The influence of legal coercion on dropout from substance abuse treatment: Results from a national survey

Brian E. Perron

School of Social Work, University of Michigan, 1080 South University Avenue, Ann Arbor MI 48109

Charlotte L Bright

Brown School of Social Work, Washington University, 1 Brookings Drive, St. Louis MO 63130

Abstract

Legal coercion is frequently used to leverage substance abuse treatment upon persons who would otherwise not seek it voluntarily. Various methodological and conceptual problems of the existing research have prevented a clear understanding of its effectiveness. The influence of legal coercion on retention in substance abuse treatment was examined using a national survey of programs in the public sector of care and three different treatment modalities including short-term residential ($N = 756$), long-term residential ($N = 757$), and outpatient treatment ($N = 1,181$). Legal coercion was found to reduce the risk of dropout across all three treatment modalities. The greatest effect was among persons in short-term residential treatment. The smallest effect was observed in outpatient treatment. This study shows that legal coercion significantly reduces the risk of dropout in substance abuse treatment. However, there are differential effects across treatment conditions. These differences must be carefully considered when using coercion to involve individuals in treatment.

Key words: Treatment dropout, legal coercion, mandated treatment, survival analysis

1 Background

Legal coercion is a common method for leveraging substance abuse treatment among people who would otherwise not participate voluntarily. It involves legally compelling an individual to participate in treatment as an alternative to another type of sanction, such as incarceration (Hough, 2002; Miller and Flaherty, 2000). The practice of coercion reflects a desire on the part of the criminal justice system to provide treatment to substance users, with the idea that this approach can reduce recidivism among criminal offenders (Anglin

et al., 1989).

The ethics of using coercive tactics to mandate treatment have been debated for years (Fagan, 1999). On one hand, coercion is seen as a legitimate solution to problems of community safety and a response to society's disillusionment with incarceration as a means of curbing the problems of this population (Klag et al., 2005). In other words, it can help provide treatment to individuals who would otherwise not access these resources (Anglin et al., 1989). On the other hand, coercion conflicts with the patient-centered philosophy advocated by the Institute of Medicine (Institute of Medicine, 2006) and professional organizations advocating the importance of self- determination (National Association of Social Workers, 2007). In American public policy, decision- making autonomy in health care is valued above the potential benefit of treatment (Caplan, 2006).

The emergence of drug courts reflects a shift in criminal justice policy to the disease model of addiction (Nolan, 2002). There has been a rise in the use of coercion as an increasing number of criminal acts are related to substance use (Fagan, 1999). Approximately half of all persons in community-based substance abuse treatment programs are legally coerced (Farabee et al., 1998). Legal coercion is increasingly common among persons with co- occurring substance use and psychiatric conditions (Institute of Medicine, 2006), and among criminal recidivists who are polysubstance users (Cooper, 2003).

The ethics of legal coercion and its widespread use necessitate a clear understanding of its outcomes. Retention remains one of the most important short-term outcomes in substance abuse treatment settings because time in treatment is one of the strongest and most consistent predictors of post-treatment

success (Broome et al., 1999; Mateyoke-Scrivner et al., 2004; Simpson et al., 1997; Zhang et al., 2003). As the rate of dropout across treatment programs is estimated to be between 25 and 75% (Jacobson, 2004), legal coercion provides a potentially important mechanism for admitting and retaining people in treatment for an amount of time that would have clinical benefits. Despite the potential of legal coercion to keep people in treatment, a recent review of the literature by Klag and colleagues (Klag et al., 2005) shows mixed evidence on the positive influence of legal coercion on retention in substance abuse treatment. They argued that the current knowledge is based on small, non-empirical, single-site studies that have serious conceptual and methodological problems(Klag et al., 2005).

1.1 Research questions

The purpose of the current study is to examine the impact of legal coercion. The following two research questions guided this study: First, do clients who are coerced exhibit better retention than voluntary clients? Second, does coerced treatment have differential effects on retention across different treatment modalities? To overcome limitations of prior research, this study used a national survey of clients from a large number of treatment programs within the public system of care.

