a volunteer sample of rather functional alcohol dependent individuals with little co-morbidity in terms of additional psychiatric problems and/or dependence on other drugs. They are clearly dependent on alcohol, however, and are drinking 75% of the days and consume typically 12 drinks per drinking day. They have moderate levels of problems or consequences, and modest levels of efficacy and temptation to drink. They seem representative of a sample of outpatients in programs that recruit from the general public, but do not represent an impoverished or homeless population. Thus some relationships, like the impact of psychiatric severity and other environmental barriers on readiness to change are probably underestimated in this study. There are also other variables that could impact readiness that were not studied. Legal involvement and other significant pressures to come to treatment were not included in this study and were not very prevalent

in this volunteer population. Prior treatment and prior success at change were also not included, although the level of drinking in the past 3 months that was included in these analyses could be seen as a marker of current successful management of drinking behavior. These participants also were volunteers for a study that involved the potential to receive medications which may have interferred some wihtthe size of the relationships between some psychosocial variables and motivational constructs. Despite limitations, the study included a very large sample from multiple sites representing a rather heterogeneous population of dependent drinkers and offers a unique view of motivation to change drinking behavior.

There are also limitations associated with the measure of readiness and motivation chosen for the study. The URICA represents only one way to evaluate patient motivation and actual stages of change per se were not evaluated in this study. Results support the relationships between subscales and not any identified subgroups of individuals classified by stage so there was no direct test of staging. However, the pattern of relationships among subscales and predictors provides some support for construct validity of the subscales and the measure and has now been replicated in a number of studies. Although readiness as assessed in this study appeared to be a rather independent self-evaluation, the variables used as predictors are not the only ones that could be related to readiness and so there may be other variables that could account for readiness. Moreover, it should be noted that readiness as evaluated in this study is not appropriate for a pre-post evaluation of treatment because some of the subscales change in direction and strength of endorsement as individuals become abstinent. As noted in prior studies, although a strong predictor at pretreatment, this linear combination of subscales does not function well as a predictor at the end of treatment since time in treatment and recovery seems to change the relationships of the subscales with drinking outcomes (DiClemente et al., 2001). This study only included the URICA measure at intake so an analysis of the measure post-treatment as was done with Project MATCH participants was not possible. However, investigators and clinicians must be cautious in using this measure in pretreatment to post-treatment analyses to indicate increases or decreases in readiness since there is evidence that the subscale scores change directions with increasing sobriety and a linear combination at the end of treatment is not equivalent to one at intake (Carbonari & DiClemente, 2000;DiClemente et al., 2001).

There are important implications of this study for understanding and intervening with individuals coming to outpatient treatment. Positive expectancies for treatment are easier to engender if patients are more ready to change. Individuals with fewer perceived consequences and dependence symptoms have a more difficult time being ready to engage in the tasks needed to change and are less optimistic about treatment. It is clear that with individuals lower in readiness, providers need to help patients become aware of and convinced of the problem and the need to change and not simply provide change tools or strategies. Commitment to change seems to be related not only to admission of problem but also to temptation to drink and confidence to abstain which need to be addressed as individuals begin to take responsibility and action. Paying attention to and managing perceived stress and enhancing the environmental life context of the individual seems critical to helping increase readiness and support efforts to change. An outpatient program designed to address all the domains represented by the various predictor variables in this study should help to support and increase patient motivation to change drinking

The implications for understanding of motivation some aspects of stage assessments are also important. The URICA continues to be an interesting and informative way to evaluate readiness to change and stage-related tasks on entry to treatment. The study does suggest that there are different components to motivation to change drinking behavior that are influenced most by consequences and dependence and that this motivation is closely related

to positive expectancies for treatment. The evaluation of stage tasks, as operationalized in the subscales of the URICA, sheds some light on how individuals' perceptions and self-evaluations are involved in their assessment of stage tasks and overall readiness to change. What is also clear is that only a small part of the variance in readiness was predicted by the broad array of drinking, environmental, and personal evaluations included in this study. There is a lot that is not understood about this readiness and additional predictors are needed to understand this composite readiness measure and its underlying constructs. Current work being done with implicit cognition, mechanisms of change, and other more subtle influences as well as more overt social environmental factors may be able to contribute to a better understanding and explanation of patient readiness to change (Amrhein, et al., 2003; Baumeister & Muraven, 2000; Gollwitzer, 1999; DiClemente, 2007; Palfai 2004). Although this study provides a view of the initial readiness to change of this sample, follow-up data from the study will offer a better view of how these variables and participant's readiness affect participation in treatment and drinking outcomes.

