A Latent Profile Analysis of Rural Women Who Use Drugs and Commit Crimes

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ABSTRACT
The majority of rural Appalachian women in jail meet criteria for a drug use disorder and need treatment. Using a latent profile analysis of a random sample of rural women in Appalachian jails (N=400), the current study established groups of women based on criminal history, drug use in the commission of crimes, and role of the partner's drug use in the commission of crimes. Analysis found five distinct profiles of rural women based on involvement of criminal activities as a function of drug use severity. Results suggest that among criminally involved rural women, severity of drug use is a critical factor in the criminal career. Findings can be used to better inform treatment approaches and tailor treatment to meet the needs of this vulnerable population.

Research has consistently shown the link between illicit drug use and crimes (e.g., Sinha and Easton 1999), and this relationship may uniquely impact women. The number of incarcerated women, largely due to drug

use and drug-related offenses, grew more than 700 percent between 1980 and 2014, a rate nearly two times greater than that for men (The Sentencing Project 2018). In addition, a higher percentage of incarcerated females (~70 percent) meet the criteria for drug abuse or dependence compared to incarcerated males (~60 percent), and women are more likely to report drug use during the month before and at the time of their arrest (Bronson et al. 2017). Women in rural Appalachia who use drugs are particularly vulnerable to negative outcomes related to substance use, including involvement in the criminal justice system (Staton et al. 2018). Early studies examining the unique complexities of the drug use/crime relationship primarily focused on men (e.g., Pottieger and Inciardi 1981; Ball et al. 1982) in urban areas (e.g., Valdez, Kaplan, and Curtis 2007). Feminist criminologists have suggested that because women are typically "expected" to be more committed to families and children, their illicit drug use and subsequent commission of crimes has been viewed as particularly egregious (Daly and Chesney-Lind 1988). Therefore, it is important to further examine the drug/crime relationship among women in rural areas. This study advances the field by using a latent profile analysis (LPA) to examine criminogenic risk factors and histories of rural women.

UNIQUE RISKS OF SUBSTANCE DEPENDENT JUSTICE-INVOLVED WOMEN

As the number of incarcerated substance users has increased, substance use treatment opportunities for individuals involved in the criminal justice system has also increased (e.g., Chandler, Fletcher, and Volkow 2009). The Risk-Needs-Responsivity (RNR) model (Andrews, Bonta, and Hoge 1990) has been a widely accepted and adopted model for treatment in criminal justice settings with the goal of understanding who is most likely to be successful in treatment based on "need" (such as substance dependence) and "risk" (such as criminal-related factors) associated with re-offending, as well as the "responsiveness" of treatment approaches (Andrews et al. 1990). The RNR model is partially contextualized within a social learning theoretical framework noting the importance of the social context (Andrews and Bonta 2006) which directly influences drug use and criminal behavior. For example, studies have shown that women's initiation, maintenance, abstinence, and relapse behaviors are closely tied to intimate partner relationships (e.g., Covington 1998; Staton-Tindall et al. 2007a). This relationship has also been described specifically for rural drug using women (Staton et al. 2018). Further, based on findings from studies on partner availability analysis in other cultural groups of women

(Oser et al. 2017), it is possible that the availability of partners who are not engaged in drug use and criminal activity are limited for rural women drug users in Appalachia. Literature consistently links the role of men particularly in initiating women into crime (Steffensmeier and Allan 1996), and women who are dependent on drugs are more likely to have a partner with a substance use disorder (Substance Abuse and Mental Health Services Administration 2013). This suggests that intervention approaches should vary based on individual risk and include assessing partner roles in drug use and criminal behavior among women.

Incarcerated women are vulnerable to health and mental health challenges, many of which are associated with drug abuse. Women are also considered higher risk and more vulnerable to drug use due to a shorter time span between drug use initiation and drug dependence (Westermeyer and Boedicker 2000), as well as a faster trajectory to initiating drug injection compared to men (Bryant and Treloar 2007). Further, co-occurring mental health issues are also widely documented among incarcerated women including depression, anxiety, and post-traumatic stress disorder (PTSD) (Staton-Tindall et al. 2015). Thus, women are more vulnerable to arrest and incarceration due to their extensive health, mental health, and substance abuse resulting in unique pathways to the criminal justice system compared to men (Boppre and Salisbury 2016).

