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ENVIRONMENTAL AND SOCIAL RISK FACTORS

Examining the Pathologic Adaptation Model of Community Violence Exposure in Male Adolescents of Color

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The current study examined a model of desensitization to community violence exposure—the pathologic adaptation model—in male adolescents of color. The current study included 285 African American (61%) and Latino (39%) male adolescents (M age = 12.41) from the Chicago Youth Development Study to examine the longitudinal associations between community violence exposure, depressive symptoms, and violent behavior. Consistent with the pathologic adaptation model, results indicated a linear, positive association between community violence exposure in middle adolescence and violent behavior in late adolescence, as well as a curvilinear association between community violence exposure in middle adolescence and depressive symptoms in late adolescence, suggesting emotional desensitization. Further, these effects were specific to cognitive-affective symptoms of depression and not somatic symptoms. Emotional desensitization outcomes, as assessed by depressive symptoms, can occur in male adolescents of color exposed to community violence and these effects extend from middle adolescence to late adolescence.

Exposure to community violence (ECV) has been linked with problems in mental health functioning for male adolescents of color in urban communities (Salzinger, Feldman, Stockhammer, & Hood, 2002). Much of the literature demonstrates strong positive associations between ECV and externalizing symptoms (McDonald & Richmond, 2008), whereas several studies demonstrate low associations between ECV and depressive symptoms (Cooley-Quille, Boyd, Frantz, & Walsh, 2001; Moses, 1999). To explain these findings, the pathologic adaptation model (PAM) suggests that a desensitization process occurs among youth with chronic ECV. To date, few studies have conducted direct tests of the pathways within the PAM. The purpose of the current study was to examine emotional

desensitization effects of community violence exposure in male adolescents of color by testing pathways of the PAM (Ng-Mak, Salzinger, Feldman, & Stueve, 2002). To this aim, the current study examined the linear association between community violence exposure and violent behavior over time and the curvilinear association between community violence exposure and depressive symptoms over time. Testing the model allows us to disentangle the complex effects of ECV on the psychological functioning of male adolescents of color.

EXPOSURE TO COMMUNITY VIOLENCE AND MALE ADOLESCENTS OF COLOR

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Within the general U.S. population, 58.9% of youth ages 14–17 have witnessed community assault in their lifetime (Finkelhor,

Turner, Shattuck, Hamby, & Kracke, 2015) and nearly 48.4% have experienced more than one type of victimization (e.g., physical assault, maltreatment, or witnessing family/community violence; Finkelhor et al., 2015). Despite some declines in violence exposure, ECV remains a “public health epidemic” for adolescents residing in low-income, urban neighborhoods (Bell & Jenkins, 1993; U.S. Surgeon General, 2001). Research with youth of color in urban communities demonstrates that exposure to weapon-related violence is common (Kataoka et al., 2003), with 74% of youth of color witnessing a shooting and 56% witnessing a stabbing (Paxton, Robinson, Shah, & Schoeny, 2004), and youth of color are twice as likely to witness a shooting or a stabbing as White youth in the same school system (Schwab-Stone et al., 1995). Within African American and Latino youth in urban communities, male adolescents are much more likely to witness community violence than female adolescents (Aisenberg, Trickett, Mennen, Saltzman, & Zayas, 2007; Elsaesser & Voisin, 2014; Lambert, Boyd, Cammack, & Ialongo, 2012; Springer & Padgett, 2000). Studies show estimates ranging from 50% to 96% of male adolescents of color witnessing violence in their communities (Fehon, Grilo, & Lipschitz, 2001; Gorman-Smith, Henry, & Tolan, 2004). Further, urban youth experience repeated exposure, with 75% exposed to four or more different violent events during adolescence (Miller, Wasserman, Neugebauer, Gorman-Smith, & Kamboukos, 1999). Repeated exposure heightens the risk of injury and death, and 78% of male youth of color have been physically attacked during adolescence, often more than once (Gaylord-Harden, Cunningham, & Zelencik, 2011).

Exposure to Community Violence and Desensitization Effects

Current theory and practice have held that high levels of ECV lead to more emotional symptoms and more behavioral problems; however, these cumulative stress or trauma models do not explain why youth of color exposed to high levels of violence show lower than expected levels of internalizing symptoms (Boxer et al., 2008). Specifically, the associations between ECV and aggressive behavior are consistent and robust across studies (McDonald & Richmond, 2008), but several studies have found surprisingly low associations between community violence and internalizing symptoms, such as depression (Cooley-Quille et al., 2001; Farrell & Bruce, 1997; Fitzpatrick, 1993; Moses, 1999; Ng-Mak, Salzinger, Feldman, & Stueve, 2004). The unexpected findings for depression may reflect a desensitization process, in which youth “adapt” to violence by adjusting to pain or loss and viewing violence as normal (Cooley-Quille & Lorion, 1999; Fitzpatrick & Boldizar, 1993; McCart et al., 2007; Mrug, Loosier, & Windle, 2008). Desensitization has its origins in behavioral models of learning and is consistent with the concept of habituation—when an organism’s response to a stimulus decreases over time due to repeated or prolonged exposure to the stimulus (Groves & Thompson, 1970). Initial exposure

to stressors of moderate intensity will produce an initial increase in the organism’s response, followed by decrements in organism’s response when repeatedly exposed to the same stimulus (Groves & Thompson, 1970).

