Normalized Aggression: Exploring the Role of Normalized Beliefs in the Desensitization of

Violence Exposed Youth

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Abstract

Exposure to community violence (ECV) has been associated with a host of maladaptive outcomes for youth from low-income, inner city communities including increased aggression and psychopathology symptoms such as depression. Several studies show discrepancies in the relation between exposure to violence and aggression and depression. One common finding is that ECV has a linear relation to aggression but a curvilinear or plateauing relation to depression. The Pathologic Adaptation Model has been offered as one possible explanation for this process, proposing that ECV causes the development of beliefs about aggression as common and acceptable. These normalized beliefs, in turn, lead to increased aggression due to desensitization. At the same time, desensitization blunts emotional turmoil related to such exposure, plateauing or even decreasing the level of depressive symptoms as exposure increases. This explanation has mixed support in the existing literature and has few studies including consideration of the theorized normalizing process, pointing to the need to test the theorized mediational processes (e.g. the development of normalized beliefs). As well, studies have tended to focus on males or if including females, limited attention to potential variation by gender. The present study utilizes a sample of 429 adolescent youth (265 males, 164 females) drawn from four urban communities with elevated rates of poverty, to test whether the relation between exposure to violence and ratings of aggression and depression is mediated by levels of normative beliefs about aggression and is consistent across gender. Results indicated that while normative beliefs about violence approached significance in the relation between exposure to violence and aggression for females; there was no evidence of mediation for male participants.

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Research has consistently shown that children in low-income urban communities are

exposed to violence at high rates. Studies find that 75% to 80% of sampled youth report

exposure to some form of violence in their communities (Cooley-Quille et al, 2001; Bell &

Jenkins, 1993; Fitzpatrick & Boldizar, 1993 Margolin & Gordis, 2000; McCart et al. 2007;

Schwab-Stone et al., 1995). These rates of exposure have led to interest in the potential influence

of such exposure on pathology among youth residing in these communities. A substantial body

of research over the past two decades has linked exposure to violence to a host of detrimental

behavioral outcomes including increased likelihood of aggression and violence perpetration

(Gorman-Smith, Henry & Tolan 2004; Kliewer et al, 2004; Ozer & Weinstein, 2004; Sullivan,

Kung & Farrell, 2004) and juvenile delinquency (Eitle & Turner, 2002). Similarly, several

studies have linked exposure to violence to increases in reported symptoms of depression (e.g.,

Chen, Corvo, Lee & Hahm, 2017).

Among studies that considered aggression and depression, several noted that while the

relation of exposure to aggression seems to be continuous, a non-linear trend or plateau effect

emerges between violence exposure and depression (Gaylord-Harden, Cunningham & Selenic,

2011; Guerra, Huesmann, & Spindler, 2003; Huesmann & Guerra, 1997; McCart et al, 2007;

McConville & Cornell, 2003; Mrug et al, 2008; Werner & Nixon, 2005). These findings have led

to the contention that these different patterns of outcome effect may reflect a psychological

process called "desensitization" that occurs in the face of chronic or high levels of exposure to

violence (Gaylord-Harden, Cunningham & Selenic, 2011; Gaylord-Harden, Dickson, & Pierre,

2016; Mrug Loosier & Windle, 2008). Desensitization refers to a state in which the youth

becomes hardened or differentially affected as violence exposure increases to higher or levels. The differential impact on depression is to lose the emotionally perturbing impact of depression as exposure reaches high or chronic levels. The same hardening, though, propels increasing aggression continuously; by breaking down inhibitions about use of aggression and promoting viewing aggression as useful and common (Cooley-Quille & Lorion, 1999; Gaylord-Harden, Dickson, & Pierre, 2016; McCart Smith, Saunders, Kilpatrick, Resnik, & Ruggiero, 2007). Thus, according to this theoretical formulation, while exposure rates may relate to violence and crime risk in a continuous linear fashion, problems such as anxiety or depression hit a plateau of effects (Mrug Loosier & Wilde 2008).

The Role of Normalized Beliefs about Aggression in Desensitization.

Purveyors of the Pathologic Adaptation Model argue that aggressive behavior in children is acquired when they observe or experience more aggressive behavior than other types, causing them to learn more scripts emphasizing aggressive behavior, and making them more likely to select an aggressive response (Huesmann, 1988; Ng-Mak, Salzinger, Feldman & Stueve, 2002). Scholars also argue that this consistent exposure concurrently causes youth to develop cognitive schemas of the world as a violent place which may explain the curvilinear association between ECV and depressive symptoms (Guerra et al, 2003; Huesmann, 1988, 1998; Huesmann & Guerra, 1997). Specifically, youth who come to view the world as a violent place may show less emotional impact in the face of subsequent exposures to community violence as they become habituated. Ng-Mak, Salzinger, Feldman & Stueve (2002) predicted that a weak relation between exposure and depression and strong relation between exposure and aggression is evidence of the Pathologic Adaptation Model. While several studies have operated from the Pathologic Adaptation Model implicitly or explicitly, there is a relative absence of studies that have tested

the specific theorized mediation of normative beliefs.

There is consistent support in the theoretical literature for normalized beliefs as a potential mediator of the relation between exposure to violence and aggression (Guerra, Rowell, Huesmann, & Spindler, 2003; Huesmann & Guerra, 1997; McConville & Cornell, 2003; Werner & Nixon, 2005). For instance, one mediational study found that normalized beliefs accounted for 16% of the effect of violence exposure on future aggression (Guerra et al., 2003). Furthermore, Huesmann and Guerra (1997) conducting a longitudinal study on aggression and normalized beliefs found that among adolescents, normalized beliefs about violence predicted their aggressive behavior even when using a peer nominated measure of aggression. The same researchers also found that normalized beliefs were not predicted by a measure of prior aggression, suggesting that the relation is not bi-directional or simply one of covariation.

In contrast, the evidence supporting normalized beliefs as a mediator of the relation between ECV and measures of depressive symptoms has been less clear. First, there has been relatively little research on normalized beliefs as a mediator in this relation. Most research assesses the effect that ECV has on depression as a desensitization effect but does not include a measure of normalized beliefs as a mediator of this process. Among this limited literature, there is variation in findings about the association between ECV and depression.

Research exploring the connection between ECV and depressive symptoms have found results ranging from no association (Cooley-Quille, Turner & Beidel, 1995) to linear (Ranney et al., 2013; Fitzpatrick & Boldizar, 1993) and non-linear relations (Gaylord-Harden, Cunningham & Selenic, 2011; McCart et al, 2007; Mrug et al, 2008). Among studies with findings that support a non-linear relation, some show a positive linear association between ECV and depression at low to moderate exposure to violence and a plateau at higher levels (Mrug et al

2008), while others report a similar pattern with a decrease in depression at high levels of ECV (McCart et al 2007; Gaylord-Harden Cunningham & Selenic, 2011). These findings may indicate the presence of a mediating variable between ECV and its effect on depression.