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Table 1

Descriptive Indices for Continuous Control and Predictor Variables Prior to Multiple Imputation of Missing Values, N=1375

	Min	Median	Mean	Max	Std	Missing
Control Variables						
Age	19.00	44.00	44.41	80.00	10.21	0
Education	2.00	14.00	14.55	30.00	2.73	26
Predictor Variables						
Baseline Drinks per Drinking Day	2.24	10.61	12.50	74.95	7.95	0
Baseline Percent Days Abstinent	0.00	16.67	25.09	96.67	25.09	0
CIWA-AR – Withdrawal	0.00	1.00	1.88	18.00	2.26	13
OCDS – Craving	0.00	27.00	26.62	51.00	8.21	0
OCDS Interference	0.00	3.00	3.50	12.00	2.45	1
OCDS Obsessive	0.00	8.00	8.48	19.00	3.42	1
AUDIT Total – Problems	6.00	26.00	25.85	40.00	6.12	46
AUDIT Consumption	2.00	10.50	10.15	12.00	1.76	25
AUDIT Dependence	0.00	6.00	6.01	12.00	3.01	24
AUDIT Consequences	0.00	10.00	9.69	16.00	3.06	28
ADS – Dependence	0.00	16.00	16.67	45.00	7.33	2
SCID – Dependence	2.00	5.00	5.13	7.00	1.19	0
DrInC – Consequences	7.00	45.00	47.61	124.00	20.42	1
DrInC Impulse Control	0.00	7.00	7.56	31.00	4.24	1
DrInC Social Responsibility	0.00	6.00	6.27	21.00	4.15	1
DrInC Physical	0.00	9.00	9.28	22.00	4.35	1
DrInC Interpersonal	0.00	9.00	10.07	30.00	6.02	1
DrInC Intrapersonal	0.00	15.00	14.43	24.00	5.67	1
IPA - Number of Drinkers	0.00	3.00	3.39	10.00	2.33	10
PSS Stress - Psychiatric	0.00	6.00	5.76	16.00	2.94	17
BSI Global T-score - Psychiatric	33.00	60.00	60.27	80.00	10.91	26
BSI Anxiety	38.00	59.00	58.34	80.00	11.48	26
BSI Depression	42.00	61.00	61.53	80.00	10.61	26

	Min	Median	Mean	Max	Std	Missing
BSI Hostility	39.00	57.00	55.67	80.00	9.66	26
BSI Interpersonal Sensitivity	41.00	59.00	56.72	80.00	10.96	26
BSI Obsessive-Compulsive	38.00	59.00	58.66	80.00	10.76	26
BSI Paranoid Ideation	42.00	55.00	54.53	80.00	10.47	26
BSI Phobic Anxiety	45.00	47.00	53.40	80.00	9.44	26
BSI Psychoticism	46.00	64.00	63.28	80.00	10.09	26
BSI Somatization	41.00	56.00	54.48	80.00	10.36	26
WHO Environment Domain	10.00	30.00	29.79	40.00	5.45	34
AA1 Confidence Self-Efficacy	1.00	2.55	2.61	5.00	0.74	5
AA1 Negative Affect	1.00	2.40	2.42	5.00	0.87	4
AA1 Physical	1.00	3.00	3.13	5.00	0.84	4
AA1 Social	1.00	2.20	2.40	5.00	0.95	4
AA1 Withdrawal/Urge	1.00	2.40	2.49	5.00	0.84	2
AA2 Temptation Self-Efficacy	1.00	3.10	3.11	5.00	0.78	6
AA2 Negative Affect	1.00	3.20	3.26	5.00	1.00	5
AA2 Physical	1.00	2.40	2.44	5.00	0.83	6
AA2 Social	1.00	3.60	3.49	5.00	1.04	5
AA2 Withdrawal/Urge	1.00	3.20	3.24	5.00	0.90	5
TEE Treatment Expectancy	3.00	12.00	11.97	15.00	2.03	158