One such model of desensitization is the PAM (Ng-Mak et al., 2002), which states that youth begin to respond to high levels of violence with emotional numbing, evidenced by lower than expected levels of emotional symptoms but higher levels of violent behavior (Ng-Mak et al., 2002). The PAM focuses on emotional desensitization, which occurs when an individual experiences a numbing or blunting of emotional reactions to ECV rather than the expected strong emotional response (Funk, Baldacci, Pasold, & Baumgardner, 2004). Depressive symptoms are often used as a proxy for emotional symptoms, and the PAM suggests a curvilinear (inverted U-shaped) relationship between ECV and depressive symptoms but a positive, linear relationship between violence exposure and violent behavior. For youth exposed to community violence, affective symptoms of sadness, emptiness, or worthlessness may be blunted as a way to cope with the traumatic nature of violence exposure (Porter, 1996).

This emotional desensitization process appears adaptive in the short term for decreasing depressive symptoms but places youth at elevated risk for callousness, violence perpetration, and additional violence exposure if it becomes habitual (Kerig, Bennett, Thompson, & Becker, 2012; Ng-Mak et al., 2002, 2004). In other words, the curvilinear association between ECV and depressive symptoms may predict higher levels of aggressive behavior over time. Specifically, youth who experience a numbing of emotional reactions to violence exposure may be more likely to view violent and aggressive behavior as normative, lose inhibitions about using violent behavior, and use more dangerous self-protective behaviors (e.g., carrying a weapon; Gorman-Smith & Tolan, 1998; Guerra, Huesmann, & Spindler, 2003; Jenkins & Bell, 1994; Reese, Vera, Thompson, & Reyes, 2001; Spano, Rivera, & Bolland, 2010). Indeed, research demonstrates that exposure to violence across multiple contexts predicts more numbing of sadness, which in turn predicts more aggressive behavior (Allwood, Bell, & Horan, 2011).

Existing studies of the PAM (e.g., Boxer et al., 2008; Gaylord-Harden et al., 2011; Ng-Mak et al., 2004) demonstrate that ECV shows a curvilinear association to depressive symptoms. Although these studies provided much-needed tests of pathologic adaptation, with one recent exception (Mrug, Madan, & Windle, 2015), they are limited by cross-sectional designs that provide little information about the cumulative effects of ECV or the development of behavior problems over time. It is proposed that desensitization to violence is a gradual process occurring over time (e.g., Ferguson, 2014), and there is a need to examine how ECV that is assessed repeatedly over time impacts outcomes. Also, the associations between ECV and aggression may be masking the effect of aggressive behavior that occurs before measurement of ECV (Bartholow, Bushman,

& Sestir, 2006), and there is a need to control for baseline rates of violent behavior. As such, there is a need for a longitudinal examination of the PAM that focuses on community violence in male youth of color from underresourced urban communities.

Further, the PAM highlights the role of blunted affective or emotional responses to ECV as typically assessed by depressive symptoms, but depression is a multifaceted construct consisting of not only affective symptoms (e.g., sadness, crying) but also cognitive (e.g., feelings of worthlessness and guilt) and somatic (e.g., headaches, nausea) components (Beck, 2011). African American and Latinos exposed to uncontrollable stressors within the context of societal inequalities may exhibit various components of depression with greater frequency than other components (Kirmayer & Young, 1998). For example, African American youth may be less likely to exhibit affective symptoms associated with dysphoric mood (Politano, Nelson, Evans, Sorenson, & Zeman, 1986), and studies with both African American and Latino youth suggest a more prominent role for somatic symptoms in the expression of internalizing disorders than other features of the disorders (Reynolds, O’Koon, Papademetriou, Szczygiel, & Grant, 2001; Roberts, 1992; VanVoorhis & Blumentritt, 2007). In addition, the co-occurrence of somatic symptoms and aggressive behaviors is significantly more common in adolescents from low-income urban communities than in the normative population (Grant et al., 2004), suggesting that associations to ECV may differ for symptoms of affective and cognitive symptoms versus somatic complaints. Given that somatic symptoms are reported with higher frequency among youth of color, somatic symptoms may be more immune to desensitization effects than affective or cognitive symptoms of depression.

