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Links between alcohol and other drug problems and maltreatment among adolescent girls: Perceived discrimination, ethnic identity, and ethnic orientation as moderators

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Perceived discrimination Ethnic orientation
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Abstract

Objectives: This study examined the links between maltreatment, posttraumatic stress symptoms, ethnicity-specific factors (i.e., perceived discrimination, ethnic identity, and ethnic orientation), and alcohol and/or other drug (AOD) problems among adolescent girls.
Methods: These relations were examined using archived data from a community sample of 168 Black and Hispanic adolescent girls who participated in a school-based substance use intervention.
Results: The results revealed that maltreatment was linked to AOD problems, but only through its relation with posttraumatic stress symptoms; maltreatment was positively related to posttraumatic stress symptoms, which were positively related to AOD problems. Both perceived discrimination and ethnic orientation were significant moderators. Specifically, greater perceived discrimination was associated with an increased effect of maltreatment on posttraumatic stress symptoms. Ethnic orientation demonstrated protective properties in the relation between maltreatment and AOD problem severity, such that the effect of maltreatment on AOD problem severity was less for girls with average to high ethnic orientation compared to girls with low ethnic orientation.
Conclusions: The findings of this study underscore the importance of developing interventions for Black and Hispanic girls that target maltreatment and AOD use concurrently and address ethnicity-specific factors.

Introduction

Any form of neglect, physical abuse, emotional abuse, sexual abuse, or any combination of these that occurs constitutes maltreatment (Shin, Edwards, & Heeren, 2009). It is widely accepted that maltreatment experiences and alcohol and other drug (AOD) use often co-occur in adolescence (Bensley, Spieker, Van Eenwyk, & Schoder, 1999; Kilpatrick et al., 2000). Studies have found that adolescent girls report more experiences of maltreatment than adolescent boys (e.g., Tubman, Montgomery, Gil, & Wagner, 2004), and some reports indicate that as many as 60% of adolescent girls in AOD use treatment have experienced maltreatment (Simpson & Miller, 2002).

In studies with samples comprising adolescent girls who experienced maltreatment, one well-documented psychological correlate is posttraumatic stress symptoms. Findings from both longitudinal and cross-sectional research with adolescents have demonstrated that maltreatment and posttraumatic stress symptoms are linked (Kilpatrick et al., 2000; Lansford et al.,

2002). Further, posttraumatic stress symptoms are thought to be the key link in understanding the relationship between maltreatment experiences and problematic AOD use among adolescents (Kilpatrick et al., 2003).

Adolescent research has also shown significant relations between AOD use and some ethnicity-specific factors, including perceived discrimination (Flores, Tschann, Dimas, Pasch, & de Groat, 2010), ethnic identity (James, Kim, & Armijo, 2000), and ethnic orientation (Gil, Wagner, & Tubman, 2004). Additionally, significant associations among adolescent AOD use, posttraumatic stress symptoms, and ethnicity specific factors have been found (e.g., Flores et al., 2010). However, we could find no studies that examined the relations among maltreatment, posttraumatic symptoms, AOD problems, and ethnicity-specific factors in a single explanatory model. Illuminating these associations would inform clinical interventions targeting problems associated with maltreatment experiences and AOD use in adolescent girls, in particular. Thus, this study examined the relations among maltreatment, posttraumatic symptoms, AOD problems, and ethnicity-specific factors in a cross-sectional sample of Black and Hispanic adolescent girls.

Maltreatment, posttraumatic stress and AOD use among adolescent girls

Among adolescents, research has shown that maltreatment is a strong risk factor for binge drinking even when controlling for parents' problem drinking (Shin et al., 2009), and that younger adolescents (i.e., eighth graders) with maltreatment histories have an eight times greater risk for heavy alcohol use than their non-maltreated counterparts (Bensley et al., 1999). Research has also shown that when the girls are maltreated, they exhibit AOD abuse at younger ages than non-maltreated girls (Kilpatrick et al., 2000). Taken together, these findings suggest that maltreatment experiences significantly increase the risk for AOD problems among adolescent girls.

Maltreatment may increase girls' risk for AOD problems because of resulting or lingering posttraumatic stress symptoms. Findings from clinical research suggest that increased drug and alcohol use are associated with manifestation of posttraumatic stress symptoms, particularly arousal symptoms (Stewart, 1996; Sullivan & Holt, 2008). Findings from maltreatment research with adolescents indicate that adolescents who experienced maltreatment and have PTSD exhibit more AOD use problems compared to maltreated adolescents without PTSD (Saunders, 2003). Furthermore, results from a large national study indicated that adolescents who experienced maltreatment were almost 7 times more likely to have co-occurring posttraumatic stress symptoms and AOD use disorders than their non-maltreated counterparts (Kilpatrick et al., 2003). It may be that adolescents are trying to subdue the aversive effects of posttraumatic symptoms following maltreatment episodes (Hallfours, Waller, Bauer, Ford, & Halpern, 2005) by self-medicating with AOD.

The impact of ethnicity-specific factors

Perceived discrimination, ethnic identity, and ethnic orientation each have been shown to impact mental health and AOD use patterns in ethnic minority adolescents (e.g., Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004; Gil et al., 2004; James et al., 2000). Perceived discrimination has been associated with greater AOD use among ethnic minority adolescents (e.g., Marsiglia, Kulis, & Hecht, 2001). In addition to AOD use, perceived discrimination has also been linked to both physical and mental health problems in ethnic minorities (Brody et al., 2006; Williams & Mohammed, 2009), even in instances where ethnicity is not reported as the sole basis for discrimination (Kessler, Mickelson, & Williams, 1999). For instance, in a community sample of Mexican American adolescents, perceived discrimination was positively associated with posttraumatic stress symptoms, which in turn were positively associated with AOD use (Flores et al., 2010).

