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Abstinence Self-Efficacy and Substance Use at 2 Years: The Moderating Effects of Residential Treatment Conditions

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Abstract

The relationship between abstinence self-efficacy and substance use at 2 years was examined among a sample ($N = 470$) of persons with substance use disorders and recent incarceration histories. Participants were assigned to residential (therapeutic community/TC or Oxford House) or nonresidential (usual care) conditions. The authors hypothesized abstinence self-efficacy would predict decreased substance use, and residential treatments would moderate this relationship. A conditional effect was observed, with low levels of abstinence self-efficacy predicting significant increases in substance use in the TC and usual care conditions. Supplemental analyses revealed significant decreases in substance use over time among participants in the Oxford House condition, and a significant conditional effect (gender $\times$ treatment condition) in relation to substance use. Findings point to the need for researchers to examine factors that mitigate the relationship between abstinence self-efficacy and substance use outcomes, and for treatment providers to consider the Oxford House model for this population.

Keywords

abstinence self-efficacy; substance use; incarceration; therapeutic community; Oxford House

Substance use disorders (SUDs) are highly prevalent among persons who are incarcerated in the United States (National Institute of Justice, 2003). Regular drug use prior to incarceration has been reported by the majority of inmates across studies, and recurrent substance use might be the greatest risk factor for recidivism (Broome, Knight, Hiller, & Simpson, 1996; Gunter et al., 2008; Keene, 1997), particularly among men (Stahler et al., 2013). Recidivism is also related to a lack of employment and housing opportunities that challenge community reintegration among released offenders who have SUDs (Jason, Olson, & Foli, 2008), pointing to the need for reentry programs to address these important concerns. Therapeutic communities and recovery homes are two types of residential models

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that seem promising in meeting the needs of prisoners who have SUDs upon their release from incarceration.

Therapeutic communities (TCs) are professionally-run settings that are one of the most common residential treatment models for those with SUDs in the United States (De Leon, 1985). Mutual self-help principles are typically incorporated within the therapeutic milieu of this model though TCs vary in terms of their capacities, program philosophies, and services (De Leon, Melnick, & Cleland, 2008). Nonetheless, the TC model is generally effective across studies according to meta-analytic research (Lees, Manning, & Rawlings, 2004). Most TC research involving incarceration populations have examined in-prison TC programs and found them to be associated with improvements in terms of substance use, criminal involvement, and recidivism across studies (see Bahr, Masters, & Taylor, 2012 for a review) though some research evidence suggests the in-prison TC model does not have robust effects (Wexler, Melnick, & Cao, 2004). A 6-month follow-up investigation (Lee, Shin, & Park, 2014) found increased levels of abstinence self-efficacy among inmates who participated in an in-prison TC program, suggesting that the TC model reinforces self-efficacious behaviors toward ongoing abstinence. However, there is a dearth of literature regarding the effects of postprison TCs for this population.

For instance, prisoners assigned to a work-release TC program were less likely to be reincarcerated or have new arrests at 5 years compared to prisoners in a regular work release program (Butzin, O'Connell, Martin, & Inciardi, 2006). Prisoners who transitioned to a TC upon release from prison, compared to those who received postrelease supervision, reported significantly greater abstinence rates and longer abstinence periods (Butzin, Martin, & Inciardi, 2005). These investigations examined the TC model in relation to control-like conditions, whereas examining the TC model in relation to another residential model (e.g., recovery homes) for those with SUDs would help us better understand potential residential options in addition to the effects of postprison TCs for released prisoners.

The Oxford House model is a community-based, recovery-home approach to SUD treatment that has been widely studied (Jason & Ferrari, 2010) and has been placed on the Substance Abuse and Mental Health Service Administration's (SAMHSA; 2011) National Registry of Evidence-Based Programs and Practices in the United States. Oxford Houses are self-run, residential settings for persons utilizing a total abstinence approach to recovery from SUDs. Residents typically live in moderately sized, single-sex, single-family homes, and many of these are occupied by individuals who have been previously incarcerated (Jason et al., 2008; Majer, Jason, Ferrari, Venable, & Olson, 2002). The number of Oxford Houses has grown to 2,000 since its inception in 1975. Most Houses are located in the United States, and there are some Oxford Houses in Australia, Bulgaria, Canada, England, and Ghana.