THE CURRENT STUDY

For male adolescents of color in urban communities, ECV has a significant influence on daily life and impinges negatively on optimal developmental outcomes (Kuther & Wallace, 2003). Thus, it is imperative that researchers devote efforts to advancing the construct empirically. The PAM offers a paradigm for understanding variations in the impact of ECV on adolescent development that challenges prior research and theory (Ng-Mak et al., 2004). Adolescence is an ideal developmental stage to examine such patterns in ECV in this population, as behavioral patterns related to violence and aggression, which may emerge during childhood or early adolescence, reach their peak prevalence during this time (e.g., Tolan, Gorman-Smith, & Henry, 2003). The current study builds on existing research in this area in a number of ways. First, the study focuses specifically on ECV in a subgroup of adolescents that is more likely to be exposed than other groups. Second,

although male adolescents are more likely than female to show pathologic adaptation to violence (Ng-Mak et al., 2002), no existing studies test the model in an all-male sample of color. Also, implicit in the PAM is the notion that desensitization is the result of repeated exposure over time. The current study used data from multiple time points to test the PAM by examining the cumulative effect of ECV on desensitization outcomes. Finally, the current study examined desensitization effects for various components of depression. Consistent with prior research, it was hypothesized that ECV would predict higher levels of violent behavior over time. It was also predicted that ECV would show a curvilinear negative (inverse-U) association to depressive symptoms over time, reflecting pathologic adaptation. Finally, it was predicted that the curvilinear negative association of ECV to depressive symptoms would be specific to affective and cognitive components of depression, whereas ECV would show a linear association to somatic symptoms.

METHODS

Participants

Data for the current study were derived from the Chicago Youth Development Study (CYDS), which investigated developmental pathways leading to the onset and participation in antisocial behaviors during early adolescence. Data collection for the original longitudinal study started in 1991 and spanned 11 waves over 20 years. Participants and their caregivers were surveyed annually over 5 years with multimodal assessments. During the first wave of interviews, there were 341 fifth- and seventh-grade male adolescents (range = 11–14 years, *M* age = 12.41 years). Specifically, these youth included 208 African American and 133 Latino male participants residing in urban neighborhoods characterized by high violence and high poverty. Among these individuals, 62% lived in single-parent homes, 47.6% had a total family income less than \$10,000 per year, and 73.5% had incomes less than \$20,000 per year.¹

In the current study, 285 participants who were interviewed during Waves 2–4 (84% of those interviewed during Wave 1) were included in the analyses. These participants completed measures assessing both exposure to community violence and violent behavior at least once during Waves 2–4. Of the 285 participants interviewed during Waves 2–4, 250 participated in at least one interview during Waves 5 and 6 (73% of those interviewed during Wave 1; 88% of those interviewed during Waves 2–4). Cross-sectional analyses examining the distributions of and associations between study variables during middle adolescence

¹The poverty threshold for a family of three with two related children was \$10,973 in 1991 (<https://www.census.gov/hhes/www/poverty/data/threshld/>).

included all 285 participants. Longitudinal analyses included the 250 participants who completed at least one interview during Waves 2–4 and at least one interview during Waves 5 and 6.

Sample Validity

Comparison of this sample with those not continuing after the initial interview yielded no significant differences on initial teacher ratings of aggression, $F(1, 524) = 0.57, p = .45$, or official arrest records (ever arrested) as of Wave 4, $\chi^2(1, N = 298) = 0.37, p = .54$. Comparisons were also made for general purposes between those continuing to participate and those not continuing for each wave on the predictors and behavioral measures. No differences in the current study variables were statistically significant.

Procedure

Participants were initially recruited from the fifth and seventh grades of 17 Chicago public schools. After obtaining parental consent and youth assent for teacher ratings 1,105 male adolescents (92% of fifth- and seventh-grade male students in the school) were screened with the Achenbach Teacher Rating Form (Achenbach, 1991). Potential participants were then selected for participation in the longitudinal study so that 50% of them were considered at “high risk” for the development of serious aggression on the basis of teacher ratings indicating that they were already engaging in high levels of aggressive behavior (above the 90th percentile using national norms). After this categorization, participants were randomly selected from the remainder of those screened. Additional parental consent and child assent were obtained prior to the first wave of assessment.

Participants were interviewed in their homes or in a mutually agreed-upon location by trained interviewers when the youth were in sixth or eighth grades. These interviews lasted between 3 and 3½ hr, and the same information was collected across participants during each wave. After a joint family interaction task, individual interviews were conducted separately with the participant and his caregiver(s). The study was successful in tracking and assessing study participants from Waves 2 to 6. The first cohort was assessed from sixth to 11th grade, and the second cohort was assessed from eighth to 12th grade. More than 73% of the youth participants have self-report data for each of the waves of data collection. Specifically, a majority (86%) of participants have self-report data for at least three of the possible five assessments.

Measures

Demographic Information

Demographic information, including ethnicity, age, parental marital status, income, number of individuals residing in the home, and relationship to the target youth, was collected from the caregiver(s).