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Table 2

Factor Loadings from Confirmatory and Exploratory Factor Analysis

	Confirmatory				Exploratory			
Item	**P**	**C**	**A**	**M**	**P**	**C**	**A**	**M**
1	.51	-	-	-	*.53*	-.01	-.02	.02
2	-	-	.44	-	-.15	.25	*.48*	-.07
3	-	.43	-	-	-.27	*.30*	.37	-.02
4	-	-	.57	-	-.01	.03	*.60*	.14
5	.58	-	-	-	*.57*	-.07	-.06	-.01
6	-	.47	-	-	-.25	*.32*	.22	.11
7	.58	-	-	-	*.52*	-.18	-.07	-.07
8	-	-	.73	-	-.07	.10	*.69*	.13
9	-	.54	-	-	-.35	*.34*	.23	.14
10	-	-	-	.57	-.07	.13	.11	*.54*
11	-	-	.62	-	.02	.08	*.59*	.26
12	-	-	-	.59	-.01	.14	.14	*.57*
13	-	.60	-	-	-.10	*.58*	.02	.35
14	-	.60	-	-	-.09	*.60*	.14	.18
15	-	-	-	.57	-.06	.25	.23	*.46*
16	.68	-	-	-	*.69*	-.03	-.02	-.08
17	-	.57	-	-	-.13	*.55*	.10	.18
18	-	-	.74	-	-.05	.15	*.66*	.16
19	.49	-	-	-	*.47*	-.18	-.15	-.05
20	-	-	-	.64	-.16	.18	.31	*.51*
21	-	-	-	.60	-.02	.08	-.02	*.65*
22	.44	-	-	-	*.45*	-.05	-.01	-.03
23	-	-	.76	-	-.11	.01	*.71*	.17
24	-	-	-	.61	.01	.07	.14	*.62*
	Loadings of each factor with higher order factor				Note: Values in italics indicate which item should load on the particular subscale.			
	-.47	.92	.57	.67				

P - Precontemplation, C - Contemplation, A - Action, M - Maintenance

Table 3

Regression Coefficients of Significant Composite Score Predictors across all URICA Subscales and Readiness Total Score.

	P	C	A	M	Readiness
R^2	.11	.16	.16	.16	.20
Control Variables					
Gender	.102***	-.077**	-.062*		-.267**
Age	.003*			.011***	.012**
Education	-.029***		-.016**		
Minority Status	.110***				
Marital Status					
Employment					
Predictor Variables					
Drinks per Drinking Day					
Percent Days Abstinent				.004***	.005**
CIWA-AR - Withdrawal					
OCDS – Craving		.002+	-.004+	.005+	
AUDIT Total - Problems	-.007**			.010**	.024**
ADS – Dependence			.007*		
SCID – Dependence	-.037**		.029*	.027+	.102**
DrInC – Consequences	-.002*	.001***	.004***	.004***	.015***
IPA - Number of Drinkers					
PSS Stress			-.015**		-.034*
BSI Global T-score		.001***		.005**	.012**
WHO Environment Domain	-.007**	.003***	.010**		.027**
AASE Confidence SE			.133+		.156**
AASE Temptation SE			-.082**		
TEE Treatment Expectancy	-.033***	.006***	.051***	.047***	.176***

P - Precontemplation, C - Contemplation, A - Action, M – Maintenance Subscales

Note:

$^{+}$ p<.15,

* p<.05,

** p<.01,

*** p<.001

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Table 4

Regression Coefficients of Significant Subscale Score Predictors across Subscales and Readiness Total Score of the URICA.

	P	C	A	M	Total Readiness
R^2	.17	.18	.18	.18	.24
Control Variables					
Gender					
Age	.004**	-.049*	-.066*	.011***	.010*
Education	-.021***		-.016**		
Minority Status					
Marital Status					
Employment					
Statistically Significant Predictor Variables					
Percent Days Abstinent				.003***	.004*
OCDS Obsessive		.007*		.017**	
AUDIT Consumption	-.015+				
AUDIT Dependence				.017*	.024+
AUDIT Consequences	-.009+			.013*	.035*
ADS – Dependence			.006*		
SCID – Dependence	-.035**		.027+	.028+	
DrInC Impulse Control	.014**				
DrInC Social Respon.		.010*	.020***		.038**
DrInC Physical	.008+	-.009*			-.034**
DrInC Interpersonal	.009**			.013***	
DrInC Intrapersonal	-.033***	.019***			.063***
PSS Stress			-.018**		-.035*
BSI Obsessive-Compulsive				-.006**	-.015**
BSI Phobic Anxiety		-.003+			

	P	C	A	M	Total Readiness
BSI Psychoticism		.006***		.013***	.023***
WHO Environment Domain	-.009**	.010***	.012***		.029**
Other Drugs Dependence			.141+		
AASE SE Negative Affect			-.052*		-.187**
AASE SE Physical					.124*
AASE SE Social					.199***
AASE SE Withd/Urge			.172***		
AASE Temptation Social			-.066***		
TEE Treatment Expectancy	-.034***	.048***	.053***	.042***	.167***

P - Precontemplation, C - Contemplation, A - Action, M - Maintenance

Note:

+ p<.15,

* p<.05,

** p<.01,

*** p<.001