Predicting Long-Term Stable Recovery from Heroin Addiction: Findings from a 33-Year Follow-Up Study

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ABSTRACT. Heroin addiction is increasingly being recognized as a chronic relapsing condition, but relatively little is known about long-term recovery processes among addicts who attain and maintain long periods of abstinence. This study is to identify predictors of long-term stable recovery from heroin addiction based on 242 heroin addicts that have been followed for more than 30 years. Results showed that recovery and non-recovery groups did not differ in deviant behaviors and family/school problems in their earlier lives. Both groups tried formal treatment and self-directed recovery ("self-treatment"), often many times. While the non-recovered addicts were significantly more likely to use substances in coping with stressful conditions, to have spouses who also abused drugs, and to lack non-drug-using social support, stable recovery ten years later was predicted only by ethnicity, self-efficacy, and psychological distress. These findings suggest that in addition to early intervention to curtail heroin addiction, increasing self-efficacy and addressing psychological problems are likely to enhance the odds of maintaining long-term stable recovery.
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KEYWORDS. Heroin addiction, stable recovery, self-efficacy, psychological problems

INTRODUCTION

Heroin addiction has often been characterized as a chronic relapsing condition, and for many addicts, it is a persistent, long-term affliction with severe consequences, particularly in terms of premature mortality and high morbidity.[1-5] Relatively little is known about long-term recovery processes among addicts who do attain and maintain abstinence. This article is based on data from longitudinal follow-up studies of a sample of heroin addicts conducted over 33 years to examine the long-term recovery from heroin addiction.

Although few studies have investigated the process of stable recovery, several hypotheses have been offered in the literature that attempt to explain how stable recovery is maintained. The *maturing out* hypotheses asserts that addicts grow out of addiction as they mature with age.[6,7] The *substitution* hypothesis states that abstinence from one drug (heroin) is simply re-

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placed by addiction to another (usually alcohol).[8,9] Additionally, several studies have further identified factors that may be related to relapse. For example, negative emotional states (e.g., stress, depression, anxiety) and continued involvement in criminal activities are risk factors related to relapse, and supportive social network and self-efficacy have been shown to be protective factors that appear to sustain favorable post-treatment outcome.[10-14] These findings suggest that addicts are likely to use drugs to relieve or change a range of psychiatric problems and painful emotional states (*self-medication*),[15,16] while individuals with *personal and social resources and support*[10-14] and those who believe in their ability to master a situation (*self-efficacy*)[17] and develop *coping skills*[18,19] other than resorting to drug use for dealing with life stress are likely to achieve and maintain stable recovery.

Empirical supports for these factors and hypotheses are often inconsistent. For example, while some studies have found age to be related to drug abstinence, others did not (e.g., see a review by Anglin et al.[7]). Evidence for possible declines in drug abuse as individuals enter middle age and later life has been mixed.[20] Substitution of heroin use with alcohol dependence was observed by Vaillant[9] and Maddux and Desmond.[8] Our prior analyses[2] on heroin addicts showed no differences in terms of age (at first heroin use, current age), but long-term heroin abstinence was concurrently associated with lower psychological distress, less use of other substances (e.g., daily alcohol drinking, other illicit drugs), less criminal involvement, and higher rates of employment. These results are in contrast to the hypothesis of substitution but appear to be consistent with self-medication. The literature was more consistent in demonstrating positive relationships between favorable post-treatment outcomes and personal resources and social supports, but these studies are mostly based on short-term observations. In addition, few studies simultaneously examined these factors. Given that several factors may contribute to the process of recovery and that little is known about longer-term relationships, it is important to identify predictors of long-term stable recovery and assess their independent contributions by examining them together in a prospectively designed study, as described in this article.

