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The role of stressors and academic competence in adolescent depression by race

Ishani R. Deo

University at Albany, State University of New York, ideo@albany.edu

Hazel M. Prelow

University at Albany, State University of New York, hmprelow@albany.edu

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The role of stressors and academic competence in adolescent depression by race

Cover Page Footnote

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Abstract

This study used a sample of 260 African American and European American adolescents to investigate whether adolescents' academic self-competence serves as a mediator of the relationship between different interpersonal stressors and depression symptoms, and whether the utility of this model changes with race. The association between exposure to violence and depression symptoms was mediated by academic self-competence. Race moderated the indirect paths from both discrimination experiences and violence exposure to depression. In addition to the significant differences by race, there was a significant indirect effect for African Americans exposed to violence. These findings suggest that African American adolescents may be more vulnerable to the effects of exposure to certain stressors, particularly discrimination and violence.

For more than a century, the developmental stage of adolescence has been considered a time of “storm and stress” (Hall, 1904). More recent research supports the assertion that although not every adolescent will go through this experience, stress and conflict are still more likely to occur during adolescence than at other ages (Arnett, 1999). Adolescents thus encounter more *stressors*, defined by Grant et al. (2003) as environmental events or conditions that pose an objective threat to an individual’s physical or psychological well-being. Yet not all adolescents are equally exposed to stress. African American youth have a greater likelihood of facing stressors than their European American peers (Anderson & Mayes, 2010), but research has yet to explore how this increased stress exposure affects cognitive factors like self-competence, and through them, mental health outcomes.

Overview of Adolescent Depression

As adolescence is a time of high risk for the onset of major depressive disorder (MDD), depressive symptoms are a frequent part of the adolescent experience in the United States. Across several studies, children under the age of 13 averaged a 2.8% rate of MDD, while adolescents 13 to 18 years old had an average MDD prevalence of 5.7% (Costello, Erkanli, & Angold, 2006). Moreover, adolescent depression has lasting consequences: it is associated with several negative outcomes, including increased suicidal behavior, delinquency, and substance use (Birmaher et al., 1996; Merry, McDowell, Hetrick, Bir, & Muller, 2004). Thus when investigating factors that lead to increased number and frequency of depressive symptoms, the high school adolescent population should be of particular interest.

Interpersonal Stress

One of the factors that have consistently been linked to and predictive of developing depression is exposure to stressors. One meta-analysis has suggested that as much as 63% of the

variance in risk for major depression is the result of individual environmental factors (Sullivan, Neale, & Kendler, 2000). Although there are many kinds of external stressors that have been related to depression outcomes in adolescents, interpersonal stressors have long been considered to be especially salient with regards to predicting depressive symptoms (Petersen et al., 1993). Not only do increases in the number of interpersonal stressors predict elevated depression, but some research even suggests that for adolescents, interpersonal stressors contribute more to major depressive episodes than non-interpersonal stressors (Shapero, Hankin, & Barrocas, 2013; Vrshek-Schallhorn et al., 2015). Three specific types of interpersonal stressors were highlighted as being of interest in the present research: peer stress, violence/victimization, and discrimination.

Peer Stress

As adolescents transition away from spending time with their parents and towards relying more on their peers, they experience a corresponding shift towards being increasingly influenced by peer behavior (Beal, Ausiello, & Perrin, 2001; Collins & Laursen, 2004; Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Laursen & Bukowski, 1997). Peer stress occurs when there is loss or interpersonal conflict in these relationships without the threat of serious injury or death, and all kinds of peer stress have been associated with depressive symptoms (McLaughlin & Nolen-Hoeksema, 2012). Longitudinal studies have found that across samples, increases in peer stress predict increased symptoms, though researchers also make the argument that peer stress interacts with other variables to result in depressive symptoms (Conley & Rudolph, 2009; Conley, Rudolph, & Bryant, 2012; Hankin et al., 2015; Sontag, Graber, & Clemans, 2011).

Exposure to Violence

Other types of interpersonal stressors are more overtly associated with risk. Exposure to violence and/or direct victimization has long-term effects on adolescents for a variety of reasons, not least of which is the significant danger these experiences pose. Exposure to violence is defined as witnessing or being threatened with a violent crime such as assault, while victimization is specifically experiencing it. Exposure to violence has been found to predict depressive symptoms regardless of whether the violence occurs in the home (Shukla & Wiesner, 2015) or in the community at large (Bennett & Joe, 2015; Eisman, Stoddard, Heinze, Caldwell, & Zimmerman, 2015). Although not every child will be exposed to violence, and not every child who is exposed will have poor outcomes, violence and victimization nevertheless play a role in many adolescents' lives, and exposure to this stress cannot be discounted as a possible factor in adolescent depressive symptoms.

Discrimination

The final stressor of interest is discrimination, which covers any biased actions against an individual on the basis of their group membership (e.g., racial status, sex). Though adolescents attending schools with more same-ethnicity peers report lower levels of discrimination, discrimination occurs across racial groups (Bellmore, Nishina, You, & Ma, 2012). Regardless of race, discriminatory experiences have been significantly related to increased levels of depressive symptoms in adolescents (Tynes, Giang, Williams, & Thompson, 2008). Longitudinal research also supports the causal relationship between increased perceptions of discrimination and depressive symptoms (Brody et al., 2006). As with other interpersonal stressors, the pathway between discriminatory experiences and depressive symptoms has been repeatedly demonstrated.