UNIQUE NEEDS OF RURAL APPALACHIAN WOMEN

Rural justice-involved women may be particularly vulnerable given the lack of available services in rural areas (Pullen and Oser 2014; Sexton et al. 2008). In general, rural women are less likely than urban women to access behavioral health services prior to involvement with the justice system (Staton-Tindall et al. 2007b). Relevant to our study sample, the rural areas of Appalachia are among the hardest hit in the United States in the wake of the opioid epidemic, with overdose deaths recorded as 65 percent higher in this area when compared to the rest of the country (Meit et al. 2017). This is particularly concerning given that unlike general populations where men are at increased risk for opioid-related overdose, among justice-involved populations, the risk is higher for women (Farrell and Marsden 2008).

In addition to high rates of illicit opioid use and limited service opportunities in rural areas, studies have suggested that rural women may have unique vulnerabilities for high-risk drug use and related criminal activity associated with relationships (Staton et al. 2017; Staton et al.

2018). The Appalachian culture is often characterized by strong networks of family, extended family, and friends (Jones 2010; Meyer et al. 2008). When women's relationships involve partners (Staton et al. 2018; El Bassel et al. 2019) or peers (Staton-Tindall et al. 2011) who engage in high-risk behaviors (e.g., injection drug use), they are also more likely to engage in high-risk behaviors. The role of relationships in influencing women's behaviors is likely even more pronounced in rural Appalachia due to the perception of traditional gender roles (Carter and Borch 2005; Staton et al. 2017).

While the importance of relationships for drug use behaviors has been established, this topic has been less examined for criminality and criminal justice involvement among rural women, which is the focus of this study. Rural criminology has received scant attention in research (Donnermeyer 2007), yet is often sensationalized by the media as a portrayal of drug-seeking offenders causing crime rates to rise (Tunnell 2005). Most research of Appalachia continues to focus on substance use, and research of criminal patterns is scarce. The most recent federal study only examines data up to the 1990s, and found that despite increased vulnerabilities (e.g., economic distress), crime rates were lower in Appalachia as compared to urban areas - yet growing at a faster rate as compared to the 1980s (Cameron 2001). Rural women who commit crime, then, are a particularly understudied group.

CURRENT STUDY

Research suggests that, while drug use and criminal activity often co-occur, most substance users are not "criminals," and most of their illegal activity is centered around obtaining drugs (Lammers et al. 2014). Because of the overlap between drug use and crime, this distinction is not always apparent and could have some significant impact on treatment progress and outcomes (Lammers et al. 2014), of relevance for vulnerable women. This study uses a latent profile analysis (LPA) to examine criminogenic risk factors and histories of rural women in order to understand the complexities of the drug use/crime relationship, including the potential role of a partner.

Compared to traditional statistical methods which focus on variables, latent variable techniques are person-centered approaches where individuals' characteristics are central components of the analysis (Collins and Lanza 2010). Studies have utilized latent analyses to understand criminal patterns among homicide offenders (Vaughn et al. 2009), burglary offenses (Fox and Farrington 2012), juvenile girls (e.g.,

Walker et al. 2016) and criminal career trajectories (e.g., Blokland, Nagin, and Nieuwbeerta 2005). More recently, latent modeling techniques were used to examine latent subgroups of women based on substance use, exposure to violence, and risky sexual behaviors (Jones et al. 2018). Findings highlight a need for trauma-informed interventions for justice-involved women, and this study builds on this prior study by examining the criminal behavior more explicitly. A strength of latent modeling techniques is that they provide a qualitative-quantitative exploration of the topic, allowing researchers to capture multiple dimensions of behavior to collectively consider the study population. Given that prior research has not examined the intersection of substance use and crime among rural women, a person-centered approach such as latent profile analysis will provide an understanding of rural women that is considered a more holistic view of the phenomenon (Collins and Lanza 2010; Lanza and Bray 2010). This holistic insight is particularly useful for understudied areas such as the current research. This study addresses gaps in previous literature by using LPA to assess specific risk factors of the drug/crime relationship for rural women to better understand other risk behaviors including injection drug use and drug use history, extent of criminal involvement, and risky partner relationships.