Testing the Pathologic Adaptation Model

Three longitudinal studies have included measures of beliefs about aggression as mediators to test the Pathologic Adaptation Model (Boxer et al, 2008; Gaylord-Harden et al, 2016; Gaylord-Harden, Bai & Simic, 2017). The findings about the influence of normalized beliefs about violence are conflicting. Boxer and colleagues (2008) assessed the extent to which children's Aggression-Supporting Beliefs and Avoidant Coping styles mediated the relation between exposure to violence and future use of violence amongst a sample of predominately African American children controlling for sex, city, and age. Results showed two pathways by which exposure to violence affects youth within these communities. The first, named the normalization pathway, works in such a way that exposure to violence influences beliefs about violence and later aggression while showing no relation to subsequent coping behaviors and emotional disturbance. The second, termed the distress pathway, characterized children who did not experience increased normalized beliefs in response to exposure but did experience an increase in avoidant-coping behaviors. The increased avoidance precipitates an increase in emotional symptoms but not increased violence. Thus, in this study evidence for the desensitization effect was found in that effects of ECV were transmitted through a measure of beliefs about aggression. However, the results also suggest that there are differences by the type of exposure as finding only direct victimization predicted the pathway to avoidant coping and in turn, to more emotional distress (Boxer et al. 2008). Conversely both witnessing and being a direct victim of violence led to desensitization and increased aggression. This latter seems more

consistent with violence exposure overall as the basis for Pathologic Adaptation. While

providing support for the Pathologic Adaptation processes, these findings suggest the value of

testing mediation of normative beliefs in explaining the effects violence.

Gaylord-Harden and colleagues (Gaylord-Harden, So, Bai, & Tolan, 2016) utilized

longitudinal data of a sample of adolescent males, over selected for elevated aggression and

residence in inner-city communities, to test the Pathologic Adaptation Model, predicting that 1)

at high levels of ECV, depression would mediate the relation between ECV and future violence

and 2) normalized beliefs mediate the relation between exposure to violence and increased

violent behavior in later adolescence. Findings provided mixed support for the Pathologic

Adaptation Model showing that depression mediates the relation between ECV and future

violence but normalized beliefs do not significantly predict a curvilinear relation between

exposure to community violence and depression (a desensitization effect) later in life (Gaylord-

Harden et al., 2016). Gaylord-Harden and colleagues argue that their findings may be a result of

using a measure asking participants to report on their family's beliefs about violence rather than

their own. This may be a poor measure of the child's normative beliefs, because use of a family

measure may not reflect the child's normative beliefs (Tolan, Gorman-Smith, Huesmann, &

Zelli, 1997).

A second study by Gaylord-Harden, Bai and Simic (2017) utilized longitudinal data to

assess the extent to which depression, physiological hyperarousal, and normalized beliefs about

aggression mediated the relation between ECV and later aggressive behavior in a sample of

black males. Unlike the Pathologic Adaptation Model, depression was positioned as a mediating

variable that, along with hyperarousal and normalized beliefs, transmits the effect of early ECV

to later aggressive behavior rather than a concurrent effect of desensitization that results from

exposure and normalization of aggressive beliefs. Results of a series of bootsrapped bias corrected regression analyses indicated that while normalized beliefs predicted future aggressive behavior, they were not predicted by prior ECV and consequently the mediation path was not significant. The association between normalized beliefs and depression and the extent to which it mediates the relation between exposure and depression was not assessed in that study.

While these three studies differ in their approaches and findings about the patterns of effects of exposure to violence, they are consistent in suggesting the value of understanding the effect of violence exposure on aggression and desensitization and the role of normative beliefs in such relations. Furthermore, the relative paucity of studies examining the Pathologic Adaptation Model as specified by Ng-Mak, (2003) suggests the value of applying that framework but with specific test of mediation of normative beliefs as well as the patterns of relation of ECV to outcome.

Gender Variations in Pathologic Adaptation Processes.

Another issue of importance is that there have been few studies that consider how gender variations might occur in regard to impact of ECV on aggression and depression and the mediating role proposed for normative beliefs. For example, only one study has included adolescent females while testing for the mediation effect of normalized beliefs about aggression on outcomes of both aggressive behavior and depressive symptoms (Boxer et al., 2008).

Despite the lack of research testing the fully outlined Pathologic Adaptation Model (which includes normalized beliefs as a mediator in both aggression and depression outcomes) pertinent research suggest variation by gender in the differential pattern of exposure to outcome for aggression and depression may occur. Similarly, there is some basis for expecting mediation by normative beliefs to be consistent across genders, even if the outcome relations to exposure

may vary. Studies have shown variation in both the rates and effects of exposure to violence by gender in inner city communities (Farrell & Bruce, 1997; Fehon, Grilo & Lipschitz, 2001; Gaylord-Harden et al., 2016; Gorman-Smith et al., 2004; Springer & Padgett, 2000). First, most studies show that African American males report higher rates of direct victimization and overall violence exposure than their female peers (Farrell & Bruce, 1997; Fehon, Grilo & Lipschitz, 2001; Gorman-Smith, et al 2004; Springer & Padgett, 2000). However, these findings are not universal. For instance, one study found that women were as likely to be directly and indirectly exposed to violence in their communities as men (Gaylord-Harden et al., 2016). If women are less likely to witness community violence, models attempting to find trends at high levels may have trouble detecting them because fewer women reach those levels of exposure.

The accumulated results have also shown inconsistencies in the effects that ECV has on adolescents by gender. In addition to differences in rates of exposure, males show higher rates of aggression and violence than females in most studies of adolescents whereas females have higher rates of depressive symptoms, across samples (Guerra et al, 2003; Kessler et al, 2003). Moreover, some studies have found that ECV is more closely related to externalizing behaviors in males than in females (Bacchini, Miranda, & Affuso, 2011), while others have found no difference in this relation by gender (Mrug & Windle, 2009). Conversely, a latent class analysis also found that the group endorsing the highest level of exposure to violence, which was 57% female, also endorsed the least depressive symptoms, indicating that there may be a similar pattern of desensitization in the face of high ECV for males and females (Gaylord-Harden et al, 2016). Overall, while the research on the effects of ECV on depression and aggression appears to be mixed, there is some evidence that ECV may play a similar role in predicting these variables regardless of gender.

In addition to differences in the rates and effects of ECV by gender, there may also be differences in the levels and effects of normalized beliefs about violence. While some research has found that males are more likely to support beliefs that normalized violence than females (Huesmann & Guerra, 1997; Stueve, O'Donnell & Link, 2001), other studies indicate that there may also be some consistency in the extent to which normalized beliefs play a role in pathologic adaptation by gender. One longitudinal study on the relation between social cognition, exposure to violence, and aggression found that males scored higher on measures of normalized beliefs about violence at the first time point but that aggression increased at a similar rate over time regardless of gender (Guerra et al., 2003). Accordingly, it may be that normalized beliefs about violence function similarly for both genders in the Pathologic Adaptation Model but that male adolescents may have higher baseline rates of normalized beliefs and consequently more aggressive behavior in later adolescence. In contrast, female adolescents may have less normalized beliefs about aggression in response to ECV but endorse higher symptoms of depression in later adolescence. Though there may be differences in the strength of these relations, it seems likely that ECV will function in a way consistent with the Pathologic Adaptation Model for both male and female youth. This study will provide some of the first comparisons of males and females in regard to the function of normalized beliefs about violence in the process of desensitization. Moreover, as this is a general or universal sample from communities that have elevated violence, this study will provide some of the first understanding about how exposure and its impact may vary as a function of individual beliefs about violence. Thus, there is value in considering if the Pathologic Adaptation mechanism applies across genders.

