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Alone on the Inside: The Impact of Social Isolation and Helping Others on AOD Use and Criminal Activity

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Abstract

Because addiction is a socially isolating disease, social support for recovery is an important element of treatment planning. This study examines the relationship between social isolation, giving and receiving social support in Alcoholics Anonymous during treatment, and post-treatment outcomes among juvenile offenders court-referred to addiction treatment. Adolescents (*N* = 195) aged 14 to 18 years were prospectively assessed at treatment admission, treatment discharge, 6 months, and 12 months after treatment discharge. The influence of social isolation variables on relapse and severe criminal activity in the 12-months post-treatment was examined using negative binomial logistic regressions and event history methods. Juveniles entering treatment with social estrangement were significantly more likely to relapse, be incarcerated, and commit a violent crime in the 12-months post-treatment. Giving help to others in Alcoholics Anonymous during treatment significantly reduced the risk of relapse, incarceration, and violent crime in the 12-months post-treatment whereas receiving help did not.

Keywords

alcohol and drug use, recidivism, adolescents, social support, service

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Introduction

Adolescent addiction is a major public health problem (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011). The overabundance of prescription medications, ease in access to harder street drugs including methamphetamines, and the increasing use of marijuana make it easier than ever before for youth to use controlled substances (Hurley & Mazor, 2013). Alcohol and other drug (AOD) use curtails youth brain development; hinders academic performance; increases the risk and spread of infectious disease, injuries, and violence; contributes to risky sex and teenage pregnancy; and negatively affects life-course trajectories (Guerri & Pascual, 2010). Increased criminal activity, higher health care costs, and lost productivity are by-products of AOD problems. The cost to society is as much as US$500 billion annually for excessive adult and youth drinking (Bouchery et al., 2011).

In comparison with youth in prior generations, young people today volunteer less and have less civic engagement, gratitude, and concern for others (Putnam, 2000; Twenge, Campbell, & Freeman, 2012). Indeed, Putnam (2015) argued that diminishing social structures and the lost opportunities they afford contribute to the fact that the American Dream is now in crisis among today's youth. Moreover, individualistic values such as money, fame, and "I" or "Big Me" thinking (Brooks, 2015; O'Keeffe & Clarke-Pearson, 2011) may exacerbate AOD use. Self-absorbed thinking may be especially problematic for teens with substance dependency disorder (Carter, Johnson, Exline, Post, & Pagano, 2012). Although ego-centric thinking appears to have grown and become more sharply expressed over recent decades, decline in youth engagement has also been linked to a decline in social structures that otherwise can create opportunities for the giving and receiving of support. For example, boys today are significantly less likely to participate in Boy Scouts than boys from previous generations (Johnson & Clifton, 2010). Describing a generational ethos is admittedly complex, but evidence does suggest that the narcissistic dimension has become more pronounced throughout society and exacerbated among youth (Carter et al., 2012). Positive outcomes associated with increased volunteerism, spirituality, and participation in well-designed youth-development programs suggest that the problem is not a function of unchangeable traits but instead relates to malleable personal, situational, and social factors and structures (Callina, Johnson, Buckingham, & Lerner, 2014; Carter et al., 2012; Hansen, Larson, & Dworkin, 2003; Hilliard et al., 2013; Lee, Veta, Johnson, & Pagano, 2014; Lerner, 2004; Lerner & Callina, 2014; Lerner, Lerner, Bowers, & Geldhof, 2015; Stoddard, Henly, Sieving, & Bolland, 2011).

Social isolation and its counterpart, social connection, are particularly important influences on youth behavior that shape a host of outcomes, including substance use. It has recently been argued that the primary driver of drug addiction is not chemicals but rather the isolation, pain, and distress experienced by users (Hari, 2015). Although social media is often thought to increase social connections, there is evidence that American youths today are more socially isolated despite these technological advances. Although the increase in youth social isolation has been noted, far less discussed are the detrimental effects of social isolation to physical and mental health (Cornwell & Waite, 2009; Holt-Lunstad, Smith, & Layton, 2010). Health risks associated with social isolation have been compared in magnitude with the hazards of smoking and obesity (House, Landis, & Umberson, 1988). Addiction is a socially isolating disease (Orford et al., 2013), but the reverse is also true. Social isolation, particularly during adolescence, has been linked to addiction (and a variety of other negative outcomes), because isolation seems to have neurological effects that increase the likelihood of addiction (Whitaker, Degoulet, & Morikawa, 2013). Social isolation clearly affects treatment in harmful ways (Pagano, Wang, Rowles, Lee, & Johnson, 2015). Ego-centric thinking can erode social bonds, thereby increasing social isolation that counters effective treatment, especially in a group setting. This tendency is why service was designed into the 12-step program to correct ego-centric thinking that alcoholics/addicts confront regardless of length of time sober. Although it seems obvious, getting addicts reconnected is an important goal that all too often remains overlooked (Hari, 2015).

