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Adverse Events and Substance Use among Female Adolescent Offenders: Effects of Coping and Family Support

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The relationship between stress and adolescent alcohol abuse has been well established. However, few studies have evaluated the factors influencing substance use among non-White and high-risk adolescent samples. Exposure to maltreatment and to a wide range of stressful life events during childhood and adolescence have been associated with early initiation of alcohol use (Hamburger, Leeb, & Swahn, 2008) and alcohol-related problems among youth (Aseltine & Gore, 2000; Johnson & Pandina, 1993; Laurent, Catanzaro, & Callan, 1997; Stewart, 1996). The impact of stressful life events on drug use has received less attention than the relationship between stressors and alcohol use; thus, more empirical analysis is needed to clarify the factors involved in stress and other substance use (Cerbone & Larison, 2000).

This study examines the interdependent impact of specific adverse events, coping strategies, and familial ties on alcohol and drug use by female adolescent offenders. Coping strategies have a major influence on whether adolescents exposed to stress exhibit emotional and behavioral problems (Clarke, 2006; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). It is important to include coping in explanatory models of substance abuse (Hasking & Oei, 2008) and to examine a range of coping strategies, as coping is considered a multidimensional construct (Carver, Scheier, & Weintraub, 1989; Compas et al., 2001). The family environment is another important determinant of alcohol and drug use among adolescents. Family support may serve as a protective factor (Wills, Vaccaro, & McNamara, 1992), while familial substance abuse increases the risk for adolescent alcohol and drug use (Barrera, Li, & Chassin, 1993; Dembo, Williams, Wothke, Schmeidler, & Brown, 1992).

Because both the exposure to chronic and multiple stressors and the use of alcohol and other drugs (AOD) are prevalent, female adolescent offenders provide an ideal population for testing factors that influence substance abuse. Additionally, it is well-documented that physical and sexual abuse, violence in the home, and exposure to multiple traumatic events are common among female juvenile offenders (Acoca & Dedel, 1998; Dembo, Williams, Wothke, Schmeidler, & Brown, 1992; Dixon, Howie, & Starling, 2005; Robertson, Morse, & Baird-Thomas, 2009). The majority of girls participating in this study are African American whose families are far more likely than any other ethnic groups to be low income and headed by females (United States Census Bureau, 2005). Consequently, they may experience higher levels of stress due to economic disadvantage and exposure to community violence compared

to other groups, especially Whites (Ennis, Hobfoll, & Schroder, 2000; Kessler & Cleary, 1980; Schulz et al., 2000).

Poly-substance use is also common among juvenile offenders. Compared to adolescents with no history of incarceration, juvenile detainees are up to three times more likely to report misuse of alcohol and other drugs (Substance Abuse and Mental Health Services Administration, 2003). In addition, the majority of adolescents in the juvenile justice system meet diagnostic criteria for substance use disorders (Neighbors, Kempton, & Forehand, 1992; Robertson, Dill, Husain, & Undesser, 2004; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Although the linkage between exposure to trauma and substance abuse among female juvenile offenders has been previously established, there are no published reports on factors that influence the correlation between stressors and substance use in this group. This study is designed to evaluate the role of family/kinship ties and the efficacy of coping behaviors in the relationship between stress and drug abuse among girls involved in the Mississippi juvenile justice system.

Coping with various adverse life events

Coping is defined as behavioral and cognitive efforts to manage stressors (Lazarus & Folkman, 1984) and may be categorized as active or problem-focused, avoidant, or accommodative coping strategies. Active coping includes support seeking, problem-solving, and other efforts aimed at solving or removing the cause of the stressor and controlling one's affective response to stress (Clarke, 2006). Avoidant coping strategies involve attempts to avoid or disengage from the stressor and related thoughts and emotions (Ebata & Moos, 1991; Herman-Stahl, 1995). A third category of coping strategies, referred to as accommodative coping, involves efforts to adapt to the situation primarily through cognitive methods of reframing, acceptance, or by distracting oneself with positive thoughts or constructive activities (Compas et al., 2001; L. S. Walker, Smith, Garber, & Van Slyke, 1997).

In general, individuals who use active or problem-focused coping strategies are less likely to develop substance use problems, while the use of avoidant coping is associated with increased substance abuse (Eftekhari, Turner, & Larimer, 2004; Wagner, Myers, & McNinch, 1999; Wills, Hirky, Zeidner, & Endler, 1996; Windle & Windle, 1996). Although avoidant coping has been consistently associated with greater adolescent substance misuse (Catanzaro & Laurent, 2004; Eftekhari et al., 2004; Wagner et al., 1999), results concerning the effect of active coping on reducing substance use are mixed. Some studies found no relationship between problem-focused coping efforts and alcohol and drug use (Laurent et al., 1997; Wills & Cleary, 1996) while others found that active coping strategies are associated with less adolescent substance use (Wagner et al., 1999; Windle & Windle, 1996). Support seeking in response to interpersonal stress is generally associated with fewer behavioral problems among children and adolescents (Clarke, 2006), but it has not been found to impact adolescent substance use (Laurent et al., 1997; Wagner et al., 1999). The effectiveness of active coping strategies is related to stressor controllability (Clarke, 2006) and to the possession of requisite cognitive and behavioral skills to solve problems, regulate emotions, and obtain help and support (Compas et al., 2001; Fields & Prinz, 1997).

