HHS Public Access

Author manuscript

J Res Adolesc. Author manuscript; available in PMC 2017 September 01.

Published in final edited form as:

J Res Adolesc. 2016 September ; 26(3): 552–566. doi:10.1111/jora.12213.

Effect of Environmental Risk and Externalizing Comorbidity on Internalizing Problems Among Economically Disadvantaged African American Youth

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Abstract

This study examined effects of racial discrimination, community violence, and stressful life events on internalizing problems among African American youth from high poverty neighborhoods (N = 607; 293 boys; Mage = 16.0 years, SD = 1.44 years). Mediated effects via externalizing problems on these relations were also examined, given the high comorbidity rate between internalizing and externalizing problems. Externalizing problems partially mediated the effect of stressful life events on internalizing problems and fully mediated the effect of racial discrimination for boys but not for girls. Exposure to violence had a significant indirect effect on internalizing problems via externalizing problems. The findings call for greater attention to internalizing problems among African American youth and pathways to internalizing problems via externalizing problems.

Keywords

internalizing problems; African American; environmental stressors

Internalizing problems commonly first emerge in adolescence, and are related to many emotional and behavioral disorders in adulthood (King, Iacono, & McGue, 2004). The risk and resilience model of developmental psychopathology (Cicchetti & Rogosch, 2002; Compas & Andreotti, 2013; Grant et al., 2003) postulates that adolescents often respond to stressors differently than children and adults, with differential risks for psychopathology, because of the marked developmental changes in biological, psychological, as well as social

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systems during this stage (Feldman & Elliott, 1990). Internalizing problems, in particular, have been shown to have different etiological factors in adolescence compared to other phases of life (Harrington et al., 1997; Jaffee et al., 2002), and predict different adulthood pathological outcomes in adolescence compared to those in childhood (Harrington et al., 1997). The developmental psychopathology model calls for examinations of the specific risk factors and mechanisms for internalizing psychopathology during adolescence (Cicchetti & Rogosch, 2002).

Internalizing problems are largely understudied among African American adolescents, partly due to a relatively lower prevalence in African Americans compared to other racial groups (Angold, Erkanli, Silberg, Eaves, & Costello, 2002). However, a lower prevalence does not negate the potential impact of such problems on African American adolescents' development. The limited research that is available with African American youth suggests that symptom presentations vary somewhat compared to White youth, and risk and protective factors for internalizing problems may also vary between African American and White youth (Anderson & Mayes, 2010).

According to the cultural ecological model (García Coll et al., 1996), mainstream developmental theories and models are inadequate in explaining the crucial roles social position and social stratification play in the cognitive, emotional, and behavioral development of racial minority youth. Racism and discrimination in particular, stem from racial minority youth's less advantaged social position, and are pervasive and systematic in a socially-stratified society (Thompson, 1984). As such, racial discrimination is a salient risk factor for poorer developmental outcomes among racial minority youth. The risk of racial discrimination might be especially relevant for participants in the current study, who were recruited from Mobile, Alabama. In the 20th century, Alabama was at the center of several racially-charged controversies, such as the Tuskegee experiment and the arrest and defense of the Scottsboro Boys. Racial tensions in Mobile, in particular, rose in the 1940s with overcrowding and competition for jobs (Gaillard, Lindsay, Williams, & DeNeefe, 2009). Alabama was also at the heart of a number of key Civil Rights events, and violence and riots were pervasive in the 1950s and 1960s. Although the city of Mobile was spared of violent outbreak, racial tension was still evident. For example, Mobile witnessed the last recorded lynching case in the history of the United States as recently as 1981 (Hollars, 2011). In short, the history of racial tensions and discrimination in Mobile and in the broader Alabama community makes this community well-suited for an examination of the potential negative effects of racial discrimination today.

A second unique contribution from the present study is its focus on African American adolescents from high poverty, high violence urban neighborhoods. From the perspective of the cultural ecological model (García Coll et al., 1996), the neighborhood is a crucial component of the environment which can be either promoting or inhibiting development. Neighborhoods with high poverty and high violence may inhibit children's development due to their relative lack of resources and higher levels of environmental stressors (Gibbons et al., 2012). Additionally, from the perspective of the risk and resilience model of developmental psychopathology (Compas & Andreotti, 2013; Grant et al., 2003), such neighborhoods put residents at heightened risk by virtue of exposure to a variety of stressors,

such as high crime rates, substance use in the community, and poverty, which are crucial etiologic factors for psychopathological symptoms and disorders. According to this model, stressors, including major life events, minor hassles, and chronic conditions, contribute to psychopathology through disturbances in biological, psychological, and social processes. Thus in addition to racial discrimination, the present study targeted two other types of stressors that may impact risk for internalizing problems in African American youth living in high poverty neighborhoods. The first is recent stressful life events, such as loss of a family member, change of a primary caregiver, or serious physical injury (Attar, Guerra, & Tolan, 1994; Grant, Compas, Thurm, McMahon, & Gipson, 2004). Another is exposure to neighborhood violence, which also contributes to chronic stress (Carlson, 2006).

Racial Discrimination

Experiencing discrimination of any type contributes to psychological distress (Pascoe & Smart Richman, 2009). Discrimination arouses negative emotions, such as anger or depression, elicits stress responses, and disturbs individuals' self-systems (Kessler, Mickelson, & Williams, 1999). One meta-analysis provided evidence that perceived discrimination (not specific to any type of group) predicted various psychopathological problems, such as depressive symptoms, psychiatric distress, and general decrease of well-being (Pascoe & Smart Richman, 2009).

Racial discrimination, specifically, has been shown to negatively impact mental and physical health among African Americans (for reviews, see Clark, Anderson, Clark, & Williams, 1999; Mays, Cochran, & Barnes, 2007). The effects of racism on health may occur in part via unequal access to health care but also via chronically aroused physiologic systems (Mays et al., 2007). For mental health specifically, experiencing racism predicts elevated anxiety and depressive symptoms (e.g. Banks, Kohn-Wood, & Spencer, 2006), conduct problems (e.g. Brody et al., 2006), and general psychological distress (e.g. Bynum, Burton, & Best, 2007).