Ethnic identity (i.e., perception of self as a group member) and ethnic orientation (i.e., specific group affiliation), two interrelated variables, are thought to be important in research on adolescent AOD use due to their impact on the development of positive self-concept and psychological well-being (James et al., 2000). The findings on ethnic identity and ethnic orientation relative to adolescent AOD use, however, have been mixed, with ethnic identity and orientation demonstrating both positive and negative relations with adolescent AOD use (Zambonga, Schwartz, Jarvis, & Van Tyne, 2009). Some researchers have speculated that these mixed findings regarding ethnic identity and orientation may be context driven. They have suggested that in sociodemographic contexts where ethnic minority youth are the numerical majority, the protective roles of ethnic orientation and identity differ from those of ethnic minority youth who are also numerical minorities, due to the youth's interpretations of the social standing of particular ethnic groups (e.g., Marsiglia, Kulis, Hecht, & Sills, 2004).

A larger group of researchers have posited that the mixed findings may be attributable to methodology: empirical investigations of ethnic identity and ethnic orientation in unidimensional and univariate models that may mask the nuanced relations among ethnic identity, ethnic orientation, and youth's AOD use, whereas dynamic, multivariate models reveal them (e.g., Pugh & Bry, 2007; Zambonga et al., 2009; Zambonga, Raffaelli, & Horton, 2006). For example, in a sample of college students, one group of researchers found a significant interaction between ethnic identity and gender on alcohol use, such that ethnic identity was positively associated with heavy alcohol use for males, but the association between ethnic identity and alcohol use was not significant for females—a finding that would not have been identified in a univariate framework (Zambonga et al., 2006). Given the divergent literature, more research is needed to add to what is known about the impact of ethnic identity and ethnic orientation on youth.

In summary, scant research has shown significant relations among posttraumatic stress symptoms, ethnicity-specific factors (i.e., perceived discrimination), and AOD use among adolescents (Flores et al., 2010). However, the risk and protective roles of broad ethnicity-specific factors on AOD use have not been explored in Hispanic and Black adolescent girls with

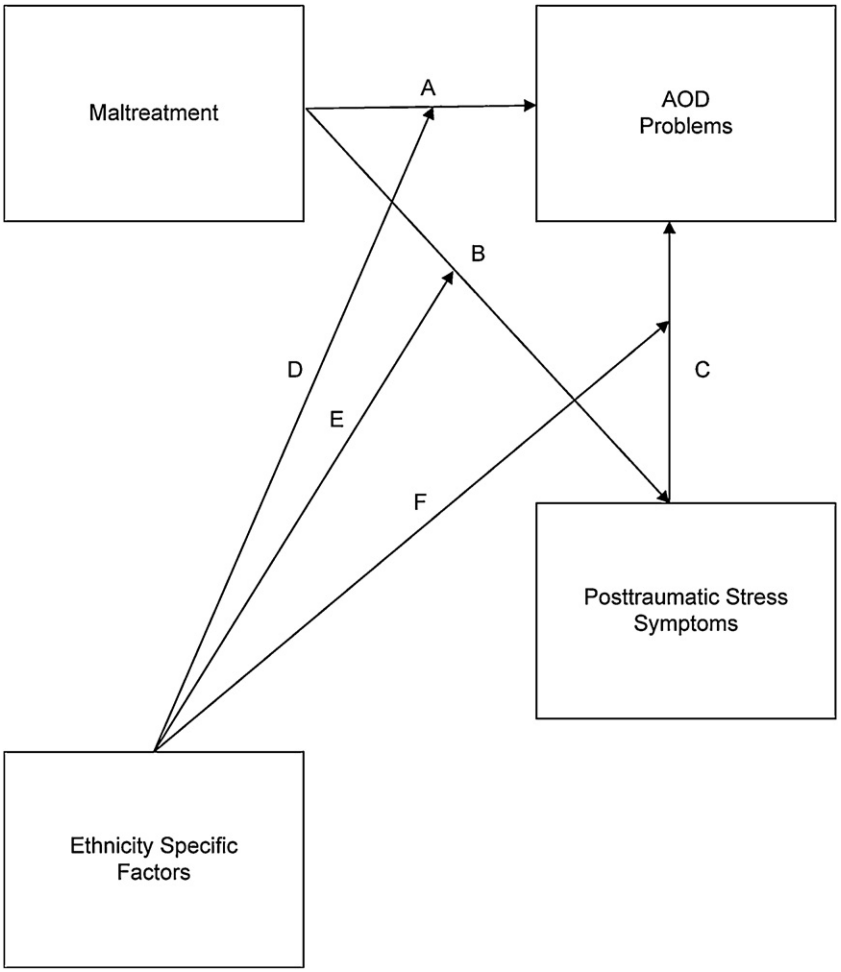


Fig. 1. Conceptual SEM model.

maltreatment experiences. Considering the gaps and paucity in empirical research on the links among AOD use, posttraumatic stress symptoms, and maltreatment experiences in samples of ethnic minority adolescent girls, more work is needed (Toth & Cicchetti, 2006). Such work could inform efforts to integrate ethnicity-specific factors into future AOD treatment interventions for maltreated adolescent girls.

