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Competing Models of Exposure to Community Violence Among Urban Youth: Dimensional Versus Person-Centered Approaches

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COMPETING MODELS OF EXPOSURE TO COMMUNITY VIOLENCE AMONG URBAN
ADOLESCENTS: DIMENSIONAL VERSUS PERSON-CENTERED APPROACHES

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University

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Abstract

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Exposure to community violence is prevalent among urban youth residing in

neighborhoods with high rates of crime and violence. Although there is strong evidence

suggesting that community violence exposure is associated with negative consequences on youth

development, there are inconsistencies in theories and evidence regarding the nature of these

associations. Methodological limitations of dimensional approaches to conceptualizing exposure,

including the assumption that adolescents are similar in their frequency and patterns of exposure,

likely contribute to the inconsistencies in findings of associations. Recently, person-centered

methods have been used to elucidate associations between community violence exposure and

consequences on adolescent development. However, studies have not compared variable-

centered and person-centered approaches and their associations with adolescent aggression and

anxiety. The main goal of this study was to test competing models of dimensions of community

violence exposure and compare them to person-centered models of exposure. Dimensional

analyses indicated that a hybrid model of hypothesized models, with factors representing

witnessing less severe violence, witnessing severe violence, and victimization, best represented adolescents' exposure to community violence. Identified factors or constructs of exposure differed in their associations with physical aggression and anxiety. In contrast, person-centered analyses revealed five subgroups of adolescents with distinct patterns of community violence exposure that differed in their levels of physical aggression and symptoms of anxiety. Overall, results suggest that victimization by community violence was associated with physical aggression and symptoms of anxiety. Witnessing community violence was only uniquely associated with physical aggression. Victimization by community violence and witnessing community violence might impact adolescent development through different mechanisms. Future research should include investigating longitudinal associations between constructs of exposure, and different patterns of exposure to understand impact on development. Further research examining different mechanisms that might underly the associations between witnessing and aggression and anxiety, and victimization and aggression and anxiety, is necessary to refine our understanding of exposure and its impact on youth development.

Competing Models of Exposure to Community Violence Among Urban Youth: Dimensional

Versus Person-Centered Approaches

Exposure to community violence (e.g., witnessing acts of violence, being a victim of

violence) is prevalent among youth growing up in the United States (Finkelhor et al., 2013).

Among middle school-aged youth (ages 10 to 13 years) participating in a nationally

representative survey, 26.4% reported witnessing any form of violence, and 46.5% reported

experiencing any form of physical assault within the past year (Finkelhor et al., 2013). Several

studies have found that youth growing up in urban settings report more frequent experiences of

violence exposure compared with youth growing up in suburban or rural settings (Stein et al.,

2003). Similarly, a nationally representative survey found that youth living in lower-income

households were more likely to witness violence and experience indirect victimization and some

forms of direct victimization than youth living in higher-income households (Finkelhor et al.,

2005).

Youth who are exposed to community violence have a high risk of experiencing both

short-term and long-term negative consequences (Foster & Brooks-Gunn, 2009; Fowler et al.,

2009). Short-term effects include internalizing symptoms and emotional problems such as

posttraumatic stress disorder (PTSD) and depression (Fowler et al., 2009; Overstreet, 2000;

Salzinger et al., 2002), and antisocial behavior such as aggression, fighting, and delinquency

(Fowler et al., 2009; Overstreet, 2000; Salzinger et al., 2002). Emotional and behavioral effects

of community violence exposure can interfere with youth functioning in multiple areas of their

life, which can lead to persisting negative consequences, such as perpetration of violence (Foster

& Brooks-Gunn, 2009; Salzinger et al., 2002), criminal activity (Foster & Brooks-Gunn, 2009;

Salzinger et al., 2002), and poor school performance or school failure (Overstreet, 2000;

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Salzinger et al., 2002). Given the high risk of multiple negative outcomes resulting from community violence exposure, research is needed to clarify how community violence increases the likelihood of negative outcomes among youth.