Pretest Aggression Status

Prior to the first wave of data collection, teachers completed the Achenbach Teacher Rating Form (Achenbach, 1991) to assess participants’ aggressive behaviors. The Achenbach Teacher Rating Form is a teacher-report measure that assesses academic performance (one item), adaptive functioning (four items), and problem behavior (112 items). The problem behavior items can be categorized into eight syndrome scales, including an Aggressive Behavior scale. Scores on the Aggressive Behavior scale were used in the CYDS study to determine pretest aggression status. Participants with a score above the 90th percentile using national norms were coded as high aggression, and other youth were coded as low aggression (Gorman-Smith & Tolan, 1998).

Community Violence Exposure

Exposure to community violence was measured at Waves 2–5 using the Exposure to Violence Interview, a section of the CYDS Stress and Coping Interview (Tolan & Gorman-Smith, 1991). During each annual interview, participants were asked to indicate the number of times they had witnessed the following five events within the past year: (a) anyone in your family was robbed or attacked (or otherwise hurt intentionally by someone); (b) someone else you know, other than a member of your family, was beaten, attacked, or really hurt by others; (c) you saw anyone beaten up; (d) you saw anyone shot or killed; (e) you witnessed any violent crime (not counting what you have already told me about). Reported frequencies were recoded using the scale of 0 (*none*), 1 (*once*), and 2 (*more than once*). The mean score of these items was computed to create a score for the overall frequency of witnessing community violence averaging across Waves 2–4 (Time 1) and Waves 5–6 (Time 2) separately.

Depressive Symptoms

The 27-item Child Depression Inventory (CDI; Kovacs, 1992) and the 21-item Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) were used as a measure of depressive symptoms. Participants completed the CDI at Waves 2–4. The CDI is a widely used measure of youth depression consisting of 27 items. Each item contains three sentences, and respondents are asked to choose the sentence within each item that most closely describes him or her over the past 2 weeks. The 27 items can be combined to provide a score that measures overall depression, with higher scores indicating higher levels of depression. An overall score for Time 1 was generated by combining scores from Waves 2–4. Cronbach’s alpha for the overall depression score in the current sample was .85 at Wave 1.

Participants completed the BDI at Waves 5–6. The BDI consists of 21 items to assess the intensity of symptoms of depression. Each item is a list of four statements arranged in increasing severity about a symptom of depression. Respondents were asked to choose the sentence within each item that most closely described him over the past 2 weeks. The 21 items can be combined to provide a Cognitive-Affective subscale, a Somatic-Performance subscale, and an overall score of depression, with higher scores indicating more symptoms (Beck, Steer, & Brown, 1996). A score for cognitive-affective symptoms at Time 2, a score for somatic-performance symptoms at Time 2, and an overall score for depression at Time 2 were generated by combining scores from Waves 5–6. To control for Time 1 cognitive-affective symptoms and somatic-performance symptoms, analogous items on the CDI at Waves 2–4 were combined to generate a cognitive-affective score and a somatic-performance score.

Violent Behavior

At each wave, youth participants completed a modified version of the Self-Report of Delinquency (Elliott, Dunford, & Huizinga, 1987). Youth participants indicated the number of times they had engaged in eight violent behaviors within the past year: (a) threw objects at people, (b) became involved in gang fights, (c) hit someone with intent to harm, (d) carried a hidden weapon, (e) hurt or threatened someone for sex, (f) tried to force someone to have sex, (g) used a weapon or force to get something, or (h) attacked someone with a weapon. Reported frequencies for each event were recoded with 0 (*none*), 1 (*once*), or 2 (*more than once*) and weighted for legal seriousness, ranging from an index of 4 (Class A misdemeanors; e.g., Item 1) to an index of 8 (Class 1, corresponding to serious felonies; e.g., Item 8; Tolan et al., 2003). After summing across weighted scores for each item within wave, composite scores were created for violent behavior by averaging across Waves 2–4 (Time 1) and Waves 5–6 (Time 2) separately. Due to positive skewness of the composite scores, natural log transformations were used in the analyses.

RESULTS

Descriptive Analyses

Means and standard deviations for each of the study variables are listed in Table 1. Correlations among the study variables are also presented in Table 1. Consistent with other studies using the CYDS data set (e.g., Brady, Gorman-Smith, Henry, & Tolan, 2008), Waves 2–4 were combined to represent Time 1 and Waves 5–6 were combined to represent Time 2. During Waves 2–4 of the study, 87% of youth reported exposure to violence in the past year and 64% reported exposure to more than one event. Table 2 includes the percentage of youth who witnessed each form of community violence.

Hypothesis 1

Simultaneous multiple regression analyses were conducted to examine Hypothesis 1: ECV would predict higher levels of violent behavior over time. For the predicted linear association between ECV and violent behavior, average participant age at Time 1, participant ethnicity, pretest aggression status, Time 1 violent behavior, and Time 1 ECV were entered as predictors in the model. Results indicated that, as predicted, Time 1 ECV predicted higher levels of violent behavior at Time 2 while accounting for Time 1 violent behavior and demographic variables ($\beta = .14, p = .03$). Also, supplemental analyses indicated that the association between ECV and violent behavior was linear and not curvilinear.