The present study

The present study investigated the relations between maltreatment, posttraumatic stress symptoms and AOD problems in Black and Hispanic adolescent girls, including the impact of ethnicity-specific factors on these relations. The hypothesized associations between girls' maltreatment experiences, posttraumatic stress symptoms, ethnicity-specific factors and AOD problems can be summarized in a model that depicts relations among these constructs (see Fig. 1). First, based on literature suggesting significant relations between maltreatment and AOD problems (e.g., Kilpatrick et al., 2000) and posttraumatic stress symptoms and AOD problems in adolescents (e.g., Kilpatrick et al., 2003), it was predicted that maltreatment (Path A) and posttraumatic stress symptoms (Path C) would be related to AOD problems (i.e., AOD problem severity and diagnoses). Specifically, it was expected that maltreatment and posttraumatic stress symptoms would both be positively associated with AOD problems.

Also of interest was the mediated relation between maltreatment and AOD problems via posttraumatic stress symptoms. Existing literature suggests that maltreatment is associated with the manifestation of posttraumatic stress symptoms, which in turn are associated with AOD problems among adolescents (e.g., Hallfours et al., 2005). To that end, it was expected that maltreatment and posttraumatic stress symptoms would be positively associated with AOD problems (Paths A and C), but that posttraumatic stress symptoms would partially mediate the relation between maltreatment and AOD problems (Path B).

Finally, this study aimed to explore the moderated effect of ethnicity-specific factors (i.e., perceived discrimination, ethnic identity, and ethnic orientation) on the relations among maltreatment experiences, posttraumatic stress symptoms and AOD problems. Developmental research has shown that perceived discrimination demonstrates greater risk for adolescent AOD use (e.g., Flores et al., 2010) whereas stronger ethnic identity and orientation are likely protective factors for adolescent AOD use (e.g., James et al., 2000). Thus, it was also expected that ethnicity-specific factors would moderate the relationships between maltreatment experiences (Paths D and E), posttraumatic stress symptoms (Path F), and AOD problems. Specifically, it was hypothesized that greater perceived discrimination would be associated with increased risk for AOD problems, and greater ethnic identity and ethnic orientation would be associated with decreased risk for AOD problems, for both Black and Hispanic girls.

Methods

Participants

This study used archival data from Black and Hispanic adolescent girls ($n = 168$) who participated in a larger study (R21AA014914, PI: Montgomery; $N = 185$) designed to investigate the efficacy of a Guided Intervention for Real Life Skills (GIRLS), a brief motivational school-based intervention for reducing girls' AOD use. Because the current study sought to investigate the hypothesized relations among Black and Hispanic adolescent girls, exclusively, data collected from girls of other ethnicities were not included ($n = 17$). Girls who self-identified as African American ($n = 33$), Caribbean Black ($n = 12$), and Black Hispanic ($n = 9$) comprised the group of Black adolescent girls. Girls who self-identified as White Hispanic comprised the group of Hispanic adolescent girls ($n = 114$). All participating girls (1) had signed IRB-approved parental consent and adolescent assent on file; (2) used AOD at least 6 times within the 3 months prior to screening; and did not have (3) current suicidal risk; or (4) a developmental delay that would preclude comprehension of study materials.

Most of the girls in the sample were Hispanic (67%) and were US born (73%). All of the girls attended high school and were in the 9th (23%), 10th (38%), 11th (24%), and 12th grades (15%). The sample was almost equally divided on family structure (53% from 2-parent or blended families; 47% from single parent households). The modal education level for both mothers and fathers was a high school diploma. The only significant difference between Black and Hispanic girls with respect to demographic factors was in the number of girls who had repeated a grade; more Black girls had repeated a grade in school than Hispanic girls [χ^2 (1) = 5.30, $p < .05$]. However, most of the girls in the sample had never repeated a grade in school (73%).

Procedures

Participants were recruited from 11 public high schools (ranging in size from approximately 150 to 3,000 students) located in a large urban southeastern city. Brief informational presentations about the GIRLS program (i.e., that it focused on substance use, involved an interview assessment, and was designed for girls and involved only female staff) were given in school assemblies (as permitted by school administrators). All attending girls were asked to submit a confidential form expressing either their interest or disinterest in participating (approximately 1,250 forms were returned). All girls expressing interest ($n = 229$; an average of 12% of girls in the schools involved) received a brief eligibility screening that elicited information regarding the inclusion criteria noted above. Following screening, eligible girls were asked to obtain parental consent ($n = 193$). To girls for whom both signed IRB-approved parental consent and participant assent forms were received, trained research interviewers administered a comprehensive computer-assisted baseline assessment that included questions about their AOD use patterns and maltreatment histories. While completing maltreatment assessments, several girls reported victimization incidents. In each case, the research team followed state and federal guidelines regarding limits of confidentiality and abuse reporting with minors. When appropriate, program staff consulted with school counselors, parents, and other outside entities (e.g., Department of Children and Families Abuse Division) in handling reported incidents. Following the baseline assessment, the girls were randomized into the control or treatment condition and received further assessments; however, only baseline data was used for this study. Each girl was given a $15 gift card to an electronic department store following each assessment.

Measures

Childhood Trauma Questionnaire-Short Form (*CTQ-SF*; Bernstein et al., 2003). Our study used a 20-item version of the CTQ-SF to assess for the frequency of any maltreatment experienced by girls while growing up (e.g., "Someone tried to touch me in a sexual way or tried to make me touch them"). Girls responded to questions using a 5-point Likert scale ranging from (1) *never true* to (5) *very often true*. While the CTQ-SF comprises subscales for various types of maltreatment, the vast majority of girls (82%) who experienced maltreatment reported more than one type. For this reason, we used scores for the total scale in the analyses. In this study, scores that exceeded "2" indicated some reported maltreatment. Research on the psychometric properties CTQ-SF has shown the measure to have good criterion-validity suggesting accurate detection of maltreatment among diverse samples, including adolescents (Bernstein et al., 2003). The Cronbach's alpha value ($\alpha = .82$) in this study demonstrated good internal consistency for the total scale.

