

EVIDENCE OF HARM PERCEPTION, PEER USE, AND TOLERANCE FOR PEER  
USE AS MEDIATORS BETWEEN COPING STYLE AND SUBSTANCE USE  
AMONG URBAN ADOLESCENTS

by

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## ABSTRACT OF THE THESIS

Evidence of Harm Perception, Peer Use, and Tolerance for Peer Use as Mediators  
Between Coping Style and Substance Use Among Urban Adolescents

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Research has provided strong evidence to support the existence of a relationship between adolescent coping styles and substance use. One area of research that has been overlooked however, is testing whether precursors of substance use serve as mediators between coping styles and substance use. The purpose of this study was to test whether the relationship between coping styles and adolescent substance use may be mediated by known proximal precursors of substance use. One hundred twenty-eight ninth graders attending an urban school participated in our study. Most of the participants were of ethnic minority descent (41% African American, 46.1% Latino/Hispanic). Scales used to measure coping styles, precursors of substance use, and substance use were derived via principal component analyses and included the following: coping via problem solving, coping via reliance on caretaker, coping via substance use, perception of harm from substance use, positive alcohol/marijuana expectancies, negative alcohol/marijuana expectancies, friends' use and tolerance for it, and substance use/intentions to use. Multiple regression analyses indicated that harm perception partially mediates the

relationship between coping via reliance on caretaker and substance use/intentions to use. Higher reliance on caretaker to cope was associated with lower perception of harm from substances, which in turn, was associated with greater use and intentions to use. Multiple regression analyses also indicated that friends' use and tolerance for it partially mediates the relationship between coping via substance use and substance use/intentions to use. Frequent use of coping via substance use was associated with higher levels of peer use and tolerance for it, which in turn, was associated with greater use and intentions to use. Consistent with previous research, we also found that coping via substance use accounted for a significant amount of the variance in substance use and intentions to use. Implications for further research are discussed.

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## Introduction

Substance use is a major problem in American society. In 2002, the American societal cost of drug abuse was \$180.8 billion, which included health care costs and productivity losses (Office of National Drug Control Policy, 2002). The government projected that this cost would increase in the upcoming years. In addition to these expenses, drug abusers often face social or interpersonal problems as a result of their drug use, which reflects DSM-IV diagnostic criteria for abuse (American Psychiatric Association, 2000), and can often encounter serious withdrawal symptoms that sometimes result in death (Dawes, Liguori, & Dougherty, 2006; Driessen, Lange, Junghanns, & Wetterling, 2005). Given the large costs of drug abuse at both the societal as well as individual level, it is important to identify the causes of substance use.

The period of middle adolescence is an especially important time because teenagers, more than any other age group, are highly susceptible to engaging in high-risk behaviors, such as experimenting with drugs (Johnston, O'Malley, Bachman, & Schulenberg, 2006). For example, it is evident that many youth are being exposed to, and trying, cigarettes at an early age and some go on to become regular smokers. According to the 2005 Monitoring the Future Survey (MTF), a national survey of approximately 49,000 eighth, tenth, and twelfth grade students, 26% of eighth graders reported that they have tried cigarettes at least once in their lifetime and 25% of adolescents are regular smokers by the time they complete high school (Johnston et al., 2006). In terms of daily smoking rates, there do not seem to be any gender differences among eighth and tenth graders (Johnston et al., 2006). There appear to be ethnic differences, however, in past thirty-day prevalence rates. Across all three grades, African Americans have the lowest

prevalence, followed by Hispanics, and then by Caucasians (Johnston et al., 2006). For instance, among eighth graders, the past thirty-day prevalence rate for cigarette use among African Americans, Hispanics, and Caucasians is 7.1%, 9.0%, and 9.4%, respectively (Johnston et al., 2006). The past thirty-day prevalence rate for cigarette use among African American, Hispanic, and Caucasian 10<sup>th</sup> graders is 8.7%, 13.5%, and 17.6%, respectively (Johnston et al., 2006).

Even though it is illegal for most secondary school students to purchase alcohol, many adolescents report consumption of it. According to the MTF Survey, 41% of eighth graders, 63% of tenth graders and 75% of twelfth graders reported trying alcohol in their lifetime (Johnston et al., 2006). Moreover, 11% of eighth graders, 21% of tenth graders and 28% of twelfth graders reported drinking heavily (five or more drinks in a row) at least once in the prior two-week period (Johnston et al., 2006). At all three grade levels, males report more frequent consumption of alcohol as well as more frequent episodes of heavy drinking (Johnston et al., 2006). Racial differences in prevalence of alcohol use are also evident. African Americans consistently have the lowest rates of annual prevalence of alcohol use across all three grade levels (Johnston et al., 2006). For instance, the prevalence of alcohol use among African American, Hispanic, and Caucasian eighth graders is 31.5%, 39.7%, and 35.6%, respectively (Johnston et al., 2006). The prevalence of alcohol use among African American, Hispanic, and Caucasian 10th graders is 47%, 63.3%, and 60.1%, respectively (Johnston et al., 2006).

In terms of illicit drugs, marijuana use appears to be most widespread. Forty-five percent of twelfth graders, 34% of tenth graders, and 17% of eighth graders reported some marijuana use in their lifetime (Johnston et al., 2006). Gender differences in



marijuana use are also apparent such that more males in eighth and tenth grade report marijuana use compared to females (Johnston et al., 2006). Additionally, there are also racial differences in prevalence of marijuana use. According to the MTF Survey, “eighth grade African American students have slightly higher rates of annual prevalence of marijuana use (13.6%) than White students (11.1%) and have rates only slightly lower than those for Hispanics (14.7%)” (Johnston et al., 2006). By the tenth grade, however, the annual prevalence of marijuana use was equivalent between Caucasians (27.3%) and African Americans (27.2%) and slightly higher among Hispanics (28.6%).

In addition to their ethnicity and sex, there is some evidence that the coping styles of individual youth help account for whether or not they use substances (Wills, 1985). A common shortcoming of the adolescent coping styles and substance use literature, however, is the lack of ethnic diversity among the study participants (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Therefore, it is unclear whether evidence that suggests a relationship between coping styles and substance use is applicable to ethnic minority adolescents.

## Review of the Literature

### *Structure and Function of Coping Styles*

Although there is a general agreement in the field that coping is defined by the behavioral or cognitive responses that people use to manage stress, there is a lack of consensus as to the basic dimensions that characterize coping (Skinner, Edge, Altman, & Sherwood, 2003). The result of research endeavors examining the relationship between coping styles and substance use has been the identification of multiple explanatory pathways originating from differently labeled coping styles and culminating in either

increasing or decreasing the likelihood of substance use. In their review of 100 assessment instruments of coping, Skinner et al. uncovered approximately 400 category names for the types of coping. These 400 category names include problem solving, problem focused, avoidance, avoidant action, cognitive avoidance, blunting, decision making, and self-criticism (Skinner et al., 2003). In addition to the surplus of coping category names, no two studies examined by the researchers used the same set of category names to measure coping. Given the lack of consensus as to how to characterize coping, it is difficult to develop a cohesive picture regarding the construct of coping as well as its relationship with other psychological measures.

Regarding the classification of coping, most research in this area uses labels that fall into one of two general categories: lower order (bottom-up) categories of coping or higher order (top-down) categories of coping. As defined by Skinner et al. (2003):

Bottom-up approaches refer to strategies used to classify instances of coping into lower order categories. In general, such classifications are based on individual items, to which participants indicate the extent to which they showed a specific coping behavior (e.g., “I tried to figure out what to do,” “I got advice from someone”) in dealing with a particular stressful event or with stress in general (p. 220).

While lower order categories capture instances of coping (i.e. self-criticism, asking for help), higher order categories capture the overall function of coping (i.e. active, passive). As indicated by Lazarus and Folkman (1984), “we do not want to confuse coping functions with coping outcomes. A coping function refers to the purpose a strategy serves; outcome refers to the effect a strategy has” (pp. 148-149). Therefore, a coping function is what the individual anticipates the outcome of using a specific coping style will be, but what one anticipates may or may not be congruent with the actual outcome.

Higher order categories address the function of coping and do not address the actual outcome of coping.

There are benefits and drawbacks to both types of classification systems. For example, a benefit of lower order classifications is that because across studies, researchers have labeled approximately 400 descriptors of instances of coping (Skinner et al., 2003), virtually any instance of coping can be classified into an already existing category of coping. The sheer number of category labels is simultaneously a drawback to lower order classification systems because it makes it difficult to generalize results across studies, as most studies do not use the same category labels (Skinner et al., 2003). Many of the lower order coping categories may appear to be equivalent, such as the categories of problem solving, problem focused, planful problem solving, and task oriented, but one cannot assume that these categories are similar to one another without finding this to be so empirically. Additionally, exact definitions of lower order categories are often not available (Skinner et al., 2003), which makes it increasingly difficult to draw conclusions across studies.

