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Predicting Substance Abuse Treatment Completion using a New Scale Based on the Theory of Planned Behavior

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Abstract

We examined whether a 9-item scale based on the theory of planned behavior (TPB) predicted substance abuse treatment completion. Data were collected at a public, outpatient program among clients initiating treatment (N=200). Baseline surveys included measures of treatment-related attitudes, norms, perceived control, and intention; discharge status was collected from program records. As expected, TPB attitude and control components independently predicted intention (model R-squared=.56), and intention was positively associated with treatment completion even including clinical and demographic covariates (model R-squared=.24). TPB components were generally associated with the alternative readiness scales as expected, and the TPB remained predictive at higher levels of coercion. Meanwhile, none of the standard measures of readiness (e.g., the URICA and TREAT) or treatment coercion were positively associated with treatment participation. Results suggest promise for application of the TPB to treatment completion and support use of the intention component as a screener, though some refinements are suggested.

Keywords

Treatment retention; treatment attendance; treatment motivation; stage of change; transtheoretical model; social desirability

1. Introduction

1.1. Study Aims

Treatment readiness is a decisive limiting factor in treatment initiation, and hence ultimately its effectiveness. Although research suggests that treatment for alcohol and drug problems is generally efficacious (Institute of Medicine, 1990; McLellan, Lewis, O'Brien, & Kleber, 2000; Miller, Walters, & Bennett, 2001; Project MATCH Research Group, 1997), as few as 14% of Americans showing symptoms of chemical abuse or dependence ever seek professional help (Substance Abuse and Mental Health Services Administration, 2004), and drop-out rates in public programs average about 40% (Substance Abuse and Mental Health Services Administration, 2008). A better understanding of the key factors that influence

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treatment participation, defined here as initiation of treatment and participation in treatment-related activities, is thus critical to improving outcomes among substance-abusing populations. Accordingly, our team conducted a study to test whether the *theory of planned behavior* (TPB; Ajzen, 1985, 1991), which is a general, social-cognitive model of human behavior that has proven useful in modeling a wide range of public health behaviors, can be successfully applied to predicting and explaining treatment completion. As part of this aim, we sought to establish whether a new, 9-item scale based on the TPB may be useful as a screener for treatment drop-out. Below, we review the relevant literature and describe our study.

1.2. Current Approaches to Understanding Readiness to Change and Treatment Readiness Specifically

Currently, the dominant theoretical approach to understanding readiness to change among substance-using populations is probably the transtheoretical model (TTM) (DiClemente & Prochaska, 1998; Prochaska & Norcross, 2001), which conceptualizes behavior change as the product of progressive changes across qualitatively distinct motivational stages (DiClemente, Schlundt, & Gemmell, 2004). This theory has informed numerous “stage of change” scales, such as the URICA (University of Rhode Island Change Assessment Scale; McConaughy, DiClemente, Prochaska, & Velicer, 1989), SOCRATES (Stages of Change Readiness and Treatment Eagerness Scale; Miller & Tonigan, 1996), and Freyer’s TREAT (Treatment Readiness Tool; Freyer et al., 2004), the former being a global measure of change readiness and the latter two aiming to capture treatment readiness specifically. Although the TTM and stage of change scales have spurred important research illuminating how motivational changes relate to behavioral changes, none of the stage of change scales have proven to be reliable predictors of substance abuse treatment participation *per se*. Indeed, independent reviewers have expressed serious concerns over both the findings and methodological problems associated with the stage of change scales and their theoretical underpinning as applied to treatment participation and effectiveness (Ashworth, 1997; Bandura, 1998; Davidson, 1998; Migneault, Adams, & Read, 2005; Sutton, 1996; Whitelaw, Baldwin, Bunton, & Flynn, 2000). In two separate studies, Miller’s (1999) single-item Readiness Ruler predicted alcohol use and marijuana-related problems among adolescents entering treatment (Maisto et al., 2011a, 2011b) and drug use among Danish adults entering methadone maintenance treatment (Hesse, 2006). However, no known studies have reported associations between the Readiness Ruler and treatment participation among alcohol- and/or drug-dependent populations.

Besides the stage of change scales, there are a handful of diverse scales that have successfully predicted treatment retention, including the RAATE (Recovery Attitude and Treatment Evaluator; Rochat, Wietlisbach, Burnand, Landry, & Yersin, 2004; Smith, Hoffmann, & Nederhoed, 1995), the TMQ (Treatment Motivation Questionnaire; Ryan, Plant, & O’Malley, 1995), and Pettinati’s TREAT (Treatment Research Experiences and Attitudes Task; Pettinati, Monterosso, Lipkin, & Volpicelli, 2003). However, published work on these alternatives remains scant, and evidence for their predictive power across subscales, studies, and outcomes is mixed. Better evidence has accumulated for the CMRS (Circumstances, Motivation, Readiness, and Suitability Scale; De Leon & Jainchill, 1986), which was designed for traditional therapeutic communities (TC’s)¹ and has been a consistent and moderately strong predictor of higher retention (De Leon & Jainchill, 1986; De

¹“A TC [therapeutic community] is a drug-free environment in which people with addictive problems live together in an organized and structured way to promote change toward a drug-free life in the outside society” (Broekaert, Kooyman, & Ottenberg, 1998), p. 595). The TC is often likened to a microcommunity because it models key elements of the macrosociety (e.g., social relationships, education, and an occupational structure) in an attempt to foster skills helpful for life post-treatment. Peers are considered to be critical elements in the change process (Borkman, Kaskutas, & Owen, 2007; De Leon, 2000).

