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A LONGITUDINAL STUDY OF SUBSTANCE USE AND VIOLENT VICTIMIZATION IN ADULTHOOD AMONG A COHORT OF URBAN AFRICAN AMERICANS

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Abstract

Aims—This article examines the effects of experiencing violent victimization in young adulthood on pathways of substance use from adolescence to mid-adulthood.

Design—Data come from four assessments of an African American community cohort followed longitudinally from age 6 to 42.

Setting—The cohort lived in the urban, disadvantaged Woodlawn neighborhood of Chicago in 1966.

Participants—All first graders from the public and parochial schools were asked to participate (N=1,242).

Measurement—Dependent variables - alcohol, marijuana, and cocaine use - came from self reports at age 42. Young adult violent victimization was reported at age 32, as were acts of violence, substance use, social integration, and socioeconomic resources. First grade risk factors came from mothers' and teachers' reports; adolescent substance use was self reported.

Findings—Structural equation models indicate a pathway from adolescent substance use to young adult violent victimization for females and those who did not grow up in extreme poverty (betas ranging from .15 to .20, $p < .05$). In turn, experiencing violent victimization in young adulthood increased alcohol, marijuana, and cocaine use yet results varied by gender and early poverty status (betas ranging from .12 to .15, $p < .05$).

Conclusions—Violent victimization appears to play an important role in perpetuating substance use among the African American population. However, within-group variations are evident, identifying those who are not raised in extreme poverty as the most negatively affected by violence.

Keywords

Victimization; substance use; structural equation modeling; African Americans

In adolescence, African Americans have similar or less substance use compared to White populations, yet as they age into adulthood, they are more likely to initiate drug use, less

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likely to desist use, and more likely to develop use disorders [1]. Alcohol and drug use as a negative coping strategy against stress is among the myriad reasons for continuation of substance use into adulthood. Stress arises from a variety of life events and contexts, one of which is violent victimization, which has been linked to substance use [2–4] and other negative consequences, such as psychological harm [5,6].

Substance use and victimization likely influence one another over time. Research demonstrates that substance use can increase the risk for victimization, particularly among females [7]. In turn, “life traumas” involving coercion and force can be highly predictive of drug dependence among Whites and African Americans [8]. Thus, victimization may be instrumental in perpetuating substance use throughout the life course [9,10].

Most prospective studies of substance use and of violent victimization have focused on child or adolescent populations as this is when risk of these behaviors peaks [11–15]. As a result, we know little about the consequences of violent victimization experienced by young adults on long-term patterns of substance use extending into midlife. This gap in our knowledge is particularly important for African Americans who are disproportionately affected by victimization [16] and whose problems connected with substance use often become more pronounced as they enter into mid adulthood [17,18]. Moreover, research shows that the experience of victimization may be more deleterious for older African Americans compared to Whites [19].

Certain demographic characteristics make violent victimization more likely, such as being male and coming from a low income household [16,20]. One unanswered question then is whether these differences lead to differential impacts of victimization within African American populations [6]. According to the accentuation principle, negative events have their greatest impact on the most vulnerable [21,22]. Alternatively, those exposed to violence more often may be less affected by violent victimization because it is considered another of the many negative aspects of their lives [6,8]. Some researchers propose that those with less disadvantage may hold a certain sense of invulnerability. Although research is limited, the effect of victimization may be influenced by one’s perceptions of invulnerability with the impact of victimization being more apparent for those whose assumption of invulnerability is threatened [6,23].

In this study we extend current research by investigating within-group differences between victimization and substance use among a community cohort of urban African American males and females followed longitudinally from age 6 to 42. Specifically, we focus on the differential impact, based on gender and early poverty, of whether adolescent substance use increases the risk of violent victimization in young adulthood and whether experiencing violent victimization in young adulthood, in turn, impacts substance use in mid-adulthood, controlling for other known risk factors. We also examine whether these relationships differ by type of substance used in adulthood.