Notably, the majority of research on racism and mental health has focused on adults, especially women (e.g. Schulz et al., 2006; Vines et al., 2006). Fewer studies have examined the effects of racial discrimination on mental health among African American adolescents (Williams & Mohammed, 2009). According to the risk and resilience model of developmental psychopathology (Cicchetti & Rogosch, 2002; Compas & Andreotti, 2013), adolescence is the developmental stage when cognitive appraisals of stressful experiences start to interplay with the stressors and contribute to adolescents' psychopathological outcomes. Compared to children, adolescents may possess more sophisticated comprehension of the numerous negative consequences of racial discrimination, such as unequal access to opportunities and resources (Brown & Bigler, 2005; Omi & Winant, 1994). At the same time, adolescents may lack the fully developed self- and ethnic identity and regulation capacity to protect against the negative mental health consequences of racial discrimination (see for discussion Gibbons et al., 2007). Therefore, the negative impact of racial discrimination may be especially pronounced during adolescence.

Prior studies that have focused on African American adolescents, such as the work by Lambert and colleagues, typically examined effects of racism on depressive symptoms rather than the full spectrum of internalizing problems (e.g. English, Lambert, & Ialongo, 2014; Lambert, Herman, Bynum, & Ialongo, 2009; Lambert, Robinson, & Ialongo, 2014; but see for exception Sanchez, Lambert, & Cooley-Strickland, 2013). Yet there is evidence to suggest that during childhood and adolescence, circumstances of adversity, such as racial discrimination, exposure to violence, and other stressful life events, are risk factors for a broad range of co-occurring internalizing and externalizing problems, including depression, anxiety, conduct disorder, aggression, and substance use (Compas & Andreotti, 2013). Therefore focusing only on depressive symptoms may not fully capture the risk effect of these stressors. Prior research also has mostly focused on clinically diagnosed disorders (e.g. Gibbons et al., 2007; Simons, Chen, Stewart, & Brody, 2003), with only a few exceptions that examined internalizing problems using continuous measures (Estrada-Martinez, Caldwell, Bauermeister, & Zimmerman, 2012; Nyborg & Curry, 2003; Riina, Martin, Gardner, & Brooks-Gunn, 2013). Although this is valuable from a clinical standpoint, an examination of internalizing problems using continuous measures may shed important light into the broader impact of racism on mental health and quality of life (see for discussion Kessler, Avenevoli, & Ries Merikangas, 2001). The present study addresses these gaps by focusing on internalizing problems using continuous measures among adolescents rather than only depressive symptoms or clinically diagnosed disorders.

Stressful Life Events

Internalizing problems among adolescents are predicted by stressful life events, including both major life events and daily hassles (e.g., Estrada-Martinez et al., 2012; Grant et al., 2000). Studies of stressful life events and internalizing problems have included both quantitatively measured internalizing problems (e.g. Sanchez et al., 2013) and clinically diagnosed depression and anxiety disorders (e.g. Gaylord-Harden, Elmore, Campbell, & Wethington, 2011). However, prior studies in African American youth, among the most extensive of which has been done by Lambert and colleagues (e.g. Sanchez et al., 2013; Sanchez, Lambert, & Ialongo, 2012), have focused on early adolescents (9 – 14 years). To our knowledge the present study is among the first to examine risks of stressful life events for internalizing problems among African American youth focusing on the period of mid- to late adolescence. Examining these pathways beyond early adolescence is important because of evidence that internalizing symptomologies change from early to late adolescence (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). The risk and prevalence of internalizing disorders also continue to increase throughout adolescence (Kessler et al., 2001).

Exposure to Violence

Adolescents who live in high poverty neighborhoods are at increased risk of being exposed to violence. The construct of exposure to violence includes not only being a victim of violence, but also witnessing others, such as friends and family, being victimized by violence. Studies have found that neighborhood poverty is significantly related to residents' exposure to violence (Carlson, 2006). In poor urban areas, 90% of children and adolescents report witnessing violence in school (Flannery, Wester, & Singer, 2004), and 77% witness

violence in the community (Weist, Acosta, & Youngstrom, 2001). African Americans disproportionally reside in high poverty areas (Conger et al., 2002), and consequentially have higher risk of exposure to violence. From the view of the cultural ecological model (García Coll et al., 1996), neighborhoods with pervasive violence may provide an inhibiting environment that contributes to higher risk for mental health problems among children and adolescents.

A meta-analysis of exposure to violence in the general population indicated that exposure to violence contributed to both externalizing and internalizing problems with moderate effect sizes (d = .63 and d = .45, respectively; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009). These effect sizes were stronger in adolescence (d = .45 - .98) than in childhood (d = .32 - .34). One study specifically involving African American children and adolescents from low-income families confirmed that witnessing violence had a greater impact on risk for depressive symptoms in adolescence than in childhood (Fitzpatrick, 1993). Collectively, these studies highlight the relevance of exposure to violence as a risk factor for internalizing problems in adolescence.

Among the studies that have examined internalizing problems among African American adolescents, exposure to violence has emerged as a risk factor in some studies (e.g. Gaylord-Harden, Cunningham, & Zelencik, 2011; Kliewer & Sullivan, 2008) but not in others (e.g. Milam et al., 2012; Sanchez et al., 2013). As with stressful life events, these studies focused on early adolescence only (Gaylord-Harden, Cunningham, et al., 2011; Kliewer & Sullivan, 2008; Sanchez et al., 2013). Interestingly, most of the studies that found a significant effect of exposure to violence examined clinically diagnosed internalizing symptoms, in particular depressive symptoms (e.g. Gaylord-Harden, Cunningham, et al., 2011; McGee, 2003), whereas those did not found an effect assessed internalizing problems via a continuous, quantitative measure (e.g. Jenkins, Wang, Turner, 2009; Sanchez et al., 2013) using the widely applied scale Youth Self Report (Achenbach, 1991). It is not clear whether exposure to violence only contributes to clinically diagnosed depressive disorders, or internalizing problems more broadly. The present study aimed to explore this question by examining the impact of exposure to violence on internalizing problems measured using a widely used continuous scale that assesses a broad spectrum of internalizing problems

The Role of Externalizing Problems

A notable limitation of prior research on exposure to stressors and internalizing problems is the relative lack of attention paid to the potential mechanism underlying the relation between stressors and internalizing problems. Lambert and colleagues suggested that perfectionism (Lambert et al., 2014) and low academic control (Lambert et al., 2009) may play a role in the association between racism and depressive symptoms. However, few studies have taken into account the high co-variance rate between internalizing and externalizing problems during child development (Grant et al., 2003; Lilienfeld, 2003), or considered its potential role in understanding the mechanisms of stressors' effects on internalizing problems.