Although the use and effectiveness of accommodative coping strategies have seldom been studied among adolescent populations, this approach should be beneficial, especially when stressors are uncontrollable. Accommodative coping promotes acceptance of unchangeable stressful situations, and therefore encourages a more positive outcome (J. S. Walker & Weaver, 2007). This coping style involves optimistic cognitive restructuring in addition to a more realistic appraisal of one's circumstances. Accommodative coping may also include the use of religion or spirituality (J. S. Walker & Weaver, 2007). Positive re-evaluation of adverse life events leads to a decrease in the need to regulate negative emotions, thus lessening the need to use substances to cope (Cooper, Russell, & George, 1988; J. S. Walker & Weaver, 2007).

Very little research has been conducted on the coping strategies used by offenders, and all of it has focused on males. Compared with a matched group of adolescent males, juvenile detainees relied more on avoidant coping (Ruchkin, Eisemann, & Hagglof, 1999). However, there were no differences between these young men in the use of assistance seeking and problem-solving forms of coping. Research on coping with the stresses of incarceration consistently shows that male prisoners use emotional venting and avoidant coping styles more than problem-solving coping (Gullone, Jones, & Cummins, 2000; Ireland, Boustead, & Ireland, 2005; Mohino, Kirchner, & Forns, 2004; E. Zamble & Porporino, 1990), but it is not known if avoidant coping is the primary response to all types of stressors. This line of research suggests that male offenders use less adaptive forms of coping than non-offenders, but research is clearly needed on how female juvenile offenders cope with stress.

Kinship ties and substance use

Family support, stability, and cohesion appear to be critical for buffering the effect of stress on adolescent substance use. A poor family environment, characterized by lack of perceived support and a high degree of family problems, was related to a higher level of alcohol and marijuana use among teenagers (Rhodes & Jason, 1990). In contrast, a close, supportive family was associated with less substance use among adolescents (Averna & Hesselbrock, 2001; Brook, Brook, Gordon, & Whiteman, 1990; Wills & Cleary, 1996; Wills et al., 1992). Kinship ties that provide instrumental and emotional support were especially helpful for African American adolescents (Taylor, Casten, & Flickinger, 1993). Emotionally-supportive family attachments, along with close monitoring and communicating about alcohol and other drugs, were associated with less use of tobacco, alcohol and other substances among African American youth (Cleveland, Gibbons, Gerrard, Pomery, & Brody, 2005). In short, a positive, supportive family environment is a protective factor against adolescent substance use.

Proposed Model and Hypotheses

The present study examines a stress-coping model of adolescent substance use and seeks to address some limitations of previous research. First, most studies of child and adolescent coping have primarily used Caucasian samples (Clarke, 2006). While recent studies of the relationship between stress and substance use have focused on low income and minority youth (Fishbein et al., 2006), more research on vulnerable youth is needed. Our study focuses on female juvenile offenders, a group that is disproportionately minority, exposed to chronic and multiple stressors, and at high risk for substance abuse and disorders. Second, multiple-item life events are a standard measure in the stress literature (Turner, Wheaton, & Lloyd, 1995), and studies using these scales have consistently demonstrated a positive relationship between cumulative stress exposure and adolescent alcohol and drug use (Agnew & White, 1992; Aseltine & Gore, 2000; Bruns & Geist, 1984; Fishbein et al., 2006; Hoffmann, Cerbone, & Su, 2000). This approach to measuring adolescent life events mixes relatively common occurrences, such as changes in school or residence and parental divorce, with more traumatic events, such as victimization. We explore the effects of three types of stress events, i.e., family-related, traumatic, and childbearing-related events. Since various coping responses may differ by stressor type, the effectiveness of coping strategies may be obscured by the use of measures of cumulative stress (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Fields & Prinz, 1997). The present study parses out different types of adverse life events and examines their impact on alcohol, marijuana and other drug (AOD) use. The use of broad categories of coping has been criticized within the literature because they do not allow for the range of coping strategies people may employ, thus limiting the ecological validity of the results (Carver et al., 1989; Fields & Prinz, 1997). In response, we use seven coping strategies as potential mediators of the relationship between stressors and AOD use among female juvenile offenders. We hypothesize that (a) use of avoidant coping strategies will be associated with greater AOD use, and (b) use of active and accommodative coping strategies will be associated with less AOD

use. Finally, we evaluate the influence of extended family cohesion and support on AOD use. More specifically, we hypothesize that (c) greater family support will be associated with less AOD use.