METHODS

Woodlawn Population—The Woodlawn study, initiated in 1966, is a prospective, longitudinal study of a cohort of 1,242 African American first graders (51.2% females and 48.8% males). Only 13 families declined participation, minimizing selection bias. The cohort is drawn from the nine public and three parochial schools in Woodlawn, a neighborhood in Southside Chicago. When the study began, Woodlawn was one of the five poorest areas in Chicago, with high rates of unemployment, poverty, and welfare participation. The cohort was followed up at three additional time points: in 1976 at age 16

(n=705), in 1992 at age 32 (n=952), and in 2002 at age 42 (n=833). Data from all four time points are used in this study.

Measures

Dependent Variable: Mid-Adulthood Substance Use—Dependent variables are alcohol, marijuana, and cocaine use as reported in the midlife (age 42) interview. A latent construct for alcohol use comprises two indicator variables: frequency of use in the past 10 years (never=0 to nearly every day=5) and the most alcohol consumed per day (0–48 drinks). Both marijuana and cocaine use are represented by latent constructs consisting of: frequency in the past year (never=0 to daily=8) and recency of use (never=0 to in the past year=3).

Violent Victimization—Violent victimization is measured from self-reports at age 32 of three types of victimization ever experienced: 1) being purposely injured, 2) having something stolen by threat, and 3) being forced to have sex. Since we were interested in young adult victimization, we restricted experiences to those last occurring between ages 17 and 32. A variety score¹ was then created (range 0–3) to indicate how many types of violent victimizations a person had experienced.

First Grade Measures—Much empirical evidence establishes the significant influence of early social adaptation, such as childhood problem behavior, on adolescent and early adult behaviors [25,26]. Therefore, we include first grade teachers' ratings of aggression (e.g., fighting, resisting authority) and shyness (e.g., timidity, aloofness) as indicators of early childhood risk of substance use. Ratings are on a four-point scale (0=adapting to 3=severely maladapting) [27]. Early economic disadvantage has been associated with later substance use [28,29] and is indicated by mothers' self-reports of their completed years of education.²

Adolescent Measures—We developed a latent construct of adolescent substance use with four indicator variables: lifetime frequency reports of beer, liquor, and marijuana use and a two-month frequency report of marijuana use (1=never to 6=40 or more times).

Young Adulthood Measures—To account for proximal factors that can influence current and future substance use, we included violent offending, social integration, and socioeconomic status (SES) [30–34]. Violent offending is an observed variable comprising an eight-point variety score of seven self-reported violent acts perpetrated any time between ages 17 and 32 (e.g., beating someone up, forcing someone to have sex) (range 0–7).

We included self-reports at age 32 of how often respondents attend church (0=never to 4=several times a week) and number of years married (0=never, 1=1 to 5 years, 2=6 to 10 years, and 3=11 or more years).

For socioeconomic resources at age 32, we included a latent construct with three indicator variables: poverty status, educational attainment, and doing well financially. Poverty status is a 4-category variable based on the Federal poverty level for 1992 (1=below the poverty level, 2=100 to 150%, 3=151 to 200%, and 4=more than 200% of the poverty line). Educational attainment is the actual number of years of schooling completed (range 4–20). Doing well financially is a count of yes responses to 8 interview questions (e.g., having a bank account, a home, car, credit card).

¹A variety score is the number of types of victimization a person reports experiencing. The assumption is that more types indicate a more serious history of violent victimization. Variety scores are considered valid and reliable estimates of self-reported criminal activity [24].

²Father or caretaker's education is used to fill in missingness on mother's education (less than 10% of the sample).

Alcohol use is an observed measure of how many drinks a person had each day when they were drinking the most in the past year (0=none to 4=more than 10 drinks per day). Marijuana and cocaine use are measured by separate latent constructs of past year use combining frequency (0=never to 8=daily) and recency (0=never to 3=in the past month) of use.

Stratification Measures—We stratify our analyses by gender (48.8% males, 51.2% females) and early structural poverty. To measure early poverty, we use first grade poverty status based on mothers' reports of household income and size. Poverty status is dichotomized (1= below or 0=at or above Federal guidelines for 1965) (52.9% were living in poverty in childhood).³

Analysis

With structural equation modeling (SEM) using Amos 19, we examine the relationship between victimization and substance use by direct maximum likelihood estimation of linear modeling [35]. This method identifies pathways over the life course, allows for the use of both latent and observed variables, and accounts for missing data, increasing the likelihood of obtaining unbiased estimates and standard errors. Separate models are run for adult alcohol, marijuana, and cocaine use to explore whether victimization relates to different types of substance use. Alcohol is a legal substance, widely available, and socially accepted. Marijuana has specific pharmacological characteristics, while cocaine is associated with aggression, increased sexual tendencies, and violent markets [36,37].