The Oxford House model has been demonstrated to increase abstinence and reduce criminal behaviors among residents over time (Jason, Davis, Ferrari, & Anderson, 2007; Jason, Olson et al., 2007). Residents typically involve themselves in 12-Step groups such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) to maintain their ongoing abstinence (Majer, Jason, Ferrari, & Miller, 2011) though separate effects for Oxford House living and 12-Step involvement have been observed in relation to total abstinence at 2 years (Majer,

Jason, Aase, Droege, & Ferrari, 2013). Recent investigations have found the Oxford House model to be effective with persons who have SUDs and criminal justice involvement.

For instance, Jason, Olson, and Harvey (2015) examined 2-year outcomes among a sample of persons with SUDs and incarceration histories who were randomly assigned to an Oxford House, TC, or usual care condition upon completion of inpatient substance treatment. Longer lengths of stay in residential (Oxford House, TC) conditions were associated with increased employment and reduced substance use. However, participants who were assigned to the Oxford House condition worked more days and earned more income through employment, achieved greater continuous (alcohol) sobriety rates, and had more cost-benefit ratios than participants assigned to the TC or usual care conditions.

In addition, Jason, Salina, and Ram (2016) examined 2-year outcomes among a sample of women with SUDs with incarceration histories who were assigned to an Oxford House or usual care condition upon completion of inpatient substance treatment. Outcomes were not significantly different between these conditions in terms of participants' substance use and employment. However, longer lengths of stay in Oxford Houses were associated with better substance use and employment outcomes in addition to greater levels of abstinence self-efficacy—an important mechanism of behavioral change among Oxford House residents.

Abstinence self-efficacy is a cognitive resource rooted in Bandura's (1997) self-efficacy theory involving the confidence in one's ability to effectively engage in behaviors for maintaining ongoing abstinence. Investigations have demonstrated relationships between abstinence self-efficacy on the one hand, and living in Oxford Houses (Davis & Jason, 2005; Majer et al., 2002) and increased abstinence outcomes at 1 year among Oxford House residents (Jason, Davis et al., 2007) on the other hand. Research evidence suggests Oxford House living provides residents with greater levels of abstinence self-efficacy compared to 12-Step members who never lived in Oxford Houses (Majer, Droege, & Jason, 2012). Although the Oxford House model has been demonstrated to produce gains in abstinence self-efficacy that leads to better abstinence outcomes, findings from recent investigations suggest the effect of abstinence self-efficacy upon substance use outcomes can be better understood by examining mitigating factors.

For instance, the influence of abstinence self-efficacy on abstinence outcomes was enhanced by levels of motivation for sobriety (Kelly & Greene, 2014) in a sample of young adults in private treatment. The relationship between self-efficacy for (marijuana) abstinence and cannabis abstinence was partially mediated by reduced emotional distress and increased coping skills (Litt & Kadden, 2015). Examining the impact of abstinence-based residential environs upon the relationship between abstinence self-efficacy and substance use would help us better understand postprison treatment options for persons with SUDs with incarceration histories.

In sum, Oxford Houses and TCs are residential models utilized by persons who were formerly incarcerated and who have SUDs. They are similar in that they provide an atmosphere of abstinence support within residential settings that strengthens abstinence self-efficacy to facilitate ongoing abstinence. However, these models differ fundamentally in a

few ways: Oxford Houses do not consist of professional staff (i.e., they are self-run) and do not impose limits to residents' length of stay, whereas TCs comprise professional staff who share responsibilities with residents, have restricted lengths of stay (ranging from 6 – 15 months), and place emphasis on the use of various therapies. Although these models have been demonstrated to reduce substance use (Butzin et al., 2005; Jason et al., 2015) and increase abstinence self-efficacy (Jason et al., 2016; Lee et al., 2014) among persons with SUDs with incarceration histories, it is unknown whether these residential models influence the relationship between abstinence self-efficacy and substance use over time, and if such moderating effects are greater than those from nonresidential treatments.