METHODS

Participants

Study participants included adult women incarcerated in rural jails in the central Appalachian region of eastern Kentucky. While this region of the state does include some urbanized areas, the target areas for recruitment for this study were predominantly rural. This analysis is part of a larger parent study focused on risk behaviors among rural Appalachian women (Staton et al. 2018). Women were randomly selected from the jail rosters, and screened for study eligibility criteria which included need for substance use intervention based on moderate risk scores (4+ for any drug) on the National Institute on Drug Abuse (NIDA)-modified Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; NIDA 2009), self-reported risky sexual practices in the three months prior to incarceration, residence in Appalachia, and willingness to participate (Staton et al. 2018).

Design and Procedures

Study procedures have been described in detail elsewhere (Staton et al. 2018). In summary, adult women were randomly selected from jail rosters

in three rural Appalachian jails. Women were provided with informed consent and screened for eligibility based on drug use severity during the time before incarceration, as well as engagement in high-risk sexual activities. Random selection and screening procedures contribute to the overall generalizability of study findings to rural, justice-involved women who use drugs. All study procedures were approved by the university Institutional Review Board (IRB) including special considerations for prisoners, as well as protected under a federal Certificate of Confidentiality. Participants were interviewed face-to-face in a private room in the jail, and they were paid $25 for completing the interview.

During the study recruitment phase between December 2012 and August 2015, 900 women were randomly selected from the three target jails, 688 (76.4 percent) participated in the study screening sessions in the jails, and 440 met study eligibility criteria. The refusal rate was less than 1 percent, and of those who met eligibility criteria, 40 were released early, and 400 completed the baseline interview.

Measures

Latent profile indicators. Four variables were used to construct the latent profiles to distinguish drug use and crime. Latent profile indicators are different from latent class indicators, in that latent profile indicators are continuous variables. The first variable was the age of onset for criminal justice involvement as self-reported by the women for their age of first arrest. The second variable was the number of lifetime arrests self-reported by women. The third variable was a ratio calculated from the total number of arrests reported by each woman and the number of arrests she reported being under the influence. For example, if a woman had a history of seven arrests and reported being under the influence of drugs or alcohol for five of those arrests, she was given a self-influence ratio of 5/7 or 0.71. The fourth variable was similar in ratio construction but utilized the number of times a woman reported being with a partner who was under the influence of alcohol or drugs at time of arrest to create a partner-influence ratio.

Drug-use covariates. Profile associations were examined among three drug history variables. Dichotomous measures of injection drug use history (lifetime) and if injection drug use induction was with a romantic partner were examined. Additionally, the number of days a woman reported being high in the six months prior to her current incarceration were measured.

Crime covariates. Three variables captured criminal history of the women. The current primary offense for which the women were incarcerated was measured at a nominal level and collapsed into the categories of: drug, property, court (e.g., contempt), violent, and alcohol (e.g., driving under influence). The total length of time women spent incarcerated was also totaled in years. Finally, a variable was created that examined the amount of time between their first and second arrest in order to assess how quickly a woman might exit and re-enter the criminal justice system.

Risky-relationship covariates. Four risky relationship variables were of interest to the current study. The women reported if the last time they had sex with their partner they were under the influence of drugs. The age the women first reported having sex and if they had ever traded sex for drugs or money were included in analysis. Finally, women reported if their current partner was incarcerated.

Statistical Analysis

Given the sampling procedures, the current sample represents a homogenous group of women who are mostly white (99 percent) and residing in rural communities. The women were on average aged 32.8 years old, with a high school diploma or less education (79.7 percent), and the majority heterosexual (79.2 percent).[1] Therefore, demographics were not included as controls in the analyses. This study utilizes latent profile analysis - a form of latent class analysis which utilizes continuous variables such as the indicators included. Often in literature, the terms "latent class" and "latent profile" are used interchangeably, and the current research refers to LPA throughout. The statistical process of LPA utilizes the observed indicators to form subgroups (i.e., profiles) that appear to be similar, and can be thought of as a "cluster analysis." In addition to understanding how the data cluster together to form subgroups, LPA also provides insights to profile probability of membership. Profile membership is independent in that individuals cannot belong to more than one profile.