A general model is depicted in Figure 1 indicating key paths of interest. Paths 1 and 2 indicate general continuity in substance use between adolescent use of beer, hard liquor, and marijuana and the separate construct of adult alcohol, marijuana, or cocaine use, depending on the model.⁴ Path 3 indicates specific continuity of use of each substance through adulthood. Path 4 represents the effect of adolescent substance use on young adult violent victimization, and path 5 represents the contribution of young adult violent victimization to substance use in mid-adulthood. Unlabeled paths represent control variables. Each model allows for correlations within time periods between all observed variables and latent constructs to control for reciprocal effects.

For each substance of interest (alcohol, marijuana, cocaine), we estimate four separate models: for females, males, those raised in impoverished households ("poor"), and those not raised in impoverished households ("not poor"). We first tested the equality of measurement models by gender and poverty to assess their invariance (i.e., females vs. males; poor vs. not poor). Several latent constructs were not invariant across either set of subsamples based on the chi-square minimum discrepancy fit statistic ($p < .05$), thus equality constraints could not be imposed. This finding suggests that the meaning of these constructs differs among the subgroups making statistical comparisons between subgroups inappropriate. Therefore, separate structural models are estimated for males, females, poor and not poor.

We assume good model fit when the root mean-squared error of approximation (RMSEA) is .05 or less (acceptable at $< .08$), the ratio of the chi-square to the degrees of freedom

³Welfare receipt is used to fill in missingness on poverty status since eligibility for public assistance in Illinois in 1966–67 required the family to be living below the poverty line.

⁴Young- and mid-adult measures of substance use are substance-specific in the models (i.e., only young adult alcohol use was used in the mid-adult alcohol model, young adult marijuana in the mid-adult marijuana model, and young adult cocaine in the mid-adult cocaine model); however, the same adolescent measure of substance use, which includes both alcohol and marijuana but not cocaine, is used in all three models. We included the most prevalently used substances in adolescence — 80% had used beer or wine, 42% had used hard alcohol, and 61% had used marijuana, yet only 7% had used cocaine by age 16. Inclusion of cocaine in the latent construct considerably reduced its adequacy.

(cmin/df) is between 2 and 5, and the comparative fit index (CFI) and the non-normed fit index (NNFI) are greater than .90 [38].

RESULTS

Table 1 displays descriptive statistics for young adult violent victimizations among Woodlawn males and females and poor and not poor subsamples. Overall, males are more likely to be victims of violence than females (49.3% vs. 42.1%, $p=.026$), yet there is no significant difference in the mean number of types of victimizations by gender. Males and females are equally likely to have something stolen by threat, while males are more likely to be victimized physically ($p<.001$), and females are more likely to be victimized sexually ($p<.001$). In contrast, poor and not poor subsamples do not differ on violent victimization. Table 2 displays the relationship between being a victim of violence between ages 17 and 32 and the substance use and control measures for those interviewed in young adulthood ($N=952$). Significance tests compare mean values for victims and non-victims of violence within each subgroup. In general, being a victim was related to many factors, including substance use throughout the life course and violence perpetration in young adulthood.

Table 3 shows standardized regression estimates from SEM models for each group and substance. We report fit statistics for the models in Table 4, all of which indicate acceptable fit.

Females

Among females, there is consistency in the results for alcohol and marijuana (Table 3, Models 1 and 2). Both show general continuity between adolescent substance use and young and mid-adult alcohol and marijuana use (paths 1 and 2, betas ranging from .15 to .27), as well as substance-specific continuity across adulthood (path 3, betas = .35 and .49, for Models 1 and 2 respectively). Moreover, adolescent substance use significantly increases young adult violent victimization (path 4, betas = .19 and .19). However, there is no significant impact of young adult violent victimization on alcohol use or marijuana use at age 42 (path 5, betas = .08 and .09). Results for cocaine are similar to the other substances with the exception of paths 1 and 5 for females. There is no evidence of general continuity between adolescent substance use and cocaine use at age 32 (path 1, beta = .02)⁵ yet there is a significant relationship between young adult violent victimization and midlife cocaine use (path 5, beta = .12), controlling for young adult cocaine use, violent offending, social integration, and socioeconomic resources.