Mediation by Academic Self-Competence

As such, it is important to turn our focus to *how* the pathway between interpersonal stressors and depression functions in adolescence. One of the foremost theories of depression, Beck's (1976) cognitive theory, proposes that stressors activate depressogenic negative schemata, or attitudes, about the self and how it relates to the world. Once activated, these schemata cause individuals to make cognitive errors, or distorted interpretations of various situations. In turn, these errors shape an individual's automatic thoughts, or immediate cognitive responses to situations, making them overwhelmingly negative and leading to the affective and behavioral symptoms of depression. For adolescents, however, this theoretical model must also be considered through a developmental lens. Though various negative schemata may be activated by exposure to stressors, beliefs about low self-competence may be a particular risk for youth. Developing a sense of one's own competence at performing various skills and activities is a crucial developmental task, and its disruption by exposure to stressors has been shown to mediate the relationship between stressors and depressive symptoms (Garber, 1984; Sandler, 2001; Tram & Cole, 2000). Specifically, findings suggest that greater incidence of stressors predicts poorer perceptions of self-competence in youth, and that lower self-competence is in turn related to depression (Tram & Cole, 2000).

In spite of this evidence showing the relationship between stress and depressive symptoms to be mediated by self-competence, the extant literature on mediation is limited by its reliance on amalgamated measures of self-competence (Grant, Compas, Thurm, McMahon, & Gipson, 2004). Indeed, research actually supports the unique influence of different forms of competence on symptoms (Cole, 1990). Given the growing importance of the academic environment as children enter adolescence, perceptions of self-competence in the academic

domain, or academic self-competence, may be more strongly related to both interpersonal stressors and depressive symptomatology than other, less salient measures of competence.

Adolescents spend much of their daily life in an academic setting, and so environments such as school may actually be intermediaries between stressors and unwanted outcomes, including increased risk of depression (Brière, Pascal, Dupéré, & Janosz, 2013; García Coll et al., 1996; Rice, Harold, & Thapar, 2002). Schools play an essential role in the development of competence beliefs because they provide a social reference point for youths to develop this system of beliefs about themselves (Sandler, 2001). As a result, the present study is focused on how poor academic self-competence developed in this specific environment may be contributing to increased risk of depressive symptoms following exposure to interpersonal stressors.

Peer stress. Though there are no studies looking at the specific mediation in question, the studies that have been conducted seem to suggest that peer stressors have a deleterious effect on academic self-competence. Looking first at objective measures, harassment by peers predicts poorer actual academic outcomes (Schwartz, Gorman, Nakamoto, & Toblin, 2005). In research that uses subjective measures, social isolation has been linked to lower ratings of academic self-competence (Oxman-Martinez et al., 2012). More overt peer stress (i.e., interpersonal conflict) has also been shown to be predictive of decreased self-perceptions of academic competence regardless of whether the adolescent in question is the aggressor or the victim (Ma, Phelps, Lerner, & Lerner, 2009). In other words, adolescent perceptions of academic self-competence decrease with more peer stressors. Given the established relationship between competence and depression, this study thus addresses the dearth of research studying academic self-competence as a mediator between peer stress and depressive symptoms.

Exposure to Violence. The literature is similarly lacking in direct tests of how academic self-competence might mediate the relationship between exposure to violence and depression. In part this is because there has been limited research on the effects of various kinds of violence on academic-specific competence, and in part it is because the work that has been done tends to focus on objective measures rather than self-perceptions of competency. However, reviews of the extant literature indicate that exposure to violence has a range of adverse outcomes, including decreases in academic functioning (Cooley-Strickland et al., 2009; Fantuzzo & Mohr, 1999). Longitudinal research offers further support for the causal effect of violence exposure, such that students become less academically engaged and high-achieving (Borofsky, Kellerman, Baucom, Oliver, & Margolin, 2013). Most importantly, the few studies that have been conducted that use self-ratings of student performance support academic self-competence having a negative relationship with greater levels of violence (Bowen & Bowen, 1999; Schwab-Stone et al., 1995). Overall, the literature points in the direction of academic self-competence as being affected by exposure to violence, suggesting there is value in exploring whether it serves as a mediator between this particular stressor and depression.

Discrimination. To the authors' knowledge, there are no studies examining discrimination and academic self-competence in European American adolescents at this time. However, studies have found that increases in discrimination predict lower academic self-competence for African American students (Dotterer, McHale, & Crouter, 2009). In considering whether academic self-competence may mediate the relationship between discrimination and depression, experiencing racial discrimination has been shown to predict not only a drop in academic self-competence, but a corresponding increase in African American students' depression (Wong, Eccles, & Sameroff, 2003). Finally, although they did not use self-reports,

Brody et al. (2006) found that caregiver ratings of African American adolescents' academic performance and investment in school were found to reduce the association between perceived discrimination and depressive symptoms. The literature seems quite clear that academic self-competence is likely to be negatively affected by experiences of discrimination, and that competence in this domain is similarly linked to depressive symptoms. As a result, the present study is intended to specifically test this potential mediation.