Several theories have been proposed to explain the mechanisms and processes that drive the relation between community violence exposure and negative outcomes. The ecological-transaction model (Cicchetti & Lynch, 1993) postulates that bidirectional relations between youth and their environment could contribute to the chronicity of stressful experiences such as community violence exposure. According to the ecological-transaction model, the environment in which youth grow up shapes them, and they in turn choose and shape their future environments. This bidirectional relation of violence exposure and youth adjustment has been shown for youth growing up in communities with high rates of violence (Lynch & Cicchetti, 1998). Youth growing up in communities with high rates of violence might view violence as acceptable and necessary for protection or to get what they want, and consequently they might be more likely to engage in acts of violence or delinquency themselves (Cicchetti & Lynch, 1993; Foster & Brooks-Gunn, 2009; Overstreet, 2000). They might also associate with deviant peers who engage in delinquent behavior (Cicchetti & Lynch, 1993; Salzinger et al., 2002). Engaging in deviant acts puts youth at risk for future exposure to community violence and stressful experiences.

The stress-process model (Foster & Brooks-Gunn, 2009) postulates that youth who grow up in disadvantaged neighborhoods (i.e., low-income, high-violence) are more likely to encounter stressful life experiences, such as community violence, than their counterparts in more affluent neighborhoods, and that these stressful experiences increase the risk of developing mental health problems. Youth growing up in disadvantaged neighborhoods often experience

multiple stressful experiences, at multiple times in their lives (Cicchetti & Lynch, 1993; Foster & Brooks-Gunn, 2009). Additionally, disadvantaged neighborhoods often lack protective resources, such as access to mental health care, to help youth cope with stressful experiences (Foster & Brooks-Gunn, 2009). Peers and family members, who could otherwise provide support and help youth cope with stress, could experience stressors of their own, and consequently be unable to help youth cope. Peers and family members are also more likely to perpetrate violence towards youth growing up in disadvantaged neighborhoods (Lynch & Cicchetti, 1998; Salzinger et al., 2002). Multiple and chronic stressful experiences coupled with a lack of protective factors further elevate the likelihood that youth develop mental health problems (Foster & Brooks-Gunn, 2009).

Adolescence is a particularly important period to study exposure to adverse experiences, such as violence exposure. Adolescents become more autonomous, and have more control over with whom they interact and where they go (Crockett & Crouter, 1995). Adolescents also spend an increasing amount of time away from their home, in neighborhood and community settings, and unsupervised by adults (Crockett & Crouter, 1995), which increases their risk of exposure to negative experiences. Indeed, rates of exposure to community violence increase for youth as they enter middle and high school (Overstreet, 2000). Further, because adolescents are more susceptible to influence from peers and community members, exposure to violence in the community could have a greater impact on adolescents' beliefs and behaviors (Tolan et al., 2003). Empirical evidence supports these hypotheses. A meta-analysis that compared effects of community violence exposure on youth distress symptoms from 114 studies found that studies with adolescent samples demonstrated stronger effects of exposure on both internalizing and externalizing symptoms compared to studies with child samples (Fowler et al., 2009). Increased

vulnerability of developing mental health problems combined with increased risk of exposure to negative experiences in the community warrant the investigation of negative experiences on the mental health of adolescents.

The goal of this proposed study is to refine the conceptualization of community violence exposure among urban youth. In the following sections I review the literature on dimensions of community violence exposure (witnessing versus victimization, level of familiarity with the victim, and severity of exposure) and their associations with internalizing and externalizing symptoms. I then discuss limitations in the conceptualization and measurement of community violence exposure among youth and highlight how alternative methods (person-centered approaches) could provide novel information about patterns of community violence exposure. This study compared a dimensional approach for measuring community violence exposure to a person-centered approach, and their relations with symptoms of internalizing and externalizing problems to determine if different models of exposure reveal different associations with symptomatology. Results from this study could inform best practices for future studies that measure community violence exposure among urban youth.

Literature review

Relations between violence exposure, internalizing symptoms and PTSD

A substantial body of research has found positive relations between community violence exposure and internalizing symptoms, including depression, anxiety, and PTSD. In a meta-analysis of 114 studies, Fowler and colleagues (2009) found that the strongest effects of community violence exposure were on symptoms of PTSD compared with effects on internalizing and externalizing symptoms. However, some recent studies (e.g., Gaylord-Harden, So, Bai, Henry, & Tolan, 2017; Kennedy & Ceballo, 2016) investigating longitudinal effects of

community violence exposure have found a curvilinear relation between exposure and internalizing symptoms, which suggests that the effects of community violence exposure on internalizing symptoms are complex. Theories regarding the relation between exposure to community violence and internalizing symptoms differ such that some theories hypothesize effects in opposite directions of other theories.