The Present Study

In summation, exposure to violence in inner city communities remains a significant risk factor for violent behavior and for psychopathology symptoms as children move through adolescence. Though the study of violence effects has made significant gains in recent years, study of the Pathologic Adaptation Model is still in its nascent stages. Little information is available about if and how desensitization occurs in the Pathologic Adaptation Model and how this relates to future behavior in adolescence, including potential variation by gender. In an attempt to address these gaps in the existing literature, the current study seeks to answer the following three research questions: 1) Do normalized beliefs about violence mediate the relation between exposure to violence and both outcome variables in later adolescence? 2) is there a curvilinear relation between normalized beliefs about violence and depression? and 3) Are there variations in any of these relations by gender?

In line with much of the theory and research on the Pathologic Adaptation, Model, we hypothesize that 1) Normalized beliefs about violence will mediate the relations between exposure to community violence and both outcomes respectively, 2) normalized beliefs will mediate pathways between exposure and depression and aggression respectively regardless of gender, and 3) the relation between normalized beliefs and depressive symptoms will follow a non-linear trend consistent with desensitization

By addressing these questions, the current study builds on previous research in several ways. First, the current study adds to the limited body of longitudinal research on Pathologic Adaptation by using multiple time points to track exposure to violence, aggression, normalized beliefs, and depression across the adolescent developmental period. Second, the current study attempts to search for differences in the Pathologic Adaptation Model by gender to further

illuminate gaps in our understanding of this process. Finally, the current study is one of relatively few studies assessing the extent to which normalized beliefs mitigate the emotional effects of ECV by mediating the relation between ECV and depressive symptoms. Consequently, findings of this research have the potential to assist in the targeting and treatment of trauma exposed youth. For instance, the findings of this study and future studies may help to identify children who are particularly at risk for negative outcomes given wide-spread exposure in particularly violent communities. These findings may also be used to develop alternative interventions or diversion programs for children who are already involved in the legal system by providing a deeper understanding of how environmental and community factors can contribute to violence risk.

Method

Sample and Data Source

This sample was drawn from the intersection of data from two samples collected as part of the Multisite Violence Prevention Project, a multi-institution collaboration with the goal of exploring the effectiveness of universal and targeted intervention strategies for children across different geographic and social settings. Teams of researchers associated with four major universities (University of Illinois at Chicago, University of Georgia, Duke University, and Virginia Commonwealth University) collected data from 37 metropolitan schools in four locations on middle school students, their families, and their communities within the service area of each respective university.

Two samples were assembled and followed for that overall study. A general population sample of approximately 100 students per school, randomly selected to be representative of the

6th grade population was drawn for each of two cohorts. At the same time a smaller

(approximately 20-40 per school) targeted sample of "high-risk" students was composed based

on teachers ratings of aggression. First, teachers rated all students in the classroom on their level

of aggression. From the top 25%, teachers were then instructed to rank these for level of

influence on other students. The most influential 3-5 students were then selected from this group

for recruitment. The goal of the intervention was to target students who were aggressive but also

socially influential and to see if intervention with them translated to change in population rates of

violence (Multisite Violence Prevention Project, 2007). The two samples were drawn to

facilitate testing the effectiveness of a targeted and a universal intervention and their

combination for violence reduction (e.g., student-based interventions, teacher-based

interventions, family-based interventions) on the high-risk segment targeted in the selective

intervention but also to test for effects on the overall school population (Henry, Farrell, & The

Multisite Violence Prevention Project, 2004).   The current study does not focus on intervention

effects, and treats intervention exposure as a control variable. The current study also combines

measures that were unique to each data set by selecting members of the high-risk sample who

also participated in the universal sample. The high-risk sample was selected based on the

assumption that these more aggressive youth would be more likely to have experienced violence

exposure.

     MVPP high risk sample identification. To compose a sample of high-risk students for

targeted interventions, researchers identified students based on teacher rating of student

misbehavior and aggression in class. (e.g., "encourages other students to fight, frequently

intimidates other students, has a short fuse, gets angry easily, gets into frequent physical fights").

Students scoring in the top 25% of the class were then rated by the teacher in regard to how

socially influential he or she was on other students (a five- point Likert scale, 1=not influential at all, 5=very influential) using the following guidelines: "Who are the students that other students listen to about attitudes, how to behave, what's good, important, or cool?", "Who sets the trends among students?", "Who seems respected by other students?", and "These should be the students that other students try to be like, try to imitate." Students who scored at a mean of 4 or 5 were then included in the high-risk sample recruitment pool.

This process identified a total of 743 students who were eligible to be recruited for the current study, of which 517 (70%) elected to participate in wave 1 (Smith, Gorman-Smith, Quinn, Rabiner, Tolan & The Multisite Violence Prevention Project, 2004). Wave 2 included 630 participants which created a total sample of 1,147 participants. Letters outlining the purpose and course of the program were sent to families followed by calls and home visits by group leaders. Group leaders received extensive training and followed a basic script approved by the Institutional Review Board of the Center for Disease Control and Prevention.

To relate the assessment of norms about violence, we cross-collated this sample with the general population sample, which yielded a final sample of 429 participants. The youth represented in this sample were predominately male (62% male and 37% female) and African American (63% Black and 22% Hispanic, 15% Non-Hispanic White or other). The resulting sample was fairly evenly distributed by treatment condition with 24% included in the control group, 20% included in the universal treatment group, 31% included in the targeted group, and 23% included in the combined (targeted and universal treatment) group.

T-Tests conducted between the 429 participants who comprised this sample and the 718 members of the high-risk sample not included due to not having data from the general population sample at wave 2, did show a statistically significant difference on aggression level T = (1006) -

3.1, $p = .002$ but not depression T (951) =1.25, p -.21 or exposure to violence T (1078) = 2.07, p = .35. Participants from this final sample were also more likely to be from the Chicago site (37%) than others which was expected as these were smaller schools so being in both the universal and targeted samples was more likely.

Measures

Predictive Measure. *Exposure to Violence.* Exposure to violence was measured by the Exposure to Violence Scale (Cooley-Quille et al, 1995; Attar et al. 1994). The Exposure to Violence scale is a validated measure of adolescent's exposure to violence against individuals other than themselves. Two subscales from this scale are included in the current study assessing the extent to which adolescents have been exposed to violence against a stranger (e.g. "In the past 6 months, have you seen a stranger being beaten up? In the past 6 months, have you seen a stranger being chased or seriously threatened? In the past 6 months, have you seen a stranger being shot?") and against someone with whom they are acquainted (e.g. "In the past 6 months, have you seen somebody you know being stabbed? In the past 6 months, have you seen somebody you know being shot? In the past 6 months have you seen somebody you know being killed?"). Responses are measured along a 4-point Likert scale ranging from 1 ('No, Never') to 4 ('Many Times'). Scores from across the students 6th grade year (Fall 2001 and 2002 through Spring 2002 and 2003) will be averaged to provide baseline (time 1) predictor assessment. Preliminary analyses indicated that the scale had acceptable reliability with the current sample ($\alpha = .86$).

