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How does early adulthood arrest alter substance use behavior? Are there differential effects by race/ethnicity and gender?

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Abstract

Purpose—Much criminal justice research has ignored racial/ethnic and gender differences in substance use subsequent to criminal justice involvement. This paper investigated how early adulthood arrest (i.e., 18 to 21 years of age) influences individuals' subsequent transitions from non-substance use to substance use, and substance use to non-substance use through age 30. We also consider if these relationships differ by race/ethnicity and gender. Processes proscribed by labeling theory subsequent to getting arrested are considered.

Methods—We analyzed 15 waves of data from the National Longitudinal Survey of Youth 1997. Multinomial logistic regressions were performed using Stata software version 14.

Results—We found racial/ethnic differences in the effect of arrest on subsequent substance use, particularly marijuana. Being arrested was associated with shifting non-binge drinkers and non-marijuana users into binge drinking and marijuana use; as well as shifting binge drinkers and marijuana users into non-use. This pattern was most evident among White and Black men. For Black men, the association between arrest and both becoming a binge drinker *and* becoming a

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non-binge drinker was experienced most strongly during their early twenties. Women's patterns in substance use transitions following an arrest were less clear than for the men.

Conclusion—Some results, particularly transitioning into marijuana use, offer qualified support for processes proscribed through labeling theory. Findings that arrest shifts individuals into non-marijuana use suggest that factors not accounted for by labeling theory – arrest serving as a teachable moment for those using substances - may be at play.

Keywords

life course; labeling; substance use; arrest; race; ethnicity; gender

Introduction

Research on alcohol and drug use has consistently found that substance use varies over the life course (Tucker, Ellickson, Edelen, et al., 2005; Costello, Dierker, Jones et al., 2008; Buller, Borland, Woodall et al., 2008). In general, individuals follow about four major trajectories that can be broadly defined as stable users (i.e. with a relatively flat slope over age); experimental users (generally characterized with a rising slope that peaks at emerging adulthood, with a subsequent decline); increasers (i.e. positive linear slope); and abstainers (little to no use).

As individuals enter adulthood, they may encounter turning points or transitions – events and settings – that can shift their life pathway (Elder 1994, 1985). This could include changing an individual's substance use patterns (Maume, Ousey & Beaver, 2005). Some individuals may begin as light drinkers and become heavy drinkers over time, whereas others may remain light drinkers or even abstain (Huang, DeJong, Towvim, et al., 2009). A turning point such as arrest or other justice system involvement (e.g., incarceration) may deflect a person from one substance use pathway to another. Arrest can result in a proliferation of stressors – commonly referred to as collateral consequences in criminal justice literature – such as not being hired for a job; not being allowed to work in certain professions; or not being able to take out loans for college. This is because arrested individuals may incur a label of criminal (Tannenbaum, 1938) regardless of whether or not they were subsequently convicted and sentenced (Wiley, 2015). These collateral consequences can result in stress to an individual. Exposure to stress in turn can increase engagement in coping behaviors that are often deemed risky – like binge drinking and drug use – as a way to alleviate the stress. For example, Lopes, Krohn, Lizotte et al. (2012) found that involvement with the police altered some individuals' substance use pathways into their twenties and thirties.

Extant research on related outcomes (e.g., future arrest) suggests that criminal justice involvement (e.g., incarceration, type of court disposition) may increase (Spohn & Holleran, 2002), decrease (Smith & Gartin, 1989; Murray & Cox, 1979), or have no effect (Gottfredson, 1999) on substance use. What is less known is how contact with the justice system impacts substance use behavior differentially by race/ethnicity and gender. First in 2008 and later in 2015 in the *Journal of Developmental and Life Course Criminology*, Piquero issued a call to life course criminologists to specifically examine racial and ethnic differences in behavioral trajectories. Race remains a less-explored factor in life course

criminology (Fine & Cauffman, 2015). Criminologists who are life course researchers do not generally focus on race/ethnicity or gender, although there has been some work in this area. Similarly, researchers who focus on race/ethnicity, gender, and crime do not often consider the life course.

Research (e.g., Bernburg & Krohn, 2003) suggests that people of color are more likely to incur a label of “criminal” than Whites. This may be because people of color are disproportionately arrested (e.g., LaFree 1995, 1998; Sabol, Couture & Harrison, 2007; Light, Massoglia & King, 2014) due to racial profiling and structural racism in the criminal justice system. To the extent that substance use could be an indicator of poorer life outcomes in the short- or long-term, we would expect to see more substance use by arrested individuals who may incur a label and subsequently experience greater stress because of that label. On the one hand, stress associated with labeling might be greater for Blacks and Latinos – and men, in particular – because they might experience more negative consequences – such as unemployment and housing discrimination – from being arrested than do Whites. On the other hand, White men may experience greater stress subsequent to arrest because of their privileged social status. That is, because they hold a privileged position within the social hierarchy due to their race and gender, being arrested might disrupt what they see as their expected life path (Pincus, 2011), at which point they might turn to substance use to cope with the stressor. In addition to differences in substance use by race/ethnicity, men and women may differ in their substance use; for example, by using different types of substances.

The present study examined how involvement with the justice system – specifically an arrest during early adulthood – alters substance use behavior during subsequent years. Of specific interest were whether there were differential effects by race/ethnicity and gender.