Moderation by Racial Status

Though the relationship between interpersonal stressors and depressive symptoms has been well-established, which stressors an adolescent will face, and how many, depends at least partially upon to which racial group they belong. Due to the variation in what is considered peer stress, it is difficult to report prevalence rates for how frequently adolescents experience these problems. At the same time, the wide range of potential stressors that fall under this heading suggests that it is likely all adolescents experience at least some form of peer stress during their development. Comparatively, nationally representative samples have consistently demonstrated that African American youth are at far greater risk of victimization and exposure to violence than their European American counterparts (Kilpatrick, Saunders, & Smith, 2003; Tillyer, Tillyer, Miller, & Pangrac, 2011). In one study, researchers reported that 57% of African American adolescents had witnessed a violent act in their lifetime, and 24% had been physically assaulted at some point (Kilpatrick et al., 2003). In the span of a year, 27% of African American adolescents had either been personally victimized or witnessed a violent crime (Chen, 2010). Discrimination is another common stressor linked to racial group status. Ethnic minority individuals, and African Americans in particular, are far more likely than the European American majority to perceive discrimination on the basis of their race (Fisher, Wallace, &

Fenton, 2000; Romero & Roberts, 1998; Seaton, Caldwell, Sellers, & Jackson, 2008). Moreover, 77% of African American adolescents reported at least one instance of racial discrimination in the past three months, 87% reported experiencing at least one such experience in the past year, and 91% of African American pre-adolescents had at least one experience in their lifetime (Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004; Prelow, Danoff-Burg, Swenson, & Pulgiano, 2004; Seaton et al., 2008). It is apparent that among African American youth, discrimination is both a nearly universal experience and one that occurs on a frequent basis.

In his application of the social model of depression to racial minorities, Fernando (1984) proposed that in addition to serving as an acute stressor, chronic perceived racism also decreases self-esteem and heightens perceptions of failure and helplessness in response to other, non-discriminatory stressors. Considering this theory in tandem with Beck's (1976) cognitive model, then, racial minorities may be more vulnerable to the effect of certain acute interpersonal stressors, especially those which they perceive as chronic or a hazard of their race. Due to greater likelihood of chronic exposure, acute interpersonal stressors are more likely to activate negative schemata in minority adolescents and cause them to hold negative attitudes about their own competence, which in turn may lead to an increase in depressive symptoms.

Present Study

The present study's goal is to examine how the differential vulnerability to interpersonal stressors associated with minority status might affect mental health in adolescents through the mediator of self-competence in an academic domain. In support of this, there is a significant body of evidence that suggests exposure to interpersonal stressors is linked to adolescent depression via the mediator of academic self-competence (e.g., Brière et al., 2013). Although the development of internal beliefs about the self is not unique to the school setting, schools may be

fertile ground for making these appraisals, particularly with regard to competence (Sandler, 2001). There is further support that ethnic minority youth are exposed to more stressors than their majority peers, and that such chronic exposure might, over time, make minority adolescents' perceptions of self-competence more vulnerable to future interpersonal stressors, and so to developing depressive symptoms (e.g., Seaton et al., 2008; Wong et al., 2003). Yet to our knowledge, no research currently exists which examines how racial minority status affects the relationship between interpersonal stressors, academic self-competence, and depressive symptoms, especially with regard to an individual's susceptibility to acute stressors. The present study is intended to begin to address that lack.

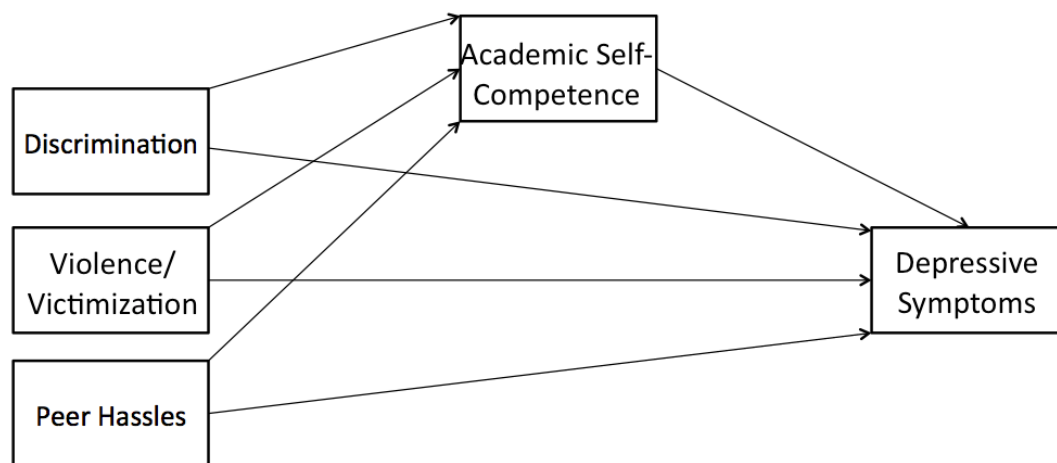


Figure 1. Hypothesized model of the relationship between interpersonal stressors and depressive symptoms mediated by academic self-competence.

The specific aims of this study, then, are twofold. The first is to investigate whether adolescents' perceptions of academic self-competence mediate the relationship between interpersonal stress and depressive symptoms as depicted in Figure 1. The second is to determine whether the utility of this model is influenced by an adolescent's self-identified racial group.

Given the support for the correlations between these factors in the literature, we hypothesized that perceptions of academic self-competence would account for some of the effect of stressful experiences on depressive symptoms among all youth. Interpersonal stressors were expected to relate to decreased perceptions of academic self-competency, which in turn were hypothesized to be related to greater levels of depressive symptoms. However, we also hypothesized that there would be moderation by race, such that for African American youth, there would be indirect and direct effects on depressive symptoms as mediated by perceptions of academic self-competence for all three types of stressors. Comparatively, for European American youth we hypothesized that the effects of discrimination and violence/victimization on depressive symptoms and academic self-competence would be diminished, and only peer stress would have significant direct and indirect effects in the model.