Using a prospective longitudinal study design, we examined how several factors are longitudinally related to trajectories in heroin addiction and recovery in our sample. We define long-term recovery to be at least 5 year abstinent from heroin use; 43% (or 104 subjects) quit heroin use for more than 5 years before the last follow-up conducted at 1996/97, and 57% (or 138) continued use. We use 5 years as the criterion for stable recovery because our previous analysis demonstrated that 5 years of heroin abstinence was a good indicator predicting future stable abstinence.[2] Using age as a simplified indicator, the *maturing out hypothesis* is supported if the recovery group is associated with older ages. The *substitution hypothesis* is supported if the recovery group showed increased use of other drugs, particularly alcohol as suggested by other researchers. The non-recovery group may have greater mental health problems and continue use of heroin for *self-medication*. Alternatively, the non-recovery group may lack effective *coping strategies* to constructively deal with life stress. The recovery group may have greater *personal and social resources and support* to maintain stable recovery. Finally, extensive literature has demonstrated that family influence (e.g., parental use) and early problem behaviors and deviance are risk factors for substance use.[21-24] We tested these hypotheses and factors by systematically comparing the two groups of long-term heroin users over their life span.

METHODS

Subjects

The study sample consisted of 242 male narcotics addicts from the sample examined in our 33-year follow-up study of narcotics addicts. The original study included 581 subjects admitted to the California Civil Addict Program (CAP) from 1962 through 1964. The CAP, established in 1961 by California legislation, was a compulsory drug treatment program for narcotics-dependent criminal offenders committed under court order. The sample was first interviewed in 1974-75,[25] then in 1985-86,[26] and

1996-97.[2] The 1996-97 study had a 96% location rate (242 interviewed, 31 refused or were too mentally dysfunctional to be interviewed, and 284 were confirmed to be dead) with 24 subjects lost to follow-up.

The 242 interviewed subjects consisted of white (36.8%), Hispanic (56.2%), and African-American (7.0%) addicts. Before age 18 years, more than 80% of the sample had been arrested and 80% had tried marijuana. Mean age at admission in 1962 through 1964 was 25.4 years (SD = 3.9). After complete description of the study to the subjects, written informed consent was obtained.

Interview Procedure

Three face-to-face interviews were conducted at ten-year intervals. Fieldwork interviewers were trained staff employed at UCLA. Most had bachelor's degrees or had years of experience conducting research interviews of similar nature. Most interviews took place in a private office at UCLA. Subjects were interviewed in private rooms arranged in jails or prisons if they were incarcerated at the time of interview. Interviews were also conducted at a subject's home or in a public place if requested by the subject. The average interview at each follow-up point required between two and three hours to administer. At the end of each interview, subjects provided a urine specimen if they were not incarcerated. At the 1996-97 follow-up, 195 subjects provided a urine specimen (93.8% of the 208 subjects who were not incarcerated when they completed interviews). All participation, including the furnishing of urine samples, was voluntary. The study was approved by the UCLA Institutional Review Board and we had obtained a federal Confidentiality Certificate. We also obtained authorization to conduct personal interviews in prisons from the Federal Bureau of Prisons of the U.S. Department of Justice.

The interview protocol was adapted from an instrument developed by Nurco et al.[27] Interview questionnaires covered information on subjects' demographic characteristics, family history, drug use history, treatment history, employment, and criminal behavior, as well as information on their legal status history. Subjects were aware that the interviewer already knew their official history of criminal activity and legal status from information obtained independently from California criminal justice system records. The reliability of the instrument has been examined and reported in previous articles.[28,29]

Urinalyses were conducted to detect recent use of heroin and other drugs (e.g., morphine, methadone, cocaine/crack, cannabis, PCP, barbiturates, benzodiazepines, amphetamines, and methamphetamine). The rates of congruence between self-reported current opiate use and urinalysis for morphine among those who provided a urine specimen was 73.7% at the first interview, 85.8% at the second interview, and 90.2% at the third interview. At the 1996-97 interview, of the 195 subjects who provided a urine specimen, underreporting (denying use but tested positive in urinalysis) was 3.1% for cocaine and 10.8% for marijuana.