A simple model (1-profile) was fit first and profile size was increased sequentially. The procedures for selecting a model were based on standard fit statistics to include Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and likelihood ratio tests. A five-profile model was most parsimonious, homogenous, with separation (AIC= 3908.117; BIC= 4019.878).

Once a final model was selected, cross-validation and model convergence was tested by randomly varying the starting points for the

maximum likelihood. A model is considered identified when the same profiles are obtained regardless as to starting point (Collins and Lanza 2010). In the current study, random iterations and the log likelihood converged to the five-factor model selected in 74.07 percent of tests, indicating the model was well-fitting and robust. Multinomial logistic regression procedures were utilized to determine predictors of profile membership with drug-use and risky relationship variables. All analyses were conducted using the latent profile functions in Stata version 15.1.

RESULTS

Sample and profile characteristics are contained in Table 1. A majority of the sample reported lifetime IDU (75.5 percent) and 22 percent reported IDU with a partner. Women reported an average of 135 days high in the past six-months, and 93 percent of them reported using multiple drugs in one day. To consider crime variables, women's current reason for incarceration included property crimes (21.5 percent), drug crimes (28.1 percent), court related crimes (27.2 percent), violent crime (3.7 percent), and alcohol related crimes (12.0 percent). The women were incarcerated an average of 1.17 years with 3.77 years between their first and second arrest. The third cluster of variables detail risky relationships among the women. Seventy-six percent of the women report using drugs with sex. The women were, on average, aged 15 at first sex. Forty-three percent of the women report trading sex for money or drugs, and the majority (78.3 percent) had a partner incarcerated.

In order to assist in understanding the profile distinctions, profiles were categorized and named according to their low/moderate/high involvement with crime, drug-use, and high-risk partners (referred to as "low/moderate/high drug/crime/partner"), as shown in Table 2. The profiles were organized along a continuum of risk where Profile 1 could be perceived as "lower risk" and Profile 5 could be perceived as "higher risk." Profile 1, characterized by low crime involvement/low drug involvement/low involvement with risky partner, represented 9.0 percent of the sample. The women were older at first arrest ($\bar{x}$= 31.39), had fewer arrests ($\bar{x}$= 1.42), and were rarely under the influence at arrest ($\bar{x}$<.01). Profile 2, moderate crime involvement/moderate drug involvement/low involvement with risky partner, represented 10.0 percent of the sample that were under the influence at about half of their arrests ($\bar{x}$= 0.43) and less often with a partner who was under the influence at the time of crime commission ($\bar{x}$= 0.22). Profile 3 was characterized by moderate crime involvement/high drug involvement/low risky partner involvement and

Table 1: Sample and Profile Characteristics (N=400)

	Total Sample Mean (SD)/ % (binary variables)	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
Drug-Use Variables						
Lifetime IDU	75.5	58.3	62.5	77.5	78.7	80.6
# of days high 6 months	135.83 (70.04)	90.44 (84.90)	99.87 (82.49)	139.99 (66.05)	133.59 (72.99)	155.77 (53.47)
Multiple drugs in one day	92.7	75.0	87.5	92.2	96.7	97.8
IDU with partner	22.0	16.7	10.0	20.9	29.5	24.6
Crime Variables						
Current incarceration offense						
Property Crime	21.5	19.4	20.0	22.5	21.3	21.6
Drug Crime	28.1	45.7	25.0	25.6	16.4	32.1
Court Crime	27.2	13.9	25.0	27.9	37.7	26.1
Violent Crime	3.7	0.0	7.5	5.4	1.6	3.0
Alcohol Crime	12.0	5.6	15.0	13.9	9.8	11.9
Incarceration length (total in years)	1.17 (2.31)	0.39 (0.90)	0.61 (0.71)	1.04 (2.44)	1.30 (1.53)	1.61 (2.90)
Length of time between first and second arrest (in years)	3.77 (4.75)	3.72 (5.36)	4.65 (6.59)	4.14 (5.17)	3.49 (3.43)	3.29 (3.98)
Risky Relationship Variables						
Sex with drugs	76.1	64.5	61.1	79.8	76.9	79.7
Age at first sex	14.75 (2.05)	14.58 (1.79)	15.15 (2.21)	14.69 (1.95)	14.87 (2.12)	14.68 (2.13)
Sex trade for money or drugs	43.5	16.7	20.0	47.3	47.5	52.2
Partner incarcerated	78.3	66.7	88.6	73.7	80.8	82.1