Method

Participants in this study were 260 adolescents from a public high school in a small northeastern city in the USA, 141 of whom self-identified as African American and 119 of whom self-identified as European American. The participants were majority female ($N = 149$, 57.3%) and had an average age of 16.4 years old. Although participants' ages ranged from 13 to 19 years old, 88% of participants were in the same developmental stage of middle adolescence (15-17 years); reflecting that, though participants were enrolled in 9th through 12th grade, 86.4% were in 11th or 12th grade. No differences by race were observed for age $t(248) = .41$, $p = .22$ or grade level $t(255) = 1.42$, $p = .92$, but there was a mean difference for gender $t(257) = -1.38$, $p = .02$ such that a greater percentage of the African American sample ($N = 86$, 61%) was female compared to the European American sample ($N = 63$, 53%). There was also a mean difference for SES $t(255) = -10.39$, $p < .001$. As indicated by receiving free or reduced school lunches, a

greater percentage of the African American sample ($N = 82$, 58.2%) was of low-SES than the European American sample ($N = 8$, 6.7%).

Procedure

The researchers contacted a school district in a northeastern city in the USA to recruit participants. After the school board and high school principal gave their approval, participants were recruited from the only public high school in that district as part of a larger sample. The school district provided researchers with the names of teachers who were willing to allow data collection to occur in their classrooms, and students in these classes took letters home on which their parents gave their informed consent. Following this, adolescents whose parents had agreed also gave their written assent prior to participation. Data was collected through a questionnaire packet, which was administered over 40 minutes to 5-10 students at a time. Students were spread throughout the administration room to maintain the privacy of responses. Trained research assistants read the questionnaire aloud for the purposes of consistency and to control for differences in reading comprehension. This study was conducted in accordance with APA ethical standards and the authors' university's Institutional Review Board.

Measures

Stressors. Participants' exposure to interpersonal stressors was assessed using an adapted version of the Multicultural Events Schedule for Adolescence (MESA; Gonzales, Gunnoe, Jackson, & Samaniego, 1995). In lieu of using the entire 70-item measure, items were selected based on prior research demonstrating their salience as stressors for urban youth (Attar & Guerra, 1994; Barrero et al., 2002; Nancy A. Gonzales, Tein, Sandler, & Friedman, 2001). As a result, discrimination was measured using a 6-item subscale, violence/victimization using a 5-item subscale, and peer stress using a 7-item subscale. The discrimination subscale identified

both verbal and behavioral discrimination and included items like “You were called a racial name that was a putdown,” the violence/victimization subscale identified witnessed, experienced, or threatened violent crime and included items like “You were threatened with a weapon,” and the peer stress subscale identified absent, conflict-ridden, or poor-quality peer relationships and included items like “Kids made fun of you because of the way you look.” Participants indicated which events they had experienced in the past three months by answering either 0 (*no, it didn’t happen*) or 1 (*yes, it happened*). Composite scores for each subscale were based on the mean of all subscale items, with higher scores reflecting a greater number of stressors. Adequate concurrent validity and test-retest reliability of this measure have been demonstrated with European American and African American samples (Cooley-Strickland, Griffin, Darney, Otte, & Ko, 2011; N. A. Gonzales et al., 1995).

As they are comprised of dichotomous items, reliability of the MESA subscales in the current study was calculated using Kuder-Richardson Formula 20 (Kuder & Richardson, 1937). The internal consistencies of the discrimination subscale ($r = .58$), the violence/victimization subscale ($r = .57$), and the peer stress subscale ($r = .51$) were lower than generally acceptable, but these scores are based on the occurrence of discrete events as opposed to a scale, and so a lower internal consistency is to be expected (Streiner, 2003). Specifically, the scores for each subscale reflect that as a count measure, each item contributes to the presence of an underlying related construct without needing to correlate with other indicators of this construct. Furthermore, each item was reported as occurring by more than 5% of the sample except for one, “You were pressured against your will to join a gang,” which only 3% of participants reported. As removing this low-frequency item did not change the results of the analyses, however, it was kept in the subscale to more accurately represent participants’ experiences.

Academic self-competence. The academic self-competence subscale of the Self-Perceived Competence Scale is a 13-item measure that assessed students' beliefs about their ability to do well in school with items like "I can do school work quickly" and "I can figure out answers in school" (Beiser, Lancee, Gotowiec, & Sack, 1993). Participants rated the degree to which they felt statements about academic success were true for them on a 4-point Likert scale ranging from 1 (*not true*) to 4 (*often or very true*). The composite score is based on the mean of all items, with higher scores reflecting greater perceived competence. Adequate reliability and convergent validity of the subscale have been demonstrated with youth from both ethnic minority and majority cultures (Beiser et al., 1993). In the present study, this scale was found to have good reliability ($\alpha = .84$).

Depressive symptomatology. The Center for Epidemiological Studies Depression Scale-Brief Version is a 12-item measure that was used to assess participants' depressive symptoms (CES-D; Roberts & Sobhan, 1992). Items on the scale are phrased colloquially rather than exactly replicating diagnostic criteria, for instance, "I could not get 'going'" and "I had crying spells." Participants indicated how often they had experienced each of the given symptoms in the past week on a 4-point Likert scale ranging from 0 (*rarely or none of the time*) to 3 (*most of the time*). One item, "I felt that everything that I did was an effort", was deleted from analyses due to poor psychometric properties, specifically a negative item-total correlation. A composite score was calculated using the remaining items and rescaled to match the full version of the measure so that scores could be compared to established cutoffs. Higher scores reflect greater depressive symptomatology. Adequate reliability and validity of the CES-D have been demonstrated with multi-ethnic samples of older adolescents (Radloff, 1991; Roberts & Sobhan, 1992). The adapted measure had good reliability in the current study ($\alpha = .75$).

