



## Using latent class analysis to identify participant typologies in a drug treatment court



Jessica L. Larsen<sup>a</sup>, Karen Nylund-Gibson<sup>b</sup>, Merith Cosden<sup>a,\*</sup>

<sup>a</sup> Department of Counseling, Clinical, and School Psychology, University of California, Santa Barbara, CA 93106, United States

<sup>b</sup> Department of Education, University of California, Santa Barbara, CA 93106, United States

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### ABSTRACT

**Background:** Drug treatment courts serve a diverse population of adults. While all have engaged in criminal activities and have substance abuse problems, participants vary in the intensity of their problems as well as related concerns in other domains of functioning which also may require intervention. The purpose of this study was to identify differences among participants, which could have implications for the effectiveness of drug treatment courts.

**Methods:** Latent class analysis (LCA) was used to identify subgroups from a sample of over 1000 adults attending two drug treatment courts in central California. Indicators measuring substance abuse, motivation for treatment, mental health concerns, education, employment, medical concerns, social supports, and demographic characteristics were obtained from the Addiction Severity Index while measures of prior criminal activity and treatment outcomes were obtained from probation; all were entered into the LCA.

**Results:** The LCA yielded three groups, which were labeled a *Psychological Problems* group, an *Early Delinquent* group, and a *Subthreshold Need* group. Significant differences in graduation and recidivism rates were found across these groups, with the *Early Delinquent* group demonstrating the poorest outcomes.

**Conclusions:** This study provides evidence that there are significant differences among subgroups of drug treatment court participants. Implications for alternate treatment approaches based on participant characteristics are discussed.

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## 1. Introduction

Drug treatment courts have existed for over two decades in the United States. Introduced in Florida in 1989 as an alternative solution to incarceration for adults charged with non-violent drug offenses, drug courts were designed to reduce jail and prison overcrowding by providing supervised treatment to address the problems underlying drug-related criminal activities (Huddleston and Marlowe, 2011). Since that time, drug courts have expanded widely across the United States and abroad (Office of Justice Programs, 2009). Central to the drug court model is adherence to a non-adversarial approach to criminal processing, reliance on ongoing court supervision and referrals to community-based treatment providers (Harrison and Scarpitti, 2002). While eligibility criteria vary, these programs serve a diverse group of adults with substance abuse problems who might not otherwise have entered treatment.

A number of studies have examined the effectiveness of drug treatment courts (see Huddleston and Marlowe, 2011). Studies have shown that drug courts reduce criminal activity (Banks and Gottfredson, 2004; Brewster, 2001; Gottfredson et al., 2003; Jensen and Mosher, 2006; Listwan et al., 2003; Peters and Murrin, 2000). Meta-analyses indicate that drug courts significantly reduce recidivism rates as long as 12–36 months after program completion (Downey and Roman, 2010; Shaffer, 2011; Wilson et al., 2006).

However, not all participants are successful. Studies on drug court outcomes have identified participant characteristics such as motivation (Cosden et al., 2006), drug of choice (Listwan et al., 2009), educational attainment (Brown et al., 2010), and employment status (Hartley and Phillips, 2001) as predictors of program success, future substance use, and recidivism. However, by examining outcomes one indicator at a time, the impact of factors which are associated with one another may be missed. The present study examines the nature of program outcomes among drug abusing offenders and the association between their presenting characteristics and programmatic outcomes by modeling patterns of offender characteristics.

\* Corresponding author. Tel.: +1 805 893 2370; fax: +1 805 893 7824.  
E-mail address: [cosden@education.ucsb.edu](mailto:cosden@education.ucsb.edu) (M. Cosden).

### 1.1. Matching interventions to participants

In an effort to maximize drug court effectiveness, researchers have studied matching treatment intensity to participant characteristics. In one study, [Marlowe et al. \(2007\)](#) placed high and low-risk offenders, as defined by whether they had a previous treatment failure or met criteria for antisocial personality disorder, into drug courts and provided treatment as usual (control condition) or treatment with increased judicial hearings (experimental condition). The authors found an interaction effect, in that heightened intervention had a positive effect for high-risk offenders but had no additional benefit for low-risk offenders. This research is compelling, but relies on singular risk variables to define groups when a set of variables representing a more holistic, comprehensive perspective may be more useful. For instance, [DeMatteo et al., 2009](#) found that antisocial personality and previous treatment failure were not independently associated with subsequent performance in drug court. Such findings point to the importance of understanding the impact of multidimensional client profiles on drug court outcomes.