Thus, we examined the relationship between abstinence self-efficacy and substance use at 2 years among persons with SUDs with recent incarcerations. The present study is an extension of two trials. The first found increased length of stay in Oxford Houses and TCs among persons with SUDs and incarceration histories was related to increased employment and reduced substance use (Jason et al., 2015), whereas the second found a similar duration effect of living in an Oxford House was related to increased abstinence self-efficacy in addition to reduced substance use (Jason et al., 2016). However, these trials did not examine whether abstinence self-efficacy predicted substance use over time among participants in TCs and did not examine whether treatment conditions had moderating effects on this relationship.

We sought to better understand the role of abstinence self-efficacy for this population, and to examine potential moderating effects in its relation to substance use outcomes in the present study. Three treatment conditions (Oxford House, TC, and usual care) were examined in terms of their potential moderating effects on the relationship between abstinence self-efficacy and substance use. We hypothesized that abstinence self-efficacy among recently incarcerated persons completing inpatient treatment for SUDs would predict decreased substance use at 2 years. We also hypothesized that this relationship would be enhanced by assignment to either an Oxford House or TC condition compared to those assigned to a usual care condition.

Method

Participants

This study analyzed data from a combined sample of two trials ($N = 470$; Jason et al., 2015; Jason et al., 2016), each examining alternative treatment sources among justice involved persons with SUDs. There were no significant differences in terms of baseline levels of substance use, abstinence self-efficacy, histories of drugs of choice, or demographic characteristics (with exception to gender and the average length of recent incarceration) between participants in these trials. The assessment measures and intervals, targeted population, and treatment conditions were very similar in each trial. However, one trial (Jason et al., 2015) included an additional TC and found significant differences in age between conditions. These trials were consistent in many respects, and it was necessary to combine samples to have enough power to detect effects and to examine potential gender and race effects across each treatment condition in the present study.

The majority of participants were African American ($n = 349$), 21% were White, and 4% of the sample reported other racial groupings. Seventy percent were single (never married), reported a mean age of 40.2 ($SD = 9.1$) years, and approximately one half the sample reported education levels lower than a high school diploma. Participants reported an average length of recent incarceration of 13.4 ($SD = 19.2$) months and approximately one third reported recent employment (part, full time) histories. In terms of substance use, the majority (45%) reported a drug of choice history of using heroin/opiates, followed by cocaine (29.2%), alcohol (13.6%), cannabis (7.3%), and amphetamine/crystal methamphetamine (.7%). Detailed information is provided elsewhere (Jason et al., 2015; Jason et al., 2016).

Procedures

Four hundred seventy participants were recruited from 2008 to 2011. Recruitment sites included multiple treatment sites for SUDs throughout Chicago and its surrounding suburbs, and northern Illinois. The majority of participants were recruited from inpatient treatment facilities where they were receiving inpatient services, and some were referred to the project through chain-referral sampling though they had recently completed inpatient treatment for SUDs. Criminal justice involvement in the past 2 years in addition to having a SUD were inclusion criteria, whereas those with any violent criminal history or who refused assignment to treatment conditions were excluded. Of the participants approached, 26 were excluded for eligibility violations (no criminal history, convicted of violent crime) and 31 declined to participate (refused assignment of conditions, not interested). All participants were engaged in a process of informed consent. They completed interviews prior to or on the day of completing their inpatient treatment program and again at 2 years, and received financial incentives for their involvement at each assessment interval.

Participants were enrolled in one of two clinical trials (Jason et al., 2015; Jason et al., 2016) that were proposed to and approved by an Institutional Review Board. Eligibility for the present study that combined samples from these trials included agreeing to be assigned to an experimental condition in one of these trials: Oxford House or usual care (control) condition ($n = 200$; Jason et al., 2016); or in the second trial, randomly assigned to an Oxford House, TC, or usual care (control) condition ($n = 270$; Jason et al., 2015). The Oxford House condition ($n = 190$) consisted of self-run, communal-living, residential settings though residents were free to seek professional treatments. The TC condition ($n = 90$) was a licensed, professional organization that consisted of a residential TC environment that included professional staff. The usual care condition ($n = 190$) consisted of what participants would ordinarily receive upon discharge (e.g., outpatient, intensive-outpatient treatment, 12-Step groups, etc.), and participants in this condition stayed with family, friends, in their own apartment, in homeless shelters, or other settings.