Research suggests that youth who are exposed to community violence (both witnessing and victimization) have a high risk of developing posttraumatic stress symptoms (Lynch, 2003). Posttraumatic stress symptoms can occur after an individual has an experience of actual or threatened death or serious injury to themselves or others (American Psychiatric Association, 2013). Witnessing or direct victimization by community violence may also be traumatic enough for youth to develop posttraumatic stress symptoms. A study of a primarily racial and ethnic minority sample of school-aged youth found that youth from high-violence communities reported more traumatic stress than youth from lower violence communities, and that total community violence exposure was associated with traumatic stress (Lynch & Cicchetti, 1998). Yet when the effects of specific forms of exposure on traumatic stress were compared, direct victimization was associated with traumatic stress whereas witnessing violence was not. However, this study used a sample of youth ages 7 to 12 years, and because youth of this age have a different level of cognitive maturity, they might have different responses to community violence exposure than adolescents.

Depressive symptoms have also been positively associated with community violence exposure (Overstreet, 2000). Youth who experience community violence might begin to feel helpless or hopeless, which could contribute to the development of depressive symptoms (Overstreet, 2000). Symptoms of posttraumatic stress might also lead youth to develop

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depressive symptoms if they re-experience the exposure or have intrusive thoughts about it (Overstreet, 2000). A study by Kliewer and colleagues (1998) found that intrusive thoughts mediated the relation between lifetime community violence exposure and internalizing symptoms, for both witnessing and direct victimization, in a predominately low-income African American sample of school-aged youth. However, the measure of violence exposure in their study included both witnessing and hearing about violence, which could represent two distinct constructs. Further, the study used a sample of elementary school-aged children, and as previously discussed, mechanisms behind outcomes of violence exposure, particularly cognitive processes, might be different for adolescents who are more cognitively mature than younger children.

Community violence exposure might contribute to youths' perception that their neighborhood is dangerous and might make them feel like no one can protect them or their loved ones (Fowler et al., 2009), further contributing to feelings of helplessness and hopelessness. Feeling that one's neighborhood is not safe combined with emotional reactions to trauma could contribute to biological stress responses, which could increase the likelihood that youth develop internalizing and posttraumatic stress symptoms (Overstreet, 2000). Additionally, chronic fear for the wellbeing of loved ones could increase the likelihood of developing internalizing symptoms (Fowler et al., 2009). However, few studies have tested the role of sense of neighborhood safety in the relation between community violence exposure and youth distress symptoms.

Having limited protective factors, such as social support, could increase youths' risk of developing internalizing symptoms. Youth growing up in communities with high crime might have limited access to social support and other coping resources that could serve as protective

factors (Foster & Brooks-Gunn, 2009). Kliewer and colleagues (1998) tested social supports and

strains as mediators of the relation between lifetime community violence exposure and

internalizing symptoms among an urban African American sample of youth. They found that

youth who had high levels of social strain or low levels of social support had higher levels of

intrusive thinking and higher levels of internalizing symptoms than other children. These results

suggest that youth who do not have access to social support are at a greater risk for developing

internalizing symptoms when exposed to community violence. Additionally, youth might not be

comfortable discussing experiences of violence with adults, or they might believe that they have

to suppress distressing thoughts and feelings, which may in turn prevent youth from developing

adaptive coping strategies (Kliewer et al., 1998).

Theories of community violence exposure, such as pathological adaptation (or emotional

desensitization), postulate that the relation between community violence exposure and

internalizing symptoms (e.g., depression, anxiety) might not be linear. According to the

pathological adaptation model, youth who experience high levels of community violence begin

to emotionally desensitize, or experience emotional numbing, causing internalizing symptoms to

level off or decrease as externalizing behaviors continue to increase over time (Foster & Brooks-

Gunn, 2009; Ng-Mak et al., 2004). Ng-Mak and colleagues (2004) investigated the association

between past-year community violence exposure and internalizing symptoms and aggression

among inner-city sixth-graders and found that community violence exposure had a curvilinear

relation with child-reported internalizing symptoms, which the authors concluded was a result of

emotional desensitization. However, their study was cross-sectional, which precludes drawing

clear conclusions regarding the direction of the relation between exposure and symptoms, and

does not consider the effects of chronic community violence exposure, which is part of the

desensitization hypothesis. Further, because Ng-Mak and colleagues (2004) measured community violence using a composite index of scores from witnessing violence, which included hearing about an event, and directly experiencing community violence, they did not address the effect of different exposures on internalizing symptoms.