Hypothesis 2

Hierarchical regression analyses were conducted to examine Hypotheses 2 and 3: ECV would show a curvilinear negative (inverse-U) association to depressive symptoms over time. For the predicted curvilinear association between ECV and depressive symptoms, average participant age at Time 1, participant ethnicity, pretest aggression status, and Time 1 depressive symptoms were entered in Step 1 of the model to account for their possible effects on the study variables, the linear Time 1 ECV variable was then entered in Step 2 of the model, and the quadratic Time 1 ECV variable was entered in the final step. Consistent with predictions, results indicated that, controlling for Time 1 depressive symptoms, the association between Time 1 ECV and Time 2 depressive symptoms was curvilinear, as evidenced by a significant increase in the variance accounted for by the quadratic violence term ($\Delta R^2 = .02, p = .03$). The effect of the quadratic term was negative ($\beta = -.39, p = .03$), suggesting that as ECV scores increased, depressive symptoms increased to approximately 1 standard deviation above the mean of ECV, and then depressive symptoms began to decrease as violence exposure continued to increase (see Figure 1).

Hypothesis 3

Consistent with predictions, results indicated that, controlling for Time 1 cognitive-affective symptoms of depression, the association between Time 1 ECV and Time 2 cognitive-affective symptoms was curvilinear, as evidenced by a significant increase in the variance accounted for by the quadratic violence term ($\Delta R^2 = .02, p = .03$). The effect of the quadratic term was negative ($\beta = -.39, p = .03$), suggesting that as ECV scores increased, cognitive-affective symptoms increased to approximately 1 standard deviation above the mean of ECV, and then cognitive-affective symptoms began to decrease as violence exposure continued to increase. Inconsistent with predictions, controlling for Time 1 somatic-performance symptoms of

TABLE 1
Means, Standard Deviations, and Correlations Among the Study Variables

	1	2	3	4	5	6	7	8
1. T1 (Waves 2–4) Violence Exposure	—							
2. T1 (Waves 2–4) Depression (CDI)	.19**	—						
3. T2 (Waves 5–6) Depression (BDI)	.09	.21**	—					
4. T1 (Waves 2–4) Violent Behavior	.41***	.11	.17**	—				
5. T2 (Waves 5–6) Violent Behavior	.25***	.13*	.33***	.32***	—			
6. Pretest Aggression Status	.15**	-.02	.09	.14*	.04	—		
7. T1 (Waves 2–4) Average Participant Age	.04	-.11	.09	.14*	-.06	.09	—	
8. Ethnic Group	-.05	.06	-.04	-.10	-.09	-.13*	-.12	—
M	.41	5.34	4.57	1.06	.90	1.47	15.32	1.35
SD	.28	5.17	5.32	1.18	1.25	.50	1.19	.48

Note: A natural log transformation based on frequencies (none, once, more than once) and weighted for legal seriousness was used to correct skewness in the violent behavior variables. The values for these variables represent the values of the transformed variables. Pretest aggression status: 1 = low aggression, 2 = high aggression; Ethnic group: 1 = African American, 2 = Latino. T = Time; CDI = Child Depression Inventory; BDI = Beck Depression Inventory.
* $p < .05$. ** $p < .01$. *** $p < .001$.

TABLE 2
Percentage of the Entire Sample Exposed to Different Types of Violence Summed Over Waves 2 Through 4

	Percentage Over Waves 2–4		
	None	Once	More Than Once
Times family member robbed or attacked	69.9	19.6	10.6
Times someone other than family beaten	62.5	17.0	20.5
Times seen someone beaten up	19.9	12.2	67.9
Times seen someone shot or killed	67.0	16.7	16.3
Times witnessed violent crime	83.0	5.4	11.5

depression, there was no significant association between the linear Time 1 ECV term and Time 2 somatic-performance symptoms or the quadratic Time 1 ECV term and somatic-performance symptoms.