Leon, Melnick, & Kressel, 1997; De Leon, Melnick, Kressel, & Jainchill, 1994; Melnick, De Leon, Hawke, Jainchill, & Kressel, 1997). Still, given that many CMRS items are specific to residential, TC treatment, it is unlikely that results for the CMRS would generalize to other treatment contexts. A further, critical, limitation is that the existing scales as a whole (with the exception of the CMRS) essentially measure only readiness *per se*; they do not assess the cognitive precursors to readiness. Consequently, it is not clear how to intervene with individuals or populations scoring low. In sum, the predictive validity and item content of these scales reveals some important limitations.

1.3. The Theory of Planned Behavior as a Model of Treatment Readiness

By contrast, existing evidence reveals a good case for use of the theory of planned behavior (TPB) in modeling treatment participation. The TPB is a general model of human behavior suggesting that the probability of engaging in a given behavior is proximally determined by the *intention* to engage in that behavior, itself a function of one's *attitude*, *subjective norm*, and *perceived control* regarding the behavior (with the relative importance of each dependent on the population and behavioral domain). One's attitude toward a behavior is defined as one's personal evaluation of that behavior, and is based on the positive and negative outcomes expected to be associated with it (*behavioral beliefs*). Subjective norm represents the perceived social pressures to engage in or avoid a given behavior, and is based on the perceived normative expectations of important referents (*normative beliefs*). Perceived control refers to one's perceived ability to perform a given behavior, and is based on beliefs about factors that may facilitate or impede its performance (*control beliefs*). Because perceived control often reflects actual control, it is typically treated as a direct predictor of behavior as well as a predictor of intention. Later iterations of the TPB have also suggested that perceived control and intention may interact to affect behavior: That is, the impact of intention on behavior may be stronger when perceived control is high. The TPB stipulates that, consistent with the principle of compatibility (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975), each of the four TPB constructs be measured at a level of specificity consistent with the behavior under examination. For example, if predicting treatment completion is the goal, then attitudes, subjective norms, perceived control, and intentions relevant to treatment completion should be assessed (and not, for example, change readiness)².

As of this writing, the TPB had been used in well over 1000 independent studies (see Ajzen, 2011, for a partial list of references), and overall, results have strongly supported the theory (for reviews and meta-analyses, see Ajzen, 2011; Armitage & Conner, 2001; Fishbein & Ajzen, 2010; Godin & Kok, 1996; Notani, 1998; Sheeran, 2002; Webb & Sheeran, 2006). Many studies have successfully modeled health-related behaviors specifically. Reviewing health studies on behaviors related to the addictions, eating, exercising, oral hygiene, HIV/AIDS, automobile use, and medical screening and treatment compliance, Godin and Kok (1996) found that on average the reviewed studies explained 41% of the variance in intentions and 34% of the variance in behavior generally, but 41% of the variance in addictive behaviors (i.e., use of alcohol, drugs, and cigarettes). In TPB-based studies on alcohol consumption, the model has predicted up to 76% of the variance in intentions and up to 50% of the variance in consumption (e.g., Armitage, Conner, Loach, & Willett, 1999; Conner, Warren, Close, & Sparks, 1999; Marcoux & Shope, 1997; Schlegel, D'Avernas, Zanna, DeCourville, & Manske, 1992; Wall, Hinson, & McKee, 1998).

²Perceived control shares similarities with the social learning construct of self-efficacy, as both constructs refer to perceived ability to execute a given behavior. However, researchers in the alcohol and drug field typically operationalize self-efficacy as perceived control over alcohol or drug use itself, whereas the TPB would demand a measure relevant to treatment completion when examining the same. Measures of perceived control may also include assessment of specific control beliefs, whereas assessments of self-efficacy typically do not address beliefs about barriers and facilitators of a behavior (Ajzen, 1985; Bandura, 1977).

Three known studies have used the TPB to examine treatment initiation or compliance. In one, Conner (1998) used the TPB to predict adherence to a medication regimen among psychiatric patients, with supportive results. In a second, Zemore and Kaskutas (2009) used the TPB to predict participation in Alcoholics Anonymous (AA) in a treatment sample. Their 17-item scale (the Alcoholics Anonymous Intention Measure, or AAIM) predicted 41% of the variance in AA involvement at 12 months when administered 6 months post-baseline. Third, Stecker et al. (2012) used the TPB as a basis for a pilot telephone intervention among a community sample of hazardous drinkers, aiming to modify beliefs related to treatment-seeking and hence enhance treatment initiation. Results showed that participants receiving the intervention had a significantly higher sense of perceived control and greater intention to seek treatment (vs. control participants); they were also 3 times more likely to enter treatment. However, there are to our knowledge no validated TPB measures tailored specifically to substance abuse treatment completion.