In an attempt to simplify the construct of coping, many researchers use higher order categories to classify coping styles. For example, a commonly cited functional distinction is problem- versus emotion-focused coping (Folkman & Lazarus, 1980). In their study, Folkman and Lazarus (1980) sampled 100 Caucasian men and women between the ages of forty-five and sixty-four. They devised a Ways of Coping Checklist, which was comprised of sixty-eight items that described a broad range of behavioral and cognitive coping strategies. Principal factor analysis classified the items into problem-focused or emotion-focused coping categories. As defined by Folkman and Lazarus

(1980), “the problem-focused category includes items that describe cognitive problem-solving efforts and behavioral strategies for altering or managing the source of the problem. The emotion-focused category includes items that describe cognitive and behavioral efforts, which are directed at reducing or managing emotional distress” (p. 225). This appears to be a simpler way to categorize the construct of coping than the 400 lower order categories. This dichotomy of problem-focused versus emotion-focused coping seems to be too simplistic, however, as oftentimes, one form of coping can function to alleviate both problems and aversive emotions (Skinner et al., 2003). For example, creating a plan of action helps manage problems and can also calm anxiety. Additionally, as found by Folkman and Lazarus (1980), these two categories of coping are not mutually exclusive. It is often the case that instances of both problem-focused and emotion-focused coping are used to handle stressful situations.

In addition to the problem- versus emotion-focused coping distinction, other researchers have attempted to classify coping using other higher order categories. For example, Amirkhan (1990) developed the Coping Strategy Indicator (CSI) using principal factor analyses and principal components analyses of 161 coping options drawn from previous research as well as suggestions from students and colleagues. Three factors of coping consistently emerged across three stages of factor analytic investigations: problem solving, seeking social support, and avoidance (Amirkhan, 1990). These categories of coping, however, face the same criticisms as any other higher order categorization system, in that one act of coping could fall into more than one category of coping. In sum, although higher order categories of coping seem to simplify the entire construct of coping, they are inadequate as a comprehensive classification system

because they do not encompass all lower order instances of coping in a systematic, well-defined way. Higher order categories are also insufficient as units of measurement because people often use more than one category of coping to deal with stressors and one form of coping often serves many functions. The complex nature of coping behaviors and their respective functions make it difficult to build knowledge in this area of research.

A few research studies have been published testing hierarchical models of coping (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Walker, Smith, Garber, & Van Slyke, 1997). Such models are a positive development in the field as they incorporate both lower order and higher order categories. Therefore, these models incorporate lower order categories of coping options as well as higher order categories that capture the functions of coping. Tobin, Holroyd, Reynolds, and Wigal (1989) conducted a hierarchical factor analysis on a modified version of the Ways of Coping Checklist (Folkman & Lazarus, 1980) with a sample of 398 college students. Eighty-nine percent of the participants were Caucasian and eight percent were African American (Tobin et al., 1989). The researchers found two tertiary factors (engagement, disengagement), four secondary factors (problem engagement, emotion engagement, problem disengagement, and emotion disengagement), and eight primary factors (problem solving, cognitive restructuring, emotional expression, social support, problem avoidance, wishful thinking, self-criticism and social withdrawal). The secondary level of this hierarchical model of coping provides evidence to support the coping models of problem- versus emotion-focused coping (Folkman & Lazarus, 1980). Additionally, the tertiary level of this model of coping (engagement, disengagement) supports the

categories of approach and avoidance coping (Miller, 1944; Scheier, Weintraub, & Carver, 1986). The data suggest that both higher order formulations (problem- and emotion-focused coping; approach and avoidance coping) describe the structure of coping, but at different levels of the coping style hierarchy (Tobin et al., 1989).

Therefore, the findings support the usefulness of higher order categories of coping in describing the complexity of coping. When used alone, however, higher order categories are too broad to capture a range of instances of coping. One also needs the lower level categories to provide a full account of coping.

Ayers, Sandler, West, and Roosa (1996) factor analyzed 11 conceptually distinct coping categories with a sample of 217 children aged nine through thirteen. The sample was ethnically diverse such that 57% of the sample was non-White. The results indicated a four-factor model of coping (active, distraction, avoidance, and support seeking) and the model was largely invariant with respect to age and gender (Ayers et al., 1996). Active coping encompassed lower order categories of cognitive decision making, direct problem solving, seeking understanding, and positive cognitive restructuring. The category of distraction encompassed physical release of emotions such as “efforts to physically work off feelings with physical exercise, play or efforts to physically relax” and distracting actions, which included “efforts to avoid thinking about the problem situation by using distracting stimuli, entertainment, or some distractive activity” (Ayers et al., 1996, p. 930). Avoidance included acts of cognitive avoidance, which encompassed instances of wishful thinking or imagining the situation was better, and avoidant actions, which included “behavioral efforts to avoid the stressful situation by staying away from it or leaving it” (Ayers et al., 1996, p. 930). Lastly, support seeking

included problem-focused support seeking, which included acts that use other people as resources to assist in seeking solutions to the problem situation, and emotion-focused support seeking, such as seeking out people to provide empathy and help calm emotions. Through a series of confirmatory factor analyses, Ayers et al. (1996) showed that this new model of coping provided a better fit to the data compared to either the problem-versus emotion-focused (Lazarus & Folkman, 1984) or passive versus active (Billings & Moos, 1981) coping models alone. These two-factor models do not seem adequate to reflect the structure of coping among youth.

### *Coping Styles Related to Adolescent Substance Use*

Research suggests that coping styles may be a potential predictor of whether or not and the degree to which adolescents use substances. Due to the lack of agreement as to the dimensions that define coping, it has been difficult to perceive progress in the field. While some reasonably reliable patterns between specific coping styles and the degree of adolescent substance use have emerged, other findings have been more difficult to replicate.

Avoidant coping. Certain coping styles among adolescents have been found to be risk factors for engagement in substance use, which can lead to future substance abuse and substance-related problems. In a cross-sectional study of 332 high school students who were currently abusing substances, frequent use of an avoidant coping style was reported (Wagner, Myers, & McNich, 1999). Coping was measured via the Revised Ways of Coping Checklist (Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). Examples of coping options endorsed by the substance abusers were “went on as if nothing bad happened,” “slept more than usual,” and “avoided being with people in general”

(Vitaliano et al., 1985). Additionally, Wills, Sandy, Yaeger, Cleary, and Shinar (2001) conducted a longitudinal study with 1,668 youth assessed at mean age 12.5 years and at two yearly follow-ups. They also found that frequent use of an avoidant coping style was related to higher initial levels of substance use, as well as to a greater rate of growth in use. Examples of an avoidant coping style in their study were daydream, do something to put the problem out of your mind, just keep away from people, and do something to take your mind off things. Among adults, it has been shown that avoidant coping styles are predictive of abuse status among drinkers who express a strong belief in the positively reinforcing properties of alcohol (Cooper, Russell, & George, 1988; Cooper, Russell, Skinner, Frone, & Mudar, 1992). For example, such drinkers reported that they tried to reduce tension by eating more, keeping feelings to themselves, and avoiding being with people in general. In sum, there has been agreement among several studies that have shown that frequent use of an avoidant coping style puts adolescents at risk for substance use and possible future abuse.

Distraction as coping. The relationship between coping with stressors via distracting oneself and adolescent substance use is less clear. Some studies have shown that distraction is positively associated with substance use among adolescents (Wills, 1985), while others have found no group difference in reported use of distraction coping between problem ( $n = 159$ ) and non-problem ( $n = 252$ ) adolescent users (Johnson & Pandina, 2000). Instances of distraction reported in Wills's (1985) study were "I daydream" and "I try to put the problem out of my mind." Instances of coping via distraction in Johnson and Pandina's (2000) study included two items such as "just try to forget about it." It seems that distraction has been measured with items that are similar or



identical to terms that have been used to measure avoidance coping in other studies (e.g., Vitaliano et al., 1985).