DISCUSSION

The aim of the current study was to examine the feasibility of a model examining pathologic adaptation to ECV in a sample of African American and Latino male adolescents residing in low socioeconomic urban neighborhoods. The PAM suggests that youth who become emotionally desensitized to violence show less depressive symptoms and more violent behavior. Consistent with predictions for Hypothesis 1, higher levels of ECV in middle adolescence predicted higher levels of violent behavior in late adolescence while accounting for levels of violent behavior in middle adolescence. Also consistent with predictions for Hypothesis 2, higher levels of ECV in middle adolescence showed a curvilinear association with depressive symptoms in late

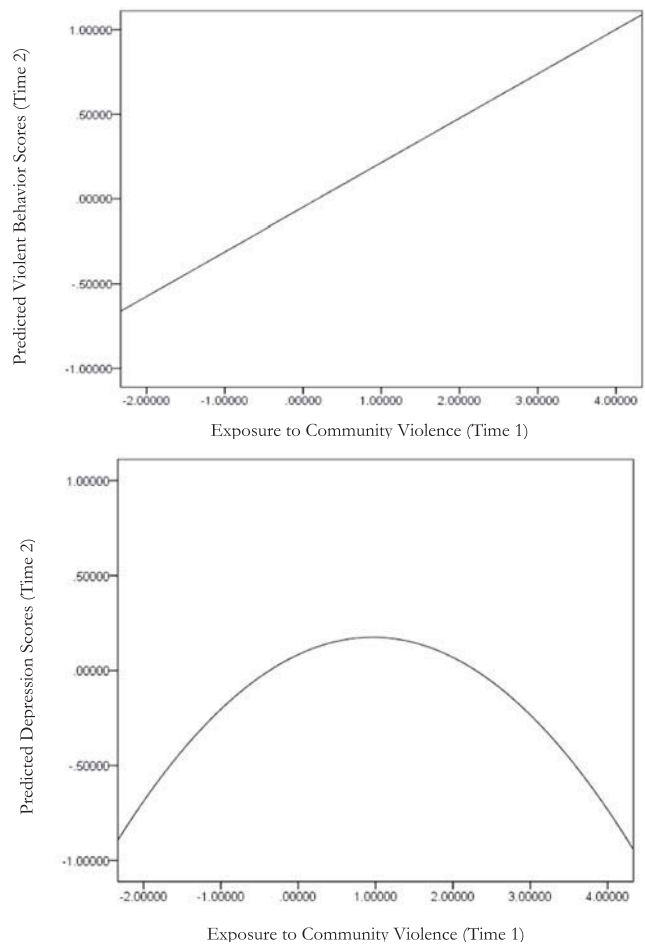


FIGURE 1 Linear and nonlinear associations between community violence exposure at Time 1 (Waves 2–4), violent behavior and depressive symptoms at Time 2 (Waves 5–6). Note: Variables are standardized.

adolescence while accounting for levels of depressive symptoms in middle adolescence. Specifically, as ECV scores increased, depressive symptoms increased to a point, and then the depressive symptoms began to decrease as violence exposure continued to increase. Consistent with Hypothesis 3, the nonlinear association between ECV and depression was specific to cognitive-affective symptoms.

Support for the PAM: Emotional Desensitization Effects

The findings of the current study support emotional desensitization hypotheses in general, and in particular show support for the PAM (Ng-Mak et al., 2002, 2004). Historically, the empirical research on the effects of ECV has been guided by *cumulative stress* or *maladaptation* models, in which more exposure leads to more emotional and behavioral problems (Ng-Mak et al., 2002). However, recent research showing that ECV does not have a linear association to internalizing symptoms (Boxer et al., 2008; Gaylord-Harden et al., 2011; McCart et al., 2007; Mrug et al., 2008; Mrug & Windle, 2010; Ng-Mak et al., 2004) suggests more complex patterns of reactivity to community violence. In the current study, as violence exposure increased, depressive symptoms started low and peaked at moderate levels of ECV. As ECV increased to high levels, depressive symptoms decreased to lower levels. By demonstrating that the association between violence exposure and violent behavior was linear, but the association between violence exposure and depressive symptoms was curvilinear, the findings are in line with this burgeoning body of research on desensitization. Further, the desensitization effect was specific to cognitive-affective symptoms of depression, and not to somatic symptoms. The unique relationship to cognitive-affective symptoms provides additional support for notions of emotional numbing or restrictions in affective symptoms for youth exposed to high levels of ECV (Ng-Mak et al., 2002).

It is unclear why youth may show lower than expected levels of depressive symptoms when they are exposed to high rates of community violence. The traumatic nature of community violence may warrant the need to consider the role of posttraumatic stress disorder (PTSD) symptoms in the discussion of emotional desensitization. PTSD symptoms, including avoidance or numbing of emotions, are common for adolescents who are exposed to community violence (e.g., Dempsey, Stacy & Moely, 2000). In fact, a recent meta-analysis demonstrated that the association of ECV to PTSD symptoms was stronger than its association to internalizing and externalizing symptoms (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltés, 2009). As a consequence of experiencing avoidance or numbing symptoms of PTSD, youth may underreport their affective symptoms of depression (McCart et al., 2007; Mrug et al., 2008). The role of PTSD symptoms in response to violence

exposure, which may reflect physiological hyperarousal, should be considered in future investigations of desensitization to ECV.