Mediator. *Normalized Beliefs About Violence*. The mediational variable, normalized beliefs about violence, was assessed using the Attitudes Toward Violence and Non-Violence scale (Farrell Meyer & White, 2001). The Attitudes Toward Violence and Non-Violence scale is

a combination of measures from the Beliefs Supporting Aggression scale (Slaby & Guerra, 1988) and the Attitudes toward Conflict Scale (Lam, Rifkin, & Townley1989). The Individual Norms for Alternatives to Aggression subscale, an 8-item measure of the extent to which each child endorses violence as an appropriate or "normalized" response (e.g. "It's O.K. for me to hit someone to get them to do what I want; If I back down from a fight, everyone will think I'm a coward; If people do something to make me really mad, they deserve to be beaten up"), will be the only measure included from this scale. Scores from the end of 6th grade (Spring 2002 and 2003) through the end of 7th grade (Spring 2003 and 2004) were averaged to assess the effect after baseline but prior to outcome (albeit overlapping some with contributors to the predictor and the outcome). These intervals were chosen because the expected year-long interval was unavailable as norms data was not collected in the beginning of 7th grade. Preliminary analyses indicated that this scale had reliability that was just at the limit of acceptability ($\alpha = .71$).

     Outcome Measures. *Aggressive Behavior.* The outcome variable aggressive behavior was measured using the Problem Behavior Frequency Scale (Farrell, Danish & Howard, 1992). The Problem Behavior Frequency Scale is a measure of the frequency with which children engage in a number of physical (e.g. "Been in a fight in which someone was hit, pushed or shoved another kid, hit or slapped another kid") and non-physical forms of aggression (e.g. teased someone to make them angry, insulted someone's family, stolen something from another student). Students indicate how frequently they engage in each behavior in the past 30 days on a 6-point anchored scale ranging from 1 (never) to 6 (20 or more times) (Farrell Meyer & White, 2001). Scores from the end of 7th grade (Spring 2003 and 2004) through the end of 8th grade (Spring 2004 and 2005) were averaged to assess outcome (time 3). For the purposes of this research only examples of physical aggression captured by the Physical Aggression 30-Day

Frequency Subscale were used in the analyses. Analyses indicated that this subscale had adequate reliability for this sample ($\alpha = .86$).

Depressive Symptoms. The outcome variable, depressive symptoms, was measured by the Behavior Assessment System for Children – Second Edition (BASC-2). The BASC is a well validated measure designed to identify a child's level of behavioral and emotional functioning (Reynolds, 2010). For the purposes of this study, the parent report version of the Depression subscale was used to determine the extent to which each child's observable behavior is consistent with symptoms endorsed by a clinically depressed population. This measure included items such as "Says I want to kill myself", "Is sad", and "Cries Easily". Responses were anchored at zero and ranged along a 4-point scale from 0, "never" to 4, "almost always." Scores from the end of 7th grade (Spring 2003 and 2004) through the end of 8th grade (Spring 2004 and 2005) were averaged to assess outcome (Time 3). Preliminary analyses indicated that this subscale had adequate reliability for this sample ($\alpha = .80$).

Covariates. Measures of gender and treatment condition, and recruitment site and ethnicity were included as covariates for the current study. To identify measures of gender, students were asked to identify themselves as "male" or "female" as part of the survey process. The treatment condition is tracked as part of the initial study design and designated by the participants inclusion in one of the four treatment conditions described above. Recruitment site was similarly tracked and designated as one of the four sites described above. Ethnicity was coded as a categorical variable asking participants to choose one of 8 options, "White, non-Hispanic", "Black, non-Hispanic", "American Indian or Alaskan", "Asian Indian", "Other Asian", "Hispanic", "Other race, non-Hispanic", and "Multi-Racial." These selections were ultimately collapsed into dummy codes representing participants who identified as "Black, Non-

Hispanic", and "Hispanic" with the combination of White, non-Hispanic, American Indian or Alaskan, Asian Indian, Other Asian, Other race, non-Hispanic and Multiracial collapsed into a reference group. This was combined reference group was chosen because the individual groups were too small to be included as individual dummy codes.

Analyses and Results

Preliminary Analyses

Missing Value Analyses were conducted using the SPSS package to determine the extent and pattern of missing data. Results revealed that all variables were missing non-negligible amounts of data; e.g., exposure to violence measure at 6% missing, the aggression measure missing at 7.5% and depression variable missing at 15.6% of the sample. Measures of control variables including site, treatment condition, race, and gender were missing negligible amounts of data (1.3 to 2.6%). Little's MCAR Test indicated that the data appeared to have no discernable pattern of missingness X^2 (20) = 22.127, p =.344.

Preliminary bivariate correlation analyses were run and indicated significant relations between exposure to violence and aggression (r = .25, p <.05), and depression (r = .16, p < .05) respectively. The mediating variable, normalized beliefs about violence, was significantly correlated with the aggression measure (r = .26, p < .05) but not the measure of depression (r = .31, p = .53) and the outcome variables, depression and aggression were significantly correlated with each other (r = .14, p <.05).   All of these are modest correlations, which may be due in part to the time span between them (across multiple years in some cases). Descriptive statistics are provided in Table 1 below.

Table 1

Descriptive Statistics for General Sample

	Minimum	Maximum	Mean	Variance
Exposure	1.00	4.00	1.46	.38
Norms	1.00	6.42	2.39	.53
Aggression	1.00	6.16	1.95	.85
Depression	0.09	2.45	0.64	.18

Table 2

Pearson Correlation Matrix among Benchmark Scale Scores and Global Ratings

	Norms	Aggression	Depression
Exposure	.13	.25*	.16*
Norms	-	.26*	.03
Aggression	-	-	.10*
Depression	-	-	-

*p < 0.05

Testing Paths of Exposure to Violence to Mediator and Outcomes

Path analysis, a form of simultaneous regression, was chosen as the method to test the

pathologic adaptation model. Path analysis was selected because it is well suited to testing

mediation effects, particularly when there are multiple outcome variables (Guzzler, Chen, Wu &

Zhang 2013; Sobel, 1982; Cloggg, Petkova, & Shihadeh, 1992). As Gunzler and colleagues

explain, this is because it simultaneously estimates relations of the mediating variable as both an

exogenous and endogenous variable (Cloggg, Petkova, & Shihadeh, 1992; Gunzler, Chen, Wu &

Zhang 2013; Sobel, 1982;). Path analysis is preferable to the partial correlation method

described by Baron & Kenney (1986) because each step regression can include different

numbers of participants when there are differences in missing data by variable, as is the case in

the current study (Gunzler, Chen, Wu & Zhang 2013; Sobel, 1982; Cloggg, Petkova, &

Shihadeh, 1992). Furthermore, statistical simulation studies indicate that the causal-step method has limited sensitivity to detect mediation effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). For example, one such study by Fritz and MacKinnon (2007) found that the causal-step method needed at least 21,000 cases in order to generate the power required to detect small effect sizes along the mediational pathway. In addition, MacKinnon and Fairchild (2009) further assert that there may be circumstances where subgroups of an aggregated data set may have different directions (i.e., positive or negative) of influence on outcome variables that would indicate no mediation in a standard causal step approach using linear regression. Such a scenario directly applies to the current study which is considering potentially different predictor outcome and mediation relations depending on gender and other variables. Structural Equation Modeling has also been used to study exposure to violence and normalized beliefs about violence in prior research (Low & Espelage, 2014; Preacher & Hayes, 2008; Mrug Madan & Windle, 2016).