Results from other studies support the pathological adaptation model. Kennedy and Ceballo (2016) tested effects of community violence exposure cross-sectionally and longitudinally among a large urban, racially and ethnically diverse sample of adolescents. Results indicated that past-year community violence exposure had a quadratic relation with depressive and anxiety symptoms at later time points, meaning that depressive and anxiety symptoms did not increase as violence exposure increased as would be expected by a linear relation. However, their study used a measure of community violence exposure that combined all experiences into one composite score, and only looked at past-year exposure. Mrug and colleagues (2016) also found support for the pathological adaptation model in a large urban, predominately African American sample of adolescents. They found that a high level of community violence exposure in pre-adolescence was associated with lower-than-expected levels of internalizing symptoms (i.e., anxiety and depression) in early adolescence. Low levels of internalizing symptoms in combination with more externalizing problems in early adolescence subsequently predicted higher levels of violent behaviors in late adolescence. However, youth with moderate levels of community violence exposure in pre-adolescence had high levels of internalizing symptoms in early adolescence, which suggests that emotional desensitization might only occur at the highest levels of exposure. Similar to other studies on pathological adaptation, Mrug and colleagues (2016) used a measure of community violence exposure that

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combined multiple types of experiences, which makes it difficult to determine which experiences contributed to which symptoms.

Relations between violence exposure and externalizing symptoms

Research has consistently shown positive associations between community violence exposure and externalizing symptoms. A meta-analysis of 114 studies on the effects of community violence exposure on mental health symptoms found that the relation between community violence and externalizing symptoms was stronger than the relation between exposure and internalizing symptoms (Fowler et al., 2009). Further, the relation between exposure and externalizing symptoms was stronger among adolescents than among children, highlighting the importance of studying community violence exposure among adolescents.

Social information processing mechanisms (Crick & Dodge, 1994) offer explanations for how exposure to community violence could increase the likelihood of perpetration of future aggression among youth. Encounters that adolescents have with others shape their heuristics and, in turn, their models and norms for behavior. If youth witness or directly experience violence, particularly repeated violence, they might be more likely to expect violence in the future and respond to situations aggressively out of self-defense. Further, youth might begin to believe that violence is acceptable behavior and be more likely to engage in acts of violence or aggression (Crick & Dodge, 1994; Guerra et al., 2003; Overstreet, 2000). McMahon and colleagues (2009) examined beliefs about aggression and self-efficacy to control aggressive behavior among a predominately African American sample of adolescents and found that community violence exposure predicted retaliatory behavior, which in turn predicted self-efficacy to control aggression, which predicted aggressive behavior. Their results support the theory that normative beliefs about aggression mediate the relation between community violence and externalizing

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symptoms. However, because their study combined different types of violence exposure, it is unclear if certain types of exposure have different impacts on beliefs and externalizing symptoms.

Aggression might be an adaptive or protective response to repeated witnessing or victimization by community violence to avoid future victimization. Kennedy and Ceballo (2016) found significant cross-sectional associations between community violence exposure and aggression, but not longitudinal associations. They argued that this could be indicative of youth acting in a manner that would protect themselves from future victimization. Taylor and colleagues (2018) found similar cross-sectional results in a study of low-income urban adolescents indicating that youth who had high levels of life-time community violence exposure had higher levels of externalizing symptoms, suggesting that youth might respond to violent situations with aggression. Mrug and colleagues (2016) found that internalizing symptoms mediated the relation between community violence exposure during pre-adolescence and violent behavior during late adolescence. They concluded that youth were emotionally desensitizing to community violence, which increased their engagement in later violent behavior. Interestingly, they did not find support for externalizing symptoms (e.g., aggression) in early adolescence mediating the relation between community violence exposure in preadolescence and violent behaviors in late adolescence. Their study only measured community violence exposure at one time point and within the past year rather than investigating the effects of prolonged exposure to community violence.