Also, although the results of the current study are promising, alternative explanations to desensitization should be considered. For example, recent research suggests that men are significantly more likely to experience symptoms of alternative “male-type” symptoms of depression, such as anger, aggression, irritability, and risk-taking behaviors over traditional symptoms of depression (Martin, Neighbors, & Griffith, 2013). Asking male participants to report on traditional symptoms could lead to underreporting of depressive symptoms (Martin et al., 2013). Further, for male youth of color living in high-crime communities, expressions of sadness or low self-esteem may increase vulnerability to direct victimization (Reynolds et al., 2001; White & Farrell, 2006). Thus, youth may be suppressing depressive symptoms to facilitate their ability to navigate dangerous neighborhoods (Cassidy & Stevenson, 2005). For example, African American male adolescents reported that they were more likely to respond to victimization in the community by acting “tough” or carrying a weapon for protection than feeling depressed (Jenkins & Bell, 1994; Reese et al., 2001), and both Latino and African American male participants report using more confrontive coping to respond to community violence, perhaps to present themselves as “tough” (Rasmussen, Aber, & Bhana, 2004).

The current study extended prior research by applying a longitudinal research design to the examination of desensitization to ECV, as the existing investigations of the PAM (e.g., Boxer et al., 2008; Gaylord-Harden et al., 2011; Ng-Mak et al., 2004) are cross-sectional in nature. Although these studies provide support for emotional desensitization to violence, some research finds that effects of violence exposure on youth developmental outcomes are time-limited (Sharkey, 2010). By including assessments of violence at multiple time points during middle adolescence, the current findings demonstrate that emotional desensitization outcomes are not limited to the immediate effects of ECV and that decreases in depressive symptoms can result from the cumulative effects of violence exposure. Further, the longitudinal design also helps to identify middle adolescence as a particularly vulnerable time for increases in ECV, with effects on emotional and behavioral outcomes that extend into late adolescence. Given the increasing shifts in roles, responsibilities, and expectations that are occurring during this developmental period (Tolan, 2014), increases in a non-normative stressor, such as ECV, may be especially detrimental for optimal developmental outcomes of young male men of color during middle adolescence (Kuther & Wallace, 2003).

Although the findings of the current study were inconsistent with Mrug et al.’s (2015) recent findings, the current study focused on ECV, whereas Mrug et al. focused on violence exposure across multiple contexts. The current

results may be specific to ECV, but there is a need for additional research to fully understand whether the findings are unique to one context. Further, due to methodological constraints in the measurement of ECV, the current study focused on witnessing violence and not victimization. Although witnessing violence produced desensitization effects in the current study, victimization is more likely than witnessing to lead to violent behavior because the greater proximity to violence leads to a stronger emotional numbing response that facilitates violent reactions and provides stronger reinforcement of the effectiveness of violence as a way to solve problems (Fowler et al., 2009; Kerig et al., 2012). Future research with male adolescents of color should assess desensitization effects separately for witnessing violence and victimization.

Limitation and Strengths

The results of the current study should be considered in light of potential limitations. First, we do not have data on the countries of origin for the Latino youth and their families. Second, the current study is limited by reliance on youth self-report of study constructs. Although adolescents' self-report data of ECV (Cooley-Quille et al., 2001) and depressive symptoms (Johnson & Kliewer, 1999; Kazdin, 1990) have shown adequate reliability, reliance on the self-report of constructs may increase the likelihood of shared method variance. Also, because the current sample is a school-based sample, the most violence-exposed or aggressive youth may have dropped out or have been expelled from the school system and thus may have been inadvertently excluded from participation in the study.

Finally, the youth in the current study were African American and Latino youth from families and urban communities experiencing high levels of poverty, violence, and associated stressors. Thus, the generalizability of the findings may be limited to boys of color from these communities. Although large-scale studies that include nationally representative samples of youth find that youth from all racial/ethnic backgrounds and communities experience violence exposure (e.g., Finkelhor, Turner, Ormrod, & Hamby, 2009), the proposed pathways in the current study may be especially relevant for youth in contexts characterized by low resources and high crime. Specifically, desensitization to violence is proposed to be a gradual process occurring over time (e.g., Ferguson, 2014), and communities marked by high crime and violence lead to repeated exposure to violence that may be more likely to result in desensitization than exposure to isolated incidents. In addition, the associations between violence exposure, depressive symptoms, and violent behavior may be influenced and maintained by contextual factors in economically disadvantaged, urban neighborhoods. For example, ethnographic research suggests that African American male adolescents in urban neighborhoods may be influenced by an informal street code that requires

them to obtain the respect of others by acting "tough" and behaving aggressively (Anderson, 1999). The proposed code of the street may develop through a sense of hopelessness resulting from structural, racial, and economic inequalities in urban neighborhoods, and research supports the existence of such neighborhood street codes and their role in increasing delinquent behavior (e.g., Stewart, Schreck, & Simons, 2006; Stewart & Simons, 2010). Thus, there are various societal, community, and individual factors in low-income urban communities that strengthen the association between violence exposure and violent behavior in male youth of color.