In Structural Equation Modeling, missing data is most commonly handled through multiple imputation via the Maximum Likelihood (ML) estimator. Accordingly, assumptions relevant to regression, path analysis, and imputation using ML were evaluated prior to the imputation process. The data set did not violate the assumption of independent errors (Durbin-Watson value = 2.03), Collinearity, or Multicollinearity (i.e. all Tolerance Values < 0.6 and all Variance Inflation Factor (VIF) values < 10). However, descriptive statistics and histograms indicated several departures from normality amongst the variables included in this model (Field, 2000; George & Mallery, 2010; Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006;). Similarly, Mahalanobis Distance indicated seven multivariate outliers. These characteristics violate the multivariate normality assumption of the Maximum Likelihood estimator used for imputation. Accordingly, the researchers utilized the Maximum Likelihood Robust (MLR)

estimator to account for missing data. MLR is designed to account for the effects of univariate

and multivariate non-normality in its imputation process (Finney & DiStefano, 2008).

Bootstrapping is a procedure used in mediation to produce confidence intervals for

estimates of indirect effects because the interaction of these pathways cannot be assessed under

the assumption of a normal distribution. Because the Mplus 7 statistical package does not allow

the use of bootstrapping with the MLR estimator, analyses were run under two conditions. First

with MLR, and again with ML and bootstrapping (10,000 sample draws; Preacher & Hayes,

2008). ML and MLR produce identical estimates and only vary in the standard errors produced

by each estimator. Accordingly estimates of indirect effects were checked against asymmetrical

bootstrapped confidence intervals produced via the ML estimator, while standard errors and all

other statistics are reported from analyses conducted using the MLR estimator.

Analyses included control variables for recruitment site, treatment condition, gender, and

ethnicity. Results indicated that none of the variables included in the model were significantly

related to normalized ideas about violence in 7th grade. The next set of relations included in the

path analysis included normative beliefs about violence as an endogenous variable and

depression and aggression as exogenous variables. Results indicated that the linear relation

between normative beliefs about violence in 7th grade and the measure of depression in 8th

approached but did not reach significance ($\beta = -.15$, $p = .51$). Similarly, a term included to

account for a curvilinear relationship was not significant ($\beta = .16$, $p = .58$). However, exposure to

violence in 6th grade did significantly predict depression scores in 8th grade ($\beta = .14$, $p = .05$).

Results also indicated that being black approached significance ($\beta = -.12$, $p = .057$), while being

Hispanic ($\beta = -.20$, $p = .04$), significantly predicted depression scores in 8th grade. Normative

beliefs about violence in 7th grade ($\beta = .23$, $p < .001$) and exposure to violence in 6th grade ($\beta =$

.22, $p = .001$) both significantly predicted aggression scores in 8th grade. Tests of indirect effects indicated that the normative beliefs did not significantly mediate the relation of exposure to violence with aggression ($\beta = .006$, $p = .13$) or depression ($\beta = -.04$, $p = .46$). Figure 3 depicts the model results with statistically significant paths coefficients included.

Figure 3

General Model with Covariates
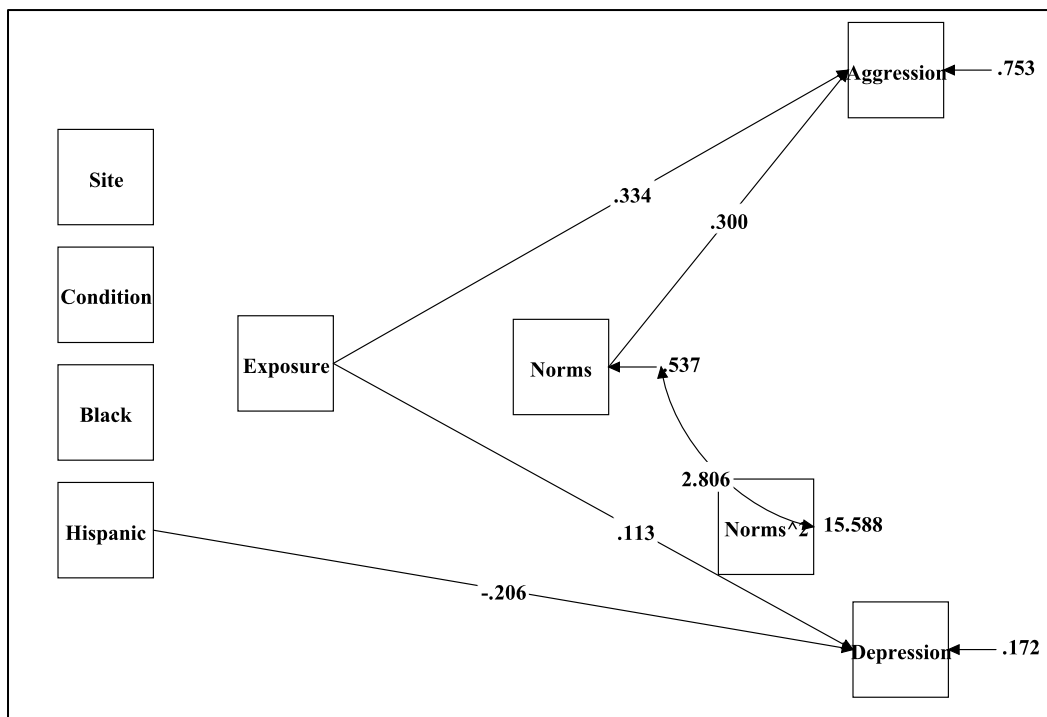
Differences by Gender. To examine potential variations in relations and effects by gender, separate models were then run for males and females. Results indicated that for male participants ($n = 265$), the relation between exposure to violence and normative beliefs about aggression was not significant ($\beta = .01$, $p = .41$). However, exposure to violence in 6th grade predicted depression scores ($\beta = .15$, $p = .04$) and aggression scores in 8th grade, ($\beta = .28$, $p = .01$) in 8th grade. Analysis of the relations between the mediator and outcome variables showed that neither normative beliefs about violence ($\beta = .29$, $p = .35$) nor its higher order term ($\beta = .28$,

$p = .33$) predicted depression in 8th grade. Results also indicated that normative beliefs about aggression predicted aggression in 8th grade ($\beta = .18$, $p = .01$). Despite the fact that both exposure to violence and normative beliefs about aggression predicted aggression in 8th grade, tests of indirect effects indicated no mediation of the exposure-outcome relation by normative beliefs for aggression ($\beta = .03$, $p = .48$), or depression ($\beta = -.02$, $p = .47$).