The present study aimed to further our understanding of the complex role of comorbidity by examining the potential mediating effects of externalizing problems on the associations of

stressors and internalizing problems. Because of the relatively higher rate of externalizing problems among African American youth compared to internalizing problems and evidence that externalizing behavior can lead to internalizing problems (Kim, Conger, Elder, & Lorenz, 2003; Timmermans, van Lier, & Koot, 2010), we hypothesized that among urban African American adolescents living in high poverty neighborhoods, externalizing problems might partially explain the relations between stressors and internalizing problems. Externalizing problems might lead directly to internalizing problems by generating additional psychosocial stressors, such as interpersonal conflict, chronic daily hassles, and family stress (Caron & Rutter, 1991; Lilienfeld, 2003), although the effects are likely to be reciprocal over time (Beyers & Loeber, 2003).

For all three types of stressors examined in this study – stressful life events, exposure to violence, and racial discrimination – there is evidence to suggest that stressors also predict externalizing problems. Racial discrimination in adolescence is associated with externalizing type problems, such as conduct problems (e.g. Brody et al., 2006) and violent delinquency (e.g. Simons et al., 2003). Exposure to violence also predicts externalizing problems among African Americans (Mrug & Windle, 2010; Sanchez et al., 2013). In studies of stressful life events among White adolescents, internalizing and externalizing problems have bi-directional effects (Kim et al., 2003; Timmermans et al., 2010). Given the high co-occurrence rate of internalizing and externalizing problems (Lilienfeld, 2003), in this study we examined the relation between environmental stressors and internalizing problems and the potential mediating role of externalizing problems.

The Present Study

In this study we aimed to address several gaps in the literature on internalizing problems in adolescence. First, we focused our analyses on African Americans, among whom internalizing problems have been largely understudied. Second, we addressed the impact of several types of environmental stressors on internalizing problems among a highly vulnerable and hard-to-reach population, adolescents from high poverty and high violence urban neighborhoods in Mobile, Alabama. Specifically we investigated the impact of general stressful life events, racial discrimination, and exposure to violence, which are all salient risk factors for African Americans in this region. Based on previous research among White or multi-racial populations, we expected residents in such neighborhoods would experience a considerable amount of stressful life events, racial discrimination, and community violence, all of which would show significant impacts on internalizing problems. To quantify internalizing problems, we utilized a well validated quantitative measure of internalizing problems that includes symptoms of anxiety, depression, withdrawn, and somatic complaints (Achenbach, 1991).

Given the high rate of comorbidity between internalizing and externalizing problems (Lilienfeld, 2003), our second aim was to examine the role of externalizing problems on the relation between environmental stressors and internalizing problems among African American adolescents. This study furthers an understanding of the role of externalizing comorbidity by examining relations of stressors and internalizing problems directly and indirectly via effects on externalizing problems. Given prior evidence that environmental

stressors predict externalizing problems (e.g. Simons et al., 2003; Timmermans et al., 2010) but also that externalizing problems might directly contribute to internalizing problems (Beyers & Loeber, 2003), we hypothesized that the relations between environmental stressors and internalizing problems would be partially or fully mediated by externalizing problems in this population.

Method

Participants and Procedure

Participants were 607 youth (293 male; *M*age = 16.0 years, SD = 1.44 years; range 13 – 19 years). The sample was comprised of 96.4% African Americans, 0.3% White youth, 0.8% mixed race, and 2.5% who did not report their race. These 607 adolescents were recruited for the Gene, Environment, Neighborhood Initiative (GENI), and were contacted based on prior participation in the Mobile Youth Survey, a community based, multiple cohort longitudinal project beginning in 1998 (Church et al., 2012). The original goals of the Mobile Youth Survey were to investigate risk and protective factors in family, school, and neighborhood for risk behaviors in adolescents living in high poverty environments. The GENI project aimed to collect more extensive environmental and behavioral phenotyping data, (along with biomarker data not reported here), among youth who continued to reside in target neighborhoods at the time of collection in 2009-2011. Among the 968 participants eligible for the GENI project from the MYS, approximately 600 were enrolled in the GENI project. The primary reason for non-enrollment was lost of contact (86%), followed by participant declining (5%) and participant incarceration (2%).

According to U.S. Census data (2012), among African American residents in the metropolitan statistical area of Mobile, 31.5% had incomes below the poverty level. In the present sample, 81.9% of caregivers reported less than $20,000 household income. Participants included both adolescents and their primary caregivers, who provided written assent and consent, respectively. The study involved two hour interviews for both adolescents and caregivers. Interviews were administered using a combination of audio-computer assisted self-interview and interviewer-administered questionnaires. Adolescents were compensated $30 for their participation.

Measures

Internalizing and externalizing problems—Internalizing and externalizing problems were self-reported by adolescents using the Youth Self Report (YSR; Achenbach, 1991). The YSR is a widely used questionnaire tapping 112 behavioral and emotional problems in adolescence. It generates raw scores, *T*-scores, and percentiles for internalizing and externalizing problems. Internalizing problems is comprised of three subscales: Anxious Depressed, Withdrawn Depressed, and Somatic Complaints. Externalizing problems is comprised of two subscales: Aggressive Behavior and Rule-breaking Behavior. The YSR has a conventional cutoff *T*-score at 60 (Achenbach, 1991). Individuals with *T*-scores higher than 60 are considered at risk for clinically significant internalizing or externalizing symptoms. Cronbach's α in this sample was 0.86 for internalizing problems and 0.90 for externalizing problems.