2 Methods

2.1 Data source

This study was a secondary data analysis of the National Treatment Improvement Evaluation Study (NTIES) (US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center

for Substance Abuse Treatment, 2004), which is publicly available through the Inter-university Consortium for Political and Social Research (Study No. 2884). The NTIES was a prospective study of the impact of drug and alcohol treatment on thousands of clients in hundreds of treatment units that received public support from the Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment (US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, 2004). It is one of only a small number of studies that examined a comprehensive set of variables among a large sample of persons from substance abuse treatment programs across the U.S.

The current study included subjects who completed intake and discharge questionnaires and participated in one of three treatment modalities: short-term residential (N = 986), long-term residential (N = 881), and outpatient (N = 1,439). Short-term residential treatment are programs with a typical treatment duration of less than two months. Long-term residential are programs with a treatment duration of two months and longer. Outpatient treatment included programs that provided non-methadone treatment services, sometimes in conjunction with primary mental health care. There was significant variability in treatment durations among outpatient programs. After listwise deletion of missing values, the effective sample size for each modality was as follows: short-term residential (N = 756), long-term residential (N = 757), and outpatient (N = 1,181).

2.2 Measurement

2.2.1 Legal coercion

Legal coercion was the primary independent variable, reflecting whether the subject was court mandated to attend substance abuse treatment (1 = yes, 0 = no). The legal status of the subject was abstracted from the client treatment records by NTIES field staff.

2.2.2 Treatment dropout

Treatment dropout was the primary outcome variable in this study. It was specified as a 'time to event' measure, taking into account whether subjects dropped out of treatment and, if so, when. Dropout reflected the subjects' failure to complete the prescribed treatment protocol from the viewpoint of the treatment provider. The timing of dropout was determined by the subjects' length of treatment, which was recorded in weeks by the treatment provider. For example, if a subject failed to complete treatment and had a length of treatment of four weeks, then dropout occurred at Week 4. Subjects who did not drop out but completed treatment during the study period, were specified as right-censored observations, meaning they were excluded from the analysis after their censoring time. Censoring times reflected their last week of treatment.

2.2.3 Control variables

A series of control variables were included in the analysis. These were selected to adjust for client demographics, psychosocial characteristics, and clinical severity. The selection of control variables was guided by the treatment process model of CitepSimpson:2001. Demographic measures included age (in years), ethnicity (Non-Hispanic Black, Hispanic, and Non-Hispanic Non-Black), edu-

cation (in years), gender (male/female), insurance (yes/no), and marital status (yes/no). Homelessness indicated whether the subject stayed in a homeless shelter or other type of shelter during the 30 days prior to treatment intake (1=yes, 0=no). The third measure was the extent to which they regarded their current treatment episode as being important. A standardized measure of treatment motivation was not contained in the NTIES survey. Thus, a proxy measure of the importance of substance abuse treatment was used. This was measured on a three-point ordinal scale (1=very important, 2= somewhat important, 3 = not at all important).

Clinical severity measures included three substance use variables and measures of psychiatric conditions. Primary substance refers to the main substance for which the subject received treatment, including cocaine, alcohol, marijuana, heroin, and other. Heroin and other were collapsed into a single category because of low cell counts. This information was abstracted from the clients' treatment records by the NTIES field staff. Substance use severity was an index computed by summing the past 30-days of use of alcohol and seven different types of drugs included in the survey (marijuana, crack, cocaine, heroin, other narcotics, uppers, downers). The response categories for each substance was measured on a six-point scale (0 = zero days; 1 = one day; 2 = two to five days; 3 = six to ten days, 4 = 11 to 20 days; 5 = more than 20 days). Thus, the theoretical range for substance use severity was zero to 40.

Four indicators of psychiatric problems were included. These were dichotomously scored items that measured depressed mood, anxiety, suicidality, and hallucinations. Each indicator reflected past year symptoms and excluded occurrences induced by drugs and alcohol. There was no survey item to apply the past-year occurrence exclusionary criterion to the hallucinations indica-

tor. However, prior research shows the persistence of hallucinations over long periods of time, even with neuroleptic medications (Frederick and Contach, 1995; Carter et al., 1996).