Youth who are exposed to high levels of violence might become desensitized to violence, which could increase the likelihood that they engage in acts of violence in the future (Guerra et al., 2003; Overstreet, 2000). Ng-Mak and colleagues (2004) found that, among inner-city

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adolescents, high levels of community violence exposure were associated with high levels of youth aggression. Conversely, community violence exposure had a curvilinear relation with internalizing symptoms such that youth with the highest levels of exposure had levels of psychological distress that were lower than would be expected if the relation was linear. However, this study was cross-sectional, which fails to model the dynamic process of pathological adaptation as a result of prolonged violence exposure, and makes it difficult to determine the direction of the relation between variables. Further, the authors combined witnessing violence and direct victimization into one score, making it unclear which experiences of violence were contributing to symptoms. Gaylord-Harden, So, Bai, and Tolan (2017) tested a model of community violence exposure in which later violent behaviors were mediated by depressive symptoms among African American and Hispanic male adolescents. They found that adolescents with the highest levels of community violence exposure at baseline later had lower levels of violent behaviors than adolescents with lower levels of community violence exposure at baseline. These results are opposite of what would be expected from a process of desensitization or pathological adaptation as the authors hypothesized in their study. However, this study only measured exposure to violence through witnessing, which ignores the potential impact of direct victimization on depressive symptoms.

Dimensions of community violence exposure

Witnessing versus victimization

One limitation of many studies of community violence exposure and youth adjustment is the practice of combining multiple forms or dimensions of community violence exposure (witnessing, hearing about, direct victimization) into a single composite score. Combing these experiences into a single dimension does not take into account theories and empirical findings

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that suggest that these constructs may differ in their effects on internalizing and externalizing symptoms. The proximity model of exposure to community violence predicts that the closer youths are in physical proximity to an act of violence, the greater the impact would be on their adjustment, similar to findings from maltreatment and family violence research (Duckworth et al., 2000). This model predicts that victimization (i.e., directly experiencing violence) would have a greater impact on adolescent distress symptoms than witnessing violence (Duckworth et al., 2000). In a meta-analysis, Fowler and colleagues (2009) found that victimization produced stronger effects on internalizing symptoms than did witnessing or hearing about community violence, but that witnessing and hearing about violence did not significantly differ in their effects on internalizing symptoms. Different types of exposure did not significantly differ in their effects on PTSD symptoms, although each had significant effects (Fowler et al., 2009). Witnessing community violence and direct victimization did not differ in their effects on externalizing symptoms, but each had a significantly stronger effect on externalizing symptoms than did hearing about community violence. These results are inconsistent with the proximity model of exposure, and suggest that different forms of exposure might differ in their effects on internalizing and externalizing symptoms. More specifically victimization might have stronger effects on internalizing symptoms than other forms of exposure, but their effects on externalizing or PTSD symptoms may not differ. This highlights the need for measures that differentiate among each form of community violence exposure to clarify how they impact youth adjustment. The following section reviews recent studies where forms of violence exposure were measured separately.

Some evidence suggests that victimization, compared with other forms of exposure, might have stronger effects on internalizing symptoms, but not externalizing symptoms.

Elsaesser (2018) investigated different types of community violence exposure to determine if they differed in their effects on internalizing and externalizing symptoms experienced by inner-city African American and Hispanic adolescent males. Results indicated that victimization, compared with witnessing and hearing about violence, was the only type of exposure that was significantly positively associated with depressive symptoms. In contrast, witnessing violence was the only type of exposure that was associated with aggression (Elsaesser, 2018). However, these effects were no longer significant longitudinally, and this study was limited by not including female participants, and by using only one item to measure experiences of victimization, and two items each for hearing about and witnessing community violence. Further, each item combined multiple violent events (e.g., "beaten, attacked, or really hurt by others" as one item), making it difficult to determine which experiences contributed to which symptoms. Conversely, a longitudinal study of lifetime community violence exposure found effects of exposure on internalizing and externalizing symptoms that were inconsistent with the proximity model of exposure. Taylor and colleagues (2018) found that three forms of community violence exposure (hearing about, witnessing, victimization) were associated with declines in internalizing and externalizing symptoms over time, but direct victimization was associated with the largest declines. However, the different forms of exposure did not differ from each other in their effect on externalizing symptoms longitudinally. More work is needed to understand unique effects of exposure on distress symptoms.

Some theories that explain relations between witnessing community violence and youth adjustments differ from theories of victimization and youth adjustment. According to the pathological adaptation model, chronic high levels of witnessing violence (but not victimization) should be associated with decreasing or stabilizing levels of internalizing symptoms and

increasing levels of externalizing symptoms over time. Two studies of urban African American and Hispanic adolescent males conducted by Gaylord-Harden, So, Bai, Henry, and Tolan (2017), and Gaylord-Harden, So, Bai, and Tolan (2017) found that, for most youth, witnessing violence, in combination with lower-than-predicted levels of internalizing symptoms, was associated with high levels of violent behavior longitudinally. However, a subgroup of youth with the highest levels of witnessing violence and lower-than-predicted levels of internalizing symptoms had decreasing levels of violent behaviors longitudinally (Gaylord-Harden, So, Bai, & Tolan, 2017). Despite the authors' conclusions, these results seem to contradict the pathological adaptation model, and suggest that the effects of witnessing community violence might be more complex than current dimensional models suggest. These studies were limited because they only assessed witnessing violence experiences in the past-year, which excludes earlier experiences that might impact adolescent adjustment. Further, their sample was limited to male adolescents were included, so the longitudinal effect witnessing community violence on female adolescents is unclear.