Literature Review

Prior Empirical Research on Life Course Theory

A life course perspective has been very useful for understanding criminal behavior. A foundational premise is that individual behaviors are not constant. Rather, behaviors ebb and flow as a person matures and also with regards to broader social norms and laws. For example, one’s propensity to binge drink may be greater during a period of emerging adulthood (from 18 to 25 years old) compared with childhood or older adulthood (e.g., White & Jackson, 2004; Arnett 2005). A corollary of this view is that the social regulations and sanctions vary in accord with the life course.

Further, behaviors do not follow a single pattern (or trajectory), but rather, there are heterogeneous trajectories within a population. Thus, one subpopulation may offend and/or use substances at high levels throughout their lifetime, whereas another subpopulation may show a cyclical pattern, and a third subpopulation may show a single peak in young adulthood. This insight has led to empirical research to document these trajectories. Within criminal justice, influential work was led by Moffitt’s (1993) development of a taxonomy. Key findings have included the existence of multiple offender groups (as opposed to just two, as originally posited by Moffitt), and differences in the type and levels of offending of

adolescence-limited (AL) and life course persistent (LCP) offenders (e.g., Nagin & Land, 1993; Roeder, Lynch & Nagin, 1999)

Since the publication of Moffitt's (1993) taxonomy, there have been numerous refinements of her basic proposition, but the general premise of multiple offender groups remains intact (e.g., Moffitt, Caspi, Dickson, et al., 1996; Moffitt, Caspi, Harrington, et al., 2002; Dean, Brame & Piquero, 1996; Patterson, Forgatch, Yoerger et al., 1998; Kratzer & Hodgins, 1999; Nagin & Land, 1993; Nagin, Farrington & Moffitt, 1995; Moffitt & Caspi, 2001; Tibbetts & Piquero, 1999; Fergusson, Horwood & Nagin, 2000; Donker, Smeenk, Laan, et al., 2003; Roisman, Aguilar & Egeland, 2004). Moffitt's own investigations of her original theory uncovered additional nuances in types of offense. One study revealed that while AL and LCP men had roughly the same percentage of police contacts and court convictions as each other, the LCP youth had more convictions for violence than the AL youth (Moffitt, Caspi, Dickson, et al., 1996). Moffitt and colleagues (2002) discovered at follow-up that by age 26, AL men had not, in fact, entirely desisted from criminal behavior. Rather, they had both property and drug convictions, and self-reported offending in both areas (i.e., property, drugs). Nagin et al. (1995) also found that some adolescence-limited offenders did not completely desist, but continued to engage in behaviors such as fighting and substance use.

Other research has examined trajectories of substance use (e.g., Belsky, van IJzendoorn, Nelson et al., 2015; Staff, Schulenberg, Maslowsky et al, 2010; Landsman-Lynne, Bradshaw, & Jalongo, 2010; Huang, DeJong, Towvim, et al., 2009; Eitle, Taylor & Eitle, 2010; Tucker, Ellickson, Orlando et al., 2005). These studies have demonstrated that there are multiple trajectories of substance use; and that certain social factors and life events (e.g., shifts in family, work and school roles; Staff et al., 2010) can influence substance use pathways. Justice system involvement could shift an individual's substance use trajectory, as demonstrated by Lopes, Krohn, Lizotte et al. (2012). They found that police intervention with adolescent young men – serious, chronic offenders – increased the likelihood of continued drug use into their late 20's and early 30's, as well as other negative outcomes such as being on welfare, subsequent arrest, and not completing high school. The authors attributed these outcomes to the effect of being labeled. That is, "being labeled [as a criminal] is a traumatic event" (Lopes et al., 2012, p.479) that removes opportunities for prosocial behavioral change.

Prior research has found gender differences in substance use (Weichold, Wiesner, & Silbereisen, 2014; Schulenberg et al., 1996), including the number of substance use trajectories for women compared to men (Windle et al., 2005) and their levels of substance use (Flory, Lynam, Milich et al., 2004). While under the supervision of the justice system, women may use substances to self-medicate as a means of coping with stress or dealing with mental health problems and/or past abuse (Johnson, 2006). Female offenders often have extensive histories of physical and sexual abuse in both childhood and adulthood (e.g., Johnson, 2006; Bloom, Owen & Covington, 2004; Holsinger, 2000; Harlow, 1999; Acoca, 1998; Belknap and Holsinger, 1998) as well as drug and alcohol problems (Johnson, 2006; Bloom, Owen & Covington, 2004; Young, 1996). That said, it is possible this progression of events – getting arrested leads to a label, which leads to exposure to stressors and stress, which leads to coping through increased substance use – would *not* differ for women vs.

men. In any case, as Weichold et al. (2014) note, more research is needed on gender differences in substance use pathways.

Labels and Substance use

Once a person has been arrested and labeled as a criminal, s/he is grouped with others with a similar label (Tannenbaum, 1938). The stigma that comes with the label could, in turn, change a person's life path in that they may incur myriad collateral consequences that limit their opportunities (e.g., inability to work in certain professions) (Bernburg & Krohn, 2003; Kurlychek, Brame, & Bushway, 2007; Pager & Quillian, 2005). The arrest may indicate to others that the offender may be a dangerous person and/or the arrest may contribute to a deviant self-image that results in the individual embracing a criminal identity (Morris & Piquero, 2013, p.838). Additionally, the labeled individual may be exposed to more criminal norms (e.g., joining a gang post-justice system involvement; Bernburg, Krohn & Rivera, 2006), which may result in subsequent criminality (Bales & Piquero, 2011; Chiricos, Barrick, Bales, & Bontrager, 2007; Holstein, 2009; Jackson & Hay, 2012; Johnson, Simons, and Conger, 2004; Sampson & Laub, 1997).