Social support seeking. Seeking social support is a commonly found to be a positive method to cope with stressors (Wills, 1985). Some studies suggest, however, that seeking social support could potentially lead to negative outcomes. Carver, Scheier, and Weintraub (1989) found that “seeking social support was associated with active coping and with planning, but also with focus on and venting of emotions, which in turn is linked to such strategies as denial and disengagement” (p.274). In terms of substance use, findings are mixed with regards to whether seeking social support as a coping style is positively or negatively associated with substance use. Johnson and Pandina (2000) found no group difference between problem (n = 159) and non-problem (n=252) adolescent alcohol users in their use of seeking emotional support. Instances of seeking emotional support included going to someone for advice. Snow and Bruce (2003) studied cigarette use in a cross-sectional study of 241 adolescent girls in Melbourne, Australia. In terms of smoking cigarettes, it appeared that current female adolescent smokers tended to rely on others as a coping strategy more so than experimental or non-smokers (Snow & Bruce, 2003).

One way the seemingly conflicting findings might be resolved is by separating adult from peer support. Wills (1985) examined these categories of social support coping in a sample of 1576 junior high students. The ethnic composition of the sample was 50% Caucasian, 20% African American, 20% Hispanic, and 10% Asian. When the dimension of social support seeking is broken down into the categories of adult support and peer support, it appears that adolescents who seek out adult support are less likely to engage in

substance use (Wills, 1985). In contrast, teenagers who seek out peer support are more likely to engage in substance use (Wills, 1985; Wills, 1986). Therefore, it seems as though the link between coping via social support and substance use is unclear. There is more evidence to suggest however, that seeking adult support is more negatively associated with substance use as compared to seeking peer support. Wills's adult social support coping scale includes seeking support from adults drawn from all domains of an adolescent's life such as a doctor, teacher, minister, or counselor. Coping via social support from one source, such as a caretaker, should be examined to further understand the specific relationship between coping via caretaker support and substance use. This may help to explain discrepant findings in this area of the literature.

Another possible explanation for the discrepant findings concerning coping via social support is the difference between a more adaptive and mature form of actively seeking social support compared to a less developmentally appropriate, passive form of relying on others to solve problems and mitigate negative emotions. Research suggests that relying on others as a coping style may not be developmentally appropriate during adolescence (Hill, Bromell, Tyson, & Flint, 2007). Research conducted by Snow and Bruce (2003) appears to be the only study to date that has examined the relationship between a more reliant form of coping via social support and substance use.

“Hanging out” and seeking social entertainment. In addition to seeking social support, adolescents can engage in other forms of coping within a social environment. For example, some youth choose to “hang out” with other youth as a coping mechanism. This form of coping has been shown to have a significant unique positive relationship to adolescent substance use (Wills et al., 2001) and has also been related to higher initial

levels of use as well as a greater rate of growth in use (Wills et al., 2001; Wills, McNamara, Vaccar, & Hirky, 1996). Among high school students who are at risk for drug abuse, coping via hanging out with friends has been shown to be predictive of substance abuse and dependence (Sussman, Dent, & Galaif, 1997). Another similar dimension of coping is social entertainment, which includes coping via hanging out with other kids as well as partying and other social activities. Coping by seeking out social entertainment has also been shown to be positively associated with adolescent substance use (Wills, 1985).

Emotion-focused coping. Some forms of coping specifically involve the emotional effects of confronting a stressor. A cross-sectional investigation by Windle and Windle (1996) with a sample of 733 primarily Caucasian youth showed that emotion-focused coping was predictive of alcohol use and positively associated with alcohol problems (Windle & Windle, 1996). Examples include “blaming myself for not knowing what to do.”

Coping via expressing anger has also been shown to be a risk factor for the higher initial amount, overall amount, and rapid escalation of engagement in substance use, as it has also been shown to have a unique positive relationship to adolescent substance use among a large, diverse sample of youth (Wills, McNamara, Vaccar, & Hirky, 1996; Wills Sandy, Yaeger, Cleary, & Shinar, 2001). Examples of anger coping are “blame and criticize other people, get upset and let out feelings, do something bad or cause trouble.” Additionally, Johnson and Pandina (2000) conducted a 13-year longitudinal study assessing the relationship between coping styles and alcohol use in a community sample comprised of 411 participants recruited at the age of twelve years old. Using DSM-IV

criteria to assess alcohol dependence, Johnson and Pandina (2000) found that “among females, subjects who were assigned into the dependent category used emotional outbursts to cope to a greater extent than other nonproblem females, and these differences were evident as early as the age of 15” (p. 677). Therefore, the evidence suggests that female adolescents with different coping styles, such as engaging in emotional outbursts as a way to cope, were more likely than did other females in the same age group to develop alcohol dependence as young adults.

Among yet another sample of high school students who are at risk for drug abuse, anger coping was also predictive of substance abuse and dependence (Sussman et al., 1997). Seemingly related to anger coping, aggressive coping has also been shown to be positively associated with engagement in substance use (Wills, 1985). Items included “get mad at people,” “blame or criticize other people,” “do something bad or cause trouble,” “do something exciting or risky,” and “avoid being with other people.” In sum, evidence suggests that frequent engagement in these types of emotion-focused coping is a risk factor for substance use.

Coping by using substances. Some people report that one coping method they engage in is using substances. Adolescents who report using substances to cope with problems or stress are more likely than other users to escalate rapidly in substance use (Wills et al., 2001). In the longitudinal study of a community sample previously discussed, Johnson and Pandina (2000) found that at ages 18 and 25, males who relied on alcohol to cope eventually became dependent on alcohol more often than did others. It was also found that at the age of 25, dependent substance users used alcohol to cope more than substance abusers or nonproblem users (Johnson & Pandina, 2000). Among adults,

coping via substance use also has been shown to be a predictor of alcohol abuse (Cooper et al., 1988). Therefore, it seems that youth who report using substances to cope with stressors are at an especially high risk of developing problems associated with use, and of abusing substances in the future.

Helpless coping. A helpless coping style has been shown to have a significant unique positive relationship to adolescent substance use (Wills et al., 2001), such that more frequent use of a helpless coping style is related to a higher likelihood of substance use. Examples of helpless coping are “admit you cannot deal with it, just give up trying to reach the goal, give up the attempt to get what you want, and stop spending time trying to solve the problem”. A helpless coping style has been related to higher initial levels of adolescent substance use as well as a greater rate of growth in use (Wills et al., 2001).

General ineffective coping. General nonproductive coping strategies, defined as those strategies that may be ineffective or exacerbate a situation, have been shown to be used more often by regular cigarette smokers as compared to experimental or non-smokers (Snow & Bruce, 2003).

#### *Coping Styles Negatively Associated with Substance Use*

While the aforementioned coping styles generally have been shown to predict or be positively related to adolescent substance use, other coping styles have been shown to be negatively associated with substance use.

Decision making. Coping via decision making includes acts such as thinking about and gathering information that is necessary to deal with the problem. It has been shown to be significantly related to a lower probability of smoking and alcohol use at the

beginning of seventh grade (Wills, 1985). This relationship, however, grows weaker as time progresses and becomes non-significant by the end of eighth grade (Wills, 1985).

Task-oriented coping. Task-oriented coping has also been shown to predict lower levels of alcohol use and fewer alcohol problems among a sample of 733 Caucasian high school students (Windle & Windle, 1996). Task-oriented coping has been shown to have a moderate correlation with the Problem Solving scale of Amirkhan's (1990) Coping Strategy Indicator (Endler & Parker, 1994). Examples of task-oriented or problem solving coping behaviors include "tried different ways to solve the problem until you found one that worked," and "set some goals for yourself to deal with the situation." Problem solving has also been shown to be negatively associated with substance abuse among a sample of high risk youth (Sussman et al., 1997). Adolescents who report greater reliance on problem-focused coping report less substance use involvement (Wagner, Myers, & McNich, 1999). In sum, research suggests that frequent use of problem solving coping methods is largely negatively related to substance use.

Cognitive coping. The relationship between cognitive forms of coping and adolescent substance use is less clear. A broad dimension entitled cognitive coping includes instances of coping such as "tell myself it will be over in a short time," "try to put it out of my mind," and "try to notice only the good things in life" (Wills, 1985). Based on a longitudinal study examining two cohorts of seventh graders for two years, this category of coping has been shown to be a significant positive predictor of cigarette smoking among youth at the beginning of seventh grade. Cognitive coping is negatively associated, however, with alcohol use at the end of eighth grade (Wills, 1985).

Behavioral coping. Behavioral coping has been shown to have a negative relationship to substance use (Wills et al., 1996; Wills et al., 2001). Examples of behavioral coping are “get information you need to solve the problem,” “think about the choices before doing something,” “think hard about what steps to take,” and “take action to try to solve the problem.” Additionally, adolescents who engage in prayer or relaxation to cope with stressors are less likely to use substances (Wills, 1985; Wills, 1986).