Measures

Abstinence self-efficacy—The Drug-Taking Confidence Questionnaire (DTCQ; Annis & Martin, 1985) was administered to assess participants' confidence in resisting the urge to use drugs or alcohol across 50 hypothetical situations. The DTCQ is based on antecedents of substance use relapse (Annis & Davis, 1991) and is rooted in Bandura's (1997) cognitive-

behavioral self-efficacy theory. The DTCQ has been used among people with different addiction typologies (Sklar, Annis, & Turner, 1999). Because confirmatory factor analyses support the eight-factor model of the DCTQ's highly reliable subscales (.79 to .95; Sklar, Annis, & Turner, 1997), we used a total confidence score in the present study by collapsing the subscale scores and averaging these scores on a scale that ranges from 0% (*not at all confident*) to 100% (*very confident*). A total score approach to calculating abstinence self-efficacy has been effectively used in previous studies (Greenfield et al., 2000; Majer, Beers, & Jason, 2014; Majer et al., 2012). The DTCQ had excellent reliability with the present sample (Cronbach's alpha = .98).

Substance use—Miller's (1996) Form-90 was administered to collect a continuous record of the number of days using alcohol and other drugs in the past 6 months at 2-year follow-up. The Form-90 has excellent test-retest reliability (Miller & Del Boca, 1994).

Demographics—A brief survey was created to collect sociodemographic data at baseline. In addition, this brief survey was administered to collect participants' incarceration histories and previous treatments for SUDs.

Data analyses

Analysis of variance (ANOVA) and chi-squared tests were conducted to examine differences between subsamples (Jason et al., 2015; Jason et al., 2016) in terms of demographic characteristics and primary variables (baseline levels of substance use and abstinence self-efficacy) to identify potential extraneous variables to be treated as covariates in our primary analysis. Combining samples was necessary to have enough power to detect effects and to examine gender and race effects across treatment conditions.

Descriptive analyses were conducted to provide demographic characteristics of the overall sample in addition to describing rates of abstinence self-efficacy (i.e., baseline DTCQ scores) and substance use (in past 180 days) at 2 years. A Pearson correlation test (one-tailed) was conducted to examine the association between baseline abstinence self-efficacy scores and substance use at 2-year follow-up. A pairwise deletion approach was used in our primary analysis ($n = 373$), and a missing values analysis of all the independent and dependent variables indicated that the data were missing completely at random; Little's MCAR test; $\chi^2(8) = 10.65, p = .22$.

Conditional effects for moderation were computed by using ordinary least squares regression and bootstrapping procedure (Preacher & Hayes, 2004). Bootstrapping has been demonstrated to be a powerful and preferred method for testing intervening variables whereby inference is based on an estimate of the conditional effect without assumptions regarding the sampling distribution (Hayes, 2009). The conditional effect reflects the amount by which the total effect of the independent variable (abstinence self-efficacy) is influenced when the moderator (treatment condition) is included in the analysis, and treatment condition was coded (Oxford House = 1, TC = 2, usual care = 3). The significance of the conditional effect is indicated when confidence interval (CI; at 95%) values, based on 5,000 bootstrap resamples, do not cross zero. Unstandardized coefficients (b) were used in our moderation analysis because they are preferred to standardized coefficients (β) to indicate

predicted changes in the dependent variable (Hayes, 2009; Preacher & Hayes, 2004), while controlling for other variables (age, gender, race, average length of recent incarceration) in the model. We controlled for age because there were significant differences in age in relation to treatment condition in one subsample (Jason et al., 2015). We dummy coded gender (men = 0, women = 1) and race (African American = 0, other = 1) and entered them as covariates in our model because of the disproportionate number of cases based on their values, and average length of recent incarceration (in months) because these values differed significantly between subsamples that made up the overall sample in the present study.

Results

Preliminary analyses

There were no significant differences between subsamples in terms of age, drug of choice histories, education, employment status, race, baseline levels of abstinence self-efficacy or substance use. However, ANOVA testing revealed a significant difference in the average length of participants' recent incarceration between sub-samples, $F(1, 462) = 6.87, p < .01$. In addition, one subsample (Jason et al., 2015) consisted of women, so gender and length of recent incarceration were treated as covariates for our primary analysis.