Morris and Piquero (2013) examined the effect of arrest on later offending, finding that individuals in the chronic delinquency trajectory group continued to engage in delinquency post-arrest whereas youth in the medium-risk and low-risk trajectories evidenced little to no effect of an arrest. Morris & Piquero (2013, p.860) note that these results suggest a possible "deviance amplification effect" of arrest for some chronic offenders. Like Morris & Piquero (2013), some have similarly found support for the harmful effects of arrest on individuals (i.e., Huizinga & Esbensen, 1992; Huizinga, Esbensen, & Weiher, 1996; Paternoster & Piquero, 1995). By contrast, others find that being arrested deters individuals from subsequent offending (Smith & Gartin, 1989; Matsueda, Kreager, & Huizinga, 2006) or has no significant impact on future offending post-arrest (McAra & McVie, 2007).

A labeled individual may also use more substances post-label because of greater exposure to criminal norms. S/he may find him/herself in an environment (e.g., a probation office, jail) where s/he meets substance users, which may normalize substance use (Dishion, Capaldi, Spracklen, & Li, 1995). Relatedly, Paternoster & Piquero (1995) determined that compared to their non-sanctioned peers, South Carolina high school students recently sanctioned (arrested, brought to juvenile court) for alcohol or marijuana use continued to use substances at a higher rate one year later, even after adjusting for prior offending.

Another possibility is that post-label life exposes individuals to greater stress. While stress is not typically included by criminologists as one of the mechanisms that are part of labeling theory, the idea is plausible and worth considering, particularly with regards to subsequent substance use. Stressors (e.g., being labeled and treated like a criminal; remaining unemployed) can undermine an individual's well-being (Pearlin, Schieman, Fazio, et al., 2012). Disruptions to a person's life "of established roles and statuses and the relationships and activities they embody may be stressful by themselves, but they may also lead to [other] stressors" (Pearlin et al., 2012, p.212). While Pearlin and colleagues give examples of stressors such as divorce or job loss, an arrest (and any subsequent conviction or sentence) could also fit with their description of a life disruption. Disruptive life events may also

worsen any already-existing strains, leading to additional stress (Pearlin, Menaghan, Liberman, et al., 1981).

To emotionally cope with these stressors, an individual may turn to using substances such as alcohol, marijuana and other drugs. A variety of theories, many of which echo one another, have been proposed to explain individuals' using substances to cope with negative emotions, including the self-medication hypothesis (Khantzian, 1997), which posits that using substances can take away emotional pain. Empirical evidence supports this idea for a variety of substances. Consuming alcohol has been found to be related to confronting stressors in daily life (Grzywacz, & Almeida, 2008; Armeli, Tennen, et al., 2000; Carney et al., 2000). Some research has also found that Blacks are at risk for drinking problems (Martin, Tuch & Roman, 2003) and cigarette smoking in response to stress (Guthrie et al., 2002).

Desisting from Substance Use

It is possible that involvement with the justice system (e.g., through arrest) may have the opposite effect than that posited through labeling theory. In other words, rather than contributing to increased substance use, an arrest could lead to *decreased* substance use or non-use. Arrest could serve as a teachable moment (Tyler, Fagan & Geller, 2014); that is, an experience that contributes to individuals being open to learning something of value and wanting to change their behavior (i.e., stop using substances). Alternatively, for individuals whose arrest leads to a conviction and subsequent incarceration, substances may be harder to obtain behind bars, thus contributing to reduced use (e.g., Walter, 1996). Various factors have been shown to contribute to reduced substance use including (in adulthood) marriage (Maume, Ousey & Beaver, 2005); having non-substance using friends and parental disapproval of drug use (Eassey, Gibson & Krohn, 2015); and among chronic marijuana users, attachment to school (Eassey, Gibson & Krohn, 2015). Among 15 to 20 year olds, Mauricio, Little, Chassin et al. (2009) found that spending more time in a supervised facility was associated with less substance use over time.

When an Event Occurs: Life Course Epidemiology (and Criminology)

According to life course epidemiology, "socially patterned exposures" at a variety of ages – including young adulthood – influence health, disease risk, and socio-economic status (Kuh, Ben-Shlomo, Lynch et al., 2003, p.778). The effect of an event (e.g., on health) may be stronger depending on when an individual experiences it (Kuh et al., 2003). It stands to reason that if exposure to an adverse event affects health and disease risk as Kuh and colleagues (2003) suggest, exposure could also impact individuals' substance use.

Relatedly, some (e.g., Sampson & Laub, 1997) have sought to blend labeling and life course theories by focusing on the impact of incurring a label over time (Lopes et al., 2012). Some researchers (Lopes et al., 2012; Bernburg & Krohn 2003) have begun to examine how early-life labels beget social-structural consequences that last into adulthood. Examining the impact of labels incurred by young people, including young adults, is useful because people in their early adult years may have not yet finished their education or achieved financial independence (Lopes et al., 2012). Relatedly, Gee and colleagues (2012) note that the age at which an event occurs is not necessarily relevant because of physiological or developmental

processes, but rather because of its social significance. “Eighteen-year-old persons do not simply have older organs than 17-year old individuals; they also possess rights, roles, and obligations that 17-year-old individuals do not. These include... the ability to drive, vote, marry, smoke cigarettes, drink alcohol, be sued, and hold a prison record” (Gee, Walsemann & Brondolo, 2012, p.967).