Social Isolation and Addiction Recovery

Social support has been recognized as vital in bringing patients out of social isolation and enhancing sobriety. Recognizing that few individuals, if any, recover from addiction on their own, recovery supports have been prioritized in the American Society of Addiction Medicine's guidelines since its inception in the 1950s. Current alcoholism treatment approaches focus on providing help *to clients*, whether it is insight into behavior, skill acquisition, social support, or pharmacological treatments. The health and mental health benefits from receiving social support have been well documented, especially for youth (Nicholson, Collins, & Holmer, 2004). A supportive social network that includes members from Alcoholics Anonymous (AA) appears especially important for sustained periods of abstinence (Rynes & Tonigan, 2012). Although some research has called into question the efficacy of AA, particularly in comparison with drug treatment (Gray, 2012), the overwhelming evidence suggests that participants in AA fare at least as well as those in treatment (Forcehimes & Tonigan, 2008; Straussner & Byrne, 2009; Tonigan & Bogenschutz, 2008).

There is also a large body of research in psychology and social psychology that has demonstrated the health benefits to those who provide help *to others* (Post, 2011). Moreover, there is a growing recognition of the importance of extending this work to include youth and youth-development programs that have begun to emphasize volunteering and community service. Emerging research suggests serving others is central to staying sober in the short term and long term (Pagano, Friend, Tonigan, & Stout, 2004), in reducing the depression that is common in early recovery (Pagano, Zeltner, Jaber, et al., 2009), and in fostering awareness of others (Pagano, Kelly, et al., 2013). The positive psychological and physical outcomes associated with prosocial behavior, particularly formal volunteering in structured settings, appear to be greatest for those who are otherwise socially isolated. Perhaps, the most popular adjunct to drug and alcohol treatment (AA) operates differently with regard to formal volunteering, but as a community of givers it is clear that service to others in the AA context also benefits those who may be socially isolated (Pagano et al., 2004; Pagano, Kelly, et al., 2013; Pagano, Zeltner, Jaber, et al., 2009).

Given the large literature in psychology and sociology on the benefits from providing and receiving social support, the lack of studies that have compared these two modes of exchange is unfortunate. To understand therapeutic mechanisms better within mutual-help (self-help) groups, Roberts et al. (1999) studied the helping transactions occurring in group meetings. Hypothesized links between giving and receiving help and psychosocial adjustment were examined in a mutual-help group for individuals with serious mental illness. Results indicated that giving help to others predicted improvements in psychosocial adjustment, though help received was not associated with adjustment. Brown, Neese, Vinokur, and Smith (2003) examined the relative contributions of giving versus receiving support to longevity in a sample of older married adults. Results from logistic regression analyses indicated that mortality was significantly reduced for individuals who reported providing support to friends, relatives, and neighbors. Receiving support, however, had no effect on mortality once giving support was taken into account. In a similar study, Poulin, Brown, Dillard, and Smith (2013) analyzed data obtained from 846 older adults who participated in a prospective study of older couples. Using mortality data from the subsequent 5 years, researchers found that stress increased the risk of earlier mortality only among those who did not engage in helping behaviors but did not increase risk among those who provided help. These studies, however, have several important limitations. For example, they rely on samples comprised largely of adults, White males, and normal populations, and they do not examine AOD outcomes. The current study seeks to remedy each of these shortcomings

with a youth sample that is approximately half female, about 30% minority, and at high risk of AOD use as well as criminal recidivism.

Social Isolation, AOD Use, and Criminal Activity

The link between crime and AOD use is well established, and longitudinal research indicates that this relationship is mutually reinforcing (Wooditch, Tang, & Taxman, 2014). AOD use is 4 times higher among criminal offenders compared with the general population (NIH Fact Sheet, 2010), and substance abuse treatment programs often reduce criminal activity as well as AOD use. Drugs and alcohol are viewed as causes of crime, particularly violent crime and property crimes such as theft, because of psychopharmacologic effects and the systemic violence and lawlessness that results from the illicit drug trade itself. Alcohol is especially implicated in family violence, and illegal drug use seems to play a greater role in violence among youths, at least in some studies (De La Rosa, Lambert, & Gropper, 1990).