Trauma Symptom Checklist (*TSC-40*; Elliott & Briere, 1992). The TSC-40 assesses for frequency of posttraumatic stress symptoms associated with traumatic experiences. The posttraumatic stress symptoms do not meet all PTSD criteria but are predictive of PTSD diagnoses (Briere & Elliott, 1994). Respondents were asked to respond to symptoms experienced in the last 2 months, such as "feeling isolated from others" and "uncontrollable crying" on a 5-point scale ranging from (0) *never* to (4) *extremely often*. In this study, the total scale was used to determine current level of trauma symptomology with scores near or above 2 (i.e., moderate manifestation of trauma symptoms) identified as concerning. The TSC-40 has been reported to have good convergent validity and predictive validity for traumatic experience reports among females (Zlotnick et al., 1996). The Cronbach's alpha value for the total scale ($\alpha = .90$) in this study demonstrated good internal consistency.

Drug Use Screening Inventory-Revised (*DUSI-R*; Tarter, 1990). We used the subscale of the adolescent version of the DUSI-R that assesses AOD use problem severity and consists of 16 items to which girls were asked to respond *yes* or *no* (e.g., "Do you have trouble resisting drugs or alcohol?"). In this study, a total score was derived by summing the number of items to which girls responded affirmatively. The proportion of items endorsed indicates the problem density for AOD use. Results from validation studies with diverse samples of adolescents showed that the DUSI has good construct and predictive validity, as well as internal reliability (e.g., Tarter & Kirisci, 2001). The Cronbach's alpha value ($\alpha = .76$) in this study demonstrated acceptable internal consistency.

Composite International Diagnostic Interview (*CIDI*; Kessler et al., 1994). Girls were assessed for alcohol abuse, alcohol dependence, drug abuse, and drug dependence using the Brief Michigan Composite International Diagnostic Interview (CIDI) developed by Kessler and colleagues. The CIDI has been widely used in epidemiological research and with multiple ethnic groups including Hispanics/Latinos and African-Americans and has demonstrated excellent reliability and validity (Haro et al., 2006). In this study, the CIDI diagnoses were significantly correlated with DUSI-R ($r = .44$–$.50$) demonstrating good concurrent validity.

Perceived discrimination. A measure developed by Williams, Yan, Jackson, and Anderson (1997) was used to assess girls' perceived discrimination. The measure evaluated girls' perceptions of discrimination in settings such as shopping centers, police interactions, school, and so on (e.g., "You receive worse services than others at restaurants or stores"). Fourteen items were dichotomously scored (i.e., 0 = No, 1 = Yes). In this study, a total score was derived by summing the number of items to which girls responded affirmatively. Results from validation studies with samples of Blacks and Hispanics show that the measure demonstrates good construct validity and test–retest reliability (e.g., Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005). The Cronbach's alpha value ($\alpha = .73$) in this study was acceptable.

Multigroup Ethnic Identity Measure (*MEIM*; Phinney, 1992). We used a 6-item version of the MEIM which evaluated individuals' perceptions of their membership, attitudes and pride in their ethnic group. Participants were asked to report the ethnic group to which they felt they were a member. Following identification of a particular ethnic group, participants were asked to respond to questions relative to their identified ethnic group (e.g., "I am active in clubs or groups that include mostly other kids in my ethnic group"). The items were rated on a 5-point Likert scale from (1) *strongly disagree* to (5) *strongly agree*. The measure has been used in many different countries and with many ethnicities and has maintained its strong psychometric properties [e.g., Hispanics (Gamst et al., 2002) and Zimbabweans (Worrell, Conyers, Mpofu, & Vandiver, 2006)]. The Cronbach's alpha value ($\alpha = .74$) in this study indicated acceptable internal consistency.

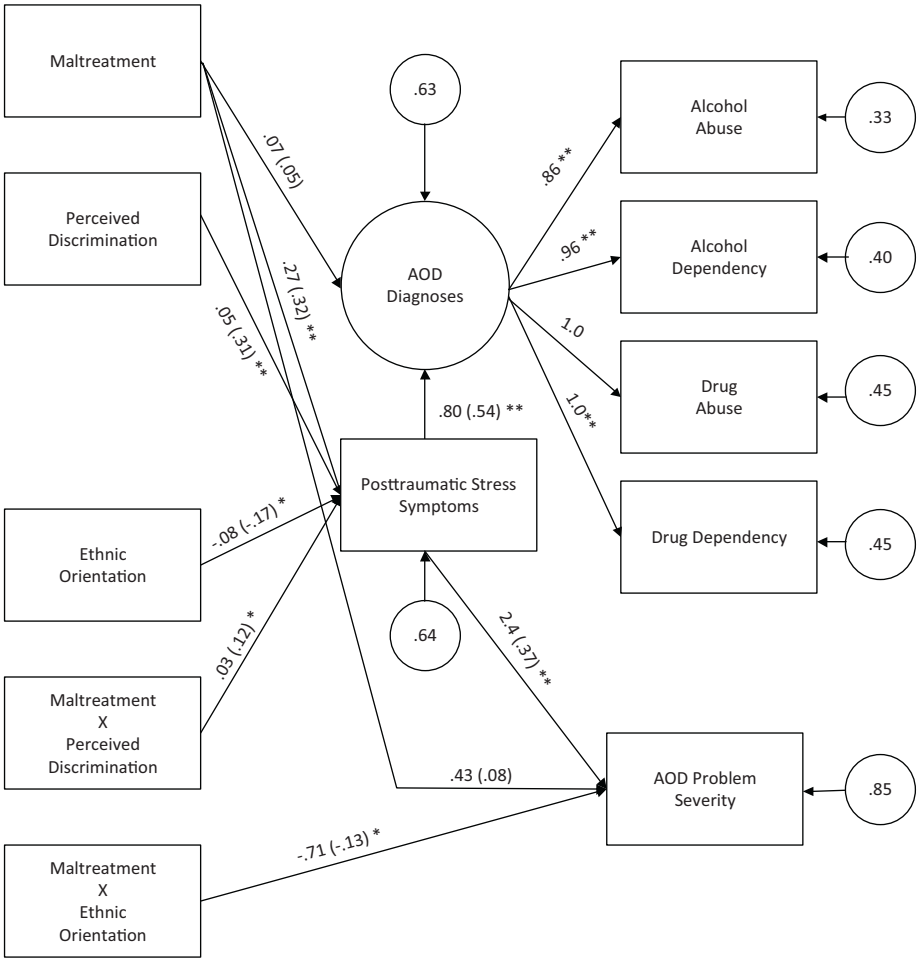
Ethnic orientation. Girls' ethnic orientation was assessed using a measure adapted from the work of Cuellar, Harris, and Jasso (1980) with Hispanics. Girls were asked to respond to 11 items evaluating their sense of ethnic pride and orientation to their respective ethnic groups (e.g., "Your ethnic heritage is important in your life") on a 5-point Likert scale from (1) *strongly disagree* to (5) *strongly agree*. The measure has been used in other research studies with Black and Hispanic adolescents who use AOD and has demonstrated good construct validity and internal reliability (e.g., Gil et al., 2004). The Cronbach's alpha value ($\alpha = .82$) in this study demonstrated good internal consistency.