Method

Participants and procedures

Participants for this study include girls who were incarcerated or had a recent history of incarceration in five Mississippi juvenile facilities. Recruitment began in November, 2005, and ended in December, 2006. Ethical issues in conducting research with vulnerable populations were carefully considered (Pimple, 2006). Three African American women experienced in working with at risk youth thoroughly explained the study and reviewed the youth assent document. Potential participants were told that their participation is voluntary and will have no effect on their length of incarceration or the disposition of their case; they have the right to refuse to answer any question and to quit at any time without incurring a penalty of any kind; and the information provided will be kept strictly confidential even from their parents and the Youth Court Judge. Although our study did not directly benefit them, the girls were told that the information collected would be used to inform interventions and treatment programs for incarcerated girls.

Of the 351 girls approached, 305 assented to be in the study, a recruitment rate of 86.9%. Participants ranged in age from 11 to 19 years ($M = 15.6$, $SD = 1.5$) and were African American (68.9%) and Caucasian (31.1%). There were no significant racial differences between those who refused (55% African American) and those who participated (69% African American; see Table 1), $\chi^2(2, N = 349) = 3.10$, $p = .21$. Those who refused tended to be slightly younger ($M = 15.20$) than those who participated ($M = 15.6$), although this difference was not statistically significant, $F(1, 349) = 3.31$, $p = .07$.

Assessments were conducted at the juvenile detention facilities or the homes of those who had been released from custody. Assessments were conducted in a private area where their responses could not be observed by others. Participants were interviewed regarding their exposure to adverse events and completed a self-administered questionnaire containing items related to kinship ties, coping, and AOD use. The study was approved by an Institutional Review Board, and informed assent was obtained from all study participants. Parental consent was also obtained unless the participant was a ward of the state, in which case permission was obtained from the state juvenile justice agency. Participants were compensated with a \$20 gift card for their time.

Measures

All measures were derived from existing assessment instruments. However, to determine if the composite measures of adverse life events, kinship support and coping strategies adequately reflect the intended concepts or latent constructs with our sample we used Confirmatory Factor Analysis (CFA) which estimates and evaluates the goodness-of-fit between the latent constructs and the empirical data. Fit was assessed with the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI). Values of .90 or greater on measures of goodness-of-fit are desirable (Kline, 2005). To properly factor-analyze the dichotomous adverse event items, we used both Amos and EQS structural equation software programs that have estimation procedures appropriate for categorical variables. In particular, we used the distribution free estimation method in Amos and the categorical specification and robust estimation method in EQS to confirm the consistency of the findings. All the factor loadings, goodness of fit statistics and significant levels are similar and highly consistent

irrespective of the level of measurement and estimation method. All missing values were imputed via a multiple imputation procedure in Amos 7 (Arbuckle, 2006).

Adverse Life Events

Twenty-two items from the Life Stressor Checklist-Revised (Wolfe & Kimerling, 1997) were used. This measure of adverse events was selected because scale evaluates women who have been affected by traumatic events and how those events specifically impact their lives. CFA revealed a multidimensional construct consisting of three distinct factors: family-related stressors (e.g. parental incarceration, physical neglect,), traumatic events (e.g. a victim of a natural disaster, robbery, mugging, or physical attack), and reproductive- or childbearing-related events (e.g. pregnancy, has child with severe health problem). Two CFA models were thus estimated: one 2-factor model for the family-related stressors and traumatic events and one single-factor model for the childbearing-related events. Goodness-of-fit statistics (CFI = .859 and .977, GFI = .932 and .987, and AGFI = .910 and .934 for family-related stressors, traumatic events, and for childbearing-related events, respectively) indicate that both models fit the data well. All factor loadings are highly statistically significant, $p < .001$.

Based on the CFA models, three composite index variables were created. Respondents were asked 9 questions to gauge family-related adverse life events, 7 questions on exposure to traumatic events, and 4 questions on childbearing-related adverse life events (yes = 1, no = 0). Each index was averaged, with higher scores indicating a higher number of adverse life events experienced. Reliability coefficients of .63 for family-related events, .58 for traumatic events, and .64 for childbearing-related events are acceptable considering that each scale is a count of unrelated life events (DeVellis, 1991). The events comprising the three adverse event indexes, the percent of participants who experienced each event and descriptive statistics are reported in Table 1.

Family Cohesion and Support

Nine items from the Kinship Social Support measure (Taylor et al., 1993) were used to form an index with excellent fit (CFI = .980, GFI = .965, and AGFI = .934) and reliability ($\alpha = .90$). Representative items included: "In my family, relatives often help each other," and "One of the good things in life is for me to talk and have fun with my relatives." Participants responded to each item using a four-point Likert-type scale ranging from 1 = *strongly disagree* to 4 = *strongly agree*. Scores were averaged, with higher scores referencing closer kinship ties and greater instrumental support.