Figure 4:

Males Model with Covariates
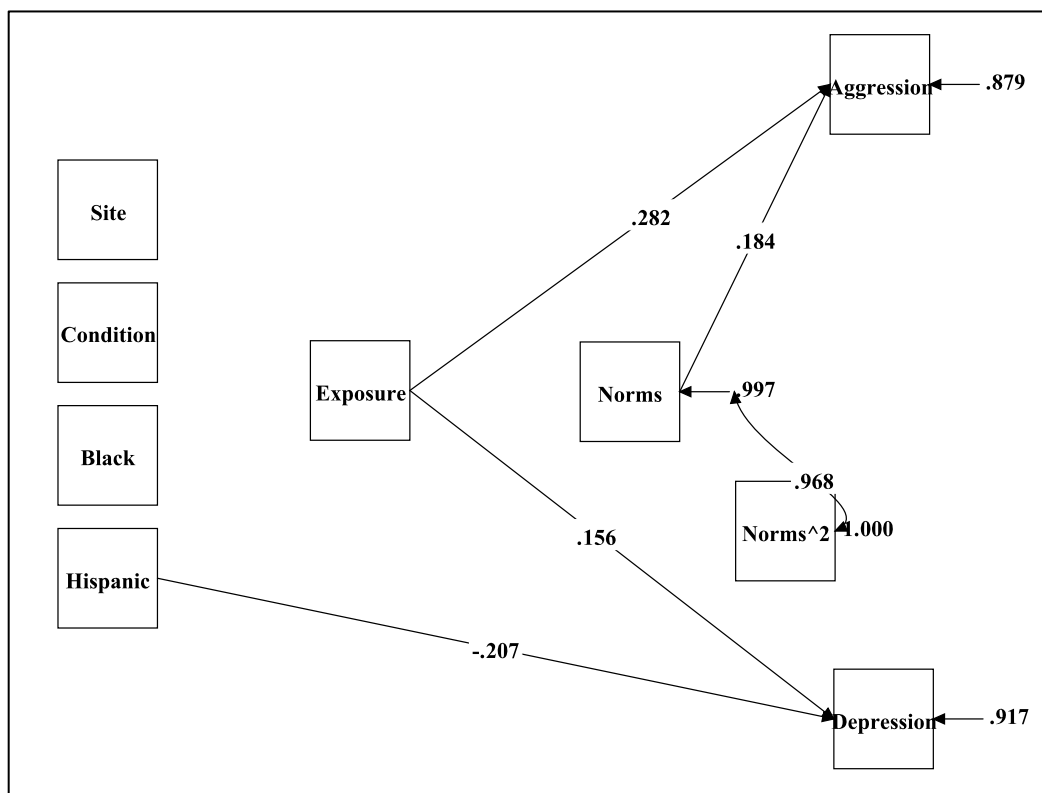

The same model was tested on a sample of female participants ($n = 164$). Model results indicated that exposure to violence in 6th grade ($\beta = .02$, $p < .03$) significantly predicted normative beliefs about aggression in later adolescence. Exposure to violence did not significantly predict depression ($\beta = .14$, $p = .10$) or aggression, ($\beta = 0.10$, $p = .23$) in 8th grade.

Normative beliefs about aggression significantly predicted aggression ($\beta = .47$, $p < .001$) but not

depression (β = .43, p = .188) in late adolescence. A higher order term included to approximate a

curvilinear relation also did not reach significance (β = -.36, p = .27). Tests of mediation

indicated that the mediating relation of normative beliefs about violence and aggression

approached significance (β = 0.09, p = .06) but did not for depression (β = 0.11, p = .30).

Figure 5

Females Model Results with Covariates
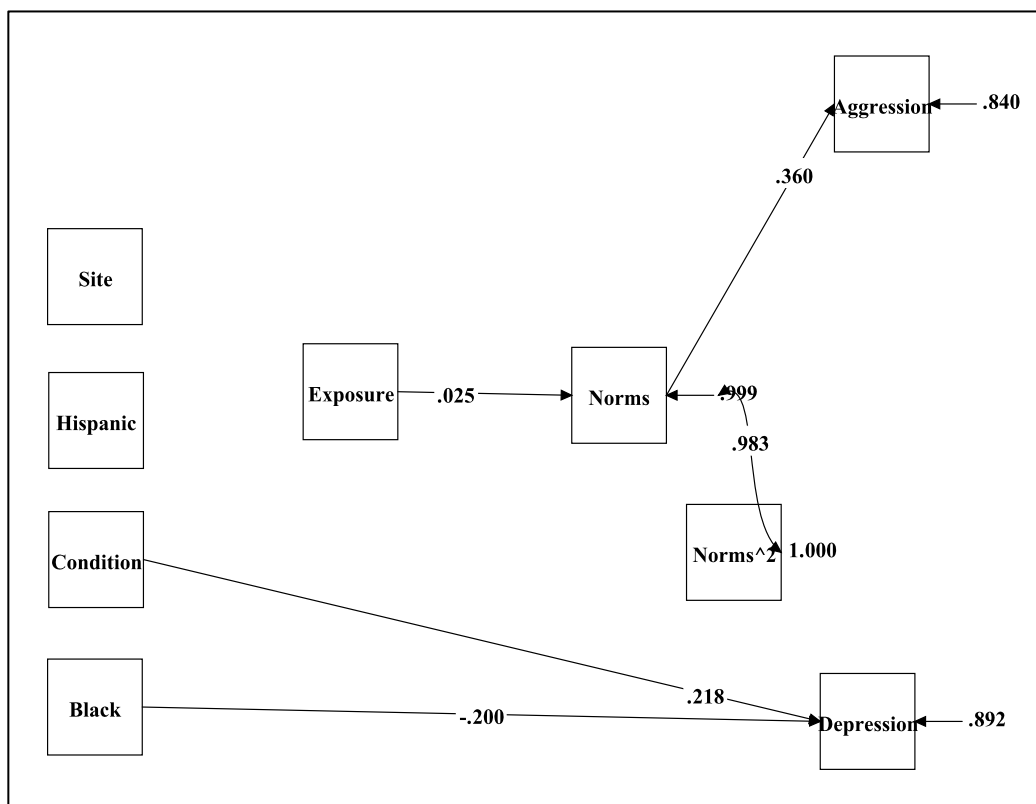
Discussion

The present study aimed to add to the scientific understanding of the effect of violence

exposure, the role of normalized beliefs about aggression, and the difference in these models by

gender. To that end, two hypotheses were tested. The first hypothesis tested was that normalized

beliefs about violence would mediate the relation between aggression and depression

respectively. Results from the overall sample (males and females together) indicated that exposure to violence in 6th grade and normalized beliefs about aggression in 7th grade each individually predicted aggression in 8th grade but the effect of exposure to violence on aggression in 8th grade was not mediated by normalized beliefs about violence. Similarly, exposure to violence in 6th grade was significantly related to depression in 8th grade but did not predict normalized beliefs about violence . When the samples were divided by gender the pattern of exposure to violence relating to aggression and depression and of norms relating to aggression two years later occurred and as in the overall model no mediation was evident. For females, however, exposure did not relate to aggression or depression, with norms relating to depression two years later. Thus, overall and in gender specific models the findings do not suggest a pattern of This finding is in conflict with several previous studies about the importance of normalized beliefs about violence in the pathologic adaptation model. However, as these trends differed by gender and the sample included more male than female participants, discussion about these differences is more important than the implications of the combined gender model.

The second hypothesis that the pathologic adaptation model would function similarly for males and females was also not supported by the results. Findings indicate that there are several important differences in the pathologic adaptation pathway by gender. First, the models indicated that exposure to violence significantly predicted normalized beliefs about violence in mid adolescence for females but not males. This finding is inconsistent with many studies which show that exposure predicts normalized beliefs about aggression regardless of gender and that this effect mediates the relation between exposure and aggression (Gaylord-Harden et al, 2016; Guerra Huesmann & Spindler, 2003; Kennedy & Ceballos, 2016; Werner & Nixon, 2005). In fact, some research suggests findings in the opposite direction of the current results where the

association between exposure, normalized beliefs about aggression, and aggression is stronger for males than for females (Huesmann & Guerra, 1997). Similarly, the mediation effect of normalized beliefs about violence approached significance for females but was not significant for males in the current study.