1.4. Study Overview and Hypotheses

The above review suggests initial support for the TPB, but also a need for additional research on substance abuse treatment samples and a TPB-based screener for that population in particular. Accordingly, the present study tested application of the TPB to treatment completion among individuals initiating formal substance abuse treatment. Baseline surveys included the new TPB screener, alternative measures of readiness to change and treatment readiness, a measure of social desirability³, and core clinical variables. TPB items were re-administered to approximately half the sample about 2 weeks post-baseline. Key hypotheses regarding the scale's convergent, construct, and predictive validity were as follows:

1. More positive attitudes toward treatment and, to a lesser extent, greater intention to complete treatment should be positively associated with the alternative readiness measures (i.e., the URICA, TREAT, and TMQ Internal scale; see measures).
2. A substantial portion of the variance in intention to complete treatment should be explained by respondents' attitudes, subjective norms, and/or perceived control in relation to treatment completion.
3. Greater intention to complete treatment and greater perceived control should predict higher odds of treatment completion even adjusting for demographic and clinical covariates.

Hypothesis 1, testing the TPB scale's convergent validity, assumes that the URICA, TREAT, and TMQ Internal scales are best conceptualized as measures of overall attitude toward change/treatment. Hypotheses 2 and 3, regarding the scale's construct and predictive validity, were derived directly from the TPB (see Fishbein & Ajzen, 2010). According to the TPB, attitudes toward a behavior, subjective norms, and perceived behavioral control are assumed to be sufficient to account for intentions and hence should account for a substantial proportion of the variance in intentions to complete treatment. Intentions, in turn, are considered to be the proximal determinant of behavior and, in conjunction with perceived control, would be expected to predict actual treatment completion. The present paper focuses on our direct measures of attitudes, subjective norms, and perceived control. Because we also assessed specific attitudinal, normative, and control beliefs, a future paper will examine how these beliefs correlated with the direct measures and provide more detailed information about the determinants of intentions.

³Social desirability is an individual difference variable reflecting the need to "obtain approval by responding in a culturally appropriate and acceptable manner" (Crowne & Marlowe, 1960, p. 350). Evidence suggests that social desirability can lead to substantial under-reporting of alcohol and drug consumption and consequences (Davis, Thake, & Vilhena, 2010; Welte & Russell, 1993). Social desirability may also affect both how individuals respond to treatment readiness scales and the relationship between those scales and treatment retention (Zemore, 2012).

2. Materials and Methods

2.1. Study Site and Recruitment

Baseline data were collected between August 2009 and August 2010 from a large, public, outpatient alcohol and drug treatment program with two sister sites in Contra Costa County, CA, both funded largely by the County. Referral sources include area residential programs, insurance companies, Children and Family Services (CFS), and probation officers. Groups are held twice weekly, and the typical prescribed length of stay is 8–12 weeks. However, clients also attend an educational group offered once-weekly while waiting for a treatment slot to open. Clients are encouraged to attend weekly continuing care groups for a minimum of one year post-discharge. About 86% of counselors are in recovery, and all counselors have a master's-level degree, doctoral-level degree, and/or a license in addiction counseling. The curriculum addresses the individual in the context of family and social relationships, and emphasizes involvement in 12-step groups.

Eligible participants included all men and women aged 18 and over presenting for intake at the regular adult outpatient program during the recruitment period. English fluency was required, and all participants had received a primary diagnosis of chemical dependency or substance abuse from the program. The program screens all clients and accepts only those without incapacitating mental or physical health problems, consistent with ASAM's patient placement criteria for outpatient services level of care I (Mee-Lee, Shulman, Fishman, Gastfriend, & Griffith, 2001). Individuals mandated to treatment via Proposition 36 (i.e., nonviolent, simple drug possession offenders) were excluded from the study.

Study participants were solicited from their first or second education group, prior to entering formal treatment. Interviewers explained that participation would involve one in-person interview (about 40–60 minutes) and a brief telephone follow-up (about 20–30 minutes) for half the sample, to be selected randomly. Interested individuals were escorted to the experimental room, onsite, where they completed consent procedures. Baseline interviews were then administered immediately using audio computer-assisted self-interviews (ACASI). ACASI have been found to produce more accurate reports for sensitive data than traditional in-person interviews and self-administered surveys (Lessler & O'Reilly, 1997; O'Reilly, Hubbard, Lessler, Biemer, & Turner, 1994). Once they had completed the survey, those participants selected for the telephone follow-up scheduled an interview time for the following week. Participants received \$50 for completing the baseline survey and \$40 for completing the telephone follow-up.

Baseline surveys were administered to 200 participants (a 91% response rate), including 134 from one sister site and 66 from the second. To accommodate a lengthy survey, a few scales were balloted: Half the respondents received the URICA, and half received the TREAT and TMQ (see below). Telephone follow-ups were completed with 76 participants (a 76% response rate), most of whom (89%) were interviewed between 6 and 14 days post-baseline. The remaining 11% were interviewed between 15 and 21 days post-baseline. All study procedures were approved by the ethical review board of the Public Health Institute.