As to the advantages of studying emerging adulthood, Friedman and colleagues (2016) note that this developmental period involves some very important life transitions – college attendance, marriage, parenthood – at a time when higher order reasoning is still developing (e.g., Giedd, Blumenthal, Jeffreis, et al., 1999; Lebel & Beaulieu, 2011). As individuals become addicted to substances, the substances can alter brain development (Volkow, 2004; Volkow, Fowler & Wang, 2004; Volkow, Fowler & Wang, 2003; Volkow, Fowler, Wang & Goldstein, 2002; Volkow, Wang, Fowler, et al., 1999). Illicit drugs increase dopamine much faster than the brain’s natural reinforcers, which in turn can lead to less interest in regular day-to-day events. Further, substance use at younger ages contributes to later substance use or abuse problems (Grant & Dawson, 1997; DeWit, Adlaf, Offord et al., 2000) as well as neurodegeneration, including in the areas of learning and memory (Zeigler, Wang, Yoast et al., 2005).

Life Course Theory, Race, Labels, and Substance Use

Piquero (2015, 2008) has commented that few empirical tests have examined racial differences in criminal trajectories over the life course. (For exceptions, see Piquero, 2001; Piquero, Brame, Mazerolle, et al., 2002; Piquero & White, 2003; Reitzel, 2006; and Schaeffer, Petras, Ialongo et al, 2003.) Other research (Raskin White, Bates & Buyske, 2001; Ge, Donnellan & Wenk, 2001; Chung, Hill, Hawkins, et al., 2002; Wiesner & Capaldi, 2003; Wiesner & Windle, 2004; Brame, Bushway, Paternoster, et al., 2005) has used samples with varying levels of racial and ethnic diversity, but did not specifically examine racial disparities in criminal behavior or substance use.

Theoretically, there is reason to believe that substance use could differ by race/ethnicity over the life course. Hypothetically, if people of color are more likely to be arrested because of factors such as racial profiling (Alexander, 2012; Light, Massoglia & King, 2014; Hagan, Shedd & Payne, 2005) and structural discrimination (Pincus, 2011), they may also be more likely to incur a label of ‘criminal’. Prior research on the effects of labeling by race has produced conflicting results. Some (Ageton & Elliott, 1974; Harris, 1975) have found that incurring a criminal label had more negative consequences (e.g., greater expectations for future criminal involvement) for White youth, whereas, others (Bernburg & Krohn, 2003; Berk, Campbell, Klap, et al., 1992) have found that justice system involvement begets worse outcomes (e.g., future criminal offenses) for Black youth than for other racial groups.

While racial/ethnic differences in substance use over the life course have not been a main focus of longitudinal research to date (Piquero 2015, 2008), prior empirical studies support the idea that substance use differs along ethnic and racial lines (e.g., Chen & Jacobson, 2012; Gilman, Breslau, Conron et al., 2008; Barnes, Welte & Hoffman, 2002; Amey & Albrecht, 1998; Kandel, Chen, Warner et al., 1997; Dawson, Grant, Chou et al., 1995; Anthony, Warner, & Kessler, 1994; Bachman, Wallace, O’Malley et al., 1991; Bachman,

Johnston & O'Malley, 1981), often with White individuals showing higher levels of substance use. For example, both Bachman et al. (1981) and Bachman et al. (1991) found that White students used more substances than their peers of other races. Black adolescents were found to be less likely to start using substances than Hispanic or White adolescents (Amey & Albrecht, 1998).

In addition to racial/ethnic differences in substance use prevalence rates, individuals' motivations for using substances may differ by race/ethnicity. For example, Terry-McElrath, O'Malley, and Johnson (2009) found that Whites were more likely to cite social reasons (e.g., to have a good time) for drug use than non-Whites. Black and Hispanic users, on the other hand, were more likely to rely on marijuana and alcohol "to get through the day" than White users.

While labeling theory is gender-neutral, the consequences of incurring a label through justice system involvement could also differ by gender (Chiricos et al., 2007; Simons, Miller & Aigner, 1980). There has not been a great deal of criminal justice research that has specifically addressed gender differences in labeling or the consequences of being labeled. Among the ideas that have been put forth is that men and boys are more likely to be formally labeled than women or girls, regardless of whether or not they actually offend more than their female counterparts (Jensen & Eve, 1976). Messerschmidt (1993) suggests that because men have more power in society than women, men may be more likely than women to be labeled as criminals but are also more effective than women at pushing back against a label. Theoretically, this might result in lower repeat offenses by labeled men than labeled women (Messerschmidt, 1993). Conversely, women may face greater social stigma than men because of criminal justice involvement, and subsequently fare worse. This could, for example, translate into greater substance use by women (e.g., to cope with the stigma of having a label).

The Present Study

We advance life course inquiry into the effect of early adulthood arrest on substance use by using a large, nationally representative sample of men and women, who were followed prospectively from ages 12 to 32. Previous research has relied heavily on male-only (e.g., Nagin & Land, 1993; Nagin et al., 1995; Laub, Nagin & Sampson, 1998; D'Unger, Land, McCall et al., 1998; Nagin & Tremblay, 1999; Brame, Bushway & Paternoster, 2003; Sampson & Laub, 2003) and non-American samples (e.g., Nagin & Land, 1993; Nagin & Tremblay, 1999; Moffitt, Caspi, Dickson, et al., 1996; Fergusson, Horwood & Nagin, 2000; Kratzer & Hodgins, 1999). Our study also builds on the work of others (e.g., Lopes et al., 2012; Sampson & Laub, 1997) who have blended labeling and life course theories, looking at the impact of incurring a label over time. We answer the following two questions: How is arrest in early adulthood associated with transitions in substance use from non-use to use and from use to non-use? How does the association differ by race/ethnicity and gender?