Measures

The study database contains admission and interview information, data from official record archives (e.g., criminal justice system, treatment records), and urinalysis results that have been accumulated across three follow-up studies. Relevant self-reported variables for this analysis included background characteristics, history of treatment and self-treatment, and criminal involvement. Substance use measures (e.g., tobacco, alcohol, marijuana, cocaine, and heroin) included ages of onset and current and past levels of use. Early deviance and problems are indicated by occurrence of problems (e.g., troubles in family or school, juvenile arrest) or behaviors (onset of smoking, alcohol, and illicit drugs), mostly before age 15. "Self-treatment" was defined as seriously ceasing drug use on one's own with sustained effort for at least two weeks continuous time without help from a formal program.

Self-Efficacy on Abstinence

The scale was based on 5 items that subjects rated on a scale from 1 (not at all) to 4 (extremely) regarding how confident they were not being addicted in the future or how much they wanted to not become addicted again (alpha = .81). The measure is the mean of ratings

across these five items; higher ratings indicate greater perceived self-efficacy on abstinence.

Stress Coping Strategies

Subjects were asked to rate the frequency on a scale of 0 to 4 (0 = never, 4 = always) of ways (e.g., drink, taking drugs, seek advice) they typically used to manage and cope with stressful or changing situations. *Negative coping strategy* was based on the mean rating across six items indicating the extent of increased use of alcohol, tobacco, or drugs in coping with stress. Similarly, *positive strategy* was the mean rating on three items indicating the extent of seeking advice or talking over with family or friends as typical ways to manage stressful situations.

Psychological distress was based on the mean of ratings of the following 3 items: (1) imagine life ending with suicide (0 = never, 4 = always), (2) emotional state (0 = excellent, 4 = poor), and (3) feeling about life as a whole (0 = delight, 4 = terrible) (alpha = 0.61).

Social Support

We define *positive support* based on the mean of ratings on three items (scaled from 0 to 4; alpha = 0.85): number of non-drug-using family/relatives/friends who can be called and talked with about private matters; seen at least once a month; and regular social group activities attended in the last month. *Negative support* is defined by having drug-abusing spouses or common-law partners.

Alcohol dependence scale is a 25-item instrument,[30] measuring the severity of alcohol dependence in the past 12-month period. Total scores can range from 0 to 47, and a score of 9 or more is classified as dependence.

Depression symptoms were assessed with the Center for Epidemiologic Studies Depression Scale (CES-D; alpha = .89).[31]

Self-Rated Health Status

Health related quality of life was assessed using the MOS 36-item Short-Form Health Survey (SF-36).[32,33] The instrument provides scores for general areas of physical and mental health: physical functioning, bodily pain, role limitations due to physical health problems, emotional well-being, social functioning, and general health perceptions. Each scale has a 0-100 range; higher scores reflect a more favorable health status.

Methods for Maintaining Drug Abstinence

Subjects responded with yes or no to a list of potential methods they have used to maintain drug abstinence; categories include establishing new important relationships, receiving support, and spare time activities.

Statistical Analyses

Descriptive statistics were reported for sample characteristics and statuses; t-tests (for continuous variables) or chi-square tests (for categorical variables) were conducted to test group differences. We conducted two multivariate logistic regression analyses predicting the recovery group (at 1996-97) using measures taken in the previous interview conducted approximately 10 years ago (1985-86) (Model 1) and selected measures at 1996-97 (Model 2), controlling for demographics. Unless otherwise indicated, the significance level (two-tailed) was set at $p < .05$.

RESULTS

Demographics, Early Deviance, and Problems in Family and School

The mean age at CAP admission was about 25 years for both the recovery and the non-recovery groups, and their mean age was also similar, about 57 at the 1995-1996 interview. Both groups had a mean of 10 years of education. There was a significant difference in ethnicity ($\chi^2 = 14.2$, $p < .01$), with more whites (50.6% vs. 26.8%) and fewer Hispanics (43.3% vs. 65.9%) in the recovery group compared to the non-recovery group.