comprised nearly one-third (32.3 percent) of the sample. Women in this profile were arrested on average for the first time at age 24, had since been arrested an average of 2.9 times, were typically always under the influence at their arrests, and less so with a partner under the influence ($\bar{x}$= 0.11). Profile 4, or the high crime involvement/high drug involvement/moderate risky partner involvement profile, included 15.3 percent of the women who reported higher self and partner influence

Table 2: Latent Profile Membership for Criminal Profiles (N=400)

Profile distinction	Low crime Low drug Low partner Profile 1	Mod crime Mod drug Low partner Profile 2	Mod crime High drug Low partner Profile 3	High crime High drug Mod partner Profile 4	High crime High drug High partner Profile 5
Age onset	31.39	23.52	24.31	21.43	21.98
Number of arrests	1.42	3.25	2.90	4.43	3.09
Self-influence ratio	0.004	0.43	0.99	0.71	0.99
Partner-influence ratio	0.16	0.22	0.11	0.37	0.86
Profile membership	9.0%	10.0%	32.3%	15.3%	33.5%

ratios than Profiles 1-3. Profile 5 was categorized as the highest risk group with high crime involvement/high drug involvement/high involvement with a risky partner and comprised the largest percentage of the sample at 33.5 percent. Women in this profile were first arrested on average at age 22 with 3.1 subsequent arrests, and they were under the influence and with a partner under the influence at essentially every arrest ($\bar{x}$= 0.86).
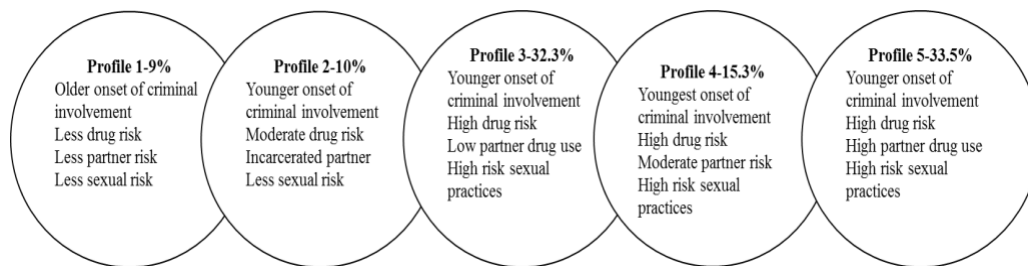
Multinomial Logistic Regression
In the models in Table 3, the profiles are the dependent variables, and the drug use and risky relationship variables examine prediction of profile membership. Several variables significantly predicted profile membership. With increasing number of days high in the previous six months, women were more likely to be in two of the profiles labeled as "high drug involvement" (Profiles 3 and 5). Women who used multiple substances in the same day had a six times greater likelihood of being in the high crime/high drug/high partner profile (Profile 5) compared to low crime/low drug/low partner (Profile 1). Women who reported that they traded sex for money or drugs were more likely to be in Profiles 3, 4, and 5, the profiles marked with high drug involvement and moderate to high crime involvement. Women who had a partner incarcerated were more likely to be in Profile 2 (moderate crime/moderate drug/low partner) compared to profiles marked by high drug use (Profile 3 and Profile 5). Profile membership was not associated with history of injection drug use, injection drug use initiation with a partner, using drugs before sex, or age at first sexual intercourse (see Table 3).