In terms of the overall sample, there were proportionately more African American participants than those from other racial groupings, $\chi^2(1, N = 470) = 110.60, p < .01$, though proportional differences in racial categories were very similar between men (47.7%) and women (52.3%). Participants reported an average abstinence self-efficacy (DTCQ) score of 78.6% ($SD = 21.6$) and an average length of recent incarceration of 13.4 ($SD = 19.2$) months at baseline. At 2-year follow-up, participants reported an average number of days using alcohol 17.6 ($SD = 39.52$) and drugs 20.39 ($SD = 45.70$) for a combined alcohol/drug use (substance use) average of 37.99 days ($SD = 68.64$); ranging from 1 to 180 days over the past 6 months. There was a significant negative correlation between participants' baseline abstinence self-efficacy scores and their substance use at two years, $r(379) = -.13, p < .007$.

Primary analysis

The moderation analysis, controlling for age, gender, race, and length of recent incarceration, was conducted using PROCESS model 1, using 5,000 bootstrap samples for percentiles and to establish 95% CIs (Preacher & Hayes, 2004). The regression model was significant $R^2 = .08, F(7, 365) = 4.22, p < .001$, and results of the moderation analysis are presented in Table 1.

Abstinence self-efficacy was not a significant predictor of this model. However, treatment condition was a significant positive predictor, indicating increased substance use at 2 years among participants in the TC and usual care conditions. In addition, the conditional effect (abstinence self-efficacy x treatment condition) was significant, $R^2 = .02, F(1, 365) = 5.86, p < .016$, indicating a significant negative relationship between abstinence self-efficacy and substance use at 2 years among participants in the TC and usual care conditions, but not the Oxford House condition. Treatment condition and the conditional effect remained statistically significant when we reran this model and controlled for the number of days

(duration) participants stayed in the Oxford House and TC conditions, though duration was not a significant covariate.

Supplementary analysis

The significant effects of treatment condition and the conditional effect (abstinence self-efficacy x treatment condition) in our analytic model suggest low levels of abstinence self-efficacy predicted increased substance use at 2 years among participants in the TC and usual care conditions. To substantiate these findings, a repeated-measures analysis of co-variance (ANCOVA) was employed to test for differences in substance use at baseline and 2-year follow-up in relation to condition (Oxford House, TC, usual care), while treating gender as a covariate because it was the only significant covariate in our moderation analysis. A significant interaction between treatment condition and substance use over time was observed. Contrast tests for the interaction of time by treatment condition indicated a significant linear trend regarding substance use over time, Wilks's $\Lambda = .98$, $F(2, 377) = 3.74$, $p < .025$, $\eta^2 p = .02$. Significant increases in substance use from baseline to 2-year follow-up were observed among participants in the TC ($M = 35.20$ vs. 47.17 , $SE = 6.55$ vs. 8.30) and usual care ($M = 26.49$ vs. 39.90 , $SE = 4.32$ vs. 5.47) conditions whereas significant decreases were observed among those assigned to the Oxford House condition ($M = 40.30$ vs. 30.48 , $SE = 4.28$ vs. 5.42). We reran this ANCOVA model with the inclusion of covariates from our moderation analyses, and the results were statistically similar.

Gender was the only significant covariate of our analytic model of moderation in that men reported more substance use at 2 years compared to women. To better understand gender effects, we tested two additional moderation models that included covariates from the first model. The second model tested the conditional effect of abstinence self-efficacy by gender in relation to substance use at 2 years by entering gender as the moderator and treatment condition as a covariate. This resulted in a significant model, $R^2 = .06$, $F(7, 365) = 3.58$, $p < .001$, whereby gender remained a significant predictor of substance use at two years, $b = -60.62$, $SE = 27.02$, $p < .025$, 95% CI $[-113.76, -7.49]$, but the conditional effect (abstinence self-efficacy x gender) was not significant. However, abstinence self-efficacy was a significant predictor of this model, $b = -.57$, $SE = .23$, $p < .015$, 95% CI $[-1.02, -.11]$.