Social connection is often seen as beneficial, unless the ties are to antisocial peers who are engaged in criminal activity. As Putnam (2000) puts it, referring to neighborhoods with higher levels of substance abuse and criminogenic tendencies, "Social integration into a community of bad actors may not produce good results" (p. 315). Researchers have identified risk factors for reoffending, including substance use and antisocial thoughts and associates, as well as protective factors, including family and marital relations, employment, and leisure and recreational activities (Wooditch et al., 2014). Although leisure activities have been protective, studies have not looked specifically at helping others, an activity which has been defined as "serious leisure" (Stebbins, 1982). Helping others may serve as a prosocial form of leisure and a pathway to prosocial integration, both factors that should reduce criminal recidivism.

Purpose of This Study

This study examines the role of social isolation and benefits of giving versus receiving help on the drink–trouble cycle among juveniles court-referred to addiction treatment. Based on prior research, we hypothesized that social isolation would be associated with greater likelihood of relapse and return to criminal activity. Because of the emphasis on service in the 12-step program and associated long-term benefits on abstinence (Pagano, White, et al., 2013), we also hypothesized that giving help would alter AOD use and criminal activity more than receiving help from others in AA.

Method

Procedures

Participants were 195 youths aged 14 to 18 years entering residential treatment at a large adolescent treatment facility in the northeastern United States. Services provided in residential treatment include gender-specific group therapy, family and individual therapy, education, and relapse prevention. Patients spent approximately 20 hours per week in therapeutic activities and attended at least three 12-step meetings each week of the residential treatment program ($M = 2.2$ months). Patients are eligible to go on pass after their initial week in treatment, and clinicians collect urine toxicology screens on their return as part of treatment procedures. Inclusion criteria included the following: ages between 14 and 18 years, English speaking, stable address and telephone, met American Psychological Association diagnostic criteria for current AOD dependency, not currently suicidal/homicidal, and medical clearance verifying the absence of acute intoxications and withdrawal symptoms. Subjects were referred to treatment from multiple sources, including juvenile court (83%), mental health professionals (65%), and non-psychiatric physicians (2%). In the week before admission date, participants were sent an information packet with an invitation letter to participate in the study. Following the admission interview with clinical staff, participants were approached by research staff and given a brief description of the study. Eligible participants signed statements of informed consent/assent and were scheduled for a baseline interview. Clinical staff members were not informed of any research results, and research data were not entered into participants' medical records. Participants were paid US$25 for completing assessments.

Of the 211 patients approached, none were ineligible, and 16 refused to participate, resulting in an enrollment sample of 195 subjects. There were no significant differences between youths enrolled versus not enrolled but treated during the enrollment period in terms of background characteristics, substance use severity, lifetime trauma experiences, treatment history, and rates of treatment completion, as reported in detail elsewhere (Kelly, Pagano, Stout, & Johnson, 2011). Eight-nine percent of the enrollment sample completed treatment, 6% were prematurely discharged against medical advice, and 5% were transferred to a higher level medical facility. Discharge assessments were unable to be scheduled for three treatment completers, three premature discharges, and two higher level facility discharges. There were no significant intake differences between participants with ($n = 185$, 96%) and without a discharge interview ($n = 8$, 4%). All 195 enrolled participants were followed for 12 months after the nominal date of leaving the treatment facility (i.e., date of treatment discharge, premature discharge, or discharge to a higher level

facility). Sixteen participants were incarcerated at the time of their 6-month and 12-month interviews and thus were unable to be scheduled for post-treatment interviews. An additional 11 subjects were incarcerated at the time of their 12-month interview only, and were thus unable to be scheduled for an interview. Six subjects refused study participation when contacted at either their 6-month ($n = 2$) or 12-month ($n = 4$) interview, and 21 subjects were lost to follow-up. Of those able to be scheduled (i.e., not incarcerated) at the time of their post-treatment interview, 87% ($n = 156/179$) completed a 6-month interview, and 84% ($n = 141/168$) completed a 12-month interview. There were no significant baseline or discharge differences between subjects who completed and did not complete a 6-month interview, as reported in detail elsewhere (Pagano et al., 2015). There were no significant differences in background characteristics, AOD severity, social isolation variables, or baseline assessment of outcomes between participants incarcerated ($n = 16$) or interviewed ($n = 141$) at both study intervals post-treatment, interviewed at the 6-month interval only ($n = 15$), lost to follow-up ($n = 21$), or refused ($n = 6$).

Measures

Data were gathered via rater-administered interviews, youth reports, clinician reports, medical chart review, and electronic court-records. Participants completed a semi-structured interview in a private location with a research assistant at three time points: at baseline in the week following the admissions interview ($M = 7$ days, range = 0-10 days), at discharge, and at 6 months after the date of discharge. Semi-structured interviews were conducted in person by experienced clinical interviewers whose training ranged from BA to MD. Training of interviewers included didactic tutorials, mock interviews and role-playing, and supervised interviews with detailed feedback provided by the principal investigator. All individuals involved in collecting data from subjects completed the National Institute of Health required courses on human subjects' protection.