DISCUSSION

The overall aim of this study was to contribute to the understanding of the drug/crime relationship for rural women using latent profile analysis methodology (summarized in Figure 1). Specifically, this analysis focuses on a vulnerable and understudied group of rural women drug users in Appalachia and established clusters based on criminal career history, influence of drug use in the commission of crimes, and role of the partner's drug use in the commission of crimes. Using the Risk-Need-Responsivity frame contextualized within the social learning theory (Andrews et al. 1990; Andrews and Bonta 2006), the clusters were then used to examine other high-risk behavior among these women. This study makes an important contribution to the literature because it is the first use of latent profile analysis to examine the drug/crime relationship among rural women.

Figure 1: Summary of Profile Characteristics

Profile 1-9%
Older onset of criminal involvement
Less drug risk
Less partner risk
Less sexual risk

Profile 2-10%
Younger onset of criminal involvement
Moderate drug risk
Incarcerated partner
Less sexual risk

Profile 3-32.3%
Younger onset of criminal involvement
High drug risk
Low partner drug use
High risk sexual practices

Profile 4-15.3%
Youngest onset of criminal involvement
High drug risk
Moderate partner risk
High risk sexual practices

Profile 5-33.5%
Younger onset of criminal involvement
High drug risk
High partner drug use
High risk sexual practices

The organization of profiles in this analysis represented a continuum of risk based on involvement with crime and drugs. Profiles at each end of the continuum – Profiles 1 and 5 – were clearly distinct from other profiles. Profile 5 was characterized by an early age of onset of justice involvement and at least three prior arrests. Their drug use ratios indicated that they were under the influence at nearly every arrest and nearly always with a partner under the influence. By comparison, Profile 1 had the latest age of onset for justice involvement (31.4), the fewest number of arrests, and lowest scores on the ratios of involvement with drugs and/or partner involvement with drugs at the time of arrest. In the multinomial model, other risk factors also clearly delineated the profiles at each end of this continuum in that women in Profile 5 were significantly more likely to have more days of drug use, to use multiple substances in the same day, and to exchange sex for drugs or money compared to women in Profile 1. The increased number of arrests and substance use history for Profile 5 is also consistent with previous findings that women who returned to the criminal justice system were more likely to report

using more substances in the last month and injecting drugs compared to those who did not return to the criminal justice system (Mannerfelt and Håkansson 2018). Research suggests there may be a crucial distinction between individuals who commit crimes as a function of their drug use and those who are more criminally involved. In the case of those who use drugs and happen to commit crimes, their crimes often centered on obtaining drugs (Lammers et al. 2014). The findings of the present study provide support to the notion that among the most criminally involved, severity of drug use is a significant and robust factor. Even within this sample of rural women who use drugs, criminal involvement seems to vary significantly based on the severity of their drug use.

The profiles at each end of the risk continuum suggest the latent profile analysis successfully distinguished risk categories in this sample. However, the profiles "in the middle" of the risk continuum warrant further discussion. In this analysis, Profile 3 might more closely approximate the distinction of women who use drugs and commit crimes. They reported being under the influence of drugs or alcohol during the commission of nearly every crime, but reported fewer arrests than Profiles 4 or 5. They also have spent less time incarcerated than women in Profiles 4 and 5. Women in this profile were also more likely to report more days of drug use and greater frequency of sex exchange for money/drugs compared to women who were less drug-involved (i.e., Profiles 1 or 2). This profile may represent the greatest opportunity for intervention in that their drug use may be progressing to a point where criminal activity is a consequence. Early intervention with these women is critical to reduce the risk for subsequent criminal activities and recidivism. Interventions with women who seem to be experiencing criminal consequences of drug use should also include a focus on addressing drug use outcomes, since applying principles focused on reducing recidivism alone does not impact drug use outcomes, as detailed in a recent meta-analysis (Prendergast et al. 2013).