Research Design

This study analyzed 15 waves of data from the National Longitudinal Survey of Youth (NLSY97), a nationally representative sample of 8,984 individuals who were 12 to 18 years

old when they were first interviewed in 1997. Respondents have been interviewed annually since 1997, with data collection ongoing. The original NLSY97 study design included two independent probability samples: a cross-sectional sample of 6,748 respondents designed to be representative of individuals born between 1980 and 1984 who were residing in the United States in 1997; and a supplemental sample of 4,236 Hispanics and Blacks who were also born between 1980 and 1984 and were residing in the U.S. in 1997. There remains an approximate 83 percent retention rate of the sample since 1997.

Variables

Dependent variables

Binge drinking: In each wave of data collection from 1997 to 2011, respondents were asked about their use of alcohol and marijuana. Respondents who reported they had drank five or more alcoholic drinks on the same occasion at least once in the past 30 days were classified as binge drinkers. All others were classified as non-binge drinkers. Change scores were then calculated from wave to wave coding whether the participant had been a binge drinker and ceased (0); had maintained their binge drinking status from the previous year (1; regardless of whether they had been a binge drinker or not); or had not been a binge drinker the previous year but had become a binge drinker (2). Maintaining binge drinking status, also referred to as “static”, was used as the reference category for the multinomial logistic regressions.

Marijuana users: Respondents who reported they had used marijuana at least once during the past 30 days were classified as marijuana users, and all others were classified as non-users. Again, change score were computed and static (maintaining marijuana use status) was used as the reference category for the models.

Independent variable

Arrested at 18 to 21 years old: In each wave of data collection, respondents were asked if they had been arrested since the date of last interview. Respondents who were arrested at least once between the ages of 18 and 21 were coded as being arrested; all others were coded as never arrested. In keeping with labeling and life course theories, we expand on the Lopes et al. study by examining how arrest in young adulthood (e.g., 18–21) may be associated with transitions in an individual’s substance use during the subsequent decade. Prior studies of labeling theory have similarly used arrest to operationalize incurring a label (e.g., Lopes et al., 2012; Brownfield & Thompson, 2008; Bernburg & Krohn, 2003; Adams, Robertson, Gray-Ray et al., 2003).

Arnett (2000, 2007) describes the period of emerging adulthood, beginning at age 18, as a less structured period of adulthood, when individuals are often somewhere in between the dependency of childhood and the responsibilities typical of adulthood. These young adults may have moved out of their parents’ home (Goldscheider & Goldscheider, 1994), but may still be uncertain about their future (Arnett, 2000). An arrest at this point in their life may alter subsequent life course opportunities, including educational pursuits and career choice, in ways these emerging adults do not yet fully foresee. Further, arrests that occur in

emerging adulthood will remain on an individual's record, unlike if s/he had been arrested as a juvenile.¹

Control variables—To account for any exogenous factors influencing transitions in binge drinking or marijuana use, the following dichotomous control variables were included in the models: any substance use (binge drinking, marijuana use, cigarette use) prior to 18 years old; being arrested before age 18; whether an individual resided with their biological, married parents or not; and whether an individual was born a U.S. citizen or foreign-born. Copies of the models containing the control variables are available upon request from the authors.

Model Building and Analyses

Multinomial logistic regressions were run using Stata software version 14², on each age transition group, from the 21–22 age transition group to the 29–30 age transition group, using arrest at 18–21 as the key independent variable for determining if there was evidence of arrest being related to subsequent substance use differently across race. The models were run separately on binge drinking transition and marijuana use transition. Also, to avoid an overly complicated 3-way interaction term, the sample was stratified by gender before applying the model. This prevents the authors from revealing any insights about potential disparities in the relationship between arrest and substance use across gender, although it does allow relative ease of interpretation in favor of a more parsimonious model without 3-way interaction terms. Subsequent research may explore these potential relationships. Finally, control variables for previous arrest, previous substance use, nuclear family structure, and U.S. born were included in every model. The graphs presented in Figures 1 through 8 were created using ggplot2 in R³. Additional details⁴ about preliminary model building are provided in the Notes to this article.

Results

Men

Transitions into binge drinking versus stable binge drinking or non-binge drinking—Figure 1 shows the impact of being arrested between ages 18 and 21 on the likelihood of transitions from non-binge drinking to binge drinking by race/ethnicity. Solid

¹See for example <http://www.criminaldefenselawyer.com/resources/expunging-or-sealing-a-juvenile-court-record.htm>.