Two measures of service characteristics were included. The first was the total number of service needs that were self-reported at intake. The needs included medical, mental health, family, vocational, social relations, financial, and housing. Each need was dichotomously scored; thus, the final service needs measure ranged from zero to seven. The second measure was the percentage of services matched. This involved calculating the proportion of services received during the treatment episode that corresponded with services needed. This scoring method followed measurement strategies of prior research (Zhang et al., 2003; Hser et al., 1999; Joe et al., 1991; Morrow-Howell et al., 1998).

2.2.4 Analytic strategy

Descriptive statistics were used to summarize the characteristics of the subjects across the three modalities. Chi-square tests (χ^2) and t-tests were used to test whether mandated subjects differed on measures of clinical severity (i.e., substance use severity and psychiatric problems) and service needs compared to non-mandated subjects. Given the large sample size, effect sizes were computed from these tests to characterize the magnitude of the differences. This involved computing phi correlations (ϕ) and point-biserial correlations (r_{pb}) for the chi-square and t-tests, respectively. Cohen's (Cohen, 1988) general guidelines for interpretation effect sizes were used: .20 was considered small; .50, medium; .80, large.

The multivariate strategy used in this study was Cox proportional hazards (PH) regression. This is the most common type of survival analysis, which

is the primary strategy for analyzing time to event data. A separate Cox PH model was fit to the data for each treatment modality. As subjects were nested in treatment programs, a Huber-White (robust) sandwich estimator was used to account for non-independence of observations.

The proportional hazards assumption of each model was examined using two different methods. The first method involved correlating Schoenfeld residuals with a transformation of time (i.e., Kaplan-Meier estimate) and inspecting the relationship graphically. The second method involved inspecting a log-log plot of the hazard function. No significant departures from the proportional hazards assumption were observed.

3 Results

3.1 Sample characteristics

Table 1 summarizes the sample characteristics by treatment modality. In general, the clients in these data were unmarried males, approximately 30 years of age with slightly less than a high-school education. Most subjects had a history of substance abuse treatment, and either alcohol or cocaine was the primary drug for their current treatment episode. Subjects had a high overall number of service needs (means between 4.5 and 5.5 services needed), and approximately one-third of the service needs were matched. Outpatient treatment had the highest coercion rate of coercion (40%) in comparison to short-term residential (31%) and long-term residential treatment (26%).

3.2 Differences in clinical severity and service needs

Prior research has suggested that clients who are legally coerced to substance abuse treatment have more problems and greater clinical severity than voluntary clients (Marshall and Hser, 2002). Only one comparison yielded a statistically significant difference with an effect size of at least .20. Specifically, contrary to prior findings, substance use severity scores (log-transformed) were lower among legally coerced subjects ($\bar{X} = 1.57$) compared to voluntary subjects ($\bar{X} = 1.20$) in short-term residential treatment. Although this difference was statistically significant, the effect size was small ($t[408] = 5.31), p < .0001, r_{pb} = .20$). This pattern of association was also true among subjects in long-term residential treatment. That is, substance use severity scores were lower among legally coerced subjects ($\bar{X} = 1.41$) than voluntary subjects ($\bar{X} = .95$). The magnitude of the effect was small: $t[6.04] = 340, p < .0001, r_{pb} = .21$. No differences in substance use severity scores were observed among subjects in outpatient treatment. No other differences in measures of clinical severity or service needs were observed across the groups.

3.3 Summary of dropout

Table 2 summarizes the rate of dropout across treatment programs. Treatment dropout occurred at the highest rate among persons in outpatient treatment (72.3%). The differences across modalities were significantly different ($\chi^2[2] = 260.7,\ p < .0001$).