Stressful life events—Experience of stressful life events was evaluated by the Stress Index (Attar et al., 1994). It contains 16 questions about frequencies of circumscribed events and life transitions during the past 12 months, such as “A family member became seriously ill” and “You had to go live in a foster home”. Frequencies of stressful events were scored on a 0 (*none*) to 3 (*three times or more*) scale. Scores on each question were summed to form a total score of stressful life events. Cronbach's α in this sample was 0.75.

Racial discrimination—Experience of racial discrimination was assessed by the Schedule of Racist Events (Landrine & Klonoff, 1996). The original measure is comprised of 18 items, such as “How often have you been treated unfairly by teachers and professors because you are Black?” and “How often have you been accused or suspected of doing something wrong (such as stealing, cheating, not doing your share of the work, or breaking the law) because you are Black?”, which were rated on a 1 – 6 Likert scale (*never* to *almost all of the time*). Because this scale was originally developed for use with adults, wording and items were adapted for use with adolescents, resulting in a total of 14 questions of racist events on a 1 to 3 scale (*never*, *sometimes*, or a *lot*). Scores were summed and rescaled to 0 – 28. Cronbach's α in this sample was 0.90.

Exposure to violence—Exposure to violence was assessed using a questionnaire version of the Exposure to Violence Interview (Gorman-Smith & Tolan, 1998). Nine specific questions related to victimization and witnessing violence within the last 12 months were asked. Some examples of the questions are “Have you seen someone get shot or stabbed or cut in your neighborhood” and “Has a member of your family been robbed or attacked in your neighborhood”. Respondents provided *yes* or *no* answers. A total summary score was computed. Cronbach's α in this sample was 0.80.

Results

Descriptive statistics were computed using SPSS 22.0 (IBM Corporation, Armonk, NY, United States) and all other analyses were performed using Mplus 7.11 (Muthén & Muthén, Los Angeles, CA, United States). Rates of missing data were low (YSR 2.3%; Stress Index 4.5%; Racial Discrimination 4.5%; Exposure to Violence 4.5%), therefore no imputation procedures were implemented. Participants from the same households were clustered to account for non-independent observation (Byck, Bolland, Dick, Ashbeck, & Mustanski, 2013).

Means, standard deviations, and correlations among variables are listed in Table 1. Participants reported high environmental stress exposure. During the past 12 months, 51% of the participants reported at least one racist event (M = 2.2 events, SD = 3.93), 68% reported witnessing or being victimized by violence (M = 1.7 events, SD = 1.91), and 84% reported one or more stressful life events (M = 5.8 events, SD = 5.26). A broad range of internalizing scores was observed, with 16% of the sample above threshold for at-risk levels (T-score = 60; Achenbach, 1991). Clinically significant levels of externalizing problems were observed in 26% of the sample by the same criteria; however, 68% of the adolescents meeting threshold for internalizing problems also showed clinically significant levels of externalizing problems, indicating high comorbidity. High comorbidity between internalizing and

externalizing problems was also reflected by the high correlation between internalizing and externalizing scores (see Table 1).

Regression analysis was used to simultaneously examine the effect of racial discrimination, stressful life events, and exposure to violence on internalizing problems, controlling for gender and age. Results are shown in Table 2, Model 1. Gender had a significant effect on internalizing problems, with girls reporting higher internalizing problems than boys (β = .10, $p < .05$). Age was not a significant covariate (β = .00, $p = .93$). Racial discrimination and stressful life events were significantly associated with internalizing problems (β = .12, .27, p's < .05). Exposure to violence did not have a significant direct effect on internalizing problems (β = .08, $p = .10$).

Given the high rate of externalizing comorbidity, and known impacts of environmental stressors on externalizing problems (Mrug & Windle, 2010), mediation models (Baron & Kenny, 1986; Preacher & Hayes, 2004) were used to test the impact of externalizing problems on the relation between environmental risks and internalizing problems. We tested an initial mediation model controlling for age and gender. The hypothesized model is shown in Figure 1 and results of each step in the mediation test are shown in Table 2. According to the procedure established by Baron and Kenny (1986), we first tested the direct relation between the three environmental stressors and the outcome variable, internalizing problem scores (path c), controlling for age and gender. As indicated above, racial discrimination and stressful life events had significant direct effects on internalizing problems (Table 2, Model 1). Next, we tested the direct relation between the two stressors and the proposed mediator (externalizing problems; path a). Stressful life events and racial discrimination both significantly predicted externalizing problems (Table 2, Model 2).

The next step was to test the direct relation between externalizing problems and internalizing problems (path b), as well as the adjusted relation between each stressor and internalizing problems controlling for the covariance of externalizing problems (path c'). We followed Baron and Kenny's (1986) established criteria for accepting mediation if the magnitude of relation between the predictor and the outcome is reduced by adding the mediator in the analysis. Preacher and Hayes' (2004) guidelines were used to test statistical significance of mediation for the indirect effects. As shown in Table 2, Model 3, when controlling for age and gender, externalizing problems significantly predicted internalizing problems, and the effects of stressful life events and racial discrimination on internalizing problems decreased after controlling for externalizing problems. The effect of racial discrimination on internalizing problems was reduced to non-significance, indicating that, when controlling for age and gender, externalizing problems fully mediated the effect of racial discrimination on internalizing problems (indirect effect = .15, $p < .05$). The effect of stressful life events remained significant but was reduced in magnitude. This indicates that externalizing problems partially mediated the effect of stressful life events on internalizing problems (indirect effect = .31, $p < .001$).

Based on current recommendations indicating indirect effects should be tested even in the absence of a direct effect (e.g. MacKinnon, Fairchild, & Fritz, 2007; Preacher & Hayes, 2004), an indirect effect of exposure to violence on internalizing problems via externalizing

problems was examined. Exposure to violence had a significant indirect effect on internalizing problems via externalizing problems (indirect effect = .50, $p < .01$). Unlike stressful life events and exposure to racism, the effects of exposure to violence met criteria for indirect effect but not mediation.