Males

For males, Models 4, 5, and 6 indicate general continuity in use for all three substances between adolescence and mid-adulthood (path 2, beta = .16, .13, .21) and substance-specific continuity between young and mid-adulthood (path 3, beta = .38, .49, .32). Unlike females, adolescent substance use does not significantly impact young adult violent victimization for men (path 4, betas ranging from .03 to .04), and as with females, young adult violent victimization predicts only mid-adult cocaine use (path 5, beta = .14).

⁵Exclusion of cocaine from the adolescent substance use construct may strengthen coefficients in the cocaine model due to the lack of controls for adolescent cocaine use. In an effort to safeguard against this, we re-ran the models including adolescent cocaine use in the latent construct. Quality of the measurement model for adolescent substance use was reduced and substantive findings were unchanged.

Poor

Models 7, 8, and 9 show the results for the subsample that was raised in Woodlawn, a disadvantaged neighborhood, *and* who grew up in an impoverished household. Results show general and substance-specific continuity over time for all substances (paths 1, 2, and 3, betas ranging from .17 to .59) with the exception of the lack of general continuity between adolescent substance use and young adult cocaine use (path 1, Model 9, beta = .04).⁵ There is also consistency in the lack of relationship between adolescent or mid-adult substance use and young adult violent victimization for any substance (paths 4 and 5, betas ranging from .00 to .10).

Not Poor

Models 10, 11, and 12 indicate findings of the subsample that was raised in Woodlawn yet did *not* grow up in an impoverished household. For this subgroup, there is substance-specific continuity of use between young- and mid-adulthood for all three substances (paths 2 and 3, betas ranging from .17 to .50), but general continuity is seen only between adolescent substance use and young adult marijuana use (path 1, beta = .18). Interestingly, there are consistent results for the relationship between adolescent substance use and young adult violent victimization, with adolescent substance use leading to greater violent victimization (path 4, betas = .16, .15, .15 for alcohol, marijuana, and cocaine, respectively), which in turn leads to greater mid-adult substance use (path 5, betas = .14, .14, .15, respectively) for the three substances.

DISCUSSION

African Americans are more likely than Whites to continue to use alcohol and drugs well into adulthood and to continue to experience adverse life events. One such adversity - violent victimization - could play an important role in perpetuating use of alcohol and illegal drugs through mid-adulthood as a coping strategy. This study shows high rates of victimization in young adulthood, as well as continuity between young adult and mid-adult alcohol, marijuana, and cocaine use for all subgroups of African Americans. Adolescent substance use also significantly predicts substance use into midlife for all subgroups, even after taking into account young adult use, demonstrating long-term continuity.

Important within-group variations emerge in the relationship between substance use and victimization over the life course. Namely, adolescent substance use is highly predictive of young adult violent victimization for females and the not poor but not for males or the poor. Thus, adolescent substance use seems to make the female and not poor subsamples of these African Americans particularly vulnerable to victimization. In turn, greater victimization in young adulthood predicts greater cocaine use in midlife for males and females and greater alcohol, marijuana, and cocaine use in midlife among those who were not raised in impoverished households.

Overall, substance use pathways among those raised in a disadvantaged neighborhood who also lived in impoverished households are unaffected by violent victimization experiences. This finding is in contrast to the accentuation principle, which states that negative events have their biggest impact on the most vulnerable [21]. It may be that those who grew up in a disadvantaged neighborhood *and* an impoverished household became inured to life's adversity and thus became less reactive to it. Woodlawn cohort members who were raised in poverty experienced other adversity at high rates; they were more likely to be raised by a single and/or depressed or anxious mother, to have done poorly in school and experienced higher residential instability [39].