Background. Background characteristics associated with outcomes in prior work (Pagano et al., 2004) were assessed at intake: gender, minority status (Black vs. non-Black), age, grade, parental marital status, parental education, urbanicity of residence (i.e., urban/suburban vs. rural/small town), global health, lifetime religiosity, and lifetime traumatic experiences. Urbanicity of residence was assessed using the zip code approximation version of the census tract-based Rural–Urban Commuting Area codes (http://depts.washington.edu/uwruca/ruca-data.php). A single health quality of life item assessed physical health: "How do you describe your health in general?" Response choices

ranged from *excellent, very good, good*, and *fair*, to *poor*. Prior studies have demonstrated good construct validity of Youth Risk Behavior Survey (YRBS), physical health indices in relation to biomarkers, and perceived life satisfaction in adolescents (Sivak & Schoettle, 2011). Lifetime religiosity was assessed using the 14-item self-report Religious Beliefs and Behaviors Questionnaire (Connors, Tonigan, & Miller, 1996). Lifetime traumatic experiences were assessed with the four-item Traumatic Experiences Scale adapted from the valid Massachusetts Youth Screening Inventory (Grisso & Barnum, 2000), which showed good internal consistency in the current sample ($\alpha = .86$).

Social isolation. Four indicators of social isolation were assessed: social estrangement, low volunteerism, help given to others in AA (G), and help received from others in AA (R). Social estrangement was assessed with one item from the Posttraumatic Stress Disorder Checklist (PCL-C; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) that asked respondents if they felt detached or estranged from others in the 6 months prior to intake (*yes/no*). Test–retest reliability analysis of the PCL-C showed substantial agreement ($\kappa = .61$). Volunteerism was assessed at intake using an item from the YRBS that asked respondents to report the number of hours in an average month they spent on volunteer work, community services, or helping people outside the home without getting paid. Participants who reported 0 hours of volunteerism were considered to have low volunteerism. Given the threshold of at least 5 hours/per month that is associated with better health outcomes (Upchurch, Mason, Kusunoki, & Kriechbaum, 2007; Zullig, Valois, Huebner, & Wanzer, 2005), participants endorsing less than 5 hours/per month were categorized with low (<5 hours) versus high (more than 5 hours) volunteerism. Help given (G) to and help received (R) from others in AA was assessed at intake and at discharge using two items from the valid and reliable Service to Others in Sobriety (SOS) Questionnaire (Pagano, Kelly, et al., 2013): "Overall, how much help did you give to others in AA?" and "Overall, how much help did you receive from others in AA?" Item responses are 1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, and 5 = *always*; item responses 1 to 3 were categorized as *low*, and 4 to 5 were *high*, as in prior work (Lee, Poloma, & Post, 2013). There were no significant correlations between social isolation variables with the exception of a moderate correlation between G and R at intake ($r = .38$, $p < .001$) and at discharge ($r = .34$, $p < .001$). Youth report of help given and received in AA during treatment showed significant agreement with counselor report of youth help given and received in AA ($rs = .32$-$.33$, $p < .0001$). Prior work has shown the utility of single-item ratings of social behavior with AOD populations and normative populations of young adults (Murphy, Lamonda, Carney, & Duncan, 2004; Pagano, Kelly, et al., 2013).

Addiction severity. Two indices of addiction severity were assessed at intake: readiness for change and years of AOD use. Readiness for change was assessed with the University of Rhode Island Change Assessment Scale, a measure of motivation for behavioral change that has been validated with treatment-seeking young adults and adults (DiClemente, Wingood, et al., 2004). With reference to the past month, 32 items are rated on a 5-point Likert-type scale from 1 (*strong disagreement*) to 5 (*strong agreement*). A readiness-for-change score is formed from the sum of three subscale scores (Contemplation, Action, and Maintenance) minus the Precontemplation subscale. Years of use were calculated by subtracting age at first AOD use (excluding sips or tastes) from participants' current age at intake.

Outcomes. Outcomes included AOD use and serious criminal activity (incarceration, violent crimes). AOD use was assessed with the valid and reliable Timeline Follow-Back interview (TLFB; Donohue et al., 2004). Following the TLFB administration manual (Sobell, Brown, Leo, & Sobell, 1996), the interviewer used a calendar grid and memory anchor points to aid participant recall of daily drinking and/or drug use on each day in the assessment period. Data on alcohol use were collected on the first pass through the calendar, followed by use of seven drug types (cannabis, cocaine, hallucinogens, sedatives/hypnotics, narcotics, stimulants, and inhalants). Percentage of days abstinent (PDA) was calculated as the number of days a subject was abstinent from AOD divided by the number of days in the assessment period multiplied by 100. PDA scores showed high agreement with testing positive for AOD use during the treatment period ($\kappa = .87$). Time to first AOD use after the nominal end of treatment, a primary time-to-event outcome measure in Matching Alcoholism Treatments to Client Heterogeneity (Project MATCH; Babor et al., 2003), was considered a relapse in this study.