Demographics. Specific questions were asked to collect background information from girls, including questions regarding grade, academic status, ethnicity of girls and parents, religious affiliation, family structure, and parental education/vocation.

Results

This study tested a relational model examining the links between maltreatment experiences among girls and their AOD problems using structural equation modeling (SEM) techniques in Mplus 4.1 (Muthén & Muthén, 2006). SEM analysis was used to estimate the direct and indirect effects of independent and mediating factors with a single indicator path analytic approach and a robust weighted least squares solution.

To reduce clutter in the figure (see Fig. 2), not all details of the analyses are apparent, including: (1) girls' grade, school attended (school variable was dummy-coded), and ethnicity (Black vs. Hispanic) were included as covariates for AOD problem variables and posttraumatic stress symptoms; (2) direct paths were included from (a) maltreatment, (b) ethnic identity, (c) ethnic orientation, and (d) perceived discrimination to AOD problem variables; (3) the path model included correlated errors for variables where it was reasonable to assume that factors other than a common cause (i.e., a variable that is modeled with direct paths to multiple variables) were influencing the correlation between variables; and (4) moderated effects of ethnicity-specific factors on the relation between posttraumatic stress symptoms and AOD problems were modeled using limited information estimation approach (more on this below).



Note: * $p < .05$ ** $p < .001$. Rectangles represent observed (measured) variables. The straight lines with arrows from observed variables represent presumed causal pathways. The values along the pathways are path coefficients. All standardized estimates are in parentheses. The values in the circles represent percentage of unexplained variance; however, for AOD diagnoses values in circles are random error related to measurement. All exogenous variables are assumed to be correlated. All standardized error variances for dependent variables were correlated.

Fig. 2. Final structural model. *Note*: *$p < .05$; **$p < .001$. Rectangles represent observed (measured) variables. The straight lines with arrows from observed variables represent presumed causal pathways. The values along the pathways are path coefficients. All standardized estimates are in parentheses. The values in the circles represent percentage of unexplained variance; however, for AOD diagnoses values in circles are random error related to measurement. All exogenous variables are assumed to be correlated. All standardized error variances for dependent variables were correlated.

Descriptive analyses

The minimal missing data (<1%) were imputed using the SPSS 17.0 missing value analysis, which utilizes Expectation-Maximization (EM) method with importance re-sampling as described in King, Honaker, Joseph, and Scheve (2001). Outlier analyses included both non-model based and model based evaluations of variable data. No outliers were found in these data. Table 1 presents the means and standard deviations for the study variables and results from an evaluation of intergroup differences between Blacks and Hispanics. Intercorrelations were computed for predictor variables to assess for mulit-collinearity (see Table 2). Statistical significance for correlations was determined using Holm-Modified Bonferroni method (Holm, 1979).

In this sample, 135 (80%) girls reported 1 or more forms of abuse or neglect. Of these girls, 60% reported histories of emotional abuse, 37% reported physical abuse, 36% reported emotional neglect, 20% reported sexual abuse, and 2% reported physical neglect. With respect to AOD diagnoses, 41% met criteria for alcohol abuse, 20% for alcohol dependency, 42% for drug abuse, and 27% met for drug dependency.

Table 1
Descriptive statistics for study variables.

Continuous variables	African Americans ($n = 54$)		Hispanics ($n = 114$)		t (166)
	M	*SD*	*M*	*SD*	
Posttraumatic stress symptoms	1.95	.53	1.92	.47	−.43
Maltreatment experiences	2.00	.54	1.97	.60	−.29
Perceived discrimination	6.05	2.79	4.93	2.99	−2.37*
Ethnic orientation	2.61	.82	2.82	1.07	1.41
Ethnic identity	2.95	.82	2.46	.77	−3.74**
AOD problem severity	4.44	3.32	6.10	3.03	3.20**

Dichotomous variables	African Americans ($n = 54$)		Hispanics ($n = 114$)	
	n	%	*n*	%
Met alcohol abuse diagnosis	20	37.0	49	43.0
Met alcohol dependency diagnosis	9	16.7	25	21.9
Met drug abuse diagnosis	18	33.3	53	46.5
Met drug dependency diagnosis	8	14.8	38	33.3†

* $p < .05$.
** $p < .01$.
† Chi-square results indicated a significant difference in the number met for drug dependency diagnosis (χ^2 (1) = 6.32, $p < .01$).