Although the composition of the sample may be detrimental to external validity, the focus on male adolescents of color from low-income, urban communities adds important information to existing research on the effects of community violence exposure. To date, youth exposed to the highest rates of community violence have been underrepresented in investigations of the PAM, and the current study explicitly examines this desensitization hypothesis in a subgroup of youth who experience some of the highest rates of community violence exposure. Understanding how community violence exposure leads to desensitization and violent behavior may inform the development of contextually relevant preventive interventions to address health disparities for young men of color residing in communities marked by elevated violence and limited resources. Further the examination of various components of depression highlight the need for intervention efforts to focus on cognitive and affective symptoms of depression. Also, existing studies of desensitization to community violence in youth of color from urban communities are cross-sectional (Boxer et al., 2008; Gaylord-Harden et al., 2011), and there is a need for longitudinal investigations. By using a longitudinal design, the current study controlled for baseline rates of violent behavior. However, the age at which baseline data were obtained in the current study does not account for temperamental aggression or hostility that may have an early onset in childhood. Nevertheless, the current study's longitudinal, prospective design assesses violence exposure over multiple time points, a critical design advantage given that male youth of color in urban communities experience repeated violence exposure over time (Miller et al., 1999).

Clinical Implications

The findings of the current study suggest that male adolescents exposed to high levels of ECV may benefit from programs that focus on reducing violent or aggressive behavior; however, the findings also suggest that there is a need to address depressive symptoms. Comparisons of prevention programs for both depression and violent behavior during adolescence demonstrate that selective prevention programs (i.e., those that target individuals at-risk for symptoms) and

indicated prevention programs (i.e., those that target individuals with symptoms) are more successful than universal prevention programs (i.e., those that target all individuals in a population; Horowitz & Garber, 2006; Limbos et al., 2007; Stice, Shaw, Bohon, Marti, & Rohde, 2009). Researchers and clinicians engaged in screening and selection of youth for such intervention and prevention programs should be aware of the likelihood that depressive symptoms may be muted as ECV increases. As previously noted, a decrease in depressive symptoms at high levels of ECV may be the result of emotional numbing or cognitive denial (Mrug et al., 2008). Although temporarily adaptive, these strategies may have negative, long-term effects on other areas of functioning (Fitzpatrick, 1993; Mrug et al., 2008; Ng-Mak et al., 2002). Thus, youth who show low rates of depressive symptoms in response to ECV may show difficulties in other areas of functioning, such as aggressive behavior, interpersonal relationships, or academic functioning. On the contrary, a decrease in depressive symptoms may reflect stress-related growth in which youth develop more adaptive strategies for coping with ECV due to repeated exposure. As such, intervention techniques should include a comprehensive assessment of multiple aspects of contextually relevant psychosocial and academic functioning using multiple reporters (e.g., caregivers, teachers) to determine the need for intervention (McCart et al., 2007; Mrug et al., 2008). Also, given that emotional numbing is a symptom of PTSD, a thorough assessment of PTSD symptoms should be conducted in intervention settings (Mrug et al., 2008).

Conclusion

Overall, the findings suggest that emotional desensitization outcomes, as assessed by depressive symptoms, can occur in male adolescents of color exposed to community violence and that these effects extend from middle adolescence to late adolescence. However, the implications of emotional desensitization on perpetration of violence found in other research (Mrug et al., 2016) may be specific to youth with low levels of ECV. The current data point to the importance of early detection of levels of ECV during early and middle adolescence to identify youth who may be more likely to exhibit violent behavior in late adolescence and early adulthood. The violent behaviors assessed in the current study carry legal ramifications and efforts to reduce the likelihood of these behaviors may, in turn, reduce rates of school suspension, expulsion, and incarceration in male individuals of color. Further, youth showing lower levels of emotional and behavioral problems despite high ECV may possess exceptional coping skills (Cooley-Quille et al., 2001; Fitzpatrick, 1993).

Future studies aimed at providing stronger support for desensitization should distinguish between desensitization effects and efforts to suppress depressive symptoms. Measures of emotional control (e.g., Watson & Greer, 1983) aimed at assessing how

much individuals attempt to suppress negative emotions should be included in future studies. Consequently, researchers can determine if the nonlinear effect of ECV on depressive symptoms can be accounted for by youth suppressing depressive affect, perhaps to avoid victimization (Reynolds et al., 2001). Further, future studies should distinguish between desensitization effects and underreporting of traditional depressive symptoms by male individuals (Martin et al., 2013). Future studies on desensitization with male adolescents of color should include measures that assess “male-type” symptoms of depression (Martin et al., 2013) to determine if a desensitization effect is also present for these symptoms. Given the findings of the current study and other research in this burgeoning area, there is a need to acknowledge that traditional stress models may not fully encompass the experiences of male adolescents of color exposed to community violence, and efforts to intervene with this population should reflect the complexity of the relationships among ECV and psychosocial functioning.

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