Because results showed gender was significantly related to both internalizing and externalizing symptoms (β's = .10, .13, p's < .05, respectively), our final set of tests examined the potential moderating role of gender in the mediation model, following Preacher and colleagues' (Preacher, Rucker, & Hayes, 2007) guideline for moderated mediation (see Figure 2). Of the three types of stressors, gender significantly moderated the effect of racial discrimination on the mediator (interaction β = −.17, $p < .05$), but did not moderate the effect of exposure to violence or stressful life events (β = .12 and −.09, *ns*). To follow up on this moderating effect, we tested the original mediation model (retaining all environmental predictors) separately for boys and girls. As shown in Figure 3, the mediated pathway from racial discrimination to internalizing problems via externalizing problems was significant for boys only.

Discussion

African Americans have long been considered to be of relatively lower risk for developing internalizing problems compared to other racial or ethnic groups (Angold et al., 2002). As a result, risk factors for internalizing problems are understudied among African Americans compared to other types of behavioral problems. Even less is known about risk factors for internalizing problems among hard to reach, highly vulnerable youth living in high-poverty, high-violence urban neighborhoods. The present study addressed these gaps by examining the impact of racial discrimination, exposure to violence, and stressful life events on internalizing problems among African American adolescents living in high poverty neighborhoods. According to the cultural ecological model (García Coll et al., 1996), high risk neighborhoods may create an inhibiting environment for minority youth's development due to its limited resources and heightened stressors. Additionally, racial discrimination derived from racial minorities' social positions may also be highly relevant to African American adolescents' development. Our hypotheses regarding other types of stressors were also based on the risk and resilience model for developmental psychopathology (Cicchetti & Rogosch, 2002; Compas & Andreotti, 2013; Grant et al., 2003), which considers environmental stressors as crucial etiologic factors for developing psychopathological problems.

We further aimed to address the role of comorbidity between internalizing and externalizing problems in relation to multiple environmental stressors, which has been frequently overlooked in the past literature, despite the high comorbidity rate widely observed among children and adolescents (Jensen, 2003). Indeed, in this study we observed that about two thirds of youth who met the at-risk criteria for internalizing problems also met the at-risk criteria for externalizing problems, indicating high comorbidity. High comorbidity was also reflected by the high correlation between internalizing and externalizing scores. Similarly high rates of comorbidity have been frequently observed among White youth (e.g. Eisenberg et al., 2005; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003), although much less is known

among racial minority youth. This highlights the importance of taking into consideration comorbid externalizing problems when studying risk and protective factors for internalizing problems, especially among African American youth living in poverty.

Our examination of stressful life events revealed that the majority of the current sample (82%) experienced one or more stressful life events during the past 12 months. Consistent with studies utilizing early adolescent samples (e.g., Estrada-Martinez et al., 2012; Grant et al., 2000; Sanchez et al., 2013; Sanchez et al., 2012), in our study of predominantly youth in mid to late adolescence, stressful life events predicted higher levels of internalizing problems.

Results of the mediation model of stressful life events indicated that externalizing problems partially mediated the relation between stressful life events and internalizing problems. This result is in line with prior studies of White adolescents indicating a complex relation between stressful life events, internalizing problems, and externalizing problems (Kim et al., 2003; Timmermans et al., 2010). Although part of the relation between stressful life events and internalizing problems was mediated by externalizing problems, there remained a unique portion of variance for internalizing problems that was directly predicted by stressful life events. This implies that internalizing problems may consist of statistically heterogeneous components, some of which may be directly related to stressful life events, while others co-vary with externalizing problems and are impacted by stressful life events via their role in promoting externalizing problems. It might be clinically and theoretically meaningful to tease these different components apart and examine whether they have different risk factors and developmental outcomes.

As with stressful life events, experience with racial discrimination predicted higher internalizing problems. The magnitude of the association between racial discrimination and internalizing problems was low to moderate, and was smaller than that observed in some prior studies of children and early adolescents (e.g. Sanchez et al., 2013). In fact, although racial discrimination is a salient risk factor for adolescents (Brown & Bigler, 2005), the magnitude of the association we observed was more in line with reports of effects of racial discrimination on internalizing problems in adults (e.g. Banks et al., 2006). It may be that racial discrimination has a stronger impact on internalizing problems during early rather than late adolescence, because older adolescents may possess better regulating capacities than younger adolescents to cope with the experiences of racial discrimination (e.g. Griffith, Dubow, & Ippolito, 2000). Future research is warranted to further our understanding of the impact of racism at different stages of adolescence in light of changes during this period of marked social, biological, and psychological development.

Our results also showed that externalizing problems fully mediated the relation between racial discrimination and internalizing problems; however, the mediation was moderated by gender such that this set of relations was evident for boys only. Consistent with previous evidence (Nyborg & Curry, 2003; Riina et al., 2013), exposure to racial discrimination predicted higher externalizing problems. Adding externalizing problems into the current model reduced the regression coefficient of racial discrimination such that it was no longer significant. This suggests that studies on effects of racial discrimination that do not take into

account the comorbidity between externalizing and internalizing problems may reach biased conclusion regarding the relation between racial discrimination and internalizing problems in this population.

The inclusion of gender in the mediational model also revealed that racial discrimination did not have a significant impact on internalizing problems for girls in this sample. This finding contrasts some previous research showing that girls are more vulnerable to interpersonal stressors, such as discrimination (Carlson & Grant, 2008; Leadbeater, Kuperminc, Blatt, & Hertzog, 1999). However, previous research also showed that girls might be more sensitive to interpersonal protective factors, such as social support (e.g. Grant et al., 2000). In particular, African American youth often exhibit strong family bonds and interpersonal connectedness (Boyd-Franklin, 1989; Choi, 2002). If African American adolescent girls benefit from these interpersonal protective factors more compared to boys, it may serve to buffer the risk effect of racial discrimination on internalizing problems for girls. These findings suggest that African American boys may have unique vulnerabilities to racial discrimination and call for closer examinations on the impact of racial discrimination on African American boys.