While no known prior research has collectively considered substance use, criminogenic factors, and risky relationships to profile rural women, some considerations to research examining latent profiles of women in general may be considered. For example, some similarities can be considered with Brennan and colleague's (2012) pathway model study of 718 women prior to release from prison. In their study, a profile emerged characterized by older women with mild drug involvement who were less likely than others to have problematic partner relationships and less extensive arrest histories. This profile compares to Profile 1 in the current study - women who were more likely to be older than other

Table 3: Multinomial Logistic Regression Model of Estimated Profile Membership Based on Drug and Risky Relationship Variables (95% CI)

PROFILE	(1) vs (2)	(1) vs (3)	(1) vs (4)	(1) vs (5)	(2) vs (3)	(2) vs(4)	(3) vs (4)	(5) vs (2)	(5) vs (3)	(5) vs (4)
Lifetime IDU	0.82 (0.23-2.88)	1.00 (0.33-3.04)	0.81 (0.23-2.89)	0.77 (0.25-2.38)	1.21 (0.44-3.35)	0.98 (0.30-3.19)	0.81 (0.31-2.15)	1.07 (0.39-2.96)	1.30 (0.61-2.74)	1.05 (0.40-2.77)
# of days high 6 months	1.00 (0.99-1.01)	1.01** (1.00-1.01)	1.00 (1.00-1.01)	1.01*** (1.00-1.02)	1.01** (1.00-1.01)	1.00 (1.00-1.01)	1.00 (0.99-1.00)	0.99*** (0.98-0.99)	1.00 (0.99-1.00)	0.99* (0.99-1.00)
Multiple substances in one day	2.19 (0.53-9.10)	2.23 (0.65-7.68)	4.98 (0.84-29.47)	6.15* (1.30-29.01)	1.01 (0.26-3.95)	2.27 (0.35-14.48)	2.23 (0.42-12.02)	0.36 (0.07-1.84)	0.36 (0.09-1.47)	0.81 (0.12-5.52)
IDU with partner	0.46 (0.10-2.14)	1.04 (0.32-3.43)	1.54 (0.43-5.46)	1.27 (0.39-4.16)	2.26 (0.66-7.70)	3.34 (0.91-12.20)	1.47 (0.67-3.25)	0.36 (0.11-1.22)	0.82 (0.44-1.54)	1.21 (0.56-2.61)
Sex with drugs	0.71 (0.21-2.38)	0.92 (0.32-2.67)	0.79 (0.24-2.55)	0.70 (0.24-2.06)	1.30 (0.48-3.48)	1.11 (0.37-3.32)	0.85 (0.36-2.03)	1.01 (0.38-2.70)	1.31 (0.66-2.60)	1.12 (0.48-2.61)
Age at first sex	1.09 (0.85-1.40)	1.15 (0.93-1.43)	1.13 (0.89-1.43)	1.17 (0.94-1.46)	1.05 (0.86-1.28)	1.03 (0.82-1.29)	0.98 (0.83-1.16)	0.94 (0.77-1.14)	0.98 (0.86-1.12)	0.96 (0.81-1.14)
Sex trade for money or drugs	1.19 (0.27-5.23)	4.29* (1.27-14.44)	4.89* (1.65-17.77)	5.02** (1.49-16.90)	3.60* (1.25-10.37)	4.11** (1.31-12.90)	1.14 (0.55-2.38)	0.24** (0.08-0.68)	0.85 (0.48-1.51)	0.97 (0.47-2.01)
Partner incarcerated	3.81 (0.9-15.59)	0.07 (0.25-2.06)	1.07 (0.32-3.51)	1.08 (0.37-3.19)	0.19** (0.05-0.66)	0.28 (0.07-1.09)	1.47 (0.62-3.48)	3.52 (0.99-12.49)	0.67 (0.35-1.28)	0.98 (0.41-2.36)

NOTE: Profile 1 – Low crime, low drug, low partner; Profile 2 – Moderate crime, moderate drug, low partner; Profile 3 – Moderate crime, high drug, low partner; Profile 4 – High crime, high drug, moderate partner; Profile 5 – High crime, high drug, high partner

profiles, with less extensive arrest histories, and low partner and sexual risk factors. Additionally, a profile of women was found in Brennan et al.'s (2012) research comprised of younger women with more extensive arrest histories, particularly for drug and property crimes, with criminally involved partners similar to risk factors found for the current research's Profile 2. Also, a study of women in drug court found a continuum of risk with regard to women's drug use, violence histories, and sexual risk behavior (Jones et al. 2018), indicating that in general women experience a range of risk and a multitude of pathways to their involvement in the criminal justice system.