In sum, a review of the literature suggests that some coping styles are predictive of substance use among adolescents while other styles are associated with limited use. It appears that coping methods characterized as avoidant, hanging out, social entertainment, peer social support, emotion-focused, anger, substance use, helpless and ineffective may put adolescents at risk to use substances and possibly escalate their use. In contrast, frequent use of coping styles such as seeking adult support, decision making, problem solving, behavioral, prayer, and relaxation tend to be related to less use.

#### *Precursors of Substance Use as Potential Mediators Between Coping Styles and Substance Use*

To our knowledge, there have not been any studies published that have examined precursors of substance use as potential mediators between coping styles and adolescent substance use. The following constructs have been shown to be indicators of the likelihood that an adolescent will become involved in substance use in the future: perception of limited harm due to substance use (Hawkins & Catalano, 1996; Johnston et al., 2006), high peer use (Kandel et al., 1978; Johnston et al., 2006), high levels of tolerance for deviant behaviors (Hawkins & Catalano, 1996), high number of positive

expectancies, and low number of negative expectancies regarding alcohol/marijuana effects (Christiansen, Goldman, & Brown, 1985; Christiansen, Smith, Roehling, & Goldman, 1989; Schafer & Brown, 1991). Since many studies have established the relationship between substance use and the aforementioned precursors of use, these precursors may serve as potential mediators between coping styles and substance use.

Coping styles may influence cognitive variables, which in turn, influence one's level of risk for engaging in substance use. For example, individuals who frequently employ maladaptive coping styles may experience more anger, arguments, accumulations of resentment, and unresolved problems (Wills & Shiffman, 1985). Chronic experience of negative emotions and unresolved problems may cause an individual to have a greater inclination to acknowledge the potential positive benefits of substance use and minimize the negative consequences of substance use. For these individuals, the perpetual use of maladaptive coping styles may influence precursors of use by decreasing perception of harm from substance use and negative expectancies regarding alcohol/marijuana effects, while increasing tolerance for social deviance and one's positive expectancies regarding alcohol/marijuana effects. Additionally, individuals who have difficulty coping effectively with stressors may seek out peers who also employ similar maladaptive coping styles and may also be at risk for engaging in substance use (Carver, Scheier, & Weintraub, 1989). Thus, precursors of substance use such as cognitions regarding use as well as peer substance use may serve as mediators between coping styles and actual substance use.

#### *Rationale and Overview of the Current Study*



The above review of the literature suggests that coping styles help explain a portion of the variance in adolescent substance use. Evidence is increasing that certain coping styles predict use and others predict less use. One major limitation of many of the studies, however, is that the samples have been comprised mostly of middle-class, Caucasian adolescents. The majority of studies in this area either focus strictly on Caucasian teenagers or include only small percentages of ethnic minority, lower income adolescents. Another limitation of the literature is that no study has examined potential mediators between coping styles and adolescent substance use. Substance use precursors may serve as mediators because how individuals cope with problems may influence how they view the potential benefits and drawbacks to substance use, which may ultimately affect their decision to engage in or refrain from substance use .

In the current study, we extend past research by examining the relationship between coping styles and substance use in a sample of mostly minority adolescents attending an urban school in New Jersey and testing the notion that proximal precursors of substance use may serve as possible mediators of the relationship. By sampling from this school, we are able to examine primarily minority youth living in low socioeconomic conditions. We are interested in examining whether any of the previous findings concerning the relationship between coping styles and substance use will also be found in our sample of ninth graders dealing with the stress of urban living and transitioning to high school. Our hypotheses are 1) coping via problem solving will be negatively associated with substance use, 2) coping via substance use will be predictive of substance use, and 3) known proximal precursors of substance use will mediate the relationships.

Conflicting previous findings make it difficult to predict how coping via relying on a caretaker will relate to the probability of substance use.

## Method

### *Participants*

Participants attended a high school in New Jersey that is located in an area composed primarily of low income minority families. Approximately 65% of students are eligible for free lunch (Public School Review, 2006), which is above the New Jersey average percentage (25%) of students eligible for a free lunch. The median household income in the school district is \$30,995, which is much lower than the median household income for the state (\$55,536).

One-hundred twenty-eight high school freshmen (69 female, 59 male) attending an urban school in New Jersey participated in our study. Forty-one percent of the participants identified their ethnicity as African American ( $n=52$ ), 3.1% Caucasian ( $n=4$ ), 46.1% Latino/Hispanic ( $n=59$ ) and 1.6% Asian American ( $n=2$ ). Additionally, 8.6% of students ( $n=11$ ) reported their ethnicity as “other”. The age of participants ranged from 13 to 16 years, with a mean of 14.3 ( $SD=.68$ ).

### *Procedure*

Participants were surveyed at the end of their freshmen year of high school as part of a larger study (Johnson, Holt, & Bry, in press). Data were obtained through group administration of a battery of questionnaires including items on coping, precursors of substance use, and intentions to use drugs/alcohol. Due to the large proportion of ethnic minority students in our sample, English and Spanish versions of the questionnaire were available to all students. Project staff members were trained to follow a standardized protocol in giving instructions to students and were available to answer students' questions. To protect the students' right to confidentiality, questionnaires were labeled

only with a code number and students were instructed not to write their name on the survey. The school administration and the Rutgers University Institutional Review Board approved the procedures. Additionally, a Certificate of Confidentiality was obtained from the National Institutes of Health.

Students participated under a passive parental consent procedure. Letters were mailed to parents with information about the purpose of research and the general content of the survey. Parents were instructed to sign and return the letter if they did not want their child to participate. At the time of the survey, students were also told that they could refuse to participate at any time without facing negative consequences.

### *Measures*

Demographic variables. Participants were asked to report their sex, age and ethnicity. To report ethnicity, participants were asked to circle the group that best describes who they are. The choices were African American, Caucasian, Latino/Hispanic, Asian American, or Other. For this study, the variable of ethnicity was dichotomized into two categories, “African American” and “Other”. This variable was dichotomized in this fashion because according to the data obtained from the 2005 MTF survey, substance use among African Americans was most different compared to other ethnic groups (Johnston et al., 2006).

Coping style. Coping styles were initially measured via a 15-item self-report questionnaire included in a battery of questionnaires (Pandina, Labouvie, & White, 1984). Students were instructed to respond on a five-point scale as to how they usually respond to problems, stress or anger. The question was phrased “when you experience problems, stress or anger, how often do you...” Items included “think of different

possible ways to deal with the problem;” “think about how the problem could change your life in a positive way;” “try to get information and find out more about the situation.” In an effort to expand the number of items and broaden the scope of the measure, we examined items from the entire battery and found an additional three items that we believed might also measure aspects of coping. These items included questions such as “how often do you let your caretaker cheer you up when you are sad or worried” and “how often do you feel that you can talk to your caretaker about what is on your mind?” Before any analyses were conducted, reverse scoring was computed where appropriate.

In order to determine if the coping items were discriminable from items on other scales in the survey, a principal components analysis with varimax rotation was performed on the 18 items believed to represent coping and the 14 items of the Academic Motivation Scale (Vallerand, Pelletier, Blais, Briere, Senecal, & Valliere; 1992). Results demonstrated the discriminant validity of the coping items, as none of them loaded on the Academic Motivation component and vice versa.

To learn what categories of coping were represented by our coping items, we conducted principal components analysis with varimax rotation including only the 18 items related to coping as determined by our first factor analysis. This yielded five components with eigenvalues greater than 1.00. However, based on the reliability of scales based on the components, interpretability of the components, and scree plots, three components were extracted and they accounted for 48% of the total variance. Items with loadings of .500 and above were considered for inclusion in the scales based on the components unless reliability was reduced greatly by including them. Seven *problem*

*solving* items loaded on the first component ( $\alpha=.81$ ). Three *relying on caretaker* items loaded on the second component ( $\alpha=.76$ ). Lastly, two *coping via substance use* items loaded on the third component ( $\alpha=.72$ ). (See Table 1.)

Substance use-related scales. To develop substance use-related scales, a set of 51 items believed to measure substance use or its precursors were analyzed using principal components analysis with varimax rotation. Items included self reports of substance use, intentions to use substances, perceptions of harm from substance use, expectancies of effects of alcohol and marijuana use, friends' use of alcohol and drugs, and tolerance for friends' use of alcohol and drugs. Before any analyses were conducted, reverse scoring was computed where appropriate.