3.4 Cox PH Regression Models

Table 3 provides a summary of the hazard ratios (HR) and 95% confidence intervals for each treatment modality. The hazard ratios for legal coercion are also depicted graphically in Figure 1a. The overall model for short-term residential treatment exhibited a good fit with the data (Likelihood Ratio $\chi^2[22] = 83,\ p < .0001$, pseudo-$R^2 = .10$). As revealed in Figure 1a., legal coercion was associated with the greatest reduction in the risk of dropout for clients in short-term residential treatment, compared to long-term residential and outpatient treatment. The narrow confidence interval suggests a high degree of precision in this estimate.

The model for long-term residential treatment also exhibited a good fit with the data (Likelihood Ratio $\chi^2[22] = 189,\ p < .0001$, pseudo-$R^2 = .22$). Although legal coercion was associated with a reduced risk of dropout in long-term residential treatment, the effect size was not nearly as large or precise as short-term residential. However, the overall model explained approximately twice as much variance as the short-term residential treatment model.

Figures 1b-1d are survival curves, showing the estimated survival – that is, probability of remaining in treatment through each week – over the duration of the study period. Each of the survival curves extends to Week 50. This is due to some subjects remaining in their respective treatment modality for an extended period of time. Long-term residential (Figure 1c) and outpatient treatment (Figure 1d) exhibited a very similar pattern of dropout, with legally coerced and voluntary clients dropping out at a high rate until Week 25. The differences between the two groups represents the estimated effect of

legal coercion. Legally coerced persons in short-term residential treatment (Figure 1b) had a rate of survival that was consistently higher than the other modalities.

It should be noted that service matching was associated with a reduced risk of dropout across all three modalities. However, interpretation of these effects are challenged by directions of causality, which is discussed in further detail in the following section. Substance use severity was associated with an increased risk of dropout in long-term residential and outpatient treatment.

4 Discussion

This study contributes to the existing literature on the effects of legal coercion on treatment retention. It utilized one of the most comprehensive data sources on publicly funded substance abuse treatment services. The results of this study generalize to outpatient substance abuse treatment programs in the public sector that receive funding from the Center for Substance Abuse Treatment (CSAT) and Substance Abuse and Mental Health Services Administration (SAMHSA). This study does not generalize to clients in private tier programs.

The results indicate that legal coercion is associated with a reduced risk of treatment dropout across all three treatment modalities – short-term residential, long-term residential, and outpatient treatment. There were clear differences in effect size, with the largest and most precise effect observed for short-term residential treatment. The differences may be attributed to treatment duration. That is, subjects may have more difficulty completing a long-term residential or outpatient program than a short-term program. The wide

confidence intervals for the estimated effects for long-term residential and outpatient treatment suggest that legal coercion is likely to be more effective for some persons than others.

In this study, legal coercion and services matched were the only variables that significantly reduced the risk of dropout across all three modalities. Although legal coercion is a potentially strong leverage point for helping retain persons in treatment, the influence of service matching on treatment dropout must be carefully considered since the direction of causality cannot be established. More specifically, persons may find treatment beneficial if the program is responsive to their individual service needs, thus giving them a reason to persist in treatment. However, treatment programs may be better able to respond to service needs the longer persons stay in treatment.

Prior authors have suggested that legally coerced clients may have more problems and be more resistant and ill-prepared for substance abuse treatment than voluntary clients (Hunt and Stevens, 2004; Marshall and Hser, 2002). The results of this study showed that clients who were legally coerced exhibited lower substance use severity scores than voluntary clients. Given the legal mandate of these subjects, it is possible that they were responding in a socially desirable manner. Additional evidence to triangulate the subjects' self-report of substance use is necessary to clarify these results.

Some prior research has indicated that legally coerced clients have better post-treatment outcomes (Anglin et al., 1989; Brecht et al., 1993; Burke and Gregoire, 2007; Easton et al., 2007; Fagan, 1999; Kelly et al., 2005; Polcin, 2001). These findings can be supported, in part, by the results of this research. Specifically, this study showed that legally coerced persons received a higher dose

of substance abuse treatment since they significantly more likely to remain in treatment longer. The existing research on substance abuse treatment has consistently indicated that time in treatment is a key factor in achieving post-treatment success(National Institute of Drug Abuse, 1999). Again, this underscores the importance of examining treatment retention and dropout as short-term outcome measures.