Both the recovery group and non-recovery group reported early engagement in substance abuse and problem behaviors in schools and family before age 15, as well as family problems in alcohol, drug, and mental health, but the

two groups did not differ in any of these measures (Table 1).

Heroin Use Career, Psychological Distress, and Social Support

At the 1985-86 interview, the sample overall had used heroin regularly for a mean of 22 years; the mean number of years for the recovery group was significantly shorter than the non-recovery group (18 vs. 26 years; t = 8.58, p < .01) (see Table 2). Self-efficacy and commitment in maintaining abstinence from heroin was significantly higher among the recovery group than the non-recovery group. The recovered individuals also reported lower levels of psychological problems (e.g., suicidal, negative emotional state), greater social network of non-drug-using support, and less likelihood having a spouse/partner who also abused drugs. Many non-recovered individuals (42%) were involved in criminal justice systems either under probation or parole or were incarcerated at the 1985-86 interview, which was significantly higher than that for the recovered individuals (16%). Both groups reported participation in

TABLE 1. Early Deviance and Problems

	Recovery Group (N = 104)	Non-Recovery Group (N = 138)
Deviance behaviors before age 15 (%)		
Left school	26.0	23.2
Juvenile arrest	61.5	58.7
Fighting in school	70.2	68.1
Truancy in school	67.3	62.3
Early deviance index, Mean (SD)	2.3 (1.1)	2.1 (1.2)
Onset of substance abuse before age 15 (%)		
Smoking tobacco	76.0	77.5
Drunkenness	67.3	69.6
Narcotic use	16.4	15.9
Marijuana use	59.6	68.1
Family problems (%)		
Run away before age 15	35.6	34.1
Left home before age 15	24.0	21.0
Parent divorced before age 15	36.5	33.6
Father alcoholic	9.6	17.4
Mother alcoholic	1.0	3.6
Family poor	43.3	42.0
Siblings have drug problem	12.5	18.8
Any family arrested	27.9	32.6
Any family have psychiatric problem	11.5	9.4

*p < .05, **p < .01
(No group differences were significant for measures in this table.)

TABLE 2. Descriptive Statistics

	Recovery Group (N = 104) % or Mean (SD)	Non-Recovery Group (N = 138) % or Mean (SD)
Background characteristics		
Ethnicity (%)**		
Black	6.7	7.2
White	50.0	26.8
Hispanic	43.3	65.9
Age at CAP admission (%)		
18-21	35.6	39.9
22-25	37.5	38.4
26+	26.9	21.7
Mean	23.7 (3.8)	23.4 (4.0)
Years of education	10.3 (1.9)	10.4 (1.9)
Parental substance abuse (%)	26.0	32.8
Age first heroin use	18.0 (3.1)	17.8 (2.8)
Measures at 1985/86		
Years of regular heroin use **	17.7 (9.1)	26.0 (5.1)
Months in treatment**	34.6 (53.8)	53.4 (56.5)
Treatment in past 12 months (%)*	17.3	29.0
Number of self-treatment attempts	4.7 (8.7)	4.9 (11.3)
Self-efficacy on abstinence**	3.8 (0.6)	2.9 (1.0)
Coping strategies		
Negative**	1.1 (0.7)	1.5 (0.7)
Positive	1.5 (1.1)	1.2 (1.0)
Psychological distress**	0.9 (0.7)	1.4 (0.7)
Social support		
Spouse using (%)**	43.2	66.4
Positive social support**	1.7 (1.2)	0.9 (1.0)
Arrested since last interview (%)**	57.3	89.6
Criminal justice involvement (%)**	15.6	41.6
Measures at 1996/97		
Alcohol dependence (%)**	6.7	21.3
Depression symptoms**	8.2 (8.6)	15.1 (12.6)
Ever on methadone since last interview (%)**	9.7	57.0
Currently on methadone maintenance (%)**	5.8	28.3
Self-help group (%)	16.0	22.2
Attending religious services (%)	64.4	63.8
Health functioning		
Physical functioning	76.1 (33.2)	71.3 (32.8)
Role limitations due to physical health	69.5 (42.9)	65.4 (43.5)
Emotional well-being**	84.2 (14.4)	71.4 (21.7)
Social functioning	85.8 (27.5)	80.6 (31.6)
Bodily pain*	66.1 (30.2)	57.6 (34.9)
General health**	62.1 (29.1)	51.7 (29.5)
Continuous heroin abstinence prior to the last interview at 1996/97		
Mean number of years(SD)**	19.3 (9.3)	0.5 (1.1)
Number of years (%) **		
0-10	26	100
11-20	25.9	0
21 or more	49.0	0