Coping Strategies

The Brief COPE Inventory (Carver, 1997) was used to gauge respondents' coping strategies. The total inventory consists of 28 items. Responses to each item ranged from 1 = *I haven't been doing this at all* to 4 = *I have been doing this a lot*. These measures were first partitioned into three categories representing active, avoidant, and accommodative coping dimensions based upon face validity and then analyzed via three separate CFA models. In the avoidant coping model, three factors were identified: self-blame (2 items; $\alpha = .57$), using humor (2 items; $\alpha = .73$), and disengagement (4 items; $\alpha = .74$). Disengagement coping includes the use of denial and simply giving up trying to deal with the situation. The CFA model fit the data well (CFI = .941, GFI = .961, and AGFI = .918). In the accommodative coping model, two factors were identified: using religion (2 items; $\alpha = .63$) and adaptation (6 items; $\alpha = .77$). Adaptation coping reflects the use of self-distraction ("I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping"), positive reframing ("I've been looking for something good in what is happening."), and acceptance ("I've been learning to live with it."). The CFA model fit the data well (CFI = .958, GFI = .966, and AGFI = .935). In the active coping model, two factors were identified: taking action

(4 items; $\alpha = .80$), and seeking help (4 items; $\alpha = .75$). The CFA model fit the data well (CFI = .968, GFI = .961, and AGFI = .962). For each scale, items were averaged to create indices with scores ranging from 1 to 4, with higher scores indicating greater use of the coping strategy.

Substance Use

There are three dependent variables that gauge the frequency of use of alcohol, marijuana and other drugs in the previous six months. Response categories for each drug were coded as 0 = *never*, 1 = *couple of times a month*, 2 = *once a week*, 3 = *couple of times a week*, and 4 = *daily use*. Alcohol and marijuana use are single-item, global measures while the third dependent variable is a composite measure of cocaine/crack, inhalants, hallucinogens, amphetamines, prescription pain medication, CNS depressants, PCP, tranquilizers, opiates, and any other drug including the “use of cough syrup when you are not sick.” An index of other drug use was first created by averaging all ten items. The scores on the index are highly skewed (mean = 0.11, SD=.032, skewness=5.35) and were therefore transformed using the natural log to remedy skewness (mean=-5.40, SD=2.41, skewness=1.20). Higher values on the index indicate more frequent use of other drugs. The CFA model for other drug use fit data well (CFI = .934, GFI = .918, and AGFI = .826), and the reliability coefficient for the additive other drug use composite variable is .86.

Analytical Strategies

Six nested Ordinary Least Squares (OLS) regression models for each of the three dependent variables were estimated. In all models, respondents’ racial/ethnic identity and age were controlled. The race variable was dummy-coded with 1 = African American and 0 = other racial groups. Age is a continuous variable measured as actual age at the time of interview. Model 1 estimates the affect of adverse life events on AOD use, net of the respondent’s age and race. Model 2 further examines the mediating and independent effects of kinship ties on alcohol and drug use, after controlling for adverse life events, age, and race. In addition, Models 3 through 5 explore the effect of coping strategies above and beyond the effects of adverse life events and statistical controls. Model 6 incorporates all the variables from previous models. Residual and multicollinearity analyses were performed and no problems surfaced.

Results

The teen years represent a transition from childhood to responsible adulthood, a span of significant personal growth, and maturity, and are typically challenging for the youth and her family. However, the transitions faced by the girls in this study are compounded by the adversity of chronic and multiple stressors, the use of alcohol and other drugs, as well as other traumatic events that may include abuse and violence. These challenges represent significant obstacles to reaching a healthy adulthood and are complicated by the limitations of lower income levels and fractured family structures.

Substance Use

Over half of the study participants reported alcohol (52.1%) and marijuana (53.8%) use in the previous six months. Almost 12% of study participants reported using amphetamines. Use of cocaine (10.1%), central nervous system depressants (e.g., sleeping pills, 9.7%), and prescription pain medication (9.0%) was also reported. Use of other drugs, such as inhalants, was much less common. Regular use, defined as several times per week to daily use, of marijuana was reported by 23.2% of participants, 3% or less reported regular use of other drugs and 8.8% reported drinking alcohol beverages on a regular basis. These findings suggest that alcohol and marijuana use is not only prevalent among incarcerated juvenile females but also is a part of their social landscapes. Normalization of alcohol and drug use within the social

contexts of juvenile offenders may make behavioral intervention success over the long-term more challenging and more prone to failure.