Jail episodes and violent crimes were collected from electronic court-records maintained in booking databases and jail/detention continuum databases across 16 municipal court districts referring participants to treatment. Jail episodes and violent crimes occurring within 12 months before the date of treatment admission and 12 months after the date of discharge were recoded and reviewed by an experienced peer interviewer for completeness and accuracy. Because youths as young as 16 years could be charged as adults, adult court-records were also collected from referring municipal courts. Participants were matched to the booking and jail databases on last name, first name, gender, and date of birth. When electronic records were not available, the courts provided paper copies with equivalent data points to the research team. Documentation of violent offenses (homicide, sex offenses, domestic violence, aggravated assault) were given the most serious offense

ranking (felony, Level 1), and AOD involvement (*yes*/*no*) was recorded. Jail episodes were registered as felonies (Level 1 severity) in jail/detention continuum databases, which also documented the date and AOD involvement (*yes*/*no*) of each jail episode. Court-records have shown high correlation with self-report of legal involvement (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996); in the current sample, jail episodes prior to treatment were significantly correlated with youth report of legal involvement on the Substance Abuse Subtle Screening Inventory (ASASSI; $r = .5$, $p < .001$). There was no correlation between jail episodes and violent crimes at intake ($r = .10$, *ns*).

Statistical Analysis

Statistical analyses were performed with SAS Version 9.2 (SAS Institute Inc., 2008). Distributions of variables were first examined for normality; positively skewed distributions (prior no. of jail episodes, prior no. of violent crimes) were given a logarithmic transformation, and the negatively skewed PDA variable received an arcsine transformation, as was done in the primary MATCH outcome analyses (Project MATCH Research Group, 1997). For descriptive purposes, participants were categorized into four groups based on youth reports of help given to (G) and received by (R) others in AA during treatment. Group categories were based on recent research on social behaviors (Lee et al., 2013): low G/low R, low G/high R, high G/low R, and high G/high R. Differences between groups at intake and discharge were examined using Fisher's Exact Test for categorical variables and Mann–Whitney Test for continuous variables. For prospective (lagged) hypothesis testing of social isolation on post-treatment outcomes, main effects of continuous item ratings of help given and help received in AA during treatment on recidivism outcomes (1 or more jail episodes, 1 or more violent crimes) were tested using negative binomial logistic regressions with a robust variance correction for over-dispersion. The likelihood of relapse post-treatment was examined using event history methods (survival analysis, Cox proportional hazard regression). Model covariates associated with outcomes in prior work (Pagano et al., 2004) included background variables (gender, race, age, parental education and marital status, urbanicity of residence, global health, lifetime religiosity, lifetime trauma experiences), social isolation variables at intake (social estrangement, volunteerism), addiction severity variables (years of use, readiness for change), treatment completion, and the dependent variable at intake. Preliminary analyses suggested that linear modeling was adequate. Examination of the correlation matrix for independent variables in analytic models found no correlation to exceed .3, and collinearity diagnostics indicated no problems. Tests for violations of the proportional hazard

assumption found no evidence of nonproportionality in the Cox regression model. For the purposes of interpretation, Cohen (1988) considered $r = .10$ (small), $r = .30$ (medium), and $r = .50$ (large). We reported all two-tailed tests with significance values greater than 95% ($p < .05$).

Results

Intake

Table 1 shows the intake profile for the sample. The vast majority of respondents entered residential treatment with marijuana dependency (92%) and comorbid alcohol dependency (61%), as reported in detail elsewhere (Kelly et al., 2011). The majority of the sample reported 10 or more lifetime uses of marijuana (98%) and alcohol (88%) and misuse of prescription drugs (46%), with rates comparable with other samples of adolescents in residential treatment (Godley, Godley, Dennis, et al., 2002; Hall et al., 2010). Participants were 16 years old on average ($M = 16.2$) and in 10th grade ($M = 10.1$ years of education). Half of the youth in the sample (50%) came from single-parent households, and 73% had a parent with a high school diploma or less. Thirty percent were African American, and 8% were Hispanic. Approximately half were male (48%) and approximately half came from a rural or small town (53%). A majority of the sample reported very good or good physical health (68%). Social isolation at intake was high; most reported low G (88%) and low R (94%) in AA, approximately half (48%) volunteered no hours, and 26% were socially estranged from others. Assessment of outcomes at intake indicated that the sample used AOD on 18 of the 30 days prior to treatment. Thirty-three percent ($n = 66$) had a prior incarceration episode in the year before treatment, the majority of which were AOD-related (85%). Sixteen percent ($n = 32$) had committed a violent crime in the year prior to treatment (24 aggravated assaults, six domestic violence, two sex offenses), most of which (89%) did not involve AOD. Additional information regarding the profile of the sample at intake is detailed elsewhere (Kelly et al., 2011).