²<http://www.stata.com/support/faqs/resources/citing-software-documentation-faqs/>

³<https://cran.r-project.org/web/packages/ggplot2/citation.html>

⁴Initially, latent transition analyses (LTA) had been attempted since LTA allows researchers to examine shifts in their latent class membership in response to an event. Previous research has used LTA to examine shifts in substance use (e.g., onset of alcohol use) over time (e.g., Guo, Collins, Hill et al., 2000; Chung & Martin, 2001; Lanza & Collins, 2002). We attempted to employ LTA in a similar fashion to determine if being arrested in emerging adulthood (i.e., 18 to 21-years-old) was associated with transitions between latent classes for low-level substance use and high-level substance use, with the latent classes determined by the LTA model using the dichotomous marijuana and binge drinking variables described in the previous section, as well as a 4-level ordinal measure of cigarette smoking frequency. However, attempts to include covariates to control for exogenous relationships, and even attempts to include interaction terms between the race and arrest variables to answer the current research question, prevented the models from properly converging and often resulted in invalid parameter estimates for those models that did converge. These convergence issues may likely have resulted from the large imbalance in the frequency distributions of the key variables of interest displayed in Table 1. Due to these model convergence issues, the researchers ultimately opted for using the change scores for the binge drinking and marijuana use dependent variables described earlier. Applying multinomial logistic regressions to these change scores yielded more stable model results with only the occasionally questionable standard error estimates, which was typically the last two age groups for Hispanic women, for which there were few observations for certain groups (e.g., female, Hispanic marijuana users).

lines (of any color) indicate individuals with an arrest, and dotted lines indicate individuals without an arrest. The results control for juvenile arrest, substance use before age 18, nuclear family structure, and being U.S. born.

Among white men, arrest in early adulthood only had a discernable effect on *decreasing* the likelihood of becoming a binge drinker between the ages of 27 to 28 and 29 to 30, counter to what might be expected as per labeling theory. Similarly, arrest generally did not appear to impact Hispanic men's likelihood of becoming a binge drinker until ages 27 to 28, when they were much *less* likely than non-arrested men to transition into binge drinking. By contrast, among Black men there were significant and noticeable differences between arrested and non-arrested men in becoming a binge drinker at younger ages (21 to 25 years). However, the effect tapered off from 25 to 30 years. Arrested Black males had the highest likelihood of transitioning into binge drinking (20% during 22 to 23 years old) of all three race/ethnic groups.

Transitions out of binge drinking versus stable binge drinking or non-binge drinking—

Among White men, no difference by arrest was seen in becoming a non-binge drinker in their early twenties (21 to 25 years). At ages 25 to 27, arrested White men were significantly less likely to become a non-binge drinker than non-arrested White men. However, this pattern reversed itself at ages 27 to 28, when arrested White men were more likely to become a non-binge drinker as compared to non-arrested White men. This association was non-significant after age 28. Among Black men, arrested men were more likely than their non-arrested counterparts to become non-binge drinkers from ages 21 to 23; and 25 to 26. In other years, there was no significant difference in transitioning to non-binge drinking by arrest status for Black men.

Arrested Hispanic men were more likely than non-arrested Hispanic men to become non-binge drinkers than remain stable in their binge drinking between 23 to 24 years old. Arrested Hispanic men also had the highest likelihood estimate of becoming non-binge drinkers than any racial/ethnic group during this period (i.e., 18% at 23 to 24 years), although other racial/ethnic groups have upper-end standard error estimates that overlap with this estimate. From ages 25 to 27 and ages 28 to 30, the association shifted; arrested Hispanic men were less likely to become non-binge drinkers than their non-arrested counterparts.

Transitions into marijuana use versus stable use or non-use of marijuana—

Overall, the probabilities of marijuana transition were generally lower than that of binge drinking transition in men, as indicated by the downward shift in scale in the y-axis. (The same held true for marijuana use *decrease*, as the overall probabilities dropped even slightly lower. See Figure 4.) As seen in Figure 3, among both White and Black men, during many years arrested individuals were more likely than non-arrested individuals to become a marijuana user. The difference between arrested vs. non-arrested White and Black men largely dissipates after age 26. The exception to this is arrested Black males turning 30 being significantly more likely to transition into marijuana use than non-arrested Black men.

Among Hispanic men, there were fewer differences between arrested and non-arrested individuals in their likelihood of becoming a marijuana user. From ages 23 to 24 and 27 to 28, arrested Hispanic men were more likely to become marijuana users as opposed to remain stable in their lack of use than non-arrested men. During the other ages, however, little difference in marijuana use by arrest was found.

Transitions out of marijuana use versus stable use or non-use of marijuana—

Among both White and Black men, during five of the nine age transition periods arrested males were significantly more likely to decrease their marijuana use than their non-arrested counterparts. Arrested Hispanic men were also more likely to decrease their marijuana use than non-arrested Hispanic men. This was seen for slightly fewer (four) of the age transition periods than was seen for White or Black men.

Females

Transitions into binge drinking versus stable binge drinking or non-binge drinking—

The patterns for women with regard to the association between being arrested in early adulthood and transitions into and out of binge drinking were more ambiguous (Figures 5 and 6) than for men. The caveat is that statistically significant differences by gender cannot be determined. Among White women, non-arrested women were slightly more likely to become a binge drinker from ages 21 to 22 as compared to their arrested counterparts (See Figure 5). This reversed itself from ages 22 to 23, when arrested White women became more likely to transition into binge drinking as compared to non-arrested White women. This reversed itself yet again at ages 24 to 25. During other years, there were no significant differences in becoming a binge drinker between arrested and non-arrested White women.

Among Black women, there were no clear differences between those who were arrested and those who were not arrested in becoming a binge drinker until ages 28 to 29. During this period, arrested Black women were significantly more likely to become binge drinkers than remain stable in their non-binge drinking as compared to non-arrested Black women. For Hispanic women, the relationship between arrest and transitioning to binge drinking fluctuated and/or remained non-significant over many of the years. Hispanic women were the smallest sample in the data (see Table 1). Therefore, their estimates and standard errors may be less trustworthy than for the other groups, especially at older ages when they often drop out of the data altogether.