This finding also suggests that reactions to victimization may vary by early contextual factors. Macmillan [6] proposes that understanding consequences of victimization begins by realizing the implications for an individual's sense of agency, self-efficacy, and perceptions of others, which influences how one shapes goals and invests in the future [40, 41]. Growing up poor in a disadvantaged neighborhood may lead to lowered expectations about one's life chances, and hence victimization may not be such an assault on their perceptions of agency and future hopes. In contrast, those with more social resources may experience more altered perceptions about their future vulnerability and agency and thus may be more negatively affected by the victimization.

An alternative explanation is that the impact of violent victimization among this cohort, or among the poor subsample specifically, may manifest itself in non-substance use behaviors or coping strategies. For instance, structurally disadvantaged urban African Americans may react outwardly with violence rather than inwardly with self-medication, while those from less disadvantaged backgrounds may be more likely to turn to substances to alleviate the stress and pain from the violence they have experienced. Although, prior research on victimization associates it with a variety of consequences (e.g., mental health, criminality, educational attainment), further examination of subgroup differences is an area for further study.

These findings should be considered in light of some limitations to the data. First, attrition has occurred with the Woodlawn study, as is expected with any longitudinal study spanning over 35 years. Several attrition analyses found no differences on key variables such as gender, SES, drug use, early childhood behavior, and adolescent problem behavior and self-reported delinquency. Those interviewed in adulthood were less likely to have been poor in first grade; however, this difference is minimized through structural equation modeling, which employs maximum likelihood estimates to retain the entire sample in the analysis.

Second, violent victimization could have occurred at any time between age 17 and 32, which is a long span of time. Further, we had information on only three types of violent victimizations with no information on the intensity, frequency, or duration of these experiences. Ideally, to more fully study the impact of victimization over the life course, one would need annualized victimization and substance use data, which could be modeled developmentally over time allowing for more precise conclusions about the potential causal nature of victimization on substance use. In this study, while we were able to examine associations over time and control for early influences, we cannot make causal inferences. Moreover, we did not have information on violent victimization in childhood and adolescence, which could be important factors in predicting later life traumas, as well as substance use.

Finally, this cohort comprises African American first graders from one urban community, which may limit generalizability of the findings. However, the data allowed us to examine the differential impact of violent victimization among those who had experienced significant adversity given their upbringing in a disadvantaged neighborhood. There is a paucity of research on the "non-disadvantaged" living in disadvantaged neighborhoods who may have unique life course pathways to substance use, and this study was able to address this gap.

With respect to prevention implications, two key directions emerge from this study. The first stems from the finding that adolescent substance use increases violent victimization among females and in those raised in poor neighborhoods but who were not necessarily raised in impoverished households. Preventing substance use in adolescence and preventing victimization among these groups of adolescent substance users may be effective strategies to break the cycle of substance use and victimization. Second, findings indicate that a focus

on both violence prevention and victim support could potentially reduce long-term patterns of substance use among African Americans, particularly among those raised in poor neighborhoods, where exposure to victimization is high, but not in impoverished households.

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FIGURE 1.

Conceptual Model of Violent Victimization and Substance Use in Adult African Americans
 Mid-Adult Substance Use

^aAll observed variables and latent constructs within a time period are correlated with all other observed variables and latent constructs in order to control for reciprocal effects within time period.

^bAdolescent Substance Use is a latent construct of beer, hard liquor, and marijuana use together in a single model.

^cYoung Adult and Mid-Adult Substance Use include alcohol, marijuana, or cocaine use and are analyzed separately by drug type.

Table 1

Characteristics of Violent Victimization among the Woodlawn Cohort: Females, Males, Those Raised in Impoverished Households ("Poor") and Those Not Raised in Impoverished Households ("Not Poor")