The third model tested the conditional effect of Gender by Treatment Condition. We examined the relationship between gender (predictor) and substance use at 2 years by entering treatment condition as the moderator and entering abstinence self-efficacy as a covariate (in addition to covariates used in previous models). This resulted in a significant model, $R^2 = .07$, $F(7, 365) = 3.99$, $p < .001$, and results of this moderation analysis are presented in Table 2. Abstinence self-efficacy and treatment condition remained significant predictors of substance use at two years, but not gender. However, the conditional effect (gender x treatment condition) was significant, $R^2 = .01$, $F(1, 365) = 4.35$, $p < .038$. Conditional effect coefficients of this third model indicate that men in the TC and usual care conditions reported significantly more substance use at 2 years compared to women in these conditions, whereas there were no significant differences in substance use at 2 years between men and women in the Oxford House condition.

Discussion

The significant negative bivariate correlation between abstinence self-efficacy and substance use at 2 years was small, suggesting that the effects of abstinence self-efficacy are not sustained among persons with SUDs and incarceration histories. It is possible that less-than-optimal levels of abstinence self-efficacy accounted for the magnitude of this relationship as research evidence has shown future abstinence at 1 year is best predicted by maximum levels of abstinence self-efficacy (Ilgen, McKellar, & Tiet, 2005). Although abstinence self-efficacy was not a significant predictor when testing for the moderating effects of treatment condition (first model), abstinence self-efficacy was a significant negative predictor of substance use at 2 years when treatment condition was controlled for (second model). These findings are consistent with those from other investigations on abstinence self-efficacy and substance use outcomes (Chavarria, Stevens, Jason, & Ferrari, 2012; Greenfield et al., 2000; Moos & Moos, 2007), suggesting that persons with SUDs and incarceration histories benefit from this cognitive resource.

However, the relationship between abstinence self-efficacy and substance use was influenced by treatment condition as evidenced by the significant negative conditional effect (abstinence self-efficacy x treatment condition). Low levels of abstinence self-efficacy predicted increased substance use at 2 years among participants assigned to the TC and usual care conditions, but not the Oxford House condition. The direction of the conditional effect was substantiated by repeated measures ANCOVA testing that found significant increases in substance use at 2 years among participants assigned to the TC and usual care conditions. Taken together, these findings demonstrate that the relationship between abstinence self-efficacy and substance use at 2 years was mitigated by treatment conditions.

Our findings add to the growing body of research that seeks to understand factors that influence the effects of abstinence self-efficacy upon substance use/abstinence outcomes. Intrapersonal factors such as coping skills, emotional distress (Litt & Kadden, 2015), and motivation for sobriety (Kelly & Greene, 2014) have been demonstrated to enhance the effects of abstinence self-efficacy in relation to abstinence outcomes. One study did not find differential effects of abstinence self-efficacy between three treatment interventions (Litt, Kadden, & Petry, 2013), suggesting that highly supportive treatments increase abstinence self-efficacy. However, findings in the present study extend this research in that we examined two highly supportive, abstinence-based residential treatments in relation to a nonresidential treatment (i.e., usual care condition) and found differential moderating effects.

The mixed results of the conditional effect in the present study have several implications, one of them being that nonresidential treatments (usual care condition) are not sufficient in maintaining abstinence self-efficacy that leads to decreased substance use over time for this population. It is possible that other factors such as housing and employment needs that are common among those with incarceration histories (Jason et al., 2008; Salina, Lesondak, Razzano, & Parenti, 2011) might have had an impact among participants in the usual care condition in the present study though such claims can only be verified through additional research. Nonetheless, we observed differential conditional effects between abstinence-

based residential conditions whereby the TC condition significantly moderated the relationship between abstinence self-efficacy and substance use at 2 years (similar to the usual care condition) whereas the Oxford House condition did not. This would suggest that some TCs do not emphasize reinforcing self-efficacious beliefs and behaviors toward ongoing abstinence, possibly accounting for recurrent drug use that leads to recidivism in previous TC investigations with persons who are incarcerated and who have SUDs (Wexler et al., 2004; Zhang, Roberts, & McCollister, 2011).