Statistical comparisons were made between eligible clients who refused and consented to participation, and between participants selected for follow-up who completed and did not complete the follow-up. Results showed no differences for either analysis on gender, race, age, or site, except that among eligible clients, refusals were more common at the smaller compared to the larger site ($p < .01$). Also, among those selected for follow-up, treatment completion rates were significantly higher among those who were successfully interviewed at follow-up (at 54%) compared to those who were not (at 24%), $p < .05$.

2.2. Main Survey Measures

2.2.1. TPB measures—TPB direct measures were developed in accordance with Ajzen's (2002) published recommendations for measurement of TPB components. Attitude, subjective norm, and perceived behavioral control with respect to treatment completion were assessed using 2 items each. Intention to complete treatment was assessed using 3 items inquiring whether respondents would try to, planned to, and intended to complete their treatment program. All items used a 7-point response scale, and scores were averaged within each domain to create a total score (see Table 2 for items and descriptives).

2.2.2. Stage of change scales—Surveys also included two stage of change scales: the URICA (McConaughy, et al., 1989), designed to measure general readiness to change, and Freyer's TREAT (Freyer, et al., 2004), assessing readiness to seek help for an alcohol and/or drug problem specifically. The URICA is a 32-item scale measuring 4 purported stages with 8 items each; the TREAT, at 15 items, assesses 5 stages using 3 items each. To create a total score for the URICA, we reverse-coded the Precontemplation items and averaged, consistent with Project MATCH's approach (DiClemente, Carbonari, Zweben, Morrel, & Lee, 2001; Project MATCH Research Group, 1997). A reflect-and-square-root transformation was used to correct the distribution. For the TREAT, we similarly reverse-coded the Precontemplation and Contemplation items and summed with the Preparation items. We did not include the Action and Maintenance subscales in the overall TREAT score for conceptual reasons (i.e., because items associated with these subscales are not measures of overall treatment motivation, but rather, actual help-seeking in the short- and long-term) and because their inclusion seriously reduced the scale's internal reliability. Cronbach's alpha levels were good for both the URICA ($\alpha = .93$) and TREAT ($\alpha = .81$).

2.2.4. Treatment Motivation Questionnaire—As additional measures of treatment readiness, we included the Internal and External subscales of the Treatment Motivation Questionnaire (TMQ; Ryan, et al., 1995). The Internal subscale is comprised of 11 items mostly measuring positive and negative reinforcement value for seeking and completing treatment (e.g., "It's in my best interests to complete treatment," "I will feel like a failure if I don't remain in treatment"). The External subscale is 5 items assessing legal and other coercion (e.g., "I was referred to treatment by the legal system," "I came to treatment because I was pressured to come"). Scores within each are averaged. Subscale choices were based on prior research showing that higher scores on both scales predicted longer treatment retention (Ryan, et al., 1995).

2.2.5. Baseline problem severity—Items from the Alcohol, Drug, and Psychiatric Severity subscales of the Addiction Severity Index (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980) were used to measure problem severity. The ASI is a structured clinical interview for the evaluation of substance abuse severity showing high reliability and validity (McLellan, et al., 1980). The Alcohol and Drug subscales elicit 30-day consumption rates for alcohol and drugs in 12 different categories, as well as alcohol- and drug-related problems and the subjective importance of treatment. The Psychiatric subscale assesses various symptoms of psychiatric distress, such as serious depression, anxiety, confusion, and suicidal behavior, as well as the subjective importance of treatment for the same. Scores were aggregated using standard algorithms (McLellan, et al., 1980).

2.2.6. Social desirability—Surveys further included Ballard's 11-item short form (Ballard, 1992) of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), which measures endorsement of "behaviors which are culturally sanctioned and approved but which are improbable" (p. 350). Items are true-false, and are recoded (1=high and 0=low) and summed. Sample items are "No matter who I'm talking to, I'm always a

good listener,” (true=1) and “There have been occasions when I took advantage of someone” (false=1). Ballard’s scale has been identified as the best of the MC-SDS short forms (Loo & Loewen, 2004; Reynolds, 1982), and current scale statistics ($\alpha = .74$, $M = 5.55$, $SD = 2.75$, range 0–11) are comparable to those reported elsewhere, though the current mean is higher than those reported for undergraduates (Ballard, 1992; Loo & Loewen, 2004).

2.2.7. Perceived Coercion—To assess treatment coercion, surveys included both the Legal and Employment subscales of the Perceived Coercion Questionnaire (PCQ; Klag, Creed, & O’Callaghan, 2006), at 5 items each. Prior research has been supportive of the scales’ dimensional structure, internal reliability, test-retest reliability, and validity, the latter evidenced by positive associations with male gender, younger age, and illegal drug use (Klag, et al., 2006). We created total scores by averaging within subscale (Legal $\alpha = .86$, Employment $\alpha = .85$) and across items ($\alpha = .84$). A square-root transformation was applied to the total score to normalize the distribution.