	Females (N=496)	Males (N=456)	Test Statistic	Poor (N=485)	Not Poor (N=465)	Test Statistic
Individual Items						
Have you ever:						
Been purposely injured?	22.6%	35.1%	$\chi^2=18.21^*$	29.5%	27.7%	$\chi^2=0.35$
Had something stolen by threat?	28.4%	29.6%	$\chi^2=0.16$	30.1%	28.0%	$\chi^2=0.53$
Been forced to have sex?	13.3%	3.5%	$\chi^2=28.97^*$	8.7%	8.6%	$\chi^2=0.00$
At what age was the last time you:						
Were purposely injured?	26.9	27.1	$t=0.68$	27.3	26.7	$t=-1.15$
Had something stolen by threat?	27.1	26.8	$t=0.46$	26.7	27.2	$t=0.81$
Were forced to have sex?	26.0	28.6	$t=-1.81$	27.1	25.8	$t=-1.14$
Summary Measures						
Victim of violence (0/1)	42.1%	49.3%	$\chi^2=4.97^*$	47.0%	44.3%	$\chi^2=0.70$
Mean Variety Score (0-3)	0.64	0.68	$t=-0.72$	0.68	0.64	$t=-0.73$

* $p<.05$

A Profile of Those Experiencing a Violent Victimization in Young Adulthood Compared with Those Who Did Not: Females, Males, Those Raised in Impoverished Households (“Poor”) and Those Not Raised in Impoverished Households (“Not Poor”)

Table 2

Variable (Range)	Females		Males		Poor		Not Poor	
	Violence Victim	No	Violence Victim	No	Violence Victim	No	Violence Victim	No
<i>Childhood (N=952; 496F, 456M; 483P, 465NP)</i>								
Mother's Education (0–22)	10.49	10.77	10.63	10.49	9.97	10.05	11.23	11.23
Aggression (0–4)	0.40	0.36	0.73	0.67	0.60	0.64	0.54*	0.36
Shyness (0–4)	0.36	0.44	0.51	0.64	0.46*	0.64	0.41	0.42
<i>Adolescence (N=599; 311F, 288M; 304P, 294NP)</i>								
Frequency of Marijuana Use (ever) (1–6)	2.88*	2.06	3.63*	3.10	3.25*	2.65	3.30*	2.38
Freq. of Marijuana Use (past 2 mo.) (1–6)	2.34*	1.75	3.19*	2.70	2.83*	2.31	2.74*	2.03
Frequency of Beer (ever) (1–6)	3.27*	2.58	3.69	3.45	3.50*	3.02	3.48*	2.91
Frequency of Liquor (ever) (1–6)	2.16*	1.57	2.20	2.15	2.07	1.86	2.31*	1.79
<i>Young Adult (N=952; 496F, 456M; 483P, 465 NP)</i>								
Number of Violent Offense Types (0–7)	0.67*	0.21	1.73*	0.55	1.22*	0.40	1.22*	0.32
Frequency of Church Attendance (0–4)	1.74	1.69	1.49	1.49	1.63	1.61	1.59	1.59
Years of Marriage (0–3)	0.84	0.78	0.69*	1.00	0.70	0.84	0.83	0.92
Doing Well Financially (0–8)	2.51	2.92	2.07*	3.14	1.92*	2.67	2.69*	3.37
Years of Education (4–20)	12.69	13.00	12.19*	12.49	12.12	12.33	12.79*	13.21
Poverty (1–4)	2.48	2.57	2.37*	2.72	2.16*	2.42	2.71	2.87
Maximum Alcoholic Drinks (0–4)	1.10*	0.71	1.69*	1.20	1.31*	0.94	1.51*	0.93
Frequency of Marijuana Use (0–8)	0.99*	0.55	1.76*	0.86	1.45*	0.67	1.31*	0.76
Recency of Marijuana Use (0–3)	0.54*	0.29	0.83*	0.42	0.73*	0.32	0.65*	0.37
Frequency of Cocaine Use (0–8)	0.59*	0.16	0.91*	0.31	0.71*	0.15	0.80*	0.30
Recency of Cocaine Use (0–3)	0.35*	0.07	0.46*	0.13	0.41*	0.05	0.40*	0.15