Covariates. In light of the literature support for the relationship between depressive symptoms and an individual's age and sex (e.g., Hankin et al., 1998), we controlled for these demographic variables to reduce the likelihood that they account for relationships between interpersonal stressors, academic self-competence, and depressive symptoms. Age was measured in years, and gender was coded as two groups, 0 (*male*) and 1 (*female*).

Statistical Analyses

To examine the hypothesis that perceptions of academic self-competence would partially mediate the relationship between interpersonal stressors and depression, linear regressions were run in Mplus to test both the direct and indirect effects of stressors on depressive symptoms using 10,000 bootstrap coefficient estimates. These tests involve determining if the independent variables predict the mediator (path a) and the mediator predicts the outcome (path b), then calculating whether the indirect, mediating effect ($a \times b$) is significant. Although classic mediation involves examining whether the predictor significantly predicts the criterion before the mediator is added to the model (path c), this step is no longer considered necessary in determining whether mediation has occurred (Edwards & Lambert, 2007). However, we would expect that adding the mediator should reduce the strength of the relationship between the predictor and outcome (path c'), such that $c > c'$. If this relationship is reduced to a non-zero quantity after the mediator has been added to the model, partial mediation has occurred. If it is reduced to zero, complete mediation has occurred.

Above and beyond the simple mediation model, we also hypothesized moderated mediation. Moderated path analysis was used to compare the differences between racial groups to test whether race would moderate which stressors had direct and indirect effects on depressive symptoms through the predicted mediator of academic self-competence. Specifically, the direct

effect and first stage moderation model described by Edwards and Lambert (2007) was analyzed for each stressor. In this model, the moderator is theorized to influence the indirect effect through the relationship between the independent variable and the mediator, as well as the direct effect of the independent variable on the dependent variable when controlling for the mediator. Model 8 of the PROCESS macro was adapted into Mplus for these analyses (Hayes, 2013; Stride, Gardner, Catley, & Thomas, 2015). All predictors and the mediator were mean centered, and then coefficients were estimated using bootstrapping. Tests of differences for the direct and indirect effects were based on bias-corrected 95% confidence intervals derived from 10,000 bootstrap coefficient estimates.

Results

Before conducting analyses, data were screened for a variety of potential issues. For each variable examined, fewer than 5% of the cases had missing values. There were 22 cases with missing data, but Little's Missing Completely At Random (MCAR) test was not significant, indicating that these values were missing completely at random. Although maximum likelihood estimation can be used during analyses to address this issue, due to increased bias it is not able to make estimates for variables missing predictor values ($N = 6$) or missing all non-predictor values ($N = 2$). The eight cases that met either of these criteria were thus deleted.

Though there were no out-of-range values, there were several outliers for the stressor variables and for academic self-competence. This, combined with moderately large skewness and kurtosis and concerns about pairwise linearity, indicated the need for transformations. All three stressor variables were adjusted using a square root transformation, which drastically reduced the number of outliers and improved normality and linearity. The remaining three cases which remained as univariate outliers were deleted, and no multivariate outliers were found

using Mahalanobis distance with $p < .001$, leaving a final sample of 249 (African American = 134). Though several of the variables were correlated, both tolerance and variance inflation factor (VIF) were found to be well within the acceptable range after transformation, suggesting there were no issues of multicollinearity. Power analyses were conducted in G*Power to establish the sample size needed to detect a small effect at each step of the moderated mediation when power was set at .8 (Faul, Erdfelder, Lang, & Buchner, 2007). These analyses yielded a required sample size of 92, indicating the present study had sufficient power.

Descriptive statistics and correlation coefficients for the transformed sample, both as a whole and split by race, can be found in Table 1. A majority of the correlations were significant, but four aspects in particular ought to be addressed. First, though discrimination does not correlate with academic self-competence for the whole sample, this can be attributed to a non-significant correlation for European Americans obscuring the significant correlation for African Americans. Similarly, there was a non-significant correlation between violence and academic self-competence for European Americans. As these results are in line with the hypothesized moderated mediation, this is not particularly surprising. More incongruent is the non-significant correlation between peer stress and academic self-competence for both subgroups of the sample. Although this would generally indicate the variable's removal from the model, we remained interested in examining any potential direct effects and so kept it in the following analyses. Lastly, age and gender were not significantly correlated with the hypothesized mediator or outcome variable, indicating neither one functions as a covariate and leading to their removal from further analyses.

Table 1
Descriptive Statistics and Intercorrelations for All Variables

Scale	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Gender	.58	.50	–	-.07	-.05	-.21**	-.09	-.01	.07
EA	.53	.50		-.10	-.04	-.25**	-.05	.16	-.01
AA	.62	.49		-.04	-.06	-.19*	-.11	-.15	.15
2. Age	16.42	.91		–	-.03	.01	.00	-.11	.03
EA	16.45	.83			.03	.14	.02	-.14	.13
AA	16.40	.97			-.07	-.10	-.02	-.09	-.05
3. Discrimination	1.51	.40			–	.37**	.41**	-.04	.22**
EA	1.44	1.32				.33**	.41**	.13	.21*
AA	1.51	.39				.41**	.40**	-.18*	.22*
4. Violence/ Victimization	1.24	.32				–	.48**	-.21**	.26**
EA	.61	.94					.37**	-.06	.25**
AA	1.25	.32					.57**	-.33**	.28**
5. Peer Stress	1.50	.40					–	-.03	.25**
EA	1.49	1.21						.06	.22*
AA	1.48	.42						-.01	.27**
6. Academic Self- Competence	3.30	.45						–	-.36**
EA	3.29	.44							-.29**
AA	3.29	.46							-.43**
7. Depressive Symptoms	19.92	9.62							–
EA	20.03	9.74							
AA	19.85	9.37							

Note. EA = European Americans; AA = African Americans.