The principal components analysis yielded 13 components with eigenvalues greater than 1.00. However, based on the scale reliability, component interpretability, and scree plots, five components were extracted and they accounted for 59% of the total variance. Items with loadings above .500 were included unless reliability was reduced greatly by including them. Eleven *perceptions of harm* items loaded on the first component ( $\alpha=.96$ ). Twelve *negative alcohol/marijuana expectancies* items loaded on the second component at ( $\alpha=.92$ ). Eleven *positive alcohol/marijuana expectancies* items loaded on the third component ( $\alpha=.90$ ). Five *friends' substance use and tolerance for it* items loaded on the fourth component ( $\alpha=.89$ ). Eleven *substance use/intentions to use* items loaded on the fifth component ( $\alpha=.83$ ). (See Table 2)

### *Power Analyses*

Statistical power analyses were conducted to determine the sample sizes needed to obtain .80 power with a significance level of .05. For regression analyses with 4

independent variables, 84 participants were needed to find a medium effect with power = .80 and a significance level of .05 (Cohen, 1992).

### *Data Analyses*

The total scores for individual scales were calculated for each participant. To obtain a total score for individuals who did not respond to particular items, we multiplied the number of items on the particular scale by the individual's mean score for the items s/he answered on the same scale. Twenty-six participants had one or more items missing whose totals were computed using this method. Six participants had missing data for more than one scale. Participants who were missing more than 50% of the items for one scale were excluded from analyses that involved that particular scale.

For the coping via problem solving scale, an average of 2.0 items was missing for the five participants with missing data. Four of these five participants were missing 14% of the items on this scale. One participant was missing 100% of the items on this scale in addition to 100% of the items for the coping via substance use scale and was excluded from further analyses. For the coping via reliance on caretaker scale, an average of 2.0 items was missing for the two participants with missing data. One of the two participants was missing 33% of the items for this scale while the other participant was missing 100% of the items and was excluded from further analyses.

For the negative alcohol/marijuana expectancies scale, an average of 1.4 items was missing for the nine participants with missing data. Two participants were missing 25% of the items and seven participants were missing 8% of the items. For the positive alcohol/marijuana expectancies, an average of 1.1 items was missing for the eight participants with missing data. One participant was missing 16% of the items while

seven participants were missing 8% of the items. For the friends' use and tolerance for it scale, an average of 2.0 items was missing for the four participants with missing data. Two participants were missing 20% of the items. Two participants were missing 60% of the items and were excluded from further analyses that included this particular scale. For the perception of harm scale, an average of 1.2 items was missing for the five participants with missing data. One participant was missing 18% of the items while four participants were missing 9% of the items. For the substance use/intentions to use scale, one person did not complete three items (100%) and was excluded from analyses that included this particular scale.

The data were analyzed in two phases to test for relationships among study variables. In the first phase, bivariate correlations between all study variables were examined. In the second phase of the data analysis, multiple regression procedures were used to test whether any precursor of substance use mediates a relationship between a coping style and substance use/intentions to use. Initial analyses were as follows: Block 1 of each regression tested for main effects of all of the independent variables (gender, coping via problem solving, coping via reliance on caretaker, and coping via substance use) on each potential mediator (negative alcohol/marijuana expectancies, positive alcohol/marijuana expectancies, friends' use and tolerance for it, and harm perception), one at a time. Block 2 examined the effects of all of the variables in Block 1 plus the interaction effects of gender by each of the coping constructs on each of the potential mediators, one at a time. The second set of multiple regression analyses consisted of a regression testing for main effects of all of the above independent variables plus all of the potential mediating variables on substance use/intentions to use.



The test of joint significance was used to examine evidence for mediation. As stated by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), “the test of joint significance simultaneously tests whether the independent variable is related to the intervening variable and whether the intervening variable is related to the dependent variable” (p. 87). If both relationships are statistically significant, then this is considered to be evidence for mediation. We chose to use the test of joint significance rather than Baron and Kenny’s (1986) “causal steps approach” after reviewing a study by MacKinnon et al. (2002). In their study, the researchers compared 14 methods to test mediation and recommended the joint significance test, as it had the most statistical power and the most accurate Type I error rates. MacKinnon et al. (2002) also noted limitations of the Baron and Kenny approach. One important limitation is that the causal steps method makes it difficult to evaluate the effects of the intervening variable when more than one intervening variable is used in the same model (MacKinnon et al., 2002). In this study, we will be testing multiple intervening variables in each model, so this particular limitation is noteworthy. Another limitation of Baron and Kenny’s “causal steps approach” is that this method requires that there is a significant relationship between the independent and dependent variable. This is an important limitation as the requirement of this relationship leads to the most Type II errors and disregards models where the relationship between the independent variable and the intervening variable and dependent variable (indirect effect) and the relationship between the independent variable and dependent variable (direct effect) have opposing signs and may cancel out (MacKinnon et al., 2002).

## Results

### *Descriptive Statistics*

Table 3 provides a summary of descriptive statistics for coping styles, precursors of substance use and substance use. The mean scale score reported for coping via substance use was 2.56 (SD = 1.42). The mean scale scores reported for coping via reliance on caretaker and problem solving were 9.5 (SD = 3.10) and 21.32 (SD = 5.76) respectively. The mean scale scores for positive and negative alcohol/marijuana expectancies was 27.7 (SD = 8.70) and 37.1 (SD = 9.12) respectively. The mean scale score for perception of harm from substance use was 34.9 (SD = 9.90). Lastly, the mean scale score for substance use/intentions to use was 9.17 (SD = 6.22).

With regards to substance use, 24.2% of our sample reported that they have already tried cigarettes at least once in their lifetime. Additionally, 38.3% of the sample reported that they have tried alcohol and 14.1% reported that they have tried marijuana. The prevalence of substance use among our sample is similar to, or perhaps slightly lower than, what is to be expected for 14 year olds according to the data collected by Johnston et al. (2006). See Table 4 for reports of substance use by gender.

Three of the scales developed for this study were not normally distributed. The coping via substance use and substance use/intentions to use scales were positively skewed such that many participants reported that they do not use substances to cope, they have never tried substances, and they do not intend to use substances in the next year. The participants' responses were not normally distributed on these scales because many ninth graders are not yet using substances. Therefore, the skewness of these scales is an accurate reflection of the relatively low rates of substance use among ninth graders

(Johnston et al., 2006). The perception of harm from substance use scale was negatively skewed such that many participants perceived substance use as harmful to one's self. Again, our data are similar to national surveys measuring the harmfulness of drugs as perceived by eighth and tenth grade students (Johnston et al., 2006).

### *Correlational Analyses*

Bivariate correlations were computed between each study variable and every other. Table 5 provides a summary of the Pearson correlations between the variables used in our analyses. Coping via substance use was significantly and positively correlated with friends' use and tolerance for it ( $r = .20$ ,  $p < .05$ ) as well as gender ( $r = .25$ ,  $p < .01$ ). Coping via substance use also was significantly and positively correlated with substance use/intentions to use ( $r = .49$ ,  $p < .001$ ). Coping via substance use was also significantly and negatively correlated with negative expectancies of alcohol and marijuana use ( $r = -.20$ ,  $p < .05$ ).

We also found that coping via reliance on caretaker exhibited a significant and positive association with positive alcohol and marijuana expectancies ( $r = .23$ ,  $p < .01$ ). Coping via problem solving was correlated with gender ( $r = -.21$ ,  $p < .01$ ), where males were more apt to report lower frequencies of employing this coping style.

In the correlational analyses, we also found significant correlations between precursors of substance use and substance use/intentions to use. Friends' use and tolerance for it was significantly and positively correlated with substance use/intentions to use ( $r = .43$ ,  $p < .001$ ). Perception of harm was also significantly and negatively correlated with substance use/intentions to use ( $r = -.32$ ,  $p < .001$ ).

### *Multiple Regression Analyses*

First, to test for relationships between coping styles, gender, and potential mediating variables, the substance use precursor variables of negative alcohol/marijuana expectancies, positive alcohol/marijuana expectancies, friends' use and tolerance for it, and perception of harm from substance use were individually regressed in Block 1 of the regression analyses onto gender, coping via substance use, coping via reliance on caretaker and coping via problem solving. To assess for moderation, Block 2 examined interaction effects of gender by each individual coping style in addition to all variables in Block 1 on each potential mediator, one at a time. Race was not included in the regression analyses because it did not significantly correlate with any other study variable.

Negative alcohol/marijuana expectancies. In Block 1, the model as a whole accounted for 8.0% of the variance;  $R^2 = .080$ ,  $F(4,121) = 2.62$ ,  $p < .05$ . Coping via substance use made a significant negative unique contribution to negative alcohol/marijuana expectancies when effects of the other variables were controlled statistically ( $\beta = -.22$ ,  $p < .05$ ). Additionally, coping via problem solving made a significant positive unique contribution to negative alcohol/marijuana expectancies ( $\beta = .21$ ,  $p < .05$ ). Since the  $\Delta R^2$  for Block 2 was not significant, only the results of Block 1 are reported in Table 6.