2.2.7. Demographic and clinical variables—Additional variables included race/ethnicity, gender, age, marital status, education, employment status, annual household income, number of prior alcohol/drug treatment episodes, and number of children under 18.

2.3. Follow-up Measures and Treatment Participation

All TPB items were re-administered at a telephone follow-up interview approximately 2 weeks post-baseline. Treatment length of stay in days and discharge status (“complete” vs. “incomplete”) were collected from program records. Discharge status codes were assigned by program staff; all those who left the program for any reason before completion were recoded as “incomplete.” We chose treatment completion as our main outcome (vs. continuous attendance) to correspond with TPB item wording, which emphasized completion.

2.4. Analysis

Descriptive tests and Pearson correlations were used to describe our TPB items, test concurrent validity in relation to other scales (Hyp. 1), and explore the alternative readiness scales. Hypotheses regarding relationships among scale components (Hyp. 2) and relationships between scale components and treatment completion (Hyp. 3) were tested using path modeling, implemented in Mplus (Muthén & Muthén, 2011). Potential covariates included all demographics and clinical severity variables; those variables that were associated with treatment completion at $p < .10$ were included in the model.

3. Results

3.1. Sample Characteristics and Drop-out Rates

Table 1 displays the sample’s characteristics. Respondents tended to be male, single, and White (though over a third were people of color), and the mean age was 35.7. The sample was much lower on socioeconomic status than the general population, as indicated by the high unemployment rates, low income, and low education. Most participants reported prior treatment. Approximately 55% of our sample had a discharge status of “incomplete,” a figure comparable to, if slightly higher than, drop-out rates nationwide (Substance Abuse and Mental Health Services Administration, 2008).

3.2. Descriptive Information and Concurrent Validity for the TPB Scale

Table 2 presents the item-total correlations (or inter-item correlations, as appropriate), test-retest reliability, and means for all TPB items. As expected, items were generally highly

correlated within component, excepting the perceived control items. Test-retest reliability was generally acceptable for the intention and subjective norm items, but low for the attitude and perceived control items. Contradicting the high drop-out rates, agreement with all items at baseline was close to ceiling (i.e., to 7). In fact, 81% agreed very strongly and another 13% agreed fairly strongly that “I intend to complete my treatment program at [program name].” Similarly, 72% agreed very strongly and 12% agreed fairly strongly that “It would be extremely valuable for me to complete my treatment program at [program name].” Most agreed very strongly (59%) or fairly strongly (20%) that “Important people in my life approve of my attending treatment at [program name],” and most agreed very strongly (58%) or fairly strongly (19%) that “If I wanted to, I could easily complete my treatment program at [program name].”

Table 3 shows associations between each TPB component (aggregating items within component) and existing scales of treatment readiness (i.e., the URICA, Freyer’s TREAT, and the TMQ; for exploratory purposes, we include both the Internal and External subscales of the TMQ). As expected, the TPB attitude and intention components were significantly and positively correlated with the URICA, TREAT, and TMQ Internal subscale, and correlations were stronger for attitude than intention. These readiness scales also (somewhat unexpectedly) tended to show moderate, positive associations with subjective norms and perceived control. Correlations were generally strongest for the TREAT and weakest for the URICA, consistent with the more specific focus of the TREAT on treatment utilization (vs. global change). Results for the TMQ External subscale suggest that greater coercion was significantly associated with more negative attitudes toward treatment, and marginally associated with more negative subjective norms. Additional, exploratory analyses (not shown) suggested that both the attitude and norm components were positively associated with higher alcohol, drug, and psychiatric severity, as indicated by the Addiction Severity Index subscales (r ’s for attitude from .14 to .18, p ’s<.10; r ’s for norm from .21 to .28, p ’s<.01), providing further support for the scale’s validity. TPB components were unrelated to social desirability (p ’s>.10), with the exception of a modest, negative relationship for the norm component (r =−.21, p <.01).

3.3. Treatment Participation as Predicted by the Alternative Readiness Scales

Table 4 shows associations between our alternative readiness scales and treatment participation. None of the four alternative measures of readiness was related to treatment retention, with the exception of the Internal subscale of the Treatment Motivation Questionnaire, where higher scores were negatively associated with participation. Similarly, other analyses (not shown) revealed that neither legal nor employer coercion, as measured by the Perceived Coercion Questionnaire, was associated with either treatment completion or days in treatment (p ’s>.10).

3.4. Construct Validity of the TPB Scale and Prediction of Treatment Completion

Figure 1 shows results of the path model testing application of the TPB to modeling treatment completion. As hypothesized, the theory performed well when modeling intention, yielding an R-squared of .56. Both more favorable attitudes and higher perceived control were associated with great intention to complete treatment, whereas subjective norms were unrelated to intention. Also as expected, greater intention to complete treatment predicted significantly higher odds of treatment completion, though the relationship between perceived control and treatment completion only trended toward significance (p =.12). The total R-squared for treatment completion was moderate, at .24. Among the covariates, parenting children under 18 (vs. not) was marginally associated with higher odds of completing treatment (B =.39, p =.06), as was Latino vs. White race/ethnicity (B =.39, p =.07).