Adverse Life Events

Incarcerated adolescent females face a number of adverse life events that make their transition from childhood to adulthood rocky. These events occur across multiple domains and include changes to family structure, experiences of trauma or traumatic events, and childbearing. Study participants experienced on average three adverse family-related events. The majority experienced family dissolution due to divorce (53.8%) and incarceration of another family member (59.7%) including parents. In addition, violence in the home was common (42.6%) and a substantial number of the girls were placed in foster care (14.1%). Other family stressors experienced by approximately one fifth of the participants includes serious financial problems, physical or mental illness, emotional abuse, and caring for a seriously ill or handicapped family member. Traumatic events, including victimization, were also prevalent. On average, participants experienced almost two traumatic events. Although adverse childbearing events were infrequently reported, it is important to recognize that one in four girls in our study report having been pregnant, while 11% report having a child. This suggests that teen pregnancies are ending in miscarriage, abortion, or the teen mother places the child for adoption, which could be an additional stressor not accounted for in our models.

For the adolescent girls in our study, exposure and experience with one or multiple aversive events has consequences. Consistent with prior literature on the relationship between stress and adolescent AOD use, Model 1 indicates that, with minor exceptions, there is a positive and patterned relationship between various adverse life events and alcohol and drug use (Tables 2–4). Family-related and traumatic events persistently and significantly increase the frequency of marijuana use (Table 2), and traumatic life events are positively and significantly associated with the frequency of other drug use (Table 4). These net regression effects remain statistically significant and robust throughout Models 2 and 6. Childbearing-related adverse life events, however, are not associated with marijuana or other drug use. But they are positively, either marginally ($p < .10$) or significantly ($p < .05$), related to alcohol use (Table 3). Although not significantly associated with alcohol use, family-related and traumatic life events are associated with alcohol use in the expected direction. Given these results, the more adverse life events that the respondent experienced, the more frequently the respondent used marijuana and other drugs.

Kinship ties

Kinship ties provide a support network and a safe environment in which adolescents can test boundaries, explore, make mistakes, and experience the process of learning to make better choices. Adolescent incarcerated females in our study do not differ in this respect. Kinship ties are negatively and significantly associated with the frequency of marijuana use (Table 2) and alcohol use (Table 3). In other words, stronger kinship ties are associated with less use of these substances. These regression effects remain statistically significant in Model 5. However, support from extended family is not associated with the use of other drugs. Although kinship ties reduce the effect of family-related events on marijuana use, the addition of the kinship tie variable to Model 2 does not seem to significantly mediate the relationship between the other types of adverse life events and drug or alcohol use. Taken together, our hypothesis that greater kinship ties will be associated with less alcohol and drug use is partially supported.

Coping Strategies

Coping strategies are tools employed by individuals to mitigate the effects of adverse events or stressors. Our study participants report minimal use of the coping strategies (e.g., average scores range from 1.45 to 2.24 out of a maximum possible score of four). The regression results

with reference to coping strategies vary. In contrast to our first hypothesis that avoidant coping would be associated with increased AOD use, we find that the effect of avoidant coping variables on the dependent variables are systematically insignificant across all regression models, with the exception of the effect of humor on alcohol use (Models 3 and 6 in Tables 2–4). With respect to our second hypothesis, the regression coefficients from Model 4 show that religious coping as a dimension of accommodative coping is negatively and significantly associated with the frequency of marijuana ($p < .10$), alcohol ($p < .001$), and other drug use ($p < .05$). All else being equal, the more the respondent employed religious coping, the less frequently they used alcohol and/or other drugs. These results remain significant after controlling for all variables in Model 6, lending strong credence to the hypothesis that religious coping is an effective form of accommodative coping for study participants. On the other hand, the use of adaptation, as a form of accommodative coping, is positively associated with marijuana use (Table 2) and alcohol use (Table 3). This unexpected finding contradicts the hypothesis that other forms of accommodative coping will be associated with less substance use. Additionally, no support was found for the hypothesis that active forms of coping lessen alcohol and other drug use. Finally, we observe little change in the regression coefficients of stressful life events with the addition of coping strategies in Models 3–6. These findings suggest that the use of coping strategies do not mediate the effect of stress on substance use among our sample. These findings may simply be a reflection of the limitations imposed by the lack of experienced success sample respondents have in coping with difficult life experiences.