* p < 0.05; ** p < 0.01

drug treatment and self-treatment, often for many times; only participation in treatment was significantly different between the two groups.

At 1996-97, the mean number of years being continuously abstinent from heroin prior to the interview was significantly longer for the recovery group than for the non-recovery group (19.3 vs. 05, $p < .001$). Additionally, 57.0% of the non-recovery group reported participation in methadone maintenance since the previous interview, in contrast to only 9.7% of the recovery group. Only 16% to 22% participated in self-help groups, while about 64% in both groups reported attendance of religious services. The recovery group reported lower levels of alcohol dependence ($\chi^2 = 9.84$, $p < .01$) and depression symptoms ($t = 4.78$, $p < .01$) than the non-recovery group. The two groups did not differ in self-rated physical or social functioning, but the recovery group reported significantly better emotional well-being and general health, and less bodily pain.

Coping Strategies and Reasons/Methods of Quitting and of Maintaining Drug Abstinence

Coping strategies reported at 1985-86 differed significantly between the recovery group and non-recovery group (see Table 2), with the non-recovery group more likely to use negative methods (e.g., using heroin and other illicit drugs, in isolation) to manage stressful events ($t = 4.79$, $p < .05$).

We explored reasons or methods given for the decision, action, and maintenance phases or stages of quitting and recovery reported at the 1996-97 interview (data not shown). A majority cited "tired of lifestyle" (87%) and "tired of addiction" (80 to 86%) or "fear of incarceration" (45%) as the reasons to start quitting use of heroin. The top list of methods used by individuals who were able to maintain drug abstinence in the previous six months included: starting new relationships with friends, relatives, children, and spouse/partner; receiving support from family, spouse/partner, new friends, and church; and spending their spare time in activities such as new interests, family activities, work, and physical fitness.

Predicting Long-Term Stable Recovery

Controlling for background covariates, we identify predictors of stable recovery by including in a multivariate analysis factors previously identified to be significantly related to recovery status. Model 1 included predictors collected at or prior to the 1985-86 interview, and Model 2 included additional measures from the 1996-97 interview selected to test specific hypotheses (e.g., substitution, self-medication). Although all predictors were significantly different between the two groups in the univariate test, the multivariate logistic regression showed that only being Hispanic (relative to white; OR = 0.34, CI = 0.15-0.77, $p < .05$), self-efficacy (OR = 3.11, CI = 1.73-5.60, $p < .001$), and psychological distress (OR = 0.41, CI = 0.21-0.79, $p < .01$) significantly predicted recovery status ten years later (Model 1; Table 3). Similar patterns of results were obtained when the predictors included alcohol dependence and depression in 1996-97 (Model 2).