Positive alcohol/marijuana expectancies. In Block 1, the model as a whole accounted for 7.9% of the variance;  $R^2 = .079$ ,  $F(4,121) = 2.59$ ,  $p < .05$ . After controlling the effects of other variables, coping via reliance on caretaker made a significant positive unique contribution to positive alcohol/marijuana expectancies ( $\beta = .22$ ,  $p < .05$ ). 4.3% of the variance in positive expectancies was explained by coping via

support from caretaker. Since the  $\Delta R^2$  for Block 2 was not significant, only the results of Block 1 are reported in Table 7.

Friends' use and tolerance for it. In Block 1, the model accounted for 7.9% of the variance;  $R^2 = .079$ ,  $F(4, 119) = 2.54$ ,  $p < .05$ . Coping via substance use made a significant positive unique contribution to friends' use and tolerance for it when effects of the other variables were controlled statistically ( $\beta = .21$ ,  $p < .05$ ). Since the  $\Delta R^2$  for Block 2 was not significant, only the results of Block 1 are reported in Table 8.

Perception of harm. In Block 1, the model as a whole accounted for 7.6% of the variance;  $R^2 = .076$ ,  $F(4, 121) = 2.50$ ,  $p < .05$ . Coping via reliance on caretaker made a significant negative unique contribution to perception of harm from substance use when effects of the other variables were controlled statistically ( $\beta = -.22$ ,  $p < .05$ ). Since the  $\Delta R^2$  for Block 2 was not significant, only the results of Block 1 are reported in Table 9.

Substance use/intentions to use. To assess whether substance use precursors had significant effect(s) on substance use/intentions to use, substance use/intentions to use was regressed upon gender, coping via problem solving, coping via reliance on caretaker, coping via substance use, positive expectancies, and negative expectancies, friends' use and tolerance for it, and perception of harm, . After controlling for all other variables, the relationship between friends' use and tolerance for it and substance use/intentions to use was significant ( $\beta = .35$ ,  $p < .001$ ), as was the relationship between perception of harm from substance use and substance use/intentions to use ( $\beta = -.25$ ,  $p < .01$ ). The relationship between coping via substance use and substance use/intentions to use was also significant ( $\beta = .39$ ,  $p < .001$ );  $R^2 = .45$ ,  $F(8, 115) = 11.91$ ,  $p < .001$  (Table 10).

As shown in Figure 1, separate tests of each path related to perception of harm (i.e., coping via reliance on caretaker to perception of harm and perception of harm to substance use/intentions to use) are jointly significant. Additionally, separate tests of each path related to friends' use and tolerance for it (i.e., coping via substance use to friends' use and tolerance for it and friends' use and tolerance for it to substance use/intentions to use) are also jointly significant. Based on the specifications of the test of the joint significance described earlier (MacKinnon et al., 2002), this provides evidence that perception of harm partially mediates the relationship between coping via reliance on caretaker and substance use/intentions to use and evidence that friends' use and tolerance for it partially mediates the relationship between coping via substance use and substance use.

## Discussion

In this study, we aimed to explain the variance in substance use among a sample of urban ethnic minority adolescents by exploring whether proximal precursors of substance use mediate the relationship between specific coping styles and substance use. By examining the relationships among coping styles, proximal precursors of use, and substance use outcome among a sample of ethnic minority adolescents, we can form a clearer picture of mechanisms that may put adolescents at risk for future substance use.

Results of the multiple regression models provide evidence to support perception of harm from substance use, a known proximal precursor of substance use, as a mediator between coping via reliance on caretaker and substance use/intentions to use. Specifically, we found evidence that a pathway between coping via reliance on caretakers to help solve problems or relieve emotional distress and substance use or intentions to use is mediated by a decreased perception of harm from using substances. Therefore, a mechanism through which coping via reliance on caretaker increases the likelihood of substance use is through lowering perceptions of harm from substance use. The theory that would explain a negative relationship between coping via reliance on caretaker and perception of harm from substance use is not clear. One might speculate that the caretakers in families that reinforce reliance on them in time of need may be substance users themselves. This hypothesis, however, is pure speculation and should be studied further.

One concept that could help explain our model of mediation is autonomy. The development of a sense of autonomy has been shown to be important during adolescence (Isakson & Jarvis, 1999) and research suggests that adolescence is an important

developmental period to renegotiate family relationships, especially the parent-adolescent relationship (Hill et al., 2007). The successful negotiation of an autonomous relationship with parental figures has been shown to be associated with less delinquent behavior (Bynum & Kotchick, 2006). Therefore, frequent engagement of coping via reliance on caretaker may be maladaptive at this stage because these particular adolescents may not be learning how to develop their own coping repertoire. By an over reliance on their caretakers, these adolescents may not be learning adaptive ways to reduce problems or alter negative emotions. Results from this study suggest that adolescents who do not successfully negotiate a sense of autonomy appear to be more likely to use substances due to lowered perceptions of harm from substance use. In contrast, our results support the notion that adolescents who infrequently cope via reliance on their caretaker appear to be less likely to use substances due to increased perceptions of harm from substance use. Successful negotiation of autonomy may serve to increase self-efficacy and decrease the probability of engaging in substance use. Again, we did not measure autonomy in this study, so this notion is speculative

Results of the multiple regression models also provide evidence to support friends' use and tolerance for it, known proximal precursors of substance use, as a mediator between coping via substance use and substance use/intentions to use. We found evidence that a pathway between coping via substance use and the outcome of substance use/intentions to use is mediated by an increase in friends' substance use and tolerance for substance use by friends. Therefore, a mechanism through which coping via substance use increases the likelihood of substance use is through both having friends who use substances and tolerating such use by friends.



One possible explanation for this model of mediation is that adolescents who use substances to cope may be more likely to seek out friends who use substances either for coping or for other purposes. These particular adolescents who use substances to cope may also exhibit more tolerance for peer substance use. The combination of peer use and tolerance of use may contribute to these adolescents using substances not only to cope but experimenting with substances for other reasons such as peer pressure, recreation, or to experience the positive feelings associated with getting “high.” This model of mediation may help to explain the finding that adolescents who use substances to cope are more likely to have higher levels of initial substance use and escalate rapidly in use (Wills et al., 2001). In the future, longitudinal studies need to be conducted to help determine the directional relationship between these variables.

We did not find significant gender or racial differences in our model of mediation. Therefore, there is no evidence of these relationships in our model being different for boys versus girls or for African Americans versus other racial/ethnic groups. According to our model, harm perception partially mediates the relationship between coping via reliance on caretaker and substance use/intentions to use, and this relationship holds true across gender and racial categories. The few studies that have found gender differences included samples of young adults and those who were dependent on substances (Johnson & Pandina, 2000).

We also failed to replicate the finding of many other researchers concerning the relationships between positive and negative expectancies of the effects of alcohol/marijuana and substance use (Christiansen, Goldman, & Brown, 1985; Christiansen, Smith, Roehling, & Goldman, 1989; Schafer & Brown, 1991). It is

possible that the amount of variance in substance use/intentions to use accounted for by perception of harm from substance use was large enough to wash away potentially significant relationships between positive/negative expectancies and substance use/intentions to use.

Additionally, we also found that coping via substance use was a strong direct predictor of substance use and intentions to use, accounting uniquely for 17% of the variance. This is consistent with findings from previous studies, which indicated that adolescents who coped via substance use were more likely to use substances and escalate rapidly in use (Wills et al., 2001). Thus, the current study provides further evidence to support the notion that coping via substance use is a maladaptive form of coping, as it may put individuals at risk for developing more regular substance use habits and they may potentially experience negative consequences of continued use.

In this study, we examined three forms of coping styles: coping via problem solving, coping via reliance on caretaker, and coping via substance use. The three categories of coping styles examined in this study are best classified according to Skinner et al. (2003) as lower order categories of coping. Our categories of coping capture instances of coping and do not capture the overall function of coping, which would be described as higher order categories of coping.

In our sample of urban ethnic minority adolescents, we identified two coping styles (coping via problem solving and coping via substance use) that have been identified previously in the coping literature (Billings & Moos; 1981; Wills, 1985; Amirkhan, 1990; Wills, McNamara, & Vaccaro, 1995; Ayers et al., 1996). The third coping style we identified (coping via reliance on caretaker) has not been discussed

extensively in the literature. Thus, one contribution we have made to the coping literature is that we identified a new coping style that is applicable to this sample of urban-dwelling, ethnic minority adolescents. Future studies will need to determine whether this coping style is related to other coping styles such as passivity (McRae, 1984) or helplessness (Wills et al., 1995), and whether this type of coping is related to substance use in other racial/ethnic samples. This new coping measure, coping via reliance on caretaker, may help reconcile inconsistent findings related to coping via social support.