Discussion

Using a stress-coping model of substance use, ours is the first systematic examination of coping strategies and kinship support among female juvenile offenders. In an attempt to gain further insight into the relationship between stressful life events and subsequent AOD use, stressors were placed into three categories. Consistent with previous research, we find that greater exposure to adverse life events is associated with greater substance use. Family-related adversity and traumatic events were significantly associated with greater marijuana use. One explanation for increased marijuana use may be linked to its calming effect (Levin & Donovan, 1998; Weiss, Griffin, & Mirin, 1992). Ongoing stressors related to home life may prompt youth to persistently avoid the emotional discomfort, but short of running away from home, adolescents are unable to physically escape family-related adversity and household dysfunction. Therefore, they may turn to marijuana as a means of escape (Felitti et al., 1998; Finkelhor & Kendall-Tackett, 1997). In addition to increased marijuana use, traumatic events were also significantly associated with the use of other drugs. It could be argued that traumatizing life events such as sexual assault or violent crime victimization may be more stressful than family-related life events, such as parental separation and divorce, and may encourage the misuse of prescription drugs and other “hard” drugs. The prevalence of non-medical prescription drug use has increased dramatically in recent years and is more prevalent than the use of illicit drugs, except marijuana (Substance Abuse and Mental Health Services Administration, 2006). Furthermore, adolescent females were more likely than males to misuse prescription drugs (Ford, 2009).

A peculiar finding was that neither family-related adversity nor traumatic events were associated with increased alcohol use among our sample. Alcohol is widely available and has been reported as the substance most commonly used by teenagers (Eaton et al., 2006). Among Mississippi high school students, 40% of females have had at least one drink of alcohol, and 22% reported binge drinking (five or more alcoholic beverages in one sitting) in the month preceding the survey (National Center for Chronic Disease Prevention and Health Promotion, 2003). This high prevalence of adolescent alcohol use suggests that youth may use alcohol regardless of their experiences with adverse life events. Interestingly, we have found that females who reported experiencing childbearing-related adversity drank alcohol more

frequently. Alcohol use at first sexual encounter and early use of alcohol in general, has been associated with continued use before and during the first trimester of pregnancy (De Genna, Larkby, & Cornelius, 2007). Although we did not collect information about the onset of substance use, it is possible that regular alcohol use was already present prior to pregnancy and childbearing. Pregnant and parenting teen girls in Mississippi can be emancipated, and therefore it is possible that when confronted with childbearing-related adversity, these young women turned to a more socially acceptable and readily available drug – alcohol – to help them cope.

Close ties and support from extended family members appears to be an important protective factor for female juvenile offenders. Misuse of alcohol and other drugs may be acquired through social learning (Roski et al., 1997) and substance use as a means of coping with stress can result if modeled by parents and siblings (Ary, Tildesley, Hops, & Andrews, 1993; Barrera et al., 1993; Hansen, 1997). We found less frequent use of marijuana and alcohol among the girls who have stronger kinship ties, which is particularly salient given the high rates of dysfunction (e.g. family criminality, substance abuse, and domestic violence) among the families of girls involved in the juvenile justice system (Acoca, 1999; Dembo et al., 1992; Lederman, Dakof, Larrea, & Li, 2004).

Our findings on coping were mixed and counter to expectations. Based on previous findings (Eftekhari et al., 2004; Wagner et al., 1999; Wills et al., 1996), we hypothesized that use of avoidant coping would be associated with increased substance use. Of the three types of avoidant coping that we examined only the use of humor or making light of the situation was associated with greater alcohol use. Self-blame and disengagement coping were not related to AOD use among our participants. Humor can be self-enhancing or self-defeating in nature. Self-defeating humor has been associated with use of avoidance coping and depressive symptoms among adolescents (Erickson, 2007). Our two-item measure of using humor as a coping mechanism does not differentiate the forms of humor employed by our study participants. Given the limitations of our measure of humor and the modest correlation between humor and alcohol use, further examination of humor as a coping strategy is warranted.

Contrary to previous research demonstrating better outcomes when active coping strategies were employed (Wills et al., 1996), we found that active coping was unrelated to AOD use among female adolescent offenders. Taking action, particularly when the action is impulsive or irrational, can often make the situation worse (Altshuler & Ruble, 1989). Our measure of active coping involved the use of problem-solving skills. The ineffectiveness of active coping in this study may be linked to these girls' inability to solve problems in a positive and adaptive manner. Prior research suggests that coping strategies are largely influenced by age, and begin to show a transition to more cognitive strategies in problem-solving as one matures (Blanchard-Fields & Irion, 1988). Adolescents often employ strategies aimed solely at reducing emotional discomfort temporarily and may not possess the cognitive maturation for problem-focused strategies as a realistic long-term solution (Wesner, 1996). Although we did not specifically assess the problem-solving abilities of these girls, we suspect that it may be limited based on the research demonstrating deficiencies in problem-solving skills among offenders (Wesner, 1996; Whitton, 2002; EdwardZamble & Quinsey, 1997).

Another possible explanation for the findings related to active coping may be attributed to the girls' environment. Active coping may only be effective if one can exercise some measure of control over the stressor (Clarke, 2006; Gamble, 1994; Newcomb & Harlow, 1986). If the problems in one's environment are not conducive to change, any attempt to employ active coping is likely to result in further frustration (Seiffge-Krenke, 2000).