DISCUSSION

Based on a prospective longitudinal follow-up study of heroin addicts, we tested several hypotheses regarding stable recovery from heroin use. Problems with family and school in earlier life no longer predicted recovery in later life periods, even though they are often demonstrated to be key risks for later problems in life. Our findings of the high prevalence of continued heroin use in this aging sample and the lack of association of older age with recovery are consistent with others that have suggested the concept of maturing out does not apply to many heroin addicts.[4,34] The substitution hypothesis also received little support from our data, as most recovered individuals in our sample demonstrated lower levels of use of alcohol or other drugs,[2] in contrast to those of the non-recovered individuals.

Our findings are consistent with prior studies on relapse documenting that negative emotional states (depression, anxiety) and lack of constructive coping skills are risk factors, while self-efficacy and adequate social support are protective factors in maintaining stable recovery. Individuals cope with stressors through

TABLE 3. Logistic Regression Model for Predicting Stable Recovery[a]

	Model 1 Odds Ratio (95% CI)	**Model 2** Odds Ratio (95% CI)
Background characteristics		
Ethnicity (Ref: white)		
Black	0.52 (0.12-2.25)	0.51 (0.12-2.26)
Hispanic	0.34 (0.15-0.77) *	0.36 (0.15-0.85) *
Age (years) at CAP admission (ref = 18-21)		
22-25	1.63 (0.68-3.91)	1.92 (0.76-4.87)
26+	0.93 (0.36-2.45)	1.06 (0.40-2.81)
Years of education	0.89 (0.73-1.10)	0.84 (0.68-1.04)
Measures at 1985/86		
Months in treatment	1.00 (0.99-1.01)	1.00 (0.99-1.01)
Self-efficacy on abstinence	3.11 (1.73-5.60) **	3.06 (1.68-5.59) **
Coping strategies		
Negative	0.59 (0.33-1.07)	0.84 (0.44-1.58)
Positive	0.81 (0.55-1.17)	0.89 (0.59-1.33)
Psychological distress	0.41 (0.21-0.79) **	0.47 (0.23-0.95) *
Social support		
Spouse using	0.49 (0.23-1.04)	0.48 (0.22-1.05)
Positive social support	1.05 (0.71-1.56)	1.20 (0.76-1.88)
Criminal Justice Involvement	0.60 (0.21-1.70)	0.59 (0.20-1.73)
Measures at 1996/97		
Alcohol dependence		0.30 (0.08-1.14)
Depression (CES-D score)		0.96 (0.92-1.00)

* $p < 0.05$; ** $p < 0.001$

[a] In a preliminary analysis, *years of regular heroin use prior to the 1985-86 interview* was a significant predictor (OR = 0.87, CI = 0.81-0.93, $p < .01$) when it was included in these models. To avoid potential confound, the final models excluded this measure, given that similar findings were obtained with or without inclusion of this measure.

their identified and preferred coping strategies, and what seems to separate the two groups is that the recovery group was more likely to have a non-drug-using supportive network, to use non-substance use strategies to cope with stressful conditions, and to have greater self-confidence and determination to stay away from heroin, while the non-recovery group relied on drugs to deal with stress. Thus, developing stress-coping strategies, identifying personal and social resources, and engaging in pro-social activities should all be considered as parts of effective strategies for achieving and maintaining stable recovery. Such findings also provide empirical support for relapse prevention interventions and clinical practice that incorporate these components.[35,36]

A substantial number (53%) of our subjects continued to use heroin into their advanced ages of late 50s or 60s. Although in the study described in this article we used 5-year abstinence as the criterion for long-term stable recovery, the mean years of abstinence for the non-recovery group was less than one year (Mean = 0.5, SD = 1.1; in contrast to Mean = 19.3, SD = 9.3 for the recovery group) at the latest follow-up. Their use of alcohol and other illicit drugs such as cocaine and marijuana also remained high.[2] Both the recovery group and non-recovery group had experience in formal treatment and tried many self-treatments; the significantly greater number of treatments tried suggests that many of these non-recovered individuals weren't without motivation to change their drug use habits. More than half of the non-recovery group reported participation in methadone maintenance (MM) in the past 10 years (compared to approximately 10% of the recovery group), and between 16% to 20% of both groups reported self-help group participation; both MM and self-help groups have been shown by previous studies to be effective for curtailing heroin addiction.[13,14,37-39] However, moving toward stable drug abstinence, if it occurred, seemed to be difficult to maintain among the non-recovery group. The adverse health consequences associated with sustained opiate use have been well documented;[2,3] this aging group of drug users may increasingly demand attention from health service providers as their health conditions are further complicated and compromised by both aging and prolonged drug abuse.