Modeling mediation and moderation

To evaluate hypothesized mediated relations (i.e., whether posttraumatic stress symptoms mediated the relation between maltreatment and AOD problems), the joint significance test recommended by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) was used. This method simultaneously tests whether the independent variable is related to the hypothesized mediators and whether the hypothesized mediators are related to the dependent variable. The joint significance test has improved statistical power than other tests of mediation while retaining adequate control over Type I error rates (MacKinnon et al., 2002).

With respect to moderation, preliminary analyses were conducted using a limited information estimation approach (Bollen, 1996). The limited information estimation approach included division of the model into smaller clusters for analyses using SEM techniques. Each cluster comprised one interaction term and the two variables for which the interaction term moderated their relationship. This approach was used to assess the significance of each interaction term individually in order to make a decision to include or trim an interaction term from the full model.

During the limited information estimation modeling approach with the interaction terms, a significant interaction between maltreatment scores and scores on ethnic orientation was found, such that the relation between maltreatment scores and AOD problem severity scores changed as a function of ethnic orientation scores. In an effort to explore this relationship further, the path from maltreatment to AOD problem severity was retained in the full model. The moderated effects of ethnicity-specific factor scores on the relation between posttraumatic stress symptoms scores and AOD problem severity scores were modeled; however, none were significant so they were trimmed from final model.

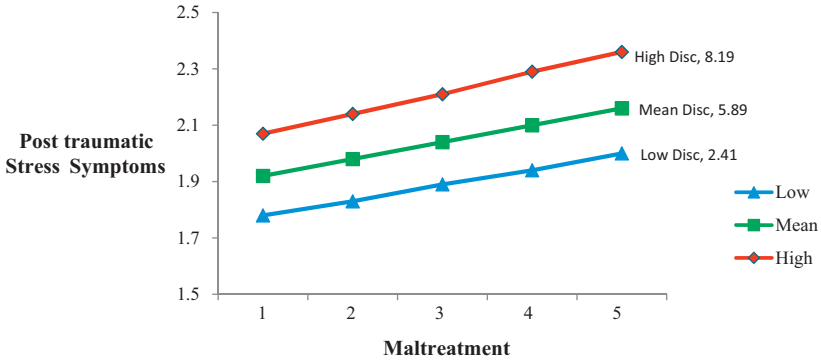
Final analyses

To evaluate model fit, this study utilized 1 absolute fit index (compares the observed and predicted covariance matrices), 1 relative fit index (how model compares to a null or baseline model), and 2 penalty fit indices (how parsimonious the model is). First, the absolute fit index, the overall chi square was examined and non-significant chi square values indicated good model fit. Next, the Tucker Lewis Index (TLI), a relative fit index was examined and values of .95 or greater indicated a good model fit. Finally, the 2 penalty fit indices were examined. The Root Mean Square Error (RMSEA) was examined and values less than .08 indicated good model fit. The *p* value for Close fit test was examined and values greater than .05 indicated good model fit.

Table 2
Intercorrelations for study variables.

Variable	1	2	3	4	5	6
1. Posttraumatic stress symptoms	–	.48*	.45*	−.22*	.08	.34*
2. Maltreatment experiences		–	.40*	−.15	.10	.20
3. Perceived discrimination			–	−.02	.29*	.09
4. Ethnic orientation				–	−.08	−.05
5. Ethnic identity					–	−.01
6. AOD problem severity						–

* Significance at critical values calculated using Holm Modified Bonferroni correction for experiment-wise error.



Note: Disc = Perceived Discrimination; high perceived discrimination is defined as one standard above the mean and low perceived discrimination is defined as one standard deviation below the mean.

Fig. 3. Moderated relation of maltreatment and trauma symptoms by perceived discrimination. *Note*: Disc = perceived discrimination; high perceived discrimination is defined as one standard above the mean and low perceived discrimination is defined as one standard deviation below the mean.

The full model was estimated and all indices pointed toward good model fit. The overall chi square of model fit for the final model was statistically non-significant [χ^2 (31) = 35.92, p = .24]. The TLI was .97. The RMSEA was .03. The p value for the test of close fit was .74. Inspection of residuals revealed no ill-fit in the model, and no modification indices of theoretical or statistical relevance were revealed.

None of the covariates in the model were significant. With regard to the individual paths, the paths from maltreatment to AOD problem severity (B = .43, *ns*) and AOD diagnoses (B = .07, *ns*) were non-significant suggesting that maltreatment experiences alone do not directly impact problematic AOD use. However, girls' reports of posttraumatic stress symptoms were significantly positively related to AOD problem severity scores and AOD diagnoses (see Fig. 2).

The results showed that as the girls' maltreatment scores increased, posttraumatic stress symptoms scores also increased (B = .27, p < .01); posttraumatic stress symptoms scores, in turn, were significantly associated with an increased likelihood that the girls qualified for a diagnosis of an AOD diagnosis of abuse or dependency (OR = 2.23; 95% CI = 1.58, 2.88) and experienced increased AOD problem severity scores (B = 2.4, p < .01).

While not of primary interest in this study, the direct paths from perceived discrimination (B = .05, p < .01) and ethnic orientation (B = −.08, p < .05) to posttraumatic stress symptoms were significant. The direct path from ethnic identity to posttraumatic stress symptoms was not significant (B = −.01, *ns*).