Discharge

The majority of the sample (89%) completed the 2-month treatment period ($M = 10.2$ weeks, $SD = 1.1$ weeks). Participants overall showed significant improvements in PDA ($t = -23.6$, $p < .001$), although only half (50%) were abstinent throughout the treatment period. Youths attended an average of 32 AA meetings ($SD = 3.7$ meetings) during the 2-month treatment period. The mean level of help given (G) in AA significantly increased ($M = 3.3$,

Table 1. Intake Characteristics.

	Social isolation during treatment				
	Low G/low R (19, 10%)	Low G/high R (63, 32%)	High G/low R (45, 23%)	High G/high R (68, 35%)	Total (195, 100%)
Background					
Male	12 (63%)	30 (48%)	23 (51%)	28 (41%)	93 (48%)
Minority (ethnicity/race)	10 (52.6)	15 (23.8)	14 (31.1)	20 (29.4)	59 (30%)
Age (years)	16.4 (1.0)	16.0 (1.1)	16.3 (1.1)	16.1 (1.0)	16.2 (1.1)
Parental information					
College graduate	4 (21.1)	20 (31.7)	15 (33.3)	14 (20.6)	53 (27%)
Married	8 (42%)	32 (51%)	25 (56%)	33 (48%)	98 (50%)
Residence					
Rural/small town	10 (53%)	37 (59%)	21 (47%)	35 (52%)	103 (53%)
Global health					
Very good/good	11 (58%)	43 (68%)	32 (71%)	47 (69%)	133 (68%)
Lifetime religiosity**	26.9 (8.7)[b]	26.3 (14.9)[b]	25.4 (14.6)[b]	32.7 (13.2)[a]	27.6 (13.2)
Lifetime trauma experiences	1.5 (1.4)	1.6 (1.5)	1.4 (1.4)	2.1 (1.4)	1.7 (1.5)
Social isolation					
Help given (G) in AA	1.7 (0.9)	1.5 (0.8)	1.3 (0.7)	1.8 (1.0)	1.6 (0.9)
Help received (R) in AA	2.2 (1.1)	2.1 (1.2)	1.9 (1.0)	2.3 (1.2)	2.0 (1.2)
Estranged from others*	4 (21%)[b]	11 (17%)[b]	11 (24%)[ab]	25 (37%)[a]	51 (26%)
No volunteering	9 (47%)	32 (50%)	21 (47%)	31 (46%)	93 (48%)
Addiction severity					
Years of use	3.5 (1.6)	3.4 (1.5)	3.3 (1.5)	3.3 (1.6)	3.4 (1.5)
Readiness for change**	10.1 (2.9)[b]	10.4 (2.3)[b]	10.9 (2.7)[ab]	11.4 (2.3)[a]	11.0 (2.5)
Outcomes at intake					
No. of jail episodes	1.0 (1.9)	1.0 (1.7)	0.8 (1.5)	1.2 (1.7)	0.9 (1.7)
No. of violent crimes	0.2 (0.5)	0.3 (0.6)	0.1 (0.3)	0.2 (0.6)	0.2 (0.5)
Alcohol/drug use (PDA)	0.6 (0.2)	0.5 (0.3)	0.6 (0.2)	0.6 (0.3)	0.6 (0.3)

Note. Groups sharing the same superscript letter are not significantly different. AA = Alcoholics Anonymous; PDA = percent days abstinent.
*$p < .05$. **$p < .01$.

$SD = 1.2$; $t = -12.7$, $p < .001$), and 58% were high G. The mean level of help received (R) in AA also increased ($M = 3.9$, $SD = 1.3$; $t = -15.7$, $p < .001$), and 67% were high R. Thirty-five percent were high G/high R, 23% were high G/low R, 32% were low G/high R, and 10% were low G/low R. As shown in Table 1, social exchange G/R groups were comparable at intake with three exceptions; although comparable with youths with high G/low R, youths with high G/high R had higher religiosity ($\chi^2 = 5.5$, $p < .05$), readiness for change ($\chi^2 = 4.8$, $p < .05$), and social estrangement ($\chi^2 = 7.3$, $p < .01$) than youths with low G/low R and low G/high R. At discharge, rates of treatment completion and meeting attendance during treatment were also comparable between social exchange G/R groups. However, youths with high G and low

R ($M = 0.3$) or high R ($M = 0.3$) had significantly more days abstinent during treatment than youths with low G and low R ($M = 0.5$) or high R ($M = 0.4$, $F = 4.3$, $p < .01$).