Although getting old made it more difficult to "take care of business," many of these addicts continued involvement with the criminal justice system as indicated by arrests and incarceration. Early childhood indicators of antisocial behavior in our sample did not differ between the recovery and non-recovery groups, other than the fact that the non-recovered individuals were more criminally involved as adults. While previous literature has suggested that antisocial personality disorder is related to poor treatment outcomes,[40] it was not a significant contributor to stable recovery in our sample. Similarly, the possibility that the genetic factor may play a

role (indicated by a higher prevalence of a family history of alcohol and drug problems) seems discounted based on our data. On the other hand, the limited ranges of measures in this sample of addicts could partially explain the lack of group differences in family/school problems and deviance in early life.

Relative to whites, Hispanics in our sample demonstrated a lower likelihood of being in the recovery group, which is consistent with our earlier observations of this same sample[41,42] and findings of several other studies.[43] The less favorable outcomes among racial/ethnic minorities could be due to their relatively lower socioeconomic status and less access to care or utilization of service, which need to be further investigated in future studies.

Study findings need to be interpreted within the context of limitations. Our sample consisted of males who started using heroin in the 1950s. Findings may not be generalizable to other drugs or user characteristics (women or recent heroin users). Despite research suggesting that specific factors or turning points may alter heroin addiction trajectories, it is difficult to identify precipitating events for the initiation of a stable recovery. Our study offered limited information on *what* initiated the onset of stable abstinence in our sample; their retrospectively self-reported reasons for quitting suggest a process (e.g., tired of lifestyle, tired of addiction) rather than single events, and their methods of maintaining abstinence involving social support networks are consistent with our predictive model analyses.

Despite these limitations, our study findings are mostly consistent with and extend current knowledge on stable recovery from heroin addiction, as previously summarized. Furthermore, even though most prior studies have shown strong negative influences of spousal drug abuse on female drug abusers, we have found similar damaging effects in our male-only sample. Most importantly, our observation that the recovered group initiated abstinence and maintained the stable recovery process in their late 30s (mean age of 38, SD = 10) highlights the importance of early termination of heroin careers. Intervening early to curtail heroin addiction careers appears to be critical to develop a normal life with adequate personal skills and resources that are necessary for sustaining a stable long-term recovery. Life events and experiences often mutually influence each other, interactively and cumulatively over time. In the CAP sample, constructive coping skills and positive social support became the "protective process" that opened some opportunities for competence and growth in other domains when these subjects terminated their addiction careers in their 30s. These addicts started new social networks or new relationships, were able to support themselves and their families, and were supported by their spouses and family members, and over this process built self-confidence and self-efficacy in maintaining abstinence. Conversely, continued drug use ensured involvement with drug-using networks and led to criminal involvement resulting in arrest and incarceration, which impeded keeping a job and maintaining relationships or family ties, in turn pushing addicts to isolation and more immersion in the drug culture. Our data suggest that breaking this vicious cycle later in life (e.g., 40s or older) appears to be more difficult, if it happens at all, as the personal experience and social resources to support recovery have not been attained in the earlier life course. In addition, self-efficacy and psychological well-being independently contribute to future stable recovery. Thus, intervening early to curtail heroin addiction careers, building self-efficacy, establishing a non-drug-using social network, and addressing psychological problems are likely to increase the odds of achieving and maintaining stable recovery.

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