Among patterns of characteristics, a high co-occurrence of a history of trauma and trauma-related symptoms has been noted for clients seeking substance abuse treatment ([Blanco et al., 2013](#); [Ehlers et al., 2013](#); [Reynolds et al., 2005](#)). Research suggests that substance abuse treatment programs that provide trauma-informed interventions for these clients result in better outcomes than do programs that provide substance abuse treatment alone ([Amaro et al., 2007](#); [Clark and Young, 2009](#); [Farley et al., 2004](#)). Drug courts serve a diverse population of men and women; the impact of trauma-informed treatment on drug court participants, and particular subpopulations among participants, requires further exploration.

Understanding how participant characteristics cluster across individuals in a drug court program could help to inform how best to adapt programs to more successfully serve different subgroups of participants. Past studies have taken a variable-centered approach, which, while useful, does not describe how variables cluster together to form distinct drug court participant profiles ([Lanza and Rhoades, 2011](#)). Understanding the profiles of subgroups of drug court participants provides an opportunity to develop treatments which might result in higher levels of success for participants with divergent needs ([Andrews and Bonta, 2010](#)).

### 1.2. Latent Class Analysis: a person centered approach

Latent Class Analysis (LCA) addresses the question of how indicators cluster across individuals. LCA posits that there is an underlying unobserved categorical variable that separates a population into subgroups. Membership in these subgroups, or latent classes, is defined by having a particular combination of responses to the set of observed characteristics. Latent classes are multi-dimensional in that they are defined by several indicators, or observed variables. Class membership of individuals is unknown but can be inferred from a set of measured items ([Lanza and Rhoades, 2011](#); [Masyn, 2013](#)).

Person-centered approaches can add to knowledge gleaned from variable-focused analyses. Whereas variable-focused methods provide information about the relationships among variables, person-centered approaches describe the relationships of variables as they combine into classes that define groups of people within a sample or population. Thus, person-centered approaches are appropriate for circumstances in which researchers believe that a population is comprised of two or more underlying subgroups defined by the intersection of numerous individual characteristics.

Person-centered approaches, such as LCA, are useful in intervention research in that they identify types of participants for whom

different treatment mechanisms may be operating. For example, it is likely that the causal processes underlying the behavior of participants will differ between those with substance abusing problems alone and those with substance abusing problems that cluster with other concerns (i.e., severe psychopathology, family problems, unemployment, or lack of education). It is also likely that subpopulations served by drug courts vary in their needs and, conversely, their responsiveness to treatment. Thus, it is important to understand whether these subgroups differ in their responses to the drug treatment court in terms of graduation rates and recidivism.

### 1.3. Purpose

The aim of the present investigation was to identify psychosocial differences among drug court participants, and to analyze variation in program outcomes based on these differences. Latent Class Analysis (LCA) was used to classify participant characteristics. We examined the predictive validity the participant classes yielded with the LCA by examining the relationship of classes to graduation and recidivism.

## 2. Method

### 2.1. Program and participants

The LCA was conducted on data obtained from 1043 participants in two drug treatment courts in central California. These participants represented 95% of offenders who had enrolled in these drug treatment courts between 2001 and 2012. Data were available on almost all participants because the analysis utilized the Addiction Severity Index (ASI; [McLellan et al., 1992](#)) a structured measure of psychosocial functioning obtained on all participants at intake for the purpose of treatment planning. To be part of the study, participants were only asked to allow us to anonymously use the data already collected on them for research, and none refused. The missing data were mistakenly either not collected or not sent to the research team. In addition, the database had incomplete information on gender, ethnicity and age on some participants; thus, the sample was reduced to 989 when these variables were included in the analysis.

Both drug courts operated within the same county in central California, under the auspices of a county-wide oversight committee comprised of key stakeholders in the criminal justice system and involved treatment providers. The programs were open to adults charged with a drug-related misdemeanor or felony offenses, who demonstrated a need for substance abuse treatment, and who met the eligibility and suitability criteria. Offenders were ineligible if they had been charged with a violent crime, the distribution of drugs, or a sex crime. Suitability was determined by the probation officer and other team members who had contact with the potential participant and was based both on their subjective impressions of the ability of that individual to benefit from treatment and objective data on that person's substance abuse problems and history with the criminal justice system. These courts, as most drug courts, were voluntary and discretionary programs. Resources were available to offer admission to the programs to all adults who met the eligibility criteria and who appeared suitable for the program. We do not have a record of how many offenders were considered but not enrolled in the drug court program for not meeting the eligibility or suitability criteria or because they chose not to participate.

Both drug courts followed the key component guidelines established by the [National Association of Drug Court Professionals \(1997\)](#), including: use of a non-adversarial approach toward offenders; monitoring of abstinence through frequent drug and alcohol testing; use of graded incentives and sanctions in response

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