Transitions out of binge drinking versus stable binge drinking or non-binge drinking—

Among White women, there were few significant differences in the risk of becoming a non-binge drinker between arrested and non-arrested women, except during ages 21 to 22 when arrested White women were more likely than non-arrested White women to become non-binge drinkers. Among Black women, arrested women fluctuated in their likelihood of becoming non-binge drinkers; during 23 to 25 they were more likely to transition out of binge drinking than their non-arrested counterparts. During ages 28 to 29, non-arrested Black women were more likely to become non-binge drinkers; but this reversed itself during ages 29 to 30. Among Hispanic women, arrested women were less likely to

become non-binge drinkers than non-arrested women from ages 23 to 25, an association that reversed itself from ages 25 to 26. From ages 27 to 28, arrested Hispanic women were again less likely to become non-binge drinkers than their non-arrested counterparts.

Transitions into marijuana use versus stable use or non-use of marijuana—

Among White women, arrested women were more likely to become marijuana smokers than non-arrested women during their earlier (23 to 25 years) and later twenties (26 to 28 years). That said, the probabilities of transitioning were not large for arrested White women (e.g., the highest likelihood was around 8%). Among Black women, the association between being arrested and becoming a marijuana user fluctuated over the years, with the largest difference occurring during their 25 to 26 age transition. Among Hispanic women, the most notable difference in becoming a marijuana smoker by arrest status was for women ages 24 to 25, when arrested Hispanic women were more likely to become marijuana users than their non-arrested counterparts. This association reversed and became non-significant at ages 25 to 26, however.

Transitions out of marijuana use versus stable use or non-use of marijuana—

As seen in Figure 8, in many years arrested White women were more likely to become non-marijuana users as compared to non-arrested women. This is evident particularly during ages 21 to 22 and 25 through 26. Similarly among Black women, in many of the years arrested women were more likely to become non-marijuana users than their non-arrested counterparts. This is particularly noticeable for Black women ages 26 through 27.

Among Hispanic women, the pattern differs slightly. Arrested Hispanic women were significantly more likely to become non-marijuana users from ages 22 through 23. In several transition periods, however (i.e., ages 26 to 27, and ages 28 through 30), no arrested Hispanic women became non-marijuana users. An important thing to note is the relatively large standard errors around Hispanic women, which is likely an indication is that an overwhelming majority of Hispanic women were never marijuana smokers to begin with, providing the model with sparse variation to provide a confident estimate.

Discussion

In this study, we examined how early adulthood arrest was associated with transitions in substance use and how the association differs by race/ethnicity and gender. The study was informed by labeling theory, which posits that individuals that incur a label through justice system involvement (e.g., arrest) may get treated differently as a result. Their substance use behavior subsequent to their arrest may change as a result, either through internalizing negative societal messages directed at them or through social norming. Individuals may also increase their substance use as a way to cope with the stress of having incurred a label through arrest.

The results of the analyses demonstrated that patterns for the relationship between arrest and subsequent substance use were complex and erratic at times. There was evidence of disparities in the relationship across race groups within both genders, and some patterns emerged more distinctly among men than women. Being arrested was sometimes associated

with shifting non-binge drinkers and non-marijuana users into binge drinking and marijuana use, respectively. The association between arrest and substance use was most evident when examining transitions into (and out of) marijuana use than transitions into binge drinking. This pattern was seen most clearly among Black men for both substances; and among White men for marijuana use.

For Black men, the association between arrest and transitioning into binge drinking and marijuana use suggests some support for labeling theory. In other words, the increase in using substances based on arrest may be associated with incurring a label through arrest and the stigma that comes with that label. That the association is seen most clearly among Black males suggests that factors such as racism and institutional discrimination (for instance) may play a role in a way that White males do not experience. As no indicators of racism or discrimination are available through the NLSY97, the researchers can only speculate that these factors may be at work. On a positive note, the association appears to wane as the men age and substance use differences by arrest dissipate.

That being arrested was also associated with transitioning male marijuana users of all races/ethnicities (and sometimes binge drinkers) into *non*-use is an interesting finding that does not immediately speak to labeling theory. One possibility is that the arrest served as a teachable moment, contributing to an individual wanting to alter their behavior (e.g., stop using substances). Transitioning to non-use may also be connected to factors not known from the current models, such as increased justice system supervision (e.g., if the arrest led to a conviction and sentence); or an individual getting married to a non-substance using spouse.

Hispanic men and women showed somewhat different patterns than Whites and Blacks in the relationship between arrest and transitions in substance use. Unlike for White or Black men, arrest was more likely to be associated with transitioning to non-binge drinking or non-marijuana use among Hispanic men. This may mean that the processes posited by labeling theory (e.g., stigma, internalizing negative societal images) play less of a role for Latinos, for reasons not immediately clear through the results presented in this paper. It is possible, for example, that Hispanic young adults already encounter stigma related to language and cultural barriers, for example; or assumptions, however incorrect, that they are illegal immigrants. In this hypothetical scenario, additional stigma stemming from a label incurred through arrest might have a negligible effect. That said, it is not possible to know this from the present analyses.