In terms of the Oxford House condition, the lack of a significant conditional effect of moderation (abstinence self-efficacy x treatment condition) and the significant treatment effect of reduced substance use at 2 years suggest that the effects of abstinence self-efficacy are not diminished over time among Oxford House residents with incarceration histories. It is possible that coping strategies that enhance the effects of abstinence self-efficacy on abstinence outcomes (Litt & Kadden, 2015) had some impact among participants in the Oxford House condition as research evidence suggests abstinence self-efficacy among Oxford House residents is developed by active (vs. passive) coping strategies (Majer, Jason, Ferrari, Olson, & North, 2003). In addition, Oxford House residents develop high levels of abstinence self-efficacy early in their recovery (Majer, Jason, & Olson, 2004), which might account for mixed results in the present study. Likewise, Oxford House members typically have high levels of abstinence social support related to their abstinence self-efficacy and abstinence (Davis & Jason, 2005; Majer et al., 2002). Such abstinent support networks have been demonstrated to increase abstinence self-efficacy and abstinence over time (Jason, Davis et al., 2007; Litt, Kadden, Kabela-Cormier, & Petry, 2009) and could be related to differences across treatment conditions in the present study. Although these claims can only be verified through additional research, findings in the present study point to the need for future investigations to identify specific elements (e.g., programmatic, social, environmental) of abstinence-based residential treatments that increase recovery outcomes for persons who have SUDs and incarceration histories.

Furthermore, there was no significant conditional effect for gender by abstinence self-efficacy, suggesting that men and women who have SUDs and incarceration histories equally benefit from abstinence self-efficacy (Litt & Kadden, 2015). However, it is important to note that differences in how abstinence self-efficacy is developed and utilized between men and women with SUDs have been observed (Davis & Jason, 2005), and that women who were incarcerated entering in-prison residential substance abuse treatment report significantly lower levels of abstinence self-efficacy than their male counterparts (Pelissier & Jones, 2006). Nonetheless, we found comparable rates of substance use outcomes between men and women in the Oxford House condition, but not the TC and usual care conditions. Taken together, these findings suggest that men and women with SUDs and incarceration histories equally benefit by abstinence self-efficacy and the Oxford House model for their ongoing recovery.

Although examining postprison residential programs such as the TCs and Oxford Houses might help explain the role of abstinence self-efficacy among persons who were previously incarcerated and with SUDs, there are some limitations in the present study. For instance, our sample comprised mostly African American men and women from the United States,

thus results may not easily generalize across other populations. We did not differentiate whether participants were detained in jail or prison settings, or include those with violent offenses, and these factors should be considered in future investigations. Likewise, the present study did not assess whether participants were mandated or otherwise observed by the courts to receive treatment (i.e., under coercion). Nonetheless, results in the present study have implications for future research, and our findings suggest that Oxford Houses might be appropriate residential treatment options for justice involved persons with SUDs.

The present study investigated a sample of persons with SUDs with recent incarceration histories. The comparative design permitted analyses that yielded intriguing findings in relation to abstinence self-efficacy and substance use among participants assigned to community-based (professionally and self-run) residential treatments and nonresidential treatments. In future investigations, with other measures pertaining to programmatic, interpersonal, and environmental level factors we can better understand how justice involved persons benefit by community-based residential treatments. Overall, findings from the present study suggest that the Oxford House model is an effective residential treatment for justice involved persons.

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Table 1

Moderating effects of treatment condition on the relationship between abstinence self-efficacy and substance use at 2 years.

Effect	Estimate (<i>b</i>)	SE	95% CI	
			Lower	Upper
Abstinence self-efficacy	.567	.42	-.253	1.380
Treatment condition	40.19**	15.60	9.517	70.860
Conditional effect				
Oxford House	.06	.24	-.409	.440
Therapeutic community	-.35*	.17	-.673	-.026
Usual care	-.76**	-.23	-1.222	-.303
Gender	-26.98***	7.12	-40.831	-12.845

Note. CI = confidence interval.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 2

Moderating effects of treatment condition on the relationship between gender and substance use at 2 years.

Effect	Estimate (<i>b</i>)	SE	95% CI	
			Lower	Upper
Abstinence self-efficacy	-.34 *	.17	-.660	-.018
Treatment condition	14.19 *	6.40	1.610	26.780
Conditional effect				
Oxford House	-11.96	10.33	-32.274	8.353
Therapeutic community	-27.08 ***	7.13	-41.099	-13.067
Usual care	-42.21 ***	10.01	-61.888	-22.524
Gender	6.50	17.82	-28.548	41.540

Note. CI = confidence interval.*
 $p < .05$.***
 $p < .001$.