3.4. Sensitivity Analyses Regarding Social Desirability and Coercion

Power was too low to reliably detect whether social desirability or coercion into treatment modified results of our path model. For exploratory purposes, however, we replicated our main model among those below and above the median on social desirability (i.e., the Marlowe-Crowne), and below and above the median on perceived coercion (i.e., the Perceived Coercion Questionnaire). Results are shown in Figures 2 and 3. Figure 2 suggests that prediction of intention may have been better for those low (vs. high) on social desirability due to stronger relationships involving the attitude and subjective norm constructs, though results for treatment completion are equivocal. (A model simply controlling for social desirability in predicting treatment completion produced parameter estimates almost identical to those in the main analysis of Figure 1.) Figure 3 shows that, contrary perhaps to intuition, prediction of intention was similar and prediction of treatment completion superior among participants high (vs. low) on perceived coercion. For those high (vs. low) on coercion, greater perceived control appeared to be more strongly related to both intention to complete treatment and treatment completion itself, while the relationship between attitude and intention to complete treatment was diminished.

4. Discussion

4.1. Main Conclusions

Overall, results of the current study support application of the theory of planned behavior (TPB) to understanding treatment participation and the utility of our 9 TPB items *per se* in predicting treatment completion. Our measures, which were developed based on Ajzen's (2002) recommendations for assessing TPB components, generally evidenced the expected associations with existing measures of treatment readiness and other clinical measures, supporting their convergent and construct validity. Further, most of the variance in intentions to complete treatment could be explained by attitudes and perceived control, and intention was moderately, but significantly, associated with treatment completion in this small study. These encouraging findings are especially noteworthy in light of the poor support for alternative readiness scales (Ashworth, 1997; Bandura, 1998; Davidson, 1998; Migneault, et al., 2005; Sutton, 1996; Whitelaw, et al., 2000) and the fact that none of the standard alternatives we studied (i.e., the URICA, TREAT, and TMQ Internal and External subscales) predicted treatment participation, excepting the negative associations between treatment participation variables and the TMQ Internal subscale. At least one other study has found that higher TMQ Internal scores predicted lower retention (Cahill, Adinoff, Hosig, Muller, & Pulliam, 2003), which may suggest that endorsement of certain items reflecting guilt and shame (e.g., "I came for treatment because I feel guilty") bodes poorly for treatment involvement. Similarly, neither of our coercion measures was significantly associated with treatment participation. Our results contribute to what is currently a very sparse literature on application of the TPB to substance abuse treatment retention, and signal a need for continuing work in this area.

Findings suggest that our intention scale in particular could be useful as a screener for identifying individuals at risk of treatment drop-out. Any individual scoring less than the maximum on all 3 intention items could be considered at risk: Most participants (77%) achieved the scale maximum, and those who did not showed over twice the odds of drop-out ($OR=2.05$, $p<.05$, post-hoc analyses). Assessing attitudes and perceived control regarding treatment at intake could also help treatment staff and researchers to identify suitable targets for intervention. Again, desirable cut-points for each would be the scale maximum; 66% and 53% of participants scored the maximum on the attitude and perceived control scales respectively. In a future paper, we will examine the relevance of a large set of specific outcome expectancies and control beliefs assessed in our surveys to participant attitudes,

perceived control, and hence treatment completion, which will help inform intervention development. As discussed, an individually-focused intervention based on the TPB has already been developed and piloted in a small community sample, with very promising results (Stecker, McGovern, & Herr, 2012). However, further work is needed to develop and test a group-based intervention for use within formal substance abuse treatment programs. Because the large majority of treatment occurs in groups (Brandsma & Pattison, 1985; Rounsaville & Carroll, 1997), an individual intervention designed to elicit participant-generated obstacles to treatment may not be widely feasible. Identifying specific attitudinal and control factors that contribute to participation for a population that has already initiated treatment will be critical to informing group-based preventive strategies.

The present study did not find a reliable association between subjective norms and intention to complete treatment. The importance of TPB components does vary across behavioral domains, and norms often play a minor role in relation to alcohol and drug use among adult samples (Chan, Wu, & Hung, 2010; Collins & Carey, 2007; Collins, Witkiewitz, & Larimer, 2011; Norman, 2011; Umeh & Patel, 2004). Because there are, further, no obvious limitations in our measurement of norms, the data seem to suggest that close friends, partners, and family typically have little influence on whether people experiencing an alcohol or drug problem intend to complete treatment (and do so) once initiated. This does not imply, however, that significant others do not influence treatment seeking; indeed, many studies suggest that social pressures to seek help can translate into treatment initiation (e.g., George & Tucker, 1996; Kaskutas, 1996; Mertens & Weisner, 2000; Weisner, Mertens, Tam, & Moore, 2001). Results contrast with findings from our paper modeling involvement in 12-step groups using the TPB, where we found that subjective norms contributed substantially to intentions to attend 12-step groups within the subsequent 12 months (Zemore & Kaskutas, 2009). Social networks may play a different role in relation to 12-step (vs. treatment) involvement, perhaps because 12-step members can play key roles in an individual's social network.