* $p < .05$ ** $p < .01$

Mediation

The mediation analysis was used to test the hypothesis that perceptions of academic self-competence would partially account for the effect of each stressor on depressive symptoms for all adolescents. The results of this analysis are shown graphically in Figure 2, including paths a, b, c', and the indirect effects of each stressor on depression. There was a significant direct effect of peer stress, but not of the other two stressors; however, findings indicate that academic self-competence completely mediated the effect of exposure to violence on depressive symptoms,

shown by the non-significant c' and significant indirect effect. Contrary to the hypotheses, it did not do the same for the other two stressors. In fact, neither the indirect effect of discrimination nor of peer stress was significant. Notably, removing peer stress from the model did not change the significance of the indirect relationship between violence and depressive symptoms or the one between discrimination and depressive symptoms, suggesting these results are robust.

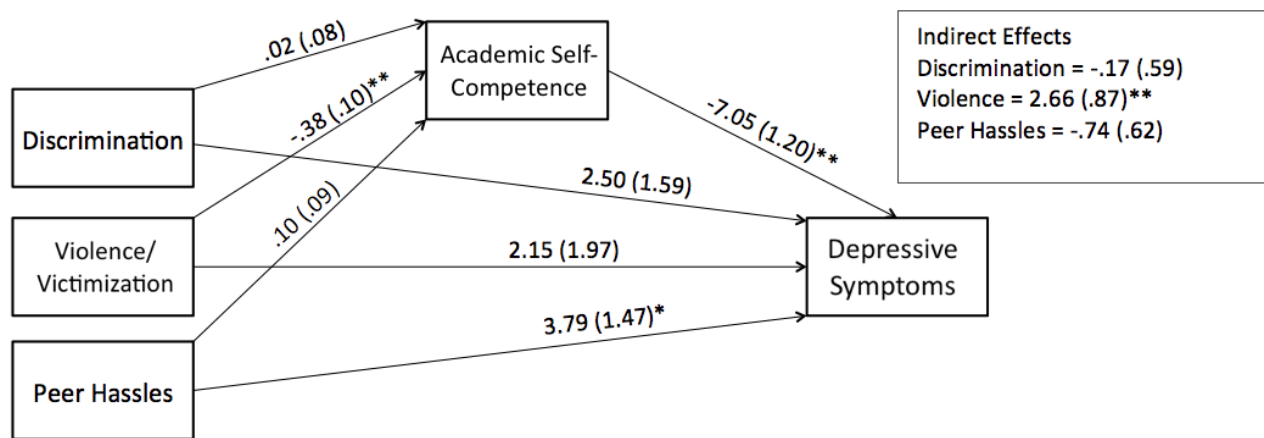


Figure 2. Relationships between interpersonal stressors and depressive symptoms as mediated by academic self-competence. Unstandardized coefficients are presented with standard errors inside parentheses.

* $p < .05$ ** $p < .01$

Moderated Path Analysis

Having established mediation, moderated path analysis was used to test whether the effects of each stressor on depressive symptoms were comparable across race. We hypothesized that for African American youth, there would be direct and indirect effects for all three types of interpersonal stressors, but that for European American youth, only peer stress would have significant direct and indirect effects. Contrary to this, none of the direct pathways from stressors to depressive symptoms were moderated by race, as shown in Table 2. A significant direct effect of peer stress on depressive symptoms was found for European Americans but not African Americans, but the difference between the groups was not significant. More congruent with the

hypotheses, race moderated the indirect path from discrimination experiences to depressive symptoms via academic self-competence, indicated by a significant difference in the effects between racial groups. Though the effects for each racial group were not independently significant, the direction of the moderation effect was as hypothesized. Race also significantly moderated the indirect path from exposure to violence to depressive symptoms via academic self-competence, such that there was a significant positive effect for African Americans but not for European Americans. The direction of these moderating effects was consistent with the hypotheses, as was the finding that there was no moderation of the indirect pathway from peer stress to depressive symptoms.

Table 2

Moderator Effects on Relationships Between Interpersonal Stressors and Depressive Symptoms

Moderator levels by predictor	Indirect effect	CI	Direct effect	CI
Discrimination				
European American	-1.45	-3.85, -.05	4.171	-.39, 8.82
African American	1.09	-.50, 3.00	.82	-3.27, 4.60
Differences	2.55*	.46, 5.22	-3.34	-9.24, 2.30
Violence/Victimization				
European American	1.19	-.38, 2.99	3.94	-1.12, 9.12
African American	4.38*	2.06, 7.55	.04	-5.13, 4.86
Differences	3.19*	.77, 6.55	-3.90	-10.63, 2.69
Peer Stress				
European American	-1.18	-3.28, .40	4.41*	.39, 8.28
African American	-.42	-2.00, 1.15	3.31	-1.90, 6.94
Differences	.76	-1.36, 3.17	-1.09	-7.80, 4.03

Note. Unstandardized coefficients are presented for each effect. Differences were calculated by subtracting the effects for European Americans from the effects for African Americans. CI = 95% confidence intervals.