Post-Treatment

In the 12 months after discharge from residential treatment, approximately half (56%) of the sample relapsed, 30% were incarcerated, and 13% committed a violent crime (Table 2). Similar to other adolescent residential treatment samples (Winters, Stinchfield, Opland, Weller, & Latimer , 2000), most relapses involved marijuana and alcohol (85%), with a portion using marijuana with inhalants (11%) or narcotics only (4%). Approximately half (56%) of 58 incarcerated youths had AOD-related felonies; 13 youths spent time in jail in the initial 3 months post-treatment, 16 in Months 4 to 6, 14 in Months 7 to 9, and 15 in Months 10 to 12. The most prevalent types of violent crime were aggravated assault ($n = 10$), domestic violence ($n = 3$), and sex offenses ($n = 2$), and most violent crimes (87%) did not involve AOD.

Social Isolation and Post-Treatment Outcomes

The relationship between social isolation variables and 12-month outcomes is shown in Table 2. Youths entering treatment with social estrangement were significantly more likely to relapse (HR = 2.25, $p < .05$), be incarcerated (odds ratio [OR] = 4.2, $p < .05$), and commit a violent crime (OR = 5.27, $p < .05$) in the 12-months post-treatment. Giving help to others in AA during treatment significantly reduced the risk of relapse (HR = 0.74, $p < .05$), incarceration (OR = 0.71, $p < .05$), and violent crime (OR = 0.62, $p < .01$) in the 12-months post-treatment. Although there were no significant main effects of receiving help in AA on outcomes, several intake covariates were significantly related to post-treatment outcomes. Entering treatment with lower readiness for change significantly increased the likelihood of relapse, incarceration, and violent crime in the year post-treatment. Being female, White, younger age, rural/small town residency, worse health, greater childhood trauma, and a history of violent crime significantly increased the likelihood of committing a violent crime post-treatment.

Discussion

This study examined the influence of social isolation on treatment outcomes and the extent to which decreases in social isolation alter the AOD relapse and criminal activity among substance dependent juvenile offenders in 12 months

Table 2. Social Isolation and 12-Month Outcomes.

	12-Month outcomes		
	1 or More jail episodes 58 (30%)	1 or More violent crimes 25 (13%)	Relapse 86 (56%)
	OR	OR	HR
Social isolation during treatment			
Help given (G) in AA	0.71*	0.62**	0.74*
Help received (R) in AA	1.11	1.06	0.88
Intake covariates			
Background			
Male	0.35*	0.25**	1.11
Minority	1.03	0.23**	0.75
Age (years)	1.02	0.59**	1.23
Parent education	0.75	1.28	1.44
Single parent	0.71	1.06	1.15
Rural/small town	2.20	3.52**	0.62
Poor health	0.52	0.19*	1.66*
Lifetime religiosity	0.98	1.01	0.99
Lifetime trauma experiences	1.13	0.88*	1.05
Social isolation			
Estranged from others	4.20*	5.27*	2.25*
Volunteering	1.11	1.18	1.03
Help given (G) in AA	0.89	0.89	0.94
Help received (R) in AA	0.51	1.01	0.98
Addiction severity			
Years of use	0.68	0.70	0.68
Readiness for change	0.49**	0.37**	0.72*
Outcomes at intake			
No. of jail episodes	1.02	1.19	0.99
No. of violent crimes	1.82	2.65**	0.98
Alcohol/drug use (PDA)	0.72	0.82	1.17
Treatment completion	0.98	0.78	0.87

Note. OR = odds ratio; HR = hazard ratio; AA = Alcoholics Anonymous; PDA = percent days abstinent.
*$p < .05$. **$p < .01$.

following addiction treatment. Our hypothesis that social isolation would be associated with worse treatment outcomes was confirmed. Feeling estranged from others more than doubled the odds of relapse and incarceration. These outcomes have the common denominator of AOD use, as most incarceration episodes in the year prior to and following treatment involved AOD use. Most alcoholics live a double life in active addiction (AA World Service, 2001);

consequently, many young adults in AA have been quoted over the years to express a sense of "feeling alone on the inside" (AA, 1950, p. 351; AA World Service, 1976, p. 19, 2001, p. 365). In early recovery, this aloneness may be acute to the extent an alcoholic/addict is not connected to other sober peers and able to commiserate with him or her, appreciate each step taken in sobriety, or encourage him or her in the same direction of responsible living. Social isolation also increased the risk of committing violent crimes, the majority of which were not AOD-related. The impact of social isolation and select characteristics on increased risk of non-intoxicated violent crimes suggests a different set of issues at play. Social isolation resulting from childhood trauma and living in a setting with little sense of control may be expressed in rage outbursts with devastating consequences. To decrease social isolation, youths with addiction and trauma may benefit from individual therapy to begin to trust others, heal severe boundary violations, and recognize acceptable and unacceptable behaviors in relationships (Pagano, Post, & Johnson, 2011).