Findings for social desirability were somewhat mixed. Fortunately, responses to items assessing TPB constructs showed no relationship with social desirability, with the exception of subjective norms (which showed a negative association). Also, controlling for social desirability did not alter the main relationships of interest, though all relationships in our model were somewhat stronger among those low (vs. high) on social desirability, as one would expect, with the exception of the relationship between perceived control and treatment completion. The reason for this exception is not yet clear; it could be an artifact of the reduced sample size (i.e., chance). These results can be contrasted with the results of another analysis of these same data (Zemore, 2012), which showed that higher social desirability was very strongly associated with lower scores on the URICA ($B = -.41, p < .001$), and that controlling for social desirability substantially strengthened the association between the URICA and treatment participation. This implies that the URICA's tendency to elicit socially desirable responding is one reason for its relatively weak empirical record. While adjusting for social desirability is feasible in a research context, the utility of the scale as a screener is nevertheless compromised. The fact that key elements of our scale were unrelated to social desirability is an argument in its favor.

Unexpectedly, the TPB scale performed at least as well among those high (vs. low) on coercion, and was if anything a stronger predictor of treatment completion in this group. Also surprising, different TPB components emerged as relevant among individuals high and low on coercion, with perceived control showing more predictive power among the former and attitudes figuring more prominently among the latter. While it makes intuitive sense that attitudes toward treatment should be more powerful predictors of intention among those low (vs. high) coercion (since those high on coercion may be willing to attend regardless of the

perceived personal benefits of treatment), sources of the differential effects for perceived control are less obvious. Post-hoc analyses indicate that, among participants high on coercion, perceived control showed substantially more variance compared to those low on coercion (high coercion $M=6.10$, $SD=1.21$; low coercion $M=6.51$, $SD=0.80$). The restricted range in perceived control among those low in coercion could thus help account for a dampening of its effects in this group.

4.2. Limitations and Future Directions

An important limitation is the current study's sample size, particularly when considering the results of the disaggregated analyses. The current data also represent a single treatment program. Although our sample was fairly representative of outpatient programs, results may not generalize to private and residential programs, or to subgroups within a single program, where the key factors affecting participation may differ.

Another set of limitations concerns measurement of the TPB constructs. Namely, results strongly suggest that ceiling effects limited the utility all TPB measures. Most participants very strongly intended to complete treatment, and the favorability of their attitudes, norms, and perceived control were typically at or close to the scale maximum. This is likely to have dampened any relationships involving these measures. Rewording questions in more extreme terms would likely enhance variability and could thus strengthen the measures. Relatedly, validity tests of the perceived control construct revealed some weaknesses, including weak correlations between items and between the control scale and validating measures. Further research should be directed toward refining the measurement of perceived control.

Last, we did not re-administer the TPB scale to the full sample, so we could not lag the attitude, norm, and control components with intention. This means that the causal ordering of relationships involving these factors remains unclear.

Large-scale, longitudinal work will be vital to reinforcing and extending the current findings. Repeated measurement of TPB constructs will be important to establishing causality and should improve the prediction of treatment participation. Our results showed substantial change in TPB components even within the first 2 weeks in treatment, as evidenced by item test-retest correlations. This suggests that our ability to predict treatment participation may decline rapidly with increasing time to follow-up, and/or that treatment entry is a particularly volatile period. Supporting this logic, our AA Intention Measure (AAIM), also based on the TPB, explained only 17% of the variance in AA involvement when 7-week scores were used to predict 6-month AA involvement, but 41% of the variance in the same when 6-month scores were used to predicted 12-month involvement (Zemore & Kaskutas, 2009). This pattern may be attributable to the fact that many respondents were still in treatment at 7 weeks post-baseline, and hence, subject to dynamically evolving information (and pressures) relevant to 12-step participation; by contrast, formal treatment had been completed by 6 months. The TPB should be predictive of a given behavior only to the extent that nothing intervenes to change cognitions relevant to that behavior. Accordingly, longitudinal studies incorporating fine-grained (e.g., daily) measurement of both treatment-related cognitions and factors that may affect them would be helpful in understanding and addressing temporal changes in treatment-related cognitions.

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Figure 1.

Prediction of intention and treatment completion in the full sample.

Notes.

*** $p < .001$, * $p < .05$.

$\chi^2 (df=7, N=198)=3.50$, $p=.84$, CFI=1.00, TLI=1.07, RMSEA=.00.

Figure presents standardized estimates. Model controls for baseline drug severity, baseline psychiatric severity, race/ethnicity, education, and parenting status in predicting treatment completion.

Figure 2.

Prediction of intention and treatment completion among respondents low/high on social desirability.

Notes.

*** $p < .001$, ** $p < .01$, † $p < .10$.

Low social desirability: $\chi^2 (df=7, N=98)=4.90$, $p=.67$, CFI=1.00, TLI=1.05, RMSEA=.00.