The use of legal coercion may be particularly effective at retaining clients in short-term residential care. While most legally coerced subjects in this sample entered outpatient care, this treatment modality also had the highest rate of dropout. Policy-makers may want to re-examine the appropriateness of relying on coercion into outpatient and long-term residential substance abuse treatment, in favor of leveraging a greater number of offenders into short-term residential treatment.

4.1 Study limitations

It is important to consider these results within the limitations of the study. First, studies that employ secondary data face a variety of challenges, especially related to measurement. Most importantly, the present approach to the measurement of coercion is the narrow conceptualization. Specifically, it is regarded as a function of legal involvement rather than one type of a broader set of diverse social pressures (Marlowe et al., 1996; Wild, 2006).

When examining the influence of legal coercion on dropout, it is important to consider that treatment completion was based solely on provider reporting. A limitation is that treatment programs and providers can vary significantly in their criteria. It is also a problem that confronts drug courts and treatment

programs, given the absence of established and empirically supported clinical guidelines.

The age of the data should also be considered (1992-1997), as the substance abuse systems of care have undergone a variety of changes. For example, there has been considerable erosion of public treatment dollars, which may have undermined the quality of care to this population, potentially accounting for dropout. Also, the rate of coercion is likely to be higher if this study were replicated with present-day data, given the increased use of coercion (Institute of Medicine, 2006).

4.2 Future research

Future research systematically comparing treatment outcomes of legally coerced and voluntary persons is still needed. This study focused on a key short-term outcome – treatment retention. Future research is still necessary to clarify the extent to which legal coercion contributes to post-treatment success. A major challenge confronting the use of legal coercion is that subjects may achieve important clinical benefits but fail to complete treatment. Thus, a person may have actually achieved important gains in treatment but may still have to carry out a sentence in the judicial system. Future research can help drug courts establish treatment mandates that focus on specific treatment outcomes. Additional research is needed to document the variability in the legal decision making surrounding the use of mandated treatment. This can help target efforts to reduce the variability and ensure greater protections against individuals who may be legally coerced.

4.3 Conclusions

In this study, legal coercion significantly reduces the risk of treatment dropout in substance abuse treatment. Differential effects were observed across treatment modalities. These differences must be carefully considered when using coercion to get people involved in treatment. Given the significant costs of long-term residential treatment, it is important that drug courts carefully consider the potential benefits of long-term versus short-term programs.

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Table 1. Descriptive Summary of Client Characteristics by Treatment Modality

Variable		Short-term residential (N = 756)	Long-term residential (N = 757)	Outpatient (N = 1,181)
Legally coerced		30.9	25.8	40.6
Gender (Male)		70.6	44.2	69.9
Age (in years)$_{[17,51]}$	$\bar{X}$*(SD)*	*31.1 (7.5)*	*29.9 (7.9)*	*32.4 (9.0)*
Education (in years)$_{[6,16]}$	$\bar{X}$*(SD)*	*11.7 (2.0)*	*11.1 (1.9)*	*11.3 (2.0)*
Insurance		22.3	56.9	57.7
Married		26.0	14.8	20.2
Race				
Non-Hispanic Black		42.0	62.7	59.6
Hispanic		17.0	11.2	14.6
Non-Hispanic Non-Black		41.0	26.1	25.7
Past 30 days homeless		21.4	29.5	18.5
Treatment importance$_{[1,3]}$	$\bar{X}$*(SD)*	*1.29 (.7)*	*1.25 (.6)*	*1.59 (.8)*