Perceived discrimination was a significant moderator in the relation between maltreatment and posttraumatic stress symptoms, such that when perceived discrimination scores are at the mean, each unit increase in maltreatment scores translates into a .27 unit increase in posttraumatic stress symptoms scores (see Fig. 3). When perceived discrimination scores are at the mean plus 1 standard deviation (high perceived discrimination), each 1 unit increase in maltreatment scores translates into a little over a third of a scale point (.36 unit) increase in posttraumatic stress symptoms scores.

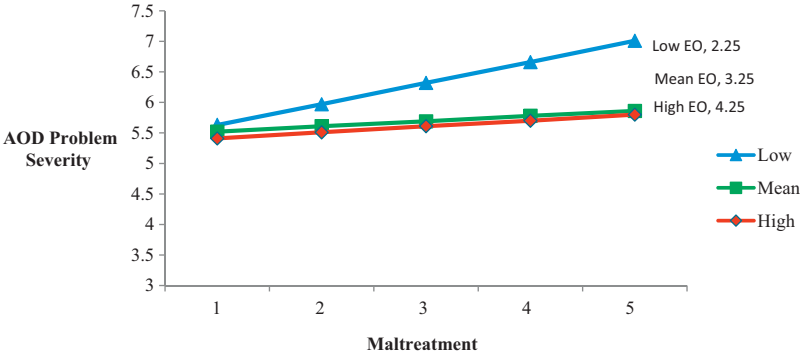
Additionally, ethnic orientation was a significant moderator in the relation between maltreatment and AOD problem severity, such that when ethnic orientation scores are at the mean, each 1 point increase in maltreatment scores translates into a .43 unit increase in AOD problem severity scores (see Fig. 4). When ethnic orientation scores are at the mean minus 1 standard deviation (low ethnic orientation), each 1 unit increase in maltreatment scores corresponds to a 1.72 unit increase in AOD problem severity scores, which translates into almost 2 additional problems related to AOD. The results also showed that ethnic identity was not a significant moderator.

Discussion

This study examined the relation between maltreatment experiences and AOD problems in a sample of Black and Hispanic adolescent girls who were participants in a school-based AOD use intervention. Two primary hypotheses were delineated and tested with this sample. First, it was hypothesized that maltreatment would predict AOD problems with these girls, but that posttraumatic stress symptoms would mediate the relation between maltreatment and AOD problems. Second, it was hypothesized that perceived discrimination, ethnic identity and ethnic orientation would moderate the maltreatment-AOD problem relation. The study's results demonstrated partial support for both hypotheses.

Maltreatment, posttraumatic stress symptoms and AOD problems

Previous research has shown causal pathways in the relationship between maltreatment and AOD use (Kilpatrick et al., 2000). However, the results in this study did not suggest a direct relation between maltreatment and AOD problems with adolescent girls. Using a statistical approach which accounted for all parts of the model simultaneously, the relation between



Note: EO = Ethnic orientation; high ethnic orientation is defined as one standard above the mean and low ethnic orientation is defined as one standard deviation below the mean.

Fig. 4. Moderated relation of maltreatment and AOD problem severity by ethnic orientation. *Note*: EO = ethnic orientation; high ethnic orientation is defined as one standard above the mean and low ethnic orientation is defined as one standard deviation below the mean.

maltreatment and AOD problems was not significant in the context of posttraumatic stress symptoms, which better explained the variation in AOD problem reported by girls.

The results showed that on average, girls who experienced maltreatment exhibited higher levels of posttraumatic stress symptoms, exhibited more AOD problems, and were more likely to meet diagnostic criteria for AOD abuse and dependency than non-maltreated girls. The literature suggests that the mood-altering effects of AOD may help relieve the persistent, intrusive thoughts and feelings associated with past traumas (Hallfours et al., 2005). Some researchers contend that the experience of being maltreated is so traumatic for some adolescent girls that they develop cognitive dysfunction, including the inability to evaluate risks, inability to form a positive self-concept (Briere & Elliott, 1994), and impulsivity (Brodsky et al., 2001). It is, perhaps, the resulting cognitive dysfunction that increases adolescent girls' vulnerability to engage in AOD use when attempting to allay their trauma symptoms.

Maltreatment and associated posttraumatic stress symptoms were linked to adolescent girls' AOD use. These results suggest that adolescent AOD-use interventions may be inadequate for maltreated girls if they are not combined with therapy specifically targeting maltreatment experiences. Abused girls may be particularly ill-equipped to handle the emergence of their posttraumatic stress symptoms in the absence of AOD. These maltreated girls may (1) reengage in AOD use to lessen the effects of trauma symptoms; (2) cognitively dissociate to cope in the absence of AOD; or (3) simply experience or "live with" increased maltreatment-related trauma symptoms. None of these coping methods are adaptive or effective long-term. Ideally, future interventions would target both AOD use and trauma resulting from maltreatment experiences concurrently (Amaro et al., 2005). Effective interventions targeting AOD problems and trauma symptoms simultaneously with adult women have been adapted for younger populations and may hold promise for promoting adaptive functioning with adolescent girls (Najavits, Gallop, & Weiss, 2006).

Impact of ethnicity-specific factors

This study also examined the effect of ethnicity-specific constructs on the relations between maltreatment, posttraumatic stress symptoms, and AOD problems. The results showed that perceived discrimination significantly moderated the relation between maltreatment and posttraumatic stress symptoms. Perceived discrimination worsened the impact of maltreatment on posttraumatic stress symptomology among maltreated girls. Because the TSC-40 was not developed to be a diagnostic or clinical instrument (Elliott & Briere, 1992), any conclusions regarding the clinical significance of this finding remain speculative; however, given the statistically significant results and the body of literature citing the negative physical and mental health effects of perceived discrimination, there are practical inferences that can be made.