Given the mixed literature on exposure to violence and internalizing problems in adolescents, with significant effects observed in some studies (Chen, 2010; Gaylord-Harden, Cunningham, et al., 2011), but not others (e.g. Milam et al., 2012; Sanchez et al., 2013), we were interested to test the relation of exposure to violence in light of the possible mediating role of externalizing problems. The results showed that exposure to violence was not directly associated with internalizing problems among African American adolescents. This is likely due in part to the fact that, by entering all environmental risk factors in one block in the regression model, we controlled for the covariances between the stressors and only looked at the unique contribution of exposure to violence in predicting internalizing problems. Another possible explanation for non-significant association with exposure to violence is based on the desensitization model of violence (Gaylord-Harden, Cunningham, et al., 2011), which suggests that as exposure to violence increases past a particular threshold, it becomes less predictive of internalizing problems. According to this model, individuals are desensitized to the effects of violence by virtue of intensive exposure to community violence. In the current sample, adolescents were recruited from extremely impoverished neighborhoods with frequent community violence. Fully two-thirds of the adolescents reported witnessing or being victimized by violence. Of note, the Exposure to Violence Interview used in this study targets severe violent events, such as physical attack, gunshot, or sexual assault. It is possible that adolescents from neighborhoods with exposure to frequent and severe acts of violence may to some extent be desensitized to violent events with subsequent reduced impact on emotional outcomes as measured in this study.

Results regarding exposure to violence revealed a significant indirect effect on internalizing problems via externalizing problems. This finding is in line with prior studies linking exposure to violence with increased risk for externalizing problems (e.g. Mrug & Windel, 2010). It further suggests that previously inconsistent findings regarding the relation of exposure to violence and internalizing problems might be due to differences in how studies have dealt with the covariance between internalizing and externalizing problems.

The findings of this study should be interpreted in light of the study design and population. First, because of the cross-sectional design of the study, causal relations between environmental stressors, externalizing problems, and internalizing problems cannot be inferred. Our findings, however, highlight the need for more thorough attention paid to the likely complex interplay of environmental stressors, internalizing and externalizing symptoms in at-risk populations of African American youth. Second, the current sample was comprised of adolescents who live in high poverty neighborhoods, and thus had higher chances of exposure to a wide range of stressors. Thus the present findings should not be considered representative of all African American adolescents. At the same time, this focus on a difficult-to-reach population of youth contributes to our understanding of those at heightened risk for developing emotional and behavioral problems by virtue of living in high risk conditions.

In sum, the present study draws attention to the prevalence of internalizing problems, and the risk factors contributing to them, in a highly vulnerable population of youth -- African American adolescents living in high poverty, high violence neighborhoods. The results of this study demonstrate that stressful life events, racial discrimination, and exposure to violence all contribute to heightened internalizing problems, although the potential pathways from these risk factors to internalizing problems may differ by gender and through effects on externalizing problems. Externalizing problems fully mediated the impact of racial discrimination on internalizing problems among boys, and partially mediated the effect of stressful life events across both genders in this population. The findings from all types of stressors were in line with both the risk and resilience model of developmental psychopathology (Cicchetti & Rogosch, 2002; Compas & Andreotti, 2013; Grant et al., 2003), which emphasizes the effect of environmental stressors on the development of psychopathological symptoms, and the cultural ecological theory (García Coll et al., 1996), which highlights the role of racial discrimination for minority youth and the broader negative impact of inhibiting environments on racial minority youth's development. Additionally, these results may clarify previous mixed evidence regarding the roles of various environmental stressors in internalizing problems (e.g. Gaylord-Harden, Cunningham, et al., 2011; Milam et al., 2012) by examining pathways to internalizing problems via comorbid externalizing problems. This implies that internalizing problems may be comprised of heterogeneous components, some of which may be directly or uniquely related to stressful experiences, while others share variances with externalizing problems. Future studies should aim to examine the potentially heterogeneous components underlying internalizing or externalizing problems with attention to their comorbidity and test whether they have different risk factors or developmental outcomes.

Acknowledgements

This project was supported by a grant from the National Institute on Drug Abuse (RO1DA025039). The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

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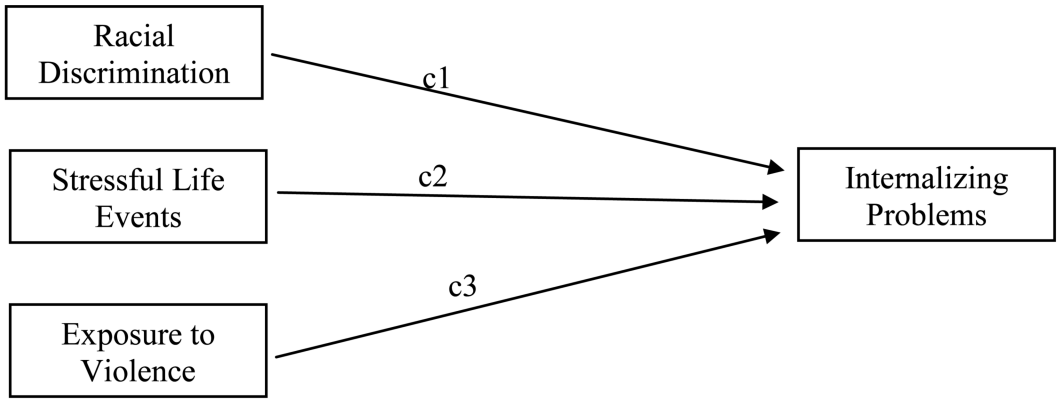
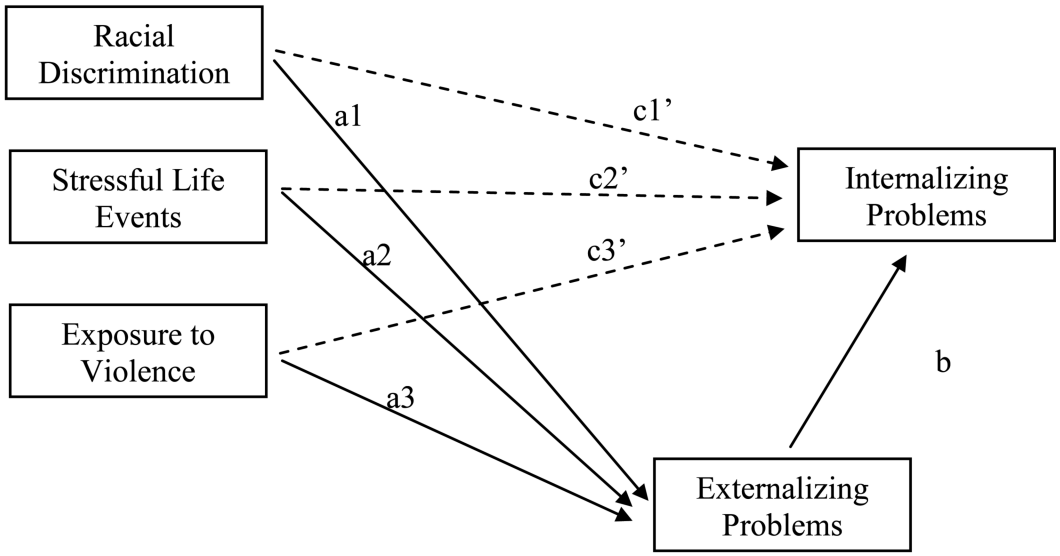