Due to the types of analyses performed, we cannot say whether any observed male-female differences in substance use subsequent to arrest were statistically significant. That said, a few observations can be made. In general, the patterns in women's binge drinking transitions were less clear than patterns for the men (i.e., more fluctuation in likelihood of transitioning by arrest vs. non-arrest over the years). The association for women between early adulthood arrest and transitioning to marijuana use or non-use was more apparent than it was with binge drinking transitions. As with the men, the results for women's marijuana use transitions provide some qualified support for labeling theory; as well as the idea of a teachable moment or the contribution of an unknown factor (e.g., increased justice system

supervision post-arrest). That the women appear to have substance use transitions distinct from those of the men may be reflective of their different life experiences leading up to adulthood (e.g., societal sexism). It is also quite possible that substance use transitions for the women (and men) would appear differently had substances other than binge drinking and marijuana use been used.

Labeling theory is often examined using a gender- and race/ethnicity-neutral approach, despite the fact that this does not reflect many individuals' life experiences. Labeling theory does not, for instance, account for the patriarchy, sexism, racism, or structural discrimination. Building on prior research that non-Whites may be more likely to incur a label of "criminal" than Whites are, labeling theorists would do well to expand the theory to incorporate factors such as these (e.g., structural discrimination) into future empirical studies of the theory.

As with all studies, there are limitations that should be mentioned. While the results provide some support for labeling theory, it is not presently known which of the processes posited by labeling theory would explain transitions into binge drinking or marijuana use post-arrest. While stress and stressors resulting from incurring a label are discussed as possible contributors to increased substance use, the NLSY97 does not include these measures of stress. Additionally, the binge drinking and marijuana use measures only capture short time periods (30 days) and only represent two specific types of substance use. The same could be said about our operationalization of labeling theory (i.e., arrest at 18–21). Other variables operationalizing labeling theory (e.g., conviction, type of criminal sanction [probation, jail, prison]) or substance use may have produced different results.

Due to the sample size issues, we were unable to include Asian respondents in our analyses. Only 160 respondents self-identified as Asians during the initial year of data collection (1997). This number declines slightly with each successive wave due to sample attrition, a common occurrence in most multi-wave survey projects. Given the complex nature of the longitudinal models and variables presented, it was not feasible to estimate models for Asian respondents as the models were unstable.

Limitations withstanding, this study makes a valuable contribution to life course and labeling theory research by specifically examining race, ethnicity, and gender differences in transitions in problematic behavior (substance use) throughout young adulthood subsequent to an arrest. We have addressed a gap in the literature specifically identified by Piquero (2015, 2008) and others, and hope to encourage other researchers to take up the call to conduct life course research through the lens of race, ethnicity and gender. Future research avenues might dig deeper into labeling theory's processes. Why should the stigma stemming from a label affect one gender (men) more than another (women), if that is in fact the case? The results presented in this paper suggest that the negative effect of a label may taper off over time for both Black and White men. What does that suggest about future experiences and opportunities (e.g., pursuing higher education, getting married, becoming an 'established' member of a community) that may wash out any negative effects of a legal entanglement as a young adult? These are some fruitful areas for future studies.

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Figure 1.

Multinomial Logistic Regression Estimates Predicting Transitions into Binge Drinking among Men

Note: Estimates of relative risk ratios and standard errors.

Figure 2.

Multinomial Logistic Regression Estimates Predicting Transitions out of Binge Drinking among Men

Note: Estimates of relative risk ratios and standard errors.

Figure 3.

Multinomial Logistic Regression Estimates Predicting Transition into Marijuana Use among Men

Note: Estimates of relative risk ratios and standard errors.

Figure 4.
 Multinomial Logistic Regression Estimates Predicting Transitions out of Marijuana Use among Men
 Note: Estimates of relative risk ratios and standard errors.

Figure 5.
Multinomial Logistic Regression Estimates Predicting Transitions into Binge Drinking among Women
Note: Estimates of relative risk ratios and standard errors.

Figure 6.

Multinomial Logistic Regression Estimates Predicting Transitions out of Binge Drinking among Women

Note: Estimates of relative risk ratios and standard errors.

Figure 7.

Multinomial Logistic Regression Estimates Predicting Transitions into Marijuana Use among Women

Note: Estimates of relative risk ratios and standard errors.

Figure 8.

Multinomial Logistic Regression Estimates Predicting Transitions out of Marijuana Use among Women

Note: Estimates of relative risk ratios and standard errors.

Gender and race/ethnicity substance use groups: Sample size, proportion in arrested/not arrested, substance users and non-users age 18

Table 1

	White males n=2,286		Black males n=1,169		Hispanic males n=977		White females n=2,126		Black females n=1,165		Hispanic females n=922	
	Arrested	No	Arrested	No	Arrested	No	Arrested	No	Arrested	No	Arrested	No
Binge drinking	69	1,049	100	715	41	472	30	1,229	31	876	14	621
	35.0%	61.7%	76.9%	84.3%	45.6%	66.6%	40.5%	70.8%	88.6%	89.6%	93.3%	80.7%
Binge drinking	128	652	30	133	49	237	44	506	4	102	1	149
	65.0%	38.3%	23.1%	15.7%	54.4%	33.4%	59.5%	29.2%	11.4%	10.4%	6.7%	19.4%
Marijuana Use	110	1,312	85	702	55	584	39	1,408	24	865	11	679
	56.1%	76.9%	65.4%	82.7%	61.8%	81.8%	52.7%	81.3%	68.6%	88.6%	73.3%	88.1%
User	86	394	45	147	34	130	35	325	11	111	4	92
	43.9%	23.1%	34.6%	17.3%	38.2%	18.2%	47.3%	18.8%	31.4%	11.4%	26.7%	11.9%