Our findings suggest that discrimination experiences have the capacity to *double traumatize* these adolescents by distorting their perceptions of themselves and compounding their pre-existing negative feelings stemming from maltreatment (Bernard, 2002). Research has shown that perceived discrimination is a chronic stressor that disproportionately impacts ethnic minorities and has a deleterious impact on myriad health outcomes (Williams & Mohammed, 2009). This study operationalized perceived discrimination to include reports of these experiences among ethnic minority adolescents irrespective of reported reasons for discrimination. This methodology has been used in previous empirical work in this area that found that the discrimination experiences—not the reasons for the experiences—are associated with poor health outcomes (Kessler et al., 1999; Williams et al., 1997). These findings are also supported by theoretical work suggesting perceived discrimination is a chronic stressor that is salient for many ethnic minorities (Williams, Neighbors, & Jackson, 2003).

Studies have not yet illuminated the unique impact of perceived discrimination among ethnic minority groups beyond Black and White comparisons (e.g., Williams et al., 2003). More precise explanations in this area would advance knowledge. For example, in this study, Black adolescent girls reported significantly more perceived discrimination experiences than their

Hispanic counterparts; however, evaluation of the model suggested that the relations between discrimination and other variables did not significantly differ for the two groups. Clearly, additional research is needed to elucidate the mechanisms underlying the findings.

While ethnic identity was significantly correlated with perceived discrimination, it was not significantly correlated with ethnic orientation as expected. Additionally, it was not associated with other variables in the model and did not moderate any model effects. However, ethnic orientation was a significant moderator in this study, such that as ethnic orientation increased, the magnitude of the relation between maltreatment and AOD problems was lessened. Conversely, low levels of ethnic orientation were associated with an increased negative impact of maltreatment on AOD problems as compared to mean and high ethnic orientation levels. Essentially, ethnic orientation acted as a protective mechanism in this relation. While this relation has not been explored in maltreatment-AOD use research, adolescent AOD research has evidenced ethnic orientation to be significantly related to AOD use. Results have been mixed, but research has shown ethnic orientation to be a significant protective factor against drug use for Hispanic (e.g., Zambonga et al., 2009) and Black adolescents (e.g., Gil et al., 2004).

Findings from extant research and the current study underscore the importance of including constructs that examine different contextual elements when studying ethnic-minority populations. Without any attention to the role of ethnicity-specific variables when treating maltreatment and AOD problems, many Black and Hispanic adolescent girls may not receive the full benefits of interventions (Toth & Cicchetti, 2006). Though not specifically with girls who experienced maltreatment, work in this area has already begun. In particular, culturally informed approaches to adolescent AOD treatment that include ethnicity-specific factors have been developed. Moreover, research findings on these interventions have shown them to produce better treatment outcomes for ethnic minority adolescents than AOD treatments not inclusive of ethnicity specific factors (e.g., Santisteban & Mena, 2009).

Despite its important findings, this study is not without its limitations and implications for future work in this area. First, this study comprised a secondary data analysis of archival retrospective data collected from a sample of adolescent girls' who received AOD use treatment. Thus, our study's research aims, sample, and variables were limited to the design of the original study. For example, the conclusions of this study are based on data obtained from a high-risk urban community sample of diverse adolescent girls using AOD who had volunteered to be in a program addressing questions and concerns about substance abuse; no conclusions can be drawn regarding girls who had been maltreated but were not using AOD or who did not volunteer for the study. Additionally, the adolescent girls in this sample were living in a geographic area where there existed minority–majority populations; findings regarding moderation for ethnic orientation and perceived discrimination may differ for ethnic-minority adolescent girls living in areas with differing ethnic compositions.

Maltreatment experiences were evaluated using the CTQ-SF, a well-validated outcome tool, and informative results using the CTQ-SF were established. However, specific facets regarding maltreatment experiences were not evaluated. Optimally, more comprehensive reports of maltreatment including recurrence or length of maltreatment, constellations of maltreatment experiences (sexual and physical abuse vs. physical and verbal abuse), and relationship of the adolescent to the perpetrator should be captured. Data from multiple sources should also be collected to increase reliability of study findings.

Additionally, our study utilized cross-sectional data which precluded causal inferences from being made. For example, the temporal ordering of the manifestation of constructs could not be investigated. Also, questions regarding these relations across time could not be addressed (e.g., does the relation between maltreatment experiences and AOD use weaken or strengthen over time after accounting for effects of ethnicity-specific factors across time). Future research examining links between the constructs in the current study should use a prospective design so that more detailed explanations can be offered.

Finally, one item on the CTQ-SF queried corporal punishment (i.e., "I was punished with a belt, board, a cord, or some other hard object"). The issue of corporal punishment in the context of cultural norms is an area of persistent debate (Gershoff, 2002). Corporal punishment is used in some Black and Hispanic communities and is perceived as normative parenting behavior (McLoyd & Smith, 2002). This study did not distinguish between corporal punishment from maltreatment. Our findings should be interpreted in light of this.

Notwithstanding its shortcomings, this study provided additional support for the body of research on maltreatment and AOD problems in Black and Hispanic adolescent girls. The results underscore the importance of considering the risk and protective effects of ethnicity-related constructs in interventions targeting maltreatment experiences, associated posttraumatic stress symptoms, and AOD use in adolescent girls. The results also highlight the importance of targeting AOD problems and maltreatment concurrently with adolescent girls. In sum, the contributions of this study provide a framework for both researchers and clinicians to refine and reconsider how to address issues of AOD use and maltreatment with adolescent girls, and highlight the importance of doing so.

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