Our measure of active coping also included seeking emotional and instrumental support. Similar to studies using school samples (Laurent et al., 1997; Wagner et al., 1999), coping by seeking support was not associated with alcohol or drug use among our study participants. The effectiveness of seeking support may be dependent upon the source of support. Parental support was not protective for delinquency among youth involved in romantic relationships (Meeus, Branje, & Overbeek, 2004). Research has demonstrated that female adolescent offenders are encouraged to engage in delinquent behaviors by their current romantic partner (Cauffman, Feldman, Waterman, & Steiner, 1998).

Religious coping, a form of accommodative coping, was associated with less substance use. However, the question remains, whether the act of turning to religion in times of stress reduced the likelihood of drug and alcohol use, or whether girls reporting the use of religious coping were predisposed against the use of alcohol and other drugs because of their religious beliefs. On the other hand, adaptation, another form of accommodative coping was associated with increased use of marijuana and alcohol. Our measure of adaptation included coping by engaging in other activities to divert one's attention (e.g. watching TV), cognitively reframing the situation in a more positive light, and/or accepting the problematic situation the way it is. The results suggest that our participants were not very proficient at these coping strategies. Their inability to distract themselves in healthy ways or accept adverse situations suggests that the participants could benefit from stress management training. Alternatively, we may have misclassified adaptation as accommodative coping. In a study of young men coping with incarceration, acceptance was considered a form of avoidant coping and was the most commonly used avoidance strategy investigated (Mohino et al., 2004).

Our results should be interpreted with caution due to limitations. First, the cross-sectional nature of the data prevents causal interpretations about the relationship between stressful life events, kinship ties, coping, and substance use. Second, all measures are based on self-report. The validity of self-reported drug use, particularly among criminal justice population, has been questioned (Harrison, 1995; Knight, Hiller, Simpson, & Broome, 1998). In addition, reports of abuse and neglect are subject to under-reporting because of embarrassment, shame, denial, or lack of insight (Widom, Ireland, & Glynn, 1995). However, since confidentiality was emphasized during study recruitment and other methods were used to increase honest self-reporting (Harrison, 1995), these procedures may have encouraged candid reporting alcohol and other drugs use and maltreatment. Our participants' reports of sexual abuse and witnessing violence in the home were very similar to rates in previous studies of female juvenile offenders (Acoca & Dedel, 1998; Dixon, Howie, & Starling, 2005). While it is possible that some adverse events and experiences were forgotten or underreported, we still observed a strong and significant effect of adverse life events on substance use. Lastly, our study focused on female juvenile offenders, and thus our findings may not generalize to male delinquents or to youth with no involvement in the juvenile justice system.

In conclusion, these results of the first exploratory study of a stress-coping model of substance use among female adolescent offenders have implications for future research and practice. Given the growing body of literature showing high prevalence of exposure to severe and chronic stressors among this population, more research is needed on coping with such stressors. In particular, a more thorough examination of the types of coping strategies employed by these girls and the factors that limit their ability to adaptively cope is warranted. There is also substantial evidence that girls involved in the juvenile justice system have high rates of substance misuse and dependence. Therefore, stress management and problem-solving skills training are necessary components of interventions for female juvenile offenders.

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Table 1

Description of Measures and Summary Statistics (N = 305)

Variables	%	Range ¹	Mean	SD
Aversive events				
Family-related events		0–9	2.92	1.95
Foster care	14.1			
Parent divorce/separation	53.8			
Serious financial problems	22.3			
Serious physical/mental illness	23.0			
Emotional abuse	24.3			
Physical neglect	8.2			
Caretaker of handicapped family member	20.3			
Domestic violence	42.6			
Incarceration of family member	59.7			
Traumatic events		0–7	1.81	1.57
Natural disaster	14.4			
Witnessed serious accident	42.1			
Unexpected/sudden death	42.6			
Witnessed violent crime	16.7			
Victim of violent crime	13.8			
Sexual harassment	24.3			
Sexual abuse	16.1			
Childbearing and rearing experiences		0–3	0.45	0.82
Ever pregnant	26.2			
Have child	11.1			
Forced/unwanted separation	3.6			
Child has serious health problem	0.7			
Social support				
Kinship ties (9 items)		1–4	2.95	0.65
Avoidant coping		1–4		
Self-blame (2 items)			1.59	0.69
Disengagement (4 items)			1.55	0.63
Using humor (2 items)			1.45	0.72
Accommodative coping		1–4		
Using religion (2 items)			2.17	0.89
Adaptation (6 items)			2.20	0.68
Active coping		1–4		
Seeking support (4 items)			2.14	0.75
Taking action (4 items)			2.24	0.83
Substance Use ²	% Any Use ³	% Regular Use ⁴		
Marijuana use (1 item)	53.8	23.2	1.18	1.39
Alcohol use (1 item)	52.1	8.8	0.75	0.95