High social desirability: $\chi^2 (df=7, N=100)=4.10$, $p=.77$, CFI=1.00, TLI=1.18, RMSEA=.00.

Figure presents standardized estimates. Models control for baseline drug severity, baseline psychiatric severity, race/ethnicity, education, and parenting status in predicting treatment completion.

Figure 3.

Prediction of intention and treatment completion among respondents low/high on perceived coercion.

Notes.

*** $p < .001$, ** $p < .01$, $\dagger p < .10$.

Low coercion: $\chi^2 (df=7, N=97)=8.92, p=.26, CFI=0.97, TLI=0.94, RMSEA=.05$.

High coercion: $\chi^2 (df=6, N=101)=1.77, p=.94, CFI=1.00, TLI=1.26, RMSEA=.00$.

Figure presents standardized estimates. Models control for baseline drug severity, baseline psychiatric severity, race/ethnicity, education, and parenting status in predicting treatment completion.

Table 1

Sample characteristics.

	% Sample (N=200)
GENDER	
Male	70.0
Female	29.5
Transgender/Intersex	0.5
AGE	
18–29	34.0
30–39	24.5
40–49	29.0
50–59	9.0
60 or higher	2.5
MARITAL STATUS	
Married/living with sig. other	32.0
Single	68.0
ETHNICITY	
White/Caucasian	62.0
Latino/Hispanic	16.0
Black/African American	13.5
Other	8.5
EMPLOYMENT	
Employed full-time	14.0
Employed part-time/self-employed	21.0
Not employed	65.0
INCOME	
UNDER \$10,000	40.0
\$10,001–\$20,000	20.0
\$20,001–\$30,000	14.5
\$30,001–\$50,000	11.0
\$50,001 or higher	12.5
EDUCATION	
Less than high school diploma	21.0
High school diploma or equivalent	37.5
Some college or higher	41.5
PRIOR TX EPISODES	
0	39.0
1–2	37.5
3 or more	22.5

% Sample (N=200)	
DRUG OF CHOICE	
Alcohol only	29.5
Methamphetamine only	25.5
Marijuana only	8.0
Other drug or poly-drug	30.0

Table 2

Descriptive information on TPB items: Item-total correlations, associations with score at retest, and means.

Item	Item-total/inter-item Corr.	Pearson r for Retest	Mean (SD) at Baseline ^I	Mean (SD) at Retest ^I
INTENTION				
1. I will try to complete my treatment program at [program name].	.84***	.22 [†]	6.83 (0.44)	6.76 (0.80)
2. I plan to complete my treatment program at [program name].	.77***	.64***	6.80 (0.49)	6.83 (0.58)
3. I intend to complete my treatment program at [program name].	.75***	.70***	6.74 (0.55)	6.83 (0.64) [†]
ATTITUDE				
1. It would be extremely rewarding for me to complete my treatment program at [program name].	.68***	.38***	6.59 (0.84)	6.45 (1.08)
2. It would be extremely valuable for me to complete my treatment program at [program name].	.68***	.36**	6.46 (1.11)	6.49 (0.89)
SUBJECTIVE NORM				
1. Important people in my life approve of my attending treatment at [program name].	.70***	.56***	6.32 (1.11)	6.50 (1.09)
2. Most people who are important to me think that I should attend treatment at [program name].	.70***	.64***	5.84 (1.58)	6.08 (1.73)
PERCEIVED CONTROL				
1. If I wanted to, I could easily complete my treatment program at [program name].	.25***	.32**	6.08 (1.33)	5.91 (1.60)
2. It is up to me whether I complete my treatment program at [program name].	.25***	.44***	6.67 (1.01)	6.67 (0.92)

Notes.***
p<.001,**
p<.01,[†]
p<.10.^I
Means calculated including only those followed at retest. Response scale from 1 (Disagree very strongly) to 7 (Agree very strongly).

Table 3

Associations between TPB components and alternative readiness scales.

TPB Component	URICA (N=100)	TREAT (N=100)	TMQ Internal (N=100)	TMQ External (N=100)
Attitude	.49 ***	.53 ***	.51 ***	-.29 **
Norm	.57 ***	.59 ***	.63 ***	-.19 †
Control	.32 ***	.43 ***	.16	-.09
Intention	.25 *	.46 ***	.24 *	-.11

Notes.***
p<.001,**
p<.01.*
p<.05,†
p<.10.

“URICA” is University of Rhode Island Change Assessment. “TREAT” is Treatment Readiness Tool. “TMQ” is Treatment Motivation Questionnaire.

Table 4

Associations between alternative readiness scales and treatment participation.

Outcome	URICA (N=100)	TREAT (N=100)	TMQ Internal (N=100)	TMQ External (N=100)
Treatment completion	-.01	-.09	-.20 *	.06
Treatment days	.04	-.09	-.21 *	.11

Notes.*
p<.05.

“URICA” is University of Rhode Island Change Assessment. “TREAT” is Treatment Readiness Tool. “TMQ” is Treatment Motivation Questionnaire.