Variable (Range)	Females		Males		Poor		Not Poor	
	Violence Victim		Violence Victim		Violence Victim		Violence Victim	
	Yes	No	Yes	No	Yes	No	Yes	No
<i>Mid Adulthood (N=731; 406F, 325M; 373P, 351NP)</i>								
Frequency of Alcohol Use (0–5)	2.17*	1.66	3.04*	2.44	2.45	2.10	2.74*	1.85
Most Alcohol Consumed Per Day (0–48)	2.34*	1.25	3.57	2.77	2.95	2.28	2.88*	1.47
Frequency of Marijuana Use (0–8)	0.52*	0.19	0.62	0.41	0.65*	0.31	0.48	0.26
Recency of Marijuana Use (0–3)	1.02*	0.80	1.32*	1.06	1.10	0.99	1.23*	0.83
Frequency of Cocaine Use (0–8)	0.27	0.08	0.26	0.26	0.25	0.15	0.28	0.16
Recency of Cocaine Use (0–3)	0.61*	0.33	0.88*	0.50	0.75*	0.39	0.73*	0.41

* $p < .05$ based on t-tests between victims and non-victims within each subgroup.

Table 3

Standardized Estimates of Regression Weights from Structural Equation Models of Victimization and Substance Use: Females, Males, Those Raised in Impoverished Households ("Poor") and Those Not Raised in Impoverished Households ("Not Poor")

		Females (N=636)			Males (N=606)			Poor (N=656)			Not Poor (N=583)		
Model 1		1	2	3	4	5	6	7	8	9	10	11	12
Pathways: From → To		Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine
Mother's Educ.		.01	.01	.01	-.04	-.04	-.04	-.02	-.02	-.02	-.01	.01	.00
Aggression		.08	.06	.08	.22*	.21*	.22*	.22*	.18*	.21*	.17*	.17*	.17*
Shyness		-.06	-.05	-.07	-.21*	-.22*	-.21*	-.18*	-.18*	-.20*	-.04	-.06	-.05
PATHS 1, 2, and 3: Continuity of Substance Use													
1 Adolescent		.15*	.15*	.02	.07	.19*	.03	.17*	.20*	.04	.11	.18*	.05
2 Adolescent		.27*	.21*	.14*	.16*	.13*	.21*	.28*	.17*	.17*	.17*	.19*	.21*
3 Young Adult		.35*	.49*	.36*	.38*	.49*	.32*	.33*	.59*	.20*	.41*	.34*	.50*
PATHS 4 and 5: Substance Use → Victimization → Substance Use													
4 Adolescent Substance Use		.19*	.19*	.20*	.04	.04	.03	.04	.05	.05	.16*	.15*	.15*
5 Violent Victimization		.08	.09	.12*	.07	.02	.14*	.00	-.00	.10	.14*	.14*	.15*
Violent Offending		.21*	.04	.03	-.04	.05	.02	.11	.03	.07	.13*	.06	.03
Church Attendance		-.02	-.05	-.07	-.07	-.06	-.17	-.00	-.03	-.10	-.11*	-.09	-.15*
Years Married		.02	-.05	-.02	.12*	.01	-.04	-.04	-.03	-.04	.15*	-.00	-.01
Socioeconomic Resources		-.11	-.05	-.20*	-.30*	.03	.02	-.15*	.01	-.10	-.22*	-.01	-.08

* p<.05

Table 4

Structural Equation Model Fit Statistics

	Females (N=636)			Males (N=606)			Poor (N=656)			Not Poor (N=583)		
	Model 1											
	Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine	Alcohol	Marijuana	Cocaine
RMSEA ^a	.059	.059	.062	.061	.054	.052	.050	.051	.048	.068	.062	.063
CMIN/DF ^b	3.24	3.23	3.42	3.28	2.78	2.66	2.62	2.70	2.50	3.69	3.24	3.30
CFI ^c	.90	.92	.91	.89	.93	.93	.92	.94	.94	.88	.91	.92
NNFI ^d	.84	.87	.86	.83	.89	.90	.88	.90	.90	.81	.87	.87

^aRoot Mean Square Error of Approximation – good models have RMSEA .05 or less. Acceptable fit=RMSEA <.08.

^bChi Square Minimum/Degrees of Freedom – no consistent standards for acceptable model. (2–5 adequate)

^cComparative Fit Index – between .90 and .95 acceptable fit; > .95 good fit.

^dNon-Normed Fit Index (Tucker-Lewis) – adjusts for the number of parameters. Between .90 and .95 acceptable fit; > .95 good fit.
Compiled from <http://davidakenny.net/cm/fit.htm> & AMOS manual.