#### *Limitations and Future Directions*

Though our findings in the current study were notable, some study limitations must be discussed. One limitation of the current study is that there were a limited number of items used to derive the coping styles, substance use, and precursors of use scales. A possible consequence of this methodology is that some coping styles may not have been tapped. Future studies may want to include already established measures so that we can begin to draw more comparable conclusions across studies in the area of coping.

Because of the cross-sectional research design, we are unable to make conclusions regarding the direction of relations among the study variables. Based on our study alone, we are unable to conclude whether maladaptive coping styles put one at risk for substance use or whether engagement in substance use leads one to develop maladaptive coping styles. Replication using longitudinal or prospective designs is necessary in order to further understand the relationship between coping styles and substance use.

Another limitation of the current study was that results were based on self-report

measures. This was the most practical way to collect data given that we had limited staff and faced significant difficulty in tracking students enrolled in an urban school. The validity of self report data has been questioned, however. Some studies suggest that the validity of self report of substance use among adolescents is fair at best (Buchan, Denis, Tims, & Diamond, 2002; Williams & Nowatzki, 2005) and use of biochemical corroboration is suggested. Given the high costs of biochemical corroboration, however, this method was not used in the current study nor was it used in any of the studies reviewed in the literature. To minimize the possibility of underreporting substance use, actions were taken to protect the confidentiality and anonymity of the participants' responses.

Despite these limitations, the present results add to understanding the role of coping styles in substance use among a sample of urban-dwelling, ethnic minority adolescents. Few studies have examined potential mediators between coping styles and substance use among adolescents. The current data suggest that perception of harm from substance use mediates the relationship between coping via reliance on caretaker and substance use and intentions to use. Furthermore, friends' substance use and tolerance for it was shown to partially mediate the relationship between a tendency to cope via substance use and use itself and intentions to use. These results would need to be replicated across several studies in order to begin to develop a clear path from coping to substance use. Results of the current study, however, suggest that coping styles are one variable that influences precursors of substance use and help shape adolescents to be more or less likely to engage in substance use. If these results are replicated, we can begin to develop prevention programs to target coping styles or mediators that we believe

are malleable. Such prevention programs may include targeting precursors of substance use such as harm perception, peer use, and tolerance for social deviance.

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Table 1

*Coping Components, Loadings, and Internal Consistencies*

<b>Component Title/Items</b>	<b>Loading</b>
Coping via Problem Solving (“When you experience problems, stress or anger, how often do you...?”) $\alpha = .81$	
Think of different possible ways to deal with the problem	.77
Talk it over with a friend or relative	.56
Figure out what to do and try hard to make things work	.80
Seek help from persons with the same kind of problem	.50
Try to see the good side of the situation	.65
Think about how the problem could change your life in a positive way	.65
Try to get information and find out more about the situation	.65
Coping via Reliance on Caretaker (“When you experience problems, stress or anger, how often do you...?”) $\alpha = .76$	
Count on your caretaker to help you when you need it	.80
Let your caretaker cheer you up when you are sad or worried	.79
Feel that you can talk to your caretaker about what is on your mind	.81
Coping via Substance Use (“When you experience problems, stress or anger, how often do you...?”) $\alpha = .72$	
Have an alcoholic drink, smoke marijuana, or take other drugs	.69
Smoke cigarettes	.68

Table 2

*Substance Use-Related Components, Loadings, and Internal Consistencies*

<b>Substance Use-Related Title/Items</b>	<b>Loading</b>
<b>Negative Alcohol/Marijuana Expectancies (<math>\alpha = .92</math>)</b>	
Alcohol Expectancies: “Even if you have never tried alcohol, please choose numbers based on what you think would happen if you drank alcohol.”	
My sense would be dulled	.54
My responses would be slow	.67
I would feel dizzy	.68
I would have difficulty thinking	.79
I would neglect my responsibilities	.66
I would be clumsy	.74
Marijuana Expectancies: “Even if you have never tried marijuana, please choose numbers based on what you think would happen if you used marijuana.”	
My senses would be dulled	.69
My responses would be slow	.74
I would feel dizzy	.76
I would have difficulty thinking	.75
I would neglect my responsibilities	.75
I would be clumsy	.82
<b>Positive Alcohol/Marijuana Expectancies (<math>\alpha = .90</math>)</b>	
Alcohol Expectancies: Even if you have never tried alcohol, please choose numbers based on what you think would happen if you drank alcohol.”	

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I would be outgoing	.62
It would be easier for me to talk to people	.62
I would be brave and daring	.74
I would be courageous	.76
I would act sociable	.69
Marijuana Expectancies: "Even if you have never tried marijuana, please choose numbers based on what you think would happen if you used marijuana."	
I would be outgoing	.66
I would feel unafraid	.66
It would be easier for me to talk to people	.71
I would be courageous	.72
I would act sociable	.62
Friends' Substance Use and Tolerance for it ( $\alpha = .89$ )	
How many of your friends smoke cigarettes	.60
How many of your friends drink alcohol or use marijuana or other drugs	.68
How would you react if your friends used alcohol	.85
How would you react if your friends used marijuana	.86
How would you react if your friends used other drugs	.81
Perceptions of Harm ("How much do you think people risk harm to themselves if they...?") $\alpha = .96$	
Smoke one or more packs of cigarettes per day	.86
Use smokeless tobacco regularly	.83
Try one or two drinks of an alcoholic beverage	.62
Drink every weekend	.76

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Drink nearly every day	.82
Try marijuana once or twice	.76
Smoke marijuana occasionally	.85
Smoke marijuana regularly	.87
Use other drugs once or twice	.82
Use other drugs occasionally	.90
Use other drugs regularly	.86
Substance Use/Intentions to Use ( $\alpha = .83$ )	
This past year, how many times have you smoked a cigarette	.55
This past year, how many times have you drank some alcohol	.70
If you drank alcohol this past year, how much did you typically drink	.64
This past year, how many times have you tried marijuana	.80
If you tried marijuana in the past year, how much did you typically use	.75
This past year, how many times have you tried another drug (besides marijuana) (for example cocaine, ecstasy, or something else)	.72
If you tried a drug (besides marijuana) in the past year, how much did you typically use	.68
If you have not ever tried cigarettes, how likely do you think it will be that you will try cigarettes in the next year	.61
If you have not ever tried alcohol, how likely do you think it will be that you will try alcohol in the next year	.51
If you have not ever tried marijuana, how likely do you think it will be that you will try marijuana in the next year	.68
If you have not ever tried drugs, how likely do you think it will be that you will try a drug in the next year	.67

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Table 3

*Descriptive Statistics for Coping Styles (Problem Solving, Reliance on Caretaker, Substance Use), Precursors of Substance Use, and Substance Use/Intentions to Use (N = 126)*

Variable	Minimum	Maximum	Mean (SD)
Coping via problem solving	8.0	35.0	21.32 (5.76)
Coping via reliance on caretaker	3.0	15.0	9.46 (3.10)
Coping via substance use	2.0	9.0	2.57 (1.42)
Perception of Harm	11.0	44.0	34.90 (9.90)
Negative alcohol/marijuana expectancies	12.0	48.0	37.08 (9.12)
Positive alcohol/marijuana expectancies	11.0	44.0	27.73 (8.70)
Friends' substance use and tolerance for it	5.0	23.0	9.43 (4.36)
Substance use/intentions to use	4.0	36.0	9.17 (6.22)

Table 4

*Breakdown of Substance Use by Gender (N=127)*

	Cigarettes	Alcohol	Marijuana
Females			
Tried	18.8%	37.7%	13.0%
Not Tried	81.2%	62.3%	87.0%
Males			
Tried	30.5%	39.0%	15.3%
Not Tried	69.5%	61.0%	84.7%
Total			
Tried	24.2%	38.3%	14.1%
Not Tried	75.8%	61.7%	85.9%

Table 5

*Pearson Product-Moment Correlations Among Coping Responses, Correlates of Substance Use, and Substance Use (N = 128)*

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender	-									
2. Race	.06	-								
3. Coping via problem solving	-.21**	-.01	-		.					
4. Coping via reliance on caretaker	-.12	-.11	.28**	-						
5. Coping via substance use	.25**	.10	.07	-.10	-					
6. Negative Expectancies	-.09	-.01	.17	-.01	-.20*	-				
7. Positive Expectancies	.05	.04	.16	.23**	.10	-.23**	-			
8. Friends' use and tolerance for it	.09	.02	-.09	-.18*	.20*	-.16	.13	-		
9. Harm Perception	-.11	-.15	.05	-.17	-.16	.17	-.25**	-.04	-	
10. Substance Use										-



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10. Substance Use/Intentions to Use	.10	.16	-.13	-.16	.49***	-.16	.15	.43***	-.32***	-
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*Note.* \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 6

*Multiple Regression for Negative Alcohol/Marijuana Expectancies (N = 126)*

Variable	Beta Wt.	B	Standard Error	Unique Variance	<i>t</i>	<i>p</i>
Gender	-.00	-.03	1.70	.00	-.02	.99
Coping via problem solving	.21	.33	.15	.04	2.24	.03*
Coping via reliance on caretaker	-.09	-.25	.27	.00	-.94	.35
Coping via substance use	-.22	-1.42	.59	.04	-2.41	.02*

*Note.* Multiple  $R^2 = .080$ .  $F(4, 121) = 2.62$ ,  $p < .05$ . Unique variance was obtained by squaring the “part” correlation.