Though in conflict with much research about adolescent males exposed to violence, these results mirror similar findings in a recent study of the pathologic adaptation model in African American males (Gaylord-Harden, Bai & Simic, 2017). In that study, Gaylord-Harden and colleagues found that violence exposure did not predict a measure of normalized beliefs about violence and that the mediation effect of this variable was not significant. The researchers posited that one explanation may have been low rates of reported ECV within the past year amongst their sample (Gaylord-Harden, Bai & Simic, 2017). This is consistent with the low rates of overall ECV in the current study. Descriptive analyses indicated that the average level of exposure at 6th grade was low which may mean that youth were not highly exposed enough to generate beliefs about violence as normal and consequently did not experience a desensitization effect consistent with the pathologic adaptation model. The low levels of exposure may be due to the sampling procedure for the current study which exclusively included students who participated in the second wave and had valid entries for the Attitudes Toward Violence and Non-Violence scale. It is possible that the most violence exposed youth may not have been in school or may have been more likely to be lost to attrition at the second wave. This is consistent with the finding of a statistically significant difference between the average 6th grade aggression levels of those students who did and did not participate at wave 2. The youth who had higher levels of baseline aggression may have already been more exposed or may have been more likely to see violence through their adolescent development.

While this may explain the lack of relation between exposure and normalized beliefs about violence for males, it does not explain why this association remained significant or why exposure did not directly affect aggression or depression in the females model. Though in conflict with much of the prior research, these findings are similar to results of one study by Boxer and colleagues (2008). Their findings show that multiple pathways exist between exposure and behavioral and emotional outcomes. One such pathway, the normalization pathway of desensitization, indicates that exposure influences beliefs and later aggression with no association to the emotional components of the model. These findings are similar to the model observed for females where exposure was not directly related to depression or aggression but affected aggression through the development of normalized beliefs about violence (Boxer et al, 2008). Results from this study also indicated that the type of exposure predicted the form of its impact on the outcome measures. In individuals who were directly exposed to violence, victimization predicted emotional symptoms through its effect on avoidant coping and not normalized beliefs about violence. Conversely, those who were indirectly exposed were more likely to follow the normalization pathway which included mediation through normalized beliefs. Though gender was not related to exposure to violence in the research of Boxer and colleagues, other studies have shown that African American males report higher rates of direct victimization than their female peers (Farrell & Bruce, 1997; Fehon, Grilo & Lipschitz, 2001: Gorman-Smith, et al 2004; Springer & Padgett, 2000). In addition to differences in whether exposure to violence is first hand or observed, there may also be differences in the type of exposure that differentially affect adolescents by gender. For instance, forms of sexual assault were not included in the available measure of the current dataset. As women are more likely to experience sexual assault than men, the association between this type of exposure and desensitization may be different.

Consequently, differences in the ways in which males and females are exposed to violence may be related to differences in the ways in which exposure affects them.

The final hypothesis that normalized beliefs about violence would show a curvilinear association with symptoms of depression captured by the BASC-2 was also inconsistent with the results. Surprisingly, the results of the current study suggest that exposure to violence has a linear association with aggression in males and no association with normalized beliefs about aggression. In females, there was as no association between depressive symptoms or measures of ECV and normalized beliefs respectively. These findings conflict with many prior studies on the impact of exposure to violence (McCart et al, 2007; Mrug et al, 2008; Gaylord-Harden, Cunningham & Selenic, 2011; Guerra, Rowell, Huesmann, & Spindler, 2003; Huesmann & Guerra, 1997: McConville & Cornell, 2003; Werner & Nixon, 2005). Though these findings are surprising, it is important to note that a curvilinear relation between ECV and Depression was not included in either models and consequently, they do not specifically disprove the existence of a desensitization effect on depression. Similarly, prior research about the relation between normalized ideas about violence and symptoms of depression is scarce. However, there are four studies with findings about the relation between ECV and depression that are similar to the observed in the boys model (linear) and girls model (no relation) in the current study (Cooley-Quille, Turner & Beidel, 1995; Gaylord-Harden et al., 2016; Fitzpatrick & Boldizar, 1993; Ranney et al. 2013). Taken together this research has several implications for the findings of the current study. First, as mentioned above, it is likely that the relatively low rate of exposure of this sample has been insufficient to cause desensitization or has made it difficult to detect its effects on the outcome variables (Gaylord-Harden et al., 2016). Second, taken together these studies suggest that characteristics of the immediate family may have some impact on the effect of ECV

on depression. In a cross-sectional study comparing groups of African American youth with high and low exposure, researchers Cooley-Quille, Turner & Beidel (1995) found that while exposure was unrelated to depressive symptoms, exposure was related to a measure of family cohesiveness. Similarly, Ranney and colleagues (2013) conducted a multivariate logistic regression on a sample of African American youth and found that while ECV and depression showed a linear association, living with a parent was the sole protective factor that significantly decreased the odds of reporting depressive symptoms when exposed to community violence. A third early study by Fitzpatrick & Boldizar (1993) found while exposure to violence was directly related to PTSD, youth who experience direct victimization and are living in a home with few familial males (fathers or brothers) were more likely than other adolescents to report symptoms of PTSD.

The findings of the current study may also have been impacted by the nature of the measure used to capture depressive symptoms. The BASC-2 is a clinical measure designed to help clinicians identify children who are exhibiting behavioral symptoms consistent with those observed in individuals diagnosed with depression according to the DSM-V. Because a measure of youth's self-reported depression scores was not included in the initial study, a parent reported measure was used. Prior research indicates that there is often poor agreement between parent and child measures and that the form of this variation is different by ethnicity (Kim, Chan, McCauley & Vander-Stoep, 2016). Specifically, this research indicates that African American and other ethnic minority parents report fewer internalizing symptoms than their children do about themselves (Lau et al., 2004). Accordingly, use of the BASC -2 may have provided an inaccurate measure of the adolescent sample's depressive symptoms because these are predominately internalized phenomenon and consequently, most accurately captured by self-report measures.

Parents may be more likely to accurately capture observable symptoms of depression such as hypersomnia, or changes in appetite that do not fully measure the emotional and affective depressive symptoms that are related to the desensitization process.

In addition to the potential for inaccurate measurement by parent report, research indicates that there are differences in the expression of depressive symptoms by race. For instance, African American and Latino youth have been shown to be more likely to report somatization symptoms than affective symptoms of depression. Accordingly, in a predominately minority sample, the BASC's overall depression score may not be as accurate in capturing depression as some of its component scores (Gaylord-Harden et al, 2017; Kramer & Young, 1998). Consistent with this is the finding that being Black or Hispanic significantly predicted 8th grade depression scores in the female model.