Variables	%	Range ¹	Mean	SD
Other drug use ⁵	% Any Use	0–4	0.11	0.32
Cocaine	10.1			
Inhalants	4.3			
Hallucinogens	2.9			
Amphetamines	11.8			
Prescription pain medication	9.0			
CNS Depressants	9.7			
PCP	2.2			
Tranquilizers	6.5			
Opiates	2.2			
Other drugs	9.0			

Notes:

¹ The range of adverse events reflects the total count of events experienced. The range for social support and coping measures reflects the scoring of items;

² Scoring of substance use measures range from 0 (never/no use) to 4 (daily use);

³ The percent reporting any drug use in the 6 months prior to interview;

⁴ Percent reporting regular use is defined as several times per week to daily use;

⁵ An index of the use of ten other drugs was created by averaging the use frequency scores of each drug.

Table 2

Unstandardized OLS Regression Coefficients of Marijuana Use (N=305)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0.17**	0.15**	0.16**	0.17**	0.17**	0.15**
African American ^I	-0.34*	-0.29 ^H	-0.31 ^H	-0.28 ^H	-0.33*	-0.22
Aversive events						
Family-related events	0.87*	0.71 ^H	0.86*	0.98*	0.87*	0.84 ^H
Traumatic events	1.08**	1.02**	1.01*	0.94*	1.03*	0.84*
Childbearing-related events	0.50	0.49	0.59	0.47	0.48	0.53
Social support						
Kinship ties		-0.30*				-0.27*
Avoidant coping						
Self-blame			0.19			0.14
Disengagement			-0.15			-0.21
Using Humor			0.18			0.17
Accommodative coping						
Using religion				-0.19 ^H		-0.20 ^H
Adaptation				0.28*		0.20
Active coping						
Seeking support					0.05	0.02
Taking action					0.03	0.07
Intercept	-1.80*	-0.70	-2.04*	-2.08*	-2.01*	-1.08
R ²	0.127	0.145	0.142	0.141	0.129	0.170
F	8.678***	8.420***	6.109***	6.943***	6.260***	4.570***

^I Other race is the reference.^H p<.10,

* p<.05,

** p<.01,

p<.001. Two-tailed test.

Table 3

Unstandardized OLS Regression Coefficients of Alcohol Use (N=305)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0.02	0.01	0.02	0.02	0.03	0.01
African American ^I	-0.39**	-0.35**	-0.39***	-0.33**	-0.38***	-0.32**
Aversive events						
Family-related events	0.00	-0.13	-0.09	0.11	0.00	-0.14
Traumatic events	0.41	0.36	0.33	0.30	0.37	0.26
Childbearing-related events	0.51 ^H	0.51 ^H	0.61*	0.49 ^H	0.50 ^H	0.57*
Social support						
Kinship ties		-0.25**				-0.19*
Avoidant coping						
Self-blame			0.12			0.12
Disengagement			0.01			-0.01
Using Humor			0.19*			0.22**
Accommodative coping						
Using religion				-0.20**		-0.23**
Adaptation				0.24*		0.06
Active coping						
Seeking support					0.02	0.00
Taking action					0.04	0.08
Intercept	0.48*	1.41*	0.05	0.35	0.34	0.92
R ²	0.055	0.082	0.088	0.081	0.057	0.136
F	3.462**	4.438***	3.568***	3.746***	2.547*	3.533***

^I Other race is the reference.^H p<.10,

* p<.05,

** p<.01,

*** p<.001. Two-tailed test.

Table 4

Unstandardized OLS Regression Coefficients of Other Drug Use (N=305)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0.07	0.07	0.07	0.06	0.07	0.07
African American [/]	-1.79***	-1.79***	-1.78***	-1.74***	-1.82***	-1.81***
Aversive events						
Family-related events	0.10	0.09	0.04	0.18	0.12	-0.04
Traumatic events	2.54***	2.53***	2.44***	2.59***	2.67***	2.65***
Childbearing-related events	0.15	0.15	0.24	0.11	0.09	0.18
Social support						
Kinship ties		-0.03				0.11
Avoidant coping						
Self-blame			0.18			0.30
Disengagement			-0.03			0.07
Using Humor			0.15			0.30
Accommodative coping						
Using religion				-0.37*		-0.42*
Adaptation				0.10		-0.23
Active coping						
Seeking support					0.33	0.35
Taking action					-0.38 ^H	-0.18
Intercept	-5.98***	-5.87***	-6.41***	-5.37***	-5.83***	-6.22***
R ²	0.175	0.175	0.180	0.190	0.183	0.210
F	12.679***	10.535***	8.112***	9.931***	9.482***	5.956***

[/] Other race is the reference.^H p<.10,

* p<.05,

** p<.01,

*** p<.001. Two-tailed test.