\* $p < .05$ .

Table 7

*Multiple Regression for Positive Alcohol/Marijuana Expectancies (N = 126)*

Variable	Beta Wt.	B	Standard Error	Unique Variance	<i>t</i>	<i>p</i>
Gender	.08	1.32	1.62	.00	.81	.42
Coping via problem solving	.10	.16	.14	.01	1.11	.27
Coping via reliance on caretaker	.22	.62	.26	.04	2.39	.02*
Coping via substance use	.10	.58	.56	.00	1.04	.30

*Note.* Multiple  $R^2 = .079$ .  $F(4, 121) = 2.59$ ,  $p < .05$ . Unique variance was obtained by squaring the “part” correlation.

\* $p < .05$ .

Table 8

*Multiple Regression for Friends' Use and Tolerance for it (N = 124)*

Variable	Beta Wt.	B	Standard Error	Unique Variance	<i>t</i>	<i>p</i>
Gender	.00	.00	.79	.00	.00	1.00
Coping via problem solving	-.05	-.04	.07	.00	-.50	.62
Coping via reliance on caretaker	-.15	-.21	.13	.02	-1.63	.11
Coping via substance use	.21	.62	.27	.04	2.28	.02*

*Note.* Multiple  $R^2 = .079$ .  $F(4, 119) = 2.504$ ,  $p < .05$ . Unique variance was obtained by squaring the “part” correlation.

\* $p < .05$ .

Table 9

*Multiple Regression for Perception of Harm from Substance Use (N = 126)*

Variable	Beta Wt.	B	Standard Error	Unique Variance	<i>t</i>	<i>p</i>
Gender	-.07	-1.35	1.85	.00	-.73	.47
Coping via problem solving	.11	.18	.16	.00	1.12	.26
Coping via reliance on caretaker	-.22	-.71	.30	.04	-2.40	.02*
Coping via substance use	-.18	-1.22	.64	.03	-1.91	.06

*Note.* Multiple  $R^2 = .076$ .  $F(4, 121) = 2.50$ ,  $p < .05$ . Unique variance was obtained by squaring the “part” correlation.

\* $p < .05$ .

Table 10

*Multiple Regression Predicting Substance Use/Intentions to Use from Gender, Coping Styles, and Substance Use Precursors (N = 124)*

Variable	Beta Wt.	B	Standard Error	Unique Variance	<i>t</i>	<i>p</i>
Gender	-.09	-1.13	.93	.00	-1.22	.23
Coping via problem solving	-.12	-.13	.08	.01	-1.57	.12
Coping via reliance on caretaker	-.08	-.16	.16	.00	-1.03	.30
Coping via substance use	.39	1.72	.34	.13	5.15	<.001**
Negative Alcohol/Marijuana Expectancies	.02	.02	.05	.00	.30	.76
Positive Alcohol/Marijuana Expectancies	.04	.03	.04	.01	.48	.63
Friends' Use and Tolerance for it	.35	.52	.11	.10	4.69	<.001**
Harm Perception	-.25	-.16	.05	.05	-3.32	<.01*

*Note.* Multiple  $R^2 = .45$ .  $F(8, 115) = 11.91$ ,  $p < .001$ . Unique variance was obtained by squaring the "part" correlation.

\* $p < .01$ , \*\* $p < .001$

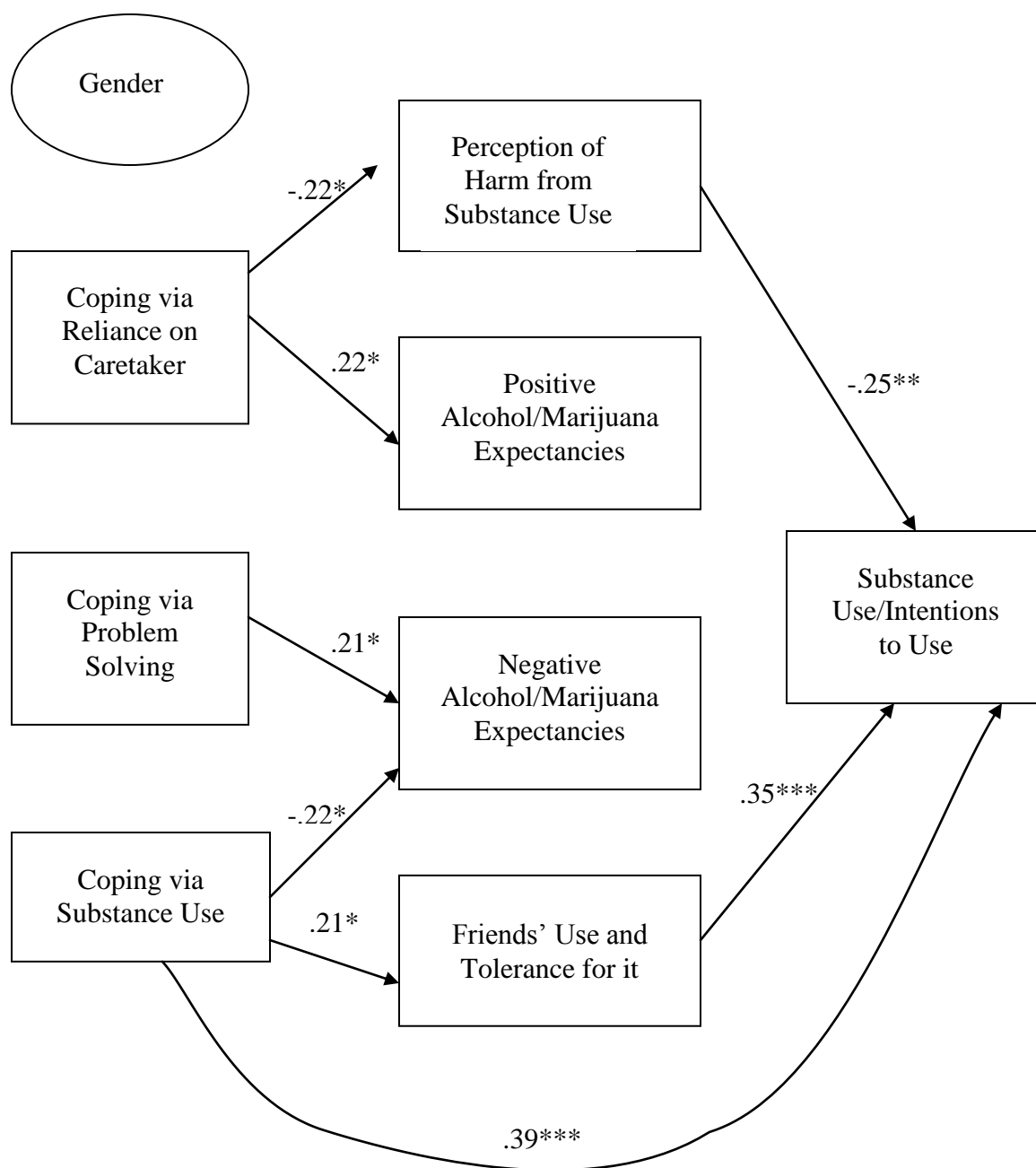


Figure 1. Significant Pathways in Model of Substance Use/Intentions to Use Employing Coping Styles and Proximal Precursors of Substance Use. Values are shown as standardized beta weights.  $^*p<.05$ ,  $^{**}p<.01$ ,  $^{***}p<.001$ . two-tailed.