Treatment offers an opportunity to decrease social isolation and interrupt AOD relapse and criminal activity. In fact, science is beginning to show healing at the cellular level from increased social connectedness. In a recent trial with 93 men with prostate cancer, Ornish and colleagues (2013) found improved prostate specific antigen (PSA) levels in cancerous cells among patients randomized to an intervention designed to improve increased intimacy and connectedness as part of a healthy lifestyle. Because most 12-step members share similarly dark pasts, they are able to understand one another's shameful behaviors and hurtful relationships with others through few words. They attribute these sources of pain to the disease of alcoholism rather than interpreting them as evidence of unchangeable personal character. This backdrop understanding may ease the defiance that characterizes many juveniles court-referred to treatment (Brown et al., 2003). Approximately half of youths reported high support received from others in AA, half became active in giving 12-step service, and only 10% remained socially isolated with low support given or received in the 12-step fellowship. Although social exchange groups did not differ in the number of meetings attended or treatment duration, giving high help with or without receiving high help from others was associated with greater AOD abstinence during treatment and in the year post-treatment. These findings supported our hypothesis that giving support in AA would alter AOD relapse and criminal activity more than receiving support. Although greater motivation for change and religiosity may make it easier for youths to adopt AA's recommended practice of helping others and having support from a sponsor, effects of providing support on reduced risk of relapse, incarceration, and committing a violent crime were found independent of these factors (Kelly et al., 2011).

Results from this study extend prior research on social support and suggest greater impact of giving help than receiving help from others in the context of addiction recovery (Brown et al., 2003; Poulin et al., 2013). Although providing support to patients entering treatment is clearly vital, getting active in service may resolve social isolation in ways that are not addressed by receiving support. Common forms of service such as sharing personal experience in recovery or assisting in service positions at 12-step meetings may be more affirming of personal mastery and integrity than receiving support, a dynamic to which youths may be sensitive when interacting with peers. As the following quote implies, the non-threatening environment of AA can be very helpful in this regard:

> Nonalcoholics had often reached down to try to help me. I was so resistant to anyone claiming to know more than I that I fear I would not have stayed in AA if it had consisted of "experts" paid to help me. (AA Grapevine, Inc, 2003, p. 26)

Helping others in AA may also treat elements of the disease that are not addressed by help received from others. There is evidence to suggest that service increases alcoholics' interest in others (Pagano, Kelly, et al., 2013) and is associated with reduced narcissistic behaviors (Carter et al., 2012). Clearly, both ends of social exchange are important for cultivating the lifestyle changes necessary to avoid relapse and return to deviant peer groups (Stoddard et al., 2011). Future research is warranted to understand whether receiving high support translates into youths' allowing others to have input in their lives and whether social isolation dissipates in the giving of oneself so that others who hurt might heal.

There are several limitations in the current study. Social isolation indices were measured with single items that did not provide content information about the nature of social bonds. Future research should explore the multifaceted conditions that contribute to social estrangement, such as poor interpersonal skills, lying or stealing, or feelings of shame, guilt, or remorse about committed acts when intoxicated. Second, longer follow-up than 12-months post-treatment is warranted to determine the long-term effects of giving and receiving help in 12-step contexts in reducing young adults' AOD use, jail stays, and involvement in violent crime. Third, social connectivity in other life domains such as school, work, and community may also influence youth behaviors. Although the 12-step context is a central life domain to individuals in addiction recovery, increased social connectivity in these other life domains may also contribute to sustained sobriety, lifestyle, and global health. Despite these limitations, our findings should be of interest to sociologists and psychologists interested in social isolation and connectivity, as well as clinicians

and practitioners working with young adults with addiction. In sum, this study found increased risk of relapse, incarceration, and violent crime associated with social isolation whereas getting active in service during treatment decreased the likelihood of these outcomes in the year post-treatment. Our results suggest the importance of addressing social isolation by engaging adolescents in social support resources in ways that allow youths to be supported by and contribute to a sober community that extends beyond the treatment period.

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