Primary substance				
Cocaine		33.6	59.8	41.1
Marijuana		39.9	13.4	11.2
Alcohol		21.3	17.9	38.9
Heroin / other		5.3	9.0	8.9
Substance use severity$_{[0,40]}$	$\bar{X}$*(SD)*	*4.8 (3.9)*	*4.3 (4.1)*	*2.6 (3.1)*
Prior substance abuse treatment		57.6	59.0	59.9
Depressed mood		57.4	63.9	58.8
Suicidality		10.0	14.9	11.4
Anxiety		29.2	30.9	30.0
Hallucinations		5.5	11.6	12.3
Service needs$_{[0,7]}$	$\bar{X}$*(SD)*	*4.5 (2.2)*	*5.5 (2.0)*	*4.6 (2.3)*
Services matched$_{[0,1]}$	$\bar{X}$*(SD)*	*.36 (.26)*	*.40 (.27)*	*.31 (31)*

Note: Numbers are percentages unless otherwise indicated.

Note: Range of values for continuous measures are provided in brackets

Table 2. Summary of treatment dropout by treatment modality

	Long-term residential	Short-term residential	Outpatient
Outcome	N (%)	N (%)	N (%)
Dropout	332 (43.9)	210 (27.7)	416 (35.2)
Censored	424 (56.1)	547 (72.3)	765 (64.8)
Total	756 (100)	757 (100)	1181 (100)

Table 3 - Summary of Final Cox Proportional Hazards Regression Model

Variable	Short-term residential	Long-term residential	Outpatient
	HR (95% CI)	HR (95% CI)	HR (95% CI)
Legally coerced	**.34 (.28-.41)**	**.64 (.46-.91)**	**.81 (.66-.99)**
Gender (Male)	1.05 (.85-1.31)	1.15 (.73-1.82)	1.12 (.92-1.35)
Age (in years)$_{[17,51]}$	**.97 (.94-.99)**	.99 (.97-1.01)	.99 (.98-1.00)
Education (in years)$_{[6,16]}$	**.94 (.90-.97)**	.98 (.94-1.01)	.99 (.99-1.05)
Insurance	1.14 (.91-1.43)	1.04 (.76-1.42)	1.05 (.85-1.29)
Married	**.67 (.49-.90)**	1.18 (.92-1.52)	1.01 (.86-1.18)
Race			
(Non-Hispanic Black)			
Hispanic	1.03 (.80-1.32)	1.08 (.78-1.49)	.87 (.69-1.12)
Non-Hispanic Non-Black	.90 (.54-1.50)	.93 (.72-1.19)	.78 (.57-1.07)
Past 30 days homeless	1.0 (.81-1.24)	.98 (.79-1.22)	1.16 (.89-1.52)

Primary substance			
(Cocaine)			
Marijuana	1.02 (.73-1.43)	1.21 (.84-1.73)	1.07 (.74-1.55)
Alcohol	**1.55 (1.16-2.06)**	.82 (.61-1.12)	.90 (.70-1.14)
Heroin / other	1.26 (.94-1.70)	.73 (.42-1.28)	.80 (.57-1.11)
Substance use severity$_{[0,3]^{\dagger}}$	.98 (.83-1.16)	**1.39 (1.11-1.74)**	**1.17 (1.05-1.31)**
Prior substance abuse treatment	.94 (.72-1.22)	.93 (.74-1.18)	1.00 (.82-1.23)
Depressed mood	.93 (.82-1.07)	1.23 (.99-1.51)	1.15 (.99-1.34)
Suicidality			
Anxiety	**1.32(1.08-1.61)**	1.12 (.87-1.44)	1.06 (.87-1.29)
Hallucinations	**.48 (.34-.70)**	1.13 (.92-1.40)	.92 (.76-1.12)
Service needs$_{[0,7]}$	**.95 (.93-.96)**	.96 (.89-1.03)	.99 (.94-1.04)
Services matched$_{[0,1]}$	**.31 (.15-.61)**	**.15 (.09-.23)**	**.31 (.19-.50)**

Note: Range of values for continuous measures are provided in brackets. All other measures are dichotomous. Statistically significant hazard ratios are presented in bold.

†Log-transformed values.

Figure 1 - Influence of Legal Coercion on Treatment Dropout by Treatment Modality.