* $p < .05$

Discussion

The purpose of this study was to examine if a) the effect of interpersonal stressors on depressive symptomatology was mediated by academic self-competence and b) that mediated model was itself moderated by race. In particular, we were interested in testing this model with

youth during the particularly high-risk developmental stage of middle adolescence, for whom the presence of depressive symptoms is more likely to lead to long-term negative outcomes.

In contrast to the initial hypotheses, the simple mediation model suggests that only peer stress was directly associated with an increase in symptoms, only exposure to violence affected depressive symptoms through academic self-competence, and discrimination was not significantly related to depressive symptoms through either the indirect or direct pathway. In combination, this suggests that while adolescents' self-perceptions were associated with negative psychological outcomes in the face of violence exposure, difficulty with peers had a more direct effect on outcomes. Also in contrast to our hypotheses, once the mediation model was split by race, none of the differences between racial groups were significant for any of the stressors' direct effects on depression. Of course, this may simply mean that there truly is no difference in the direct effect of various stressors on depressive symptoms by race. It is alternatively possible that adolescents are differentially affected by interpersonal stressors only through various mediators like academic self-competence.

Indeed, more differences by race were found in the mediated relationships. The indirect relationship of violence exposure and depressive symptoms was significantly different by race, such that there was a significant relationship among African American youth but not European Americans. Not only was the indirect relationship between discrimination and depressive symptoms significantly different by race, but the effects were also in opposite directions. This suggests that in the simple mediation model, the two effects may have canceled each other out, and might explain why the relationships between discrimination and both academic self-competence and depressive symptoms were not significant despite extensive support in prior research.

Notably, both significant differences in indirect effects were in the expected direction, where increases in African Americans' experiences of discrimination and violence or victimization were more positively related to increases in depressive symptoms than European Americans' experiences of the same stressors. This supports the theory that the chronic nature of African Americans' exposure to discrimination and violence makes them more susceptible to maladaptive responses in the face of interpersonal stressors. Overall, the moderated path analysis suggests that race is primarily linked to increased vulnerability through the association with academic self-competence, rather than to the direct effect of the stressors themselves.

While the non-significant role of age and gender as covariates in this analysis was contrary to most literature on depression, there is some evidence that gender differences are due in part to disparities in social factors (Maier et al., 1999). In samples where social factors are similar, as with students who attend the same high school, or where male students may be at greater risk for certain social factors like exposure to violence, as seen in this sample, this may equalize depression prevalence across genders. Similarly, this sample was clustered at the same developmental stage of middle adolescence, and so there simply may not have been enough variation in age to see the expected correlation with depressive symptoms.

What is less clear is why experiences of discrimination had a non-significant negative indirect effect on European Americans' depressive symptoms and a non-significant indirect positive effect on African Americans' depressive symptoms, as neither of these findings are consistent with most discrimination literature. A specific combination of psychological phenomena may provide an explanation as to why this might be the case. As previously discussed, perceptions of discrimination are lower in school environments where adolescents are surrounded by more same-race peers (Bellmore et al., 2012). This, in turn, has been linked to

increased school attachment and better resilience in the face of interpersonal stressors among African American students (Walsemann, Bell, & Maitra, 2011). At the same time, progress towards racial equality has been shown to be predictive of European Americans' perceptions of anti-White bias (Norton & Sommers, 2011; Wilkins & Kaiser, 2014). Considering why this perceived bias might decrease depressive symptoms, studies on individuals who are induced to feel uncertain about themselves, as might occur when they are the targets of discrimination, have linked self-uncertainty to defensive responses, including strengthening their self-identification on relevant facets (Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007; McGregor, 2004).

Thus in a school environment that has a significant population of African American students, like the one sampled for this study, we might expect to see two distinct trends. First, while discriminatory experiences are still potentially harmful for African American students, they may be protected from negative self-competence evaluations and depressive symptoms by having more same-race peers. Second, attributing discrimination to a more general pattern of anti-White bias might lead European American students to have a defensive reaction that bolsters, rather than damages, their sense of competence and improves their overall outcomes. Without a direct test of this, however, we must limit ourselves to speculation about these unexpected trends at this time.

Limitations

In addition to statistical and theoretical explanations for the findings that run contrary to the literature, there are methodological limitations that ought to be considered as well. First and foremost, the cross-sectional nature of this study's design prevents any conclusions from being drawn about causality. Another limitation of the study's design is the use of a single-informant measurement approach, which increases the likelihood that respondents may have been biased in

their reporting on each of the target variables. Similarly, absent additional measures of stress to establish convergent validity, the lower internal consistency and dichotomous nature of the stress measure used in the present study may not have accurately reflected the variation in stressor exposure. Although this type of measure is not uncommon in the literature, differences in frequency or intensity may have been obscured by the relatively limited amount of information provided by simply tallying whether an event occurred or not.

Furthermore, although bootstrapping was used to compensate for the moderate sample size, the sample was restricted to individuals attending a single public school. Thus the students all came from roughly the same general area, and so exposure to interpersonal stressors may have been relatively limited or shared across all participants. This might have prevented any noticeable variation of depression outcomes or academic self-competence by interpersonal stressor exposure, and so account for the non-significant mediation effects. The limitations of the sample also reduce the generalizability of these results, and so any broad conclusions about how adolescents of different races respond to interpersonal stressors from the findings of a single study would be ignoring the possibility that individual and community factors like age, urbanization, and regional culture might also influence pathways to depressive symptoms.