Taken together, the findings of this study do not support the pathologic adaptation model as specified by Ng-Mak and colleagues (2002) but illuminate several nuances in the type of normalization, the gender of the participants and the type of violence exposure that are unaddressed by the Pathologic Adaptation Model and recent research. First, findings about the role of normalization in the Pathologic Adaptation Model were mixed. Results indicated that normalization played a role in the model for female adolescents but not males and in predicting aggression but not depression. As explained above, there is little research exploring the extent to which normalized ideas about aggression actually mediates the Pathologic Adaptation Process. Though the findings of the current research provide only partial support for the importance of normalized ideas about aggression in the mediation process, it highlights the need for careful and practical consideration of how these ideas develop. As outlined above, Ng-Mak and other early purveyors of the Pathologic Adaptation Model relied upon two interrelated theories about

behavioral learning in explaining the normalization process. One theory asserts that children learn behavioral scripts and consequently are more likely to select aggressive responses based upon what has been modeled for them in their environments (Huesmann, 1988; Ng-Mak, Salzinger, Feldman & Stueve, 2002). Conversely, Ng-Mak, Salzinger, Feldman & Stueve (2002) posit that children develop cognitive schemas about their environments (e.g. that the world is violent), which in turn govern their behaviors in that context. The distinction is that one process results in the formation of beliefs about the *behavior* (leading to aggression) while the other process operates by developing beliefs about their *environment* (leading to depression). Though these are separate but parallel processes there is little study of them as separate parts of the normalization process. As the measure of normalized beliefs used in this study only captured perceptions about the appropriateness of aggressive behavior, additional study including perceptions of violence in the adolescent's environment is necessary in order to fully explore the Pathologic Adaptation Model.

Second, the finding of different models by gender highlights a consideration that has been overlooked by Ng-Mak and colleagues (2002) and much of the research stemming from his seminal work. While differences in exposure and its effects have been studied in prior research, most studies found that female participants respond to exposure to violence with increased depression while male participants are more likely to see increases in aggression in response to exposure (Guerra et al, 2003; Kessler et al, 2003). More recent research has incorporated a new understanding of depression and aggression as interrelated phenomena into the pathologic model by changing the role depression from an outcome variable to a mediator in the Pathologic Adaptation Model (Gaylord-Harden, Bai & Simic, 2017; Gaylord-Harden, So, Bai, & Tolan, 2016). Though this new iteration of the Pathologic Adaptation Model modernizes the

understanding of the relationship between these variables, available research has not yet assessed the implications of this new understanding on differences by gender. One aim of the current study is to highlight this consideration as the field moves toward this new conceptualization of depression. Specifically, future research on the Pathologic adaptation model should consider what sequential outcomes of depression and aggression mean for boys and girls individually. As outlined, positioning depression as a mediator would imply that all adolescents, regardless of gender, experience symptoms of depression that results in a plateau effect with repeated ECV and subsequent increases in aggression. Accordingly, as research on the Pathologic Adaptation Model continues to progress, considerations of differences in this process by gender needs continual study. Furthermore, distinctions about the type of normalization may also apply to considerations of gender in the pathologic adaptation model. Specifically it could be that gender differences in expression of pathologic adaptation may be related to the extent to which they experience behavioral normalization (developing ideas about aggressive behavior as normal) or environmental normalization (developing the perception that their environment is aggressive), or both.

Finally, though the Pathologic Adaptation Model focuses on explaining effects of exposure to violence, relatively few studies have explored differences in types of exposure on the form of the model. As noted above, exposure to violence may have changed the form of relationships by gender in the current study as prior research indicates that boys are more likely to be directly exposed to violence and girls are more likely to be indirectly exposed. However, it is also plausible that individuals who are directly exposed to violence may be more likely to experience normalization by learning more behavior scripts that emphasize violent behavior as emphasized by Huisman and colleagues (1988) while individuals who are indirectly exposed

may be more likely to develop the perception that the world is violent as posited by Ng-Mak, Salzinger, Feldman & Stueve (2002). Consequently, additional exploration about the different types of exposure should be a focus of future research about the Pathologic Adaptation Model.

By focusing on the Pathologic Adaptation Model, the current study attempts to further the understanding of the process and factors that contribute to and extend from community violence amongst adolescent youth in urban communities. The Pathologic Adaptation Model is important in this regard in that it elucidates the interconnectedness of individuals and their behavior to the characteristics of their communities. For instance, one common finding amongst the models analyzes in this study is that exposure to violence predicted aggression. In relating these behaviors to community factors such as ECV, the scope of intervention planning broadens to include individual, family, and community level efforts.

One variable that has been studied in relation to its effect on youth offending is Collective Efficacy (Sampson, Raudenbush, & Earls 2007). Collective Efficacy refers to the extent to which there is mutual trust, collective parenting, and collective intervention by community members (Sampson et al., 2007). Research indicates that higher levels of Collective Efficacy predict lower levels of youth offending (Sampson, 2012; Jain, Buka, Subramanian Molnar, 2010). However, the extent to which Collective Efficacy can be protective against ECV remains under studied(Fagan et al., 2014). One study by Fagan and colleagues (2014) attempted to determine whether Collective Efficacy moderates the association between ECV and use of violence in adolescents youth. Though the findings did not support Collective Efficacy as a protective factor, the researchers posited that the lack of finding may be due to other processes such as behavioral learning that act on adolescent aggression and violence. Accordingly, current research on the Pathologic Adaptation model has the potential to better inform research on

Collective Efficacy as a protective factor by specifically testing whether Collective Efficacy reduces youths perceptions of violence as normal in their environments or their learning of aggressive behavior scripts. This research would also have specific impliactions for girls as this study indicated normalized ideas about violence is a mediator for adolescent girls in these communities. In this way, research on the Pathologic Adaptation Model can help ad specificity in the targeting of interventions for individual youth and help to generate community level interventions that can help to inure them against the effects of exposure to violence.

Limitations and Future Directions

The current study expands upon the existing research by providing some of the first consideration of differentiation by gender in exploring the Pathologic Adaptation Model and the role of normalized beliefs about violence as a mediator in the effect of exposure on desensitization. Despite these merits, there are some limitations to this study that should be carefully considered in relation to its findings. First, the study is based on a sample previously collected as part of a nested (two by two) randomized control trial. Accordingly, the sample includes participants who received an intervention effect that may have suppressed relationships between the variables of interest. For the female sample, treatment condition significantly predicted 8th grade depression scores such that being in the control group predicted higher depression scores. Furthermore, the at-risk sample was created based on teacher ratings of the adolescents' aggressive behavior and influence amongst their peers. This sampling procedure excluded students who may have been aggressive but were not influential amongst their classmates.

Second, the sample had high rates of missing data that necessitated list-wise deletion of 289 participants from the high-risk sample who did not have valid entries for the measure of

normalized beliefs about violence at 7th grade. This group was predominately minority and from the Chicago recruitment site. Accordingly, the generalizability of these findings is limited to similarly diverse urban populations and may not speak globally to children exposed to violence in other contexts. Analyses revealed that there was also a statistically significant difference between those who were included and excluded in the sample by level of aggression with those excluded from the group having a higher average score. As noted above, this may have impacted the analyses as these individuals may have been more likely to show effects of desensitization at later time points.

Despite these limitations, the results of the current study provided important information about the process of desensitization for males and females in disadvantaged neighborhoods. Because these trends may vary as a result of the type of exposure for males and females, careful consideration to the measurement and methodology of research with normalized beliefs about violence should be the focus of coming research. Future studies should specifically examine whether different types of exposure are more impactful by gender and whether these types of exposures underlie differences in the way that children are affected by exposure to violence. Furthermore, as research on the nature of gender has characterized it as a spectrum rather than binary, studies should consider pathways of desensitization amongst minority genders who are at particular risk to violence exposure in minority communities.

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