a) Direct Pathway



b) Mediated Pathway

Figure 1.
Hypothesized model of externalizing problems mediating the effects of environmental stressors on internalizing problems on the basis of Baron and Kenny (1986).

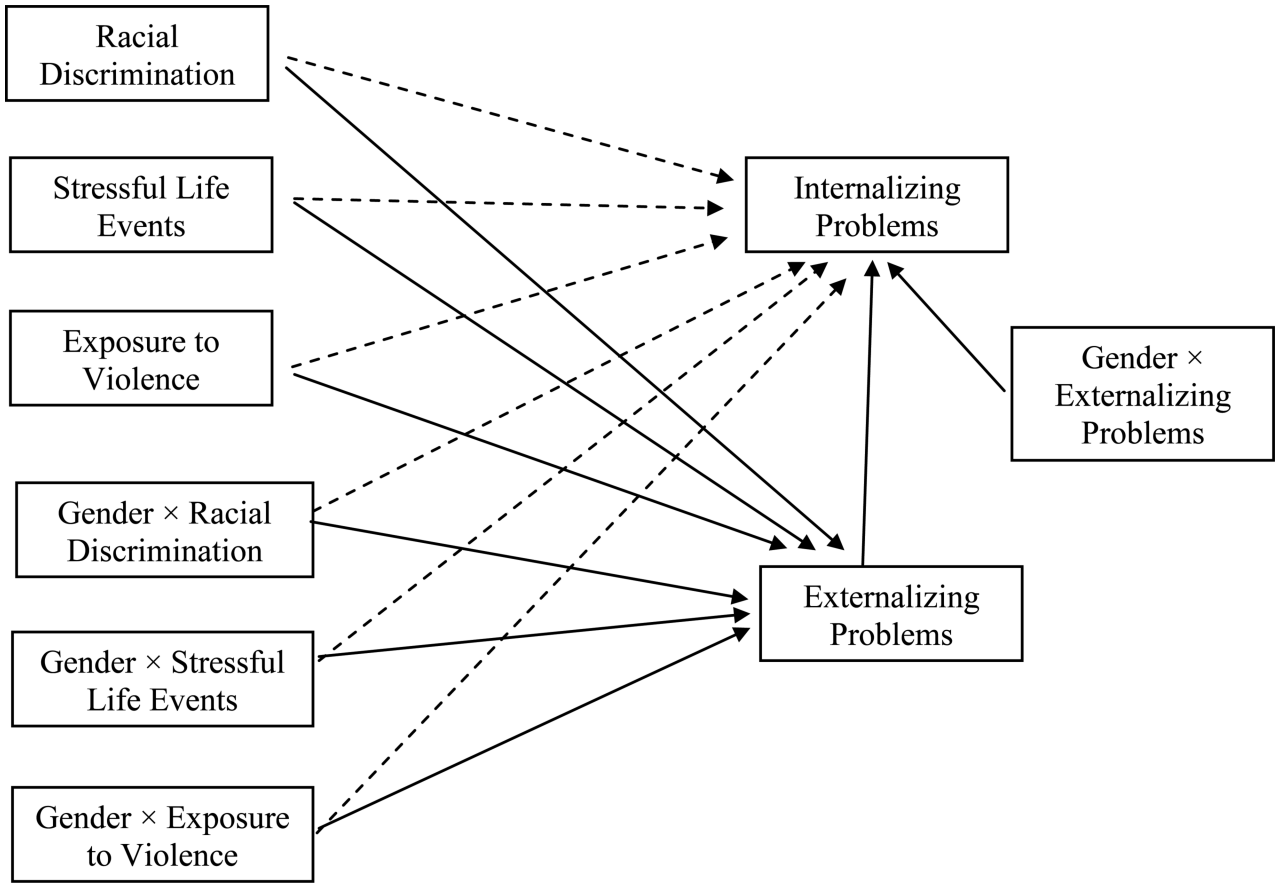


Figure 2.
Hypothesized moderated mediation model on the basis of Preacher et al. (2007).