Implications and Future Directions

Despite the noted limitations, there were important findings from this research. The simple mediation supporting the role of academic self-competence as a mediator between violence exposure and depressive symptoms suggests that schools may be in an especially influential position to implement interventions for youth from high-risk communities, providing a buffer through improving academic self-competence. Although not a longitudinal study, it seems unlikely that academic self-competence would influence exposure to stressors like threats

of assault, and we can at least say that it is more logical, as well as in line with extant research, that the direction of causality is from stressors to competence. Whether the relationship between academic self-competence and depressive symptoms is bi- or unidirectional, and in which direction, may ultimately be a secondary concern, as school personnel should have a vested interest in helping all students feel academically competent regardless of their mental health status. Reducing interpersonal stressor exposure requires systemic changes that are unfeasible if not impossible to implement, but schools may play a direct role in adolescents' mental health by providing opportunities to assess and improve academic self-competence (Hoagwood et al., 2007; Strayhorn, Strain, & Walker, 1993). Understanding how academic self-competence relates to both interpersonal stressors and depressive symptomatology should therefore be of interest to all school-based personnel who want to promote positive adolescent outcomes, as this research may identify a target for future interventions in the school setting. If there is a causal relationship between academic self-competence and depressive symptoms as has been suggested by prior research, schools may be able to improve outcomes by supporting adolescents' sense of competence in a domain that can be controlled (i.e., school performance) rather than trying to reduce stressors, which is much more difficult to do. Future studies could test this model using a longitudinal design, as well as potentially conduct randomized controlled trials of an intervention to determine if improving academic self-competence can buffer students' mental health against stressor exposure.

Schools are also contexts in which other forms of competence can be developed and demonstrated, including those, like social competence, which have also been linked to depressive symptoms (Cole, 1990). Although the present study did not examine whether other forms of self-competence might be unaffected by the interpersonal stressors of interest, it is reasonable to

assume that such stressors would not influence every competence domain. It follows, then, that positive perceptions of competence in other domains might have served as hidden protective factors in this study, buffering the mediated influence of the target interpersonal stressors on depressive symptoms. This line of research would undoubtedly benefit from examining whether other competence domains that are salient to adolescents are similarly affected by exposure to stressors, as well as whether high competence in other domains potentially weakens the detrimental effect of stressors on depressive symptoms through academic self-competence – and if so, whether that protective effect holds true for every racial group.

Looking at the moderated mediation model, it is noteworthy that the African American students in this sample were more vulnerable to the effects of exposure to discrimination and violence than their European American peers, but only through indirect pathways. This highlights the fact that even if adolescents face the same interpersonal stressors, some groups will inevitably be at greater risk for poorer outcomes than their peers. Given the history of disenfranchisement and lack of privilege associated with African American racial status, it is not particularly surprising that African American youth comprise one such group. However, it also suggests that the increased vulnerability of ethnic minority status occurs because of how it shapes the way interpersonal stressors relate to academic self-competence, raising the question of whether mechanisms like self-efficacy can explain this relationship. Per Fernando's (1984) theory, chronic stressors increase an individual's sense of helplessness over time, and a minority adolescent's perception that he or she can perform well in academic settings may be one domain damaged by that loss of control. Identifying how stressor exposure affects academic self-competence for African American youth is therefore the next step in understanding and explaining how factors associated with depressive symptoms are moderated by race.

Looking at the majority group, on the other hand, it is important to explore whether perceived discrimination is potentially related to *increased* academic self-competence in European Americans, and if so, why. While positive perceptions about the self are a desirable outcome, it seems plausible that there may be unwanted effects to increasing competence through perceived experiences of victimization. For instance, perceptions of discrimination have been linked to a tendency to engage in zero-sum beliefs about gains for one group leading to the diminishment of another, which in turn may cause individuals to engage in discriminatory and biased behavior themselves (Wilkins, Wellman, Babbitt, Toosi, & Schad, 2015). Research to explore this in adolescents with a nationally representative sample that captures different types of school composition would be ideal, but even smaller-scale studies on the various effects of perceived discrimination against European American youth could potentially contribute to understanding this finding, and may prompt finding alternative ways to support their academic self-competence.

In addition to specific follow-up studies, there are several more general directions in which future studies could expand on this area of research. It would be beneficial to conduct studies examining other potential mediators of the relationship between interpersonal stressors and depressive symptoms, particularly at different developmental stages. For instance, while academic self-competence is a logical choice for a mediator in a school-aged population, adults may or may not integrate competence at work into their self-concepts in the same way. Similarly, another area that could use further exploration is whether pathways to disorders other than depression are also moderated by race. It seems unlikely that the influence of race on these relationships is unique to depressive symptoms, and gaining a more clear understanding of how race affects a broad spectrum of psychological complaints serves both theoretical and practical

purposes in research and clinical work. Lastly, although this study was limited by the dichotomous, time-restricted nature of the measure of stress, this is not uncommon amongst the extant literature (e.g., Attar & Guerra, 1994; Tram & Cole, 2000; Wong et al., 2003).

Conceptualizing interpersonal stressors like discrimination as being both lifelong and acute may provide researchers with a more nuanced understanding of the various patterns of differential exposure, as well as the associated effects on depressive symptoms.

Ultimately, these findings emphasize how crucial it is for researchers to consider the differential impact of race on pathways to disorder. Just as the association between interpersonal stressors and depressive symptoms varies by race, so too might other relationships between risk factors and disorder be influenced by an individual's racial or ethnic identity. Indeed, these findings even suggest that racial differences may mask significant effects, and researchers who ignore the role that race plays in the development of disorder run the chance of missing risk factors for especially vulnerable subsets of the population which could otherwise be targeted by interventions.

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