A unique contribution of this analysis is the role of the partner, specifically the commission of crime with a partner who was under the influence of drugs or alcohol. It should be noted that Profile 5 – the highest risk profile – was also most likely to have committed crimes with a partner who was under the influence. Further, when examining profiles along a continuum of risk from Profile 3 to Profile 5 where the majority of women in this analysis fall (81.1 percent), there is a steady increase in the ratio of crimes committed with partners under the influence. This finding suggests that as drug use severity increases, the risks associated with partners who use drugs and commit crimes may also increase for rural women. Involvement with a substance using (Mannerfelt and Håkansson 2018) or criminally involved (Benda 2005) partner has been associated with recidivism for women. Despite research showing the influence of intimate partners on substance use and health risk behaviors in women, there is less evidence on the role of intimate partners on criminal behavior in women (Covington 1998; Staton et al. 2018; Staton-Tindall et al. 2007a). This is an important area for future research and practice in order to better understand the role of the "risky partner" in the drug/crime relationship for women.

This study has limitations. Based on the recruitment and screening procedures, enrollment in the study was based on high risk drug use and sexual practices. While criteria included a NIDA-modified ASSIST score of 4+ (indicative of a need for intervention [NIDA 2009]) in a randomly selected sample of women from jails, most women reported considerably higher scores (Staton et al. 2018). Thus, it is possible that it is more difficult to tease apart the complexities of criminal activity and drug use in this sample of women who use drugs. Further, the dataset was limited in variables to more thoroughly explain the role of the partner and the partner's drug and alcohol use in the commission of crimes. In addition, because women were randomly selected, screened for eligibility, and

entered the study from three jails in rural Appalachia, their demographic composition was very homogeneous, particularly with regards to race. While reflective of the geographic area, this finding may limit generalizability of these findings to women who are not incarcerated and women in urban areas. Finally, all data was collected through self-report via face-to-face interviews in the jail setting. It is possible that the sensitive nature of questions regarding drug use, crimes, and partner relationships may have been uncomfortable for women respondents and associated with socially desired responses.

Despite these limitations, this study makes an important contribution to the literature with the use of latent profile analysis to understand the drug/crime relationship among rural Appalachian women. Study findings suggest that there is considerable variation in drug use severity and criminal involvement, even among a sample of women who use drugs. Latent profile analysis served as a viable methodology to understand a continuum of risk based on criminal involvement, drug use involvement, and the role of a partner who also uses drugs. Rural women along the endpoints of the continuum in Profile 1 and Profile 5 demonstrated significant differences in early age of onset of criminal justice involvement, criminal history, being under the influence at the time of arrest, and being with a partner who was under the influence at the time of arrest. These findings suggest that among the most criminally involved rural women, severity of drug use is a critical factor in distinguishing women who use drugs and commit crimes compared to women who commit crimes and use drugs, which has implications for targeting interventions for women.

Identification of individual risks and needs, including the influence of intimate partners and substance use history, is important for interventions in the criminal justice system (Bonta 1997; Prendergast et al. 2013; Shearer and Carter 1999). Specifically, findings suggest that there may be a profile in the middle of the continuum (Profile 3) which represents women engaged in a trajectory of drug use that, with targeted intervention and treatment, may avoid future arrests and criminal activity. Finally, these study findings shed light on the role of the risky partner relationship as a critical underlying factor in the complexity of drug use and crime among women. Along the continuum of risk, having a partner who uses drugs and commits crimes exponentially increases risks for rural women. Findings suggest that gender responsive substance use treatment would be beneficial for rural women. These programs may need to be adapted to consider the salience of prescriptive gender roles and

social networks in the lives of Appalachian women (Buer, Leukefeld and Havens 2016). Taken together, these findings show that even among a seemingly homogenous sample of rural Appalachian women who use drugs, there are important group distinctions that have significant implications for future research and practice on the delivery of substance use disorder interventions with women in jails.

ENDNOTE

[1]Nearly eighteen percent of the women considered themselves bisexual. Eighty-nine percent of the women considered a male sexual partner to be their main partner. Of the remaining 11 percent, 5 women reported no sexual partners in the last year, 15 reported sex with a man only, 13 reported sex with a woman only, and 11 reported sex with both men and women.

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