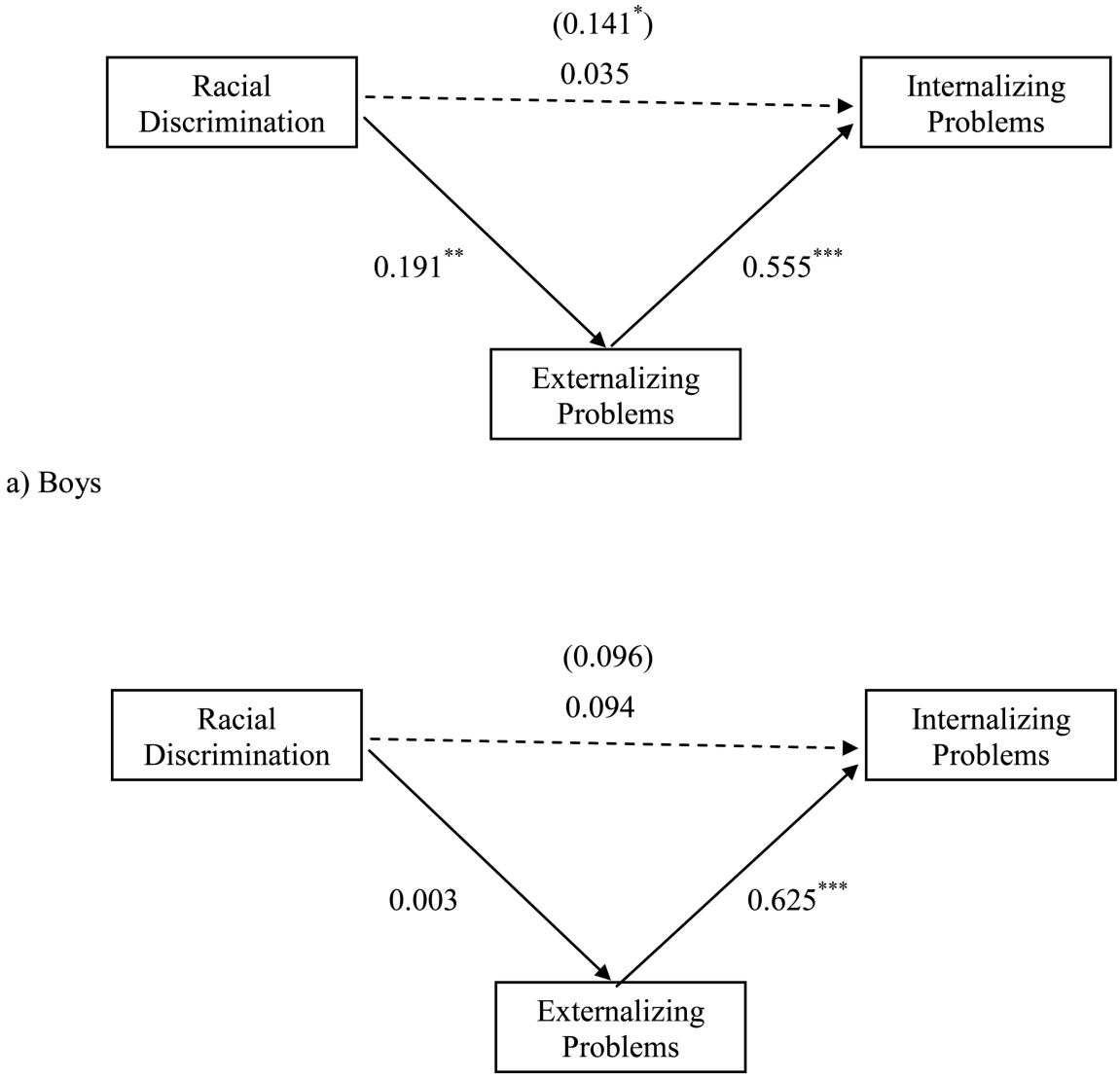


Figure 3.

Externalizing problems mediated the effect of racial discrimination on internalizing problems for boys. No significant effect of racial discrimination was found for girls. Standardized regression coefficients were presented. Coefficients presented in parentheses were direct effects of racial discrimination on internalizing problems without the mediation of externalizing problems. *$p < .05$, **$p < .01$, ***$p < .001$

Table 1

Means, Standard Deviations, and Correlations of the Variables Tested

	M (*SD*)	Internalizing Problems	Externalizing Problems	Stressful Life Events	Exposure to Violence	Racial Discrimination
Internalizing Problems	*48.4* (10.18)	1				
Externalizing Problems	*51.6* (11.45)	.648***	1			
Stressful Life Events	*5.8* (5.26)	.357***	.387***	1		
Exposure to Violence	*1.7* (1.91)	.236***	.300***	.449***	1	
Racial Discrimination	*2.2* (3.93)	.232***	.226***	.272***	.260***	1

*** *p*< .001, two-tailed.

Table 2

Regression Coefficients of Stressors on Internalizing and Externalizing Problems and Mediation Model

Model	Unstandardized Coefficients		Standardized Coefficients		*t*	*p*
	B	***Std. Error***	***Beta***	***Std. Error***		
Model 1 – *Relation of stressors and internalizing problems (path c)*						
Gender	1.990	.797	.098	.039	2.519	.012
Age	.022	.258	.003	.037	0.083	.934
Stressful Life Events	.518	.084	.269	.044	6.153	<.001
Exposure to Violence	.440	.271	.082	.051	1.627	.104
Racial Discrimination	.318	.137	.122	.052	2.327	.020
Model 2 – *Relation of stressors and externalizing problems (path a)*						
Gender	2.984	.877	.130	.038	3.433	.001
Age	.182	.288	.023	.036	0.632	.528
Stressful Life Events	.587	.095	.271	.044	6.186	.000
Exposure to Violence	.946	.315	.157	.052	3.007	.003
Racial Discrimination	.277	.136	.094	.046	2.025	.043
Model 3 – *Mediation by externalizing problems of stressor effects on internalizing problems (path c' & b)*						
Gender	.416	.643	.020	.032	0.648	.517
Age	−.074	.221	−.010	.031	−0.336	.737
Stressful Life Events	.208	.068	.108	.036	3.038	.002
Exposure to Violence	−.059	.206	−.011	.039	−0.288	.773
Racial Discrimination	.172	.095	.066	.036	1.816	.069
Externalizing Problems	.527	.030	.594	.030	20.066	<.001