Consistent with pathological adaptation, some researchers have examined models in which internalizing symptoms mediate relations between witnessing community violence and externalizing symptoms. Cooley and colleagues (2019) assessed internalizing symptoms and emotion dysregulation as moderators of the relation between witnessing community violence and aggression. In an urban, predominantly African American sample of adolescents, they found that anxiety symptoms mitigated the association between witnessing violence and aggression, such that youth with the highest levels of witnessing violence had the highest levels of aggression at low levels of anxiety. These results provided support for desensitization hypotheses and suggest that witnessing violence could have a significant impact on externalizing symptoms. However,

results indicated that depression did not significantly moderate the association between witnessing community violence and aggression, which contradicts the desensitization hypothesis. This study was cross-sectional which prevents researchers from determining whether internalizing symptoms are a mechanism behind the relation between witnessing community violence and aggression.

Beliefs about aggression and deviance are also thought to mediate the relation between witnessing community violence and externalizing symptoms, but not victimization and externalizing symptoms. Guerra and colleagues (2003) assessed witnessing violence, social cognition and later aggression among urban youth from low-income neighborhoods. Results indicated that youth who had higher levels of witnessing past-year community violence had more normative beliefs about aggression and aggressive fantasies subsequently, which were associated with subsequent aggressive behavior. However, this study only assessed past-year witnessing community violence, which fails to capture past experiences that contributed to youth's beliefs and aggression. Additionally, it was conducted with younger youth (elementary school-aged youth), and social cognitive processes are different among this age group than among adolescents. Finally, their measures of witnessing community violence were based on the number of different events youth had witnessed ("yes"/"no"), which does not account for impact that frequency of exposure has on youth aggression. Conversely, Gaylord-Harden, So, Bai, and Tolan (2017) found that deviant beliefs did not mediate the relation between witnessing community violence and subsequent changes in violent behaviors.

Prior research suggests that experiences involving direct victimization might have a greater impact on internalizing symptoms than experiences of witnessing or hearing about community violence (Fowler et al., 2009). However, the literature is inconclusive in regard to the

nature of the relation between victimization and externalizing symptoms, with some research finding positive associations and other research finding negative associations. Further, research to date is inconclusive on the magnitude and direction of the relation between witnessing community violence and externalizing symptoms. Witnessing community violence could increase normative beliefs about aggression and the use of violence, which could lead to increases in externalizing symptoms, whereas victimization is thought to cause traumatic stress responses, which could lead to decreases in externalizing symptoms, and could explain why different forms of community violence exposure differ in their effects on youth externalizing symptoms. Although conclusions of several studies suggest that witnessing community violence and being the victim of community violence could have different effects on youth internalizing symptoms, results are inconsistent and do not support theories of differential effects on symptoms such as the proximity model of exposure. Further research comparing different forms of exposure is needed to determine if different forms of community violence exposure differ in their effects on youth adjustment.

Familiarity with the victim

The effect of witnessing community violence might also differ depending on how familiar the adolescent is with the victim of violence. Several studies have indicated that familiarity with the victim of witnessed community violence has a greater impact on an individual's internalizing symptoms than witnessing violence against a stranger. Violence that occurs against someone with whom a child is familiar might disrupt the child's social network and prevent access to social support, which could increase the likelihood of developing internalizing symptoms (Lambert et al., 2012; Ward et al., 2001). Further, Ward and colleagues (2001) suggested that violence against someone with whom the adolescent is familiar might

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occur closer to where the adolescent lives (e.g., seeing a family member stabbed outside their house), which could compromise sense of safety because of the physical proximity to the adolescent's home. Youth who witness violence against a stranger instead of a familiar person might also be less likely to fear that violence could happen to them, and might therefore be less likely to develop internalizing symptoms (Lambert et al., 2012).

Lambert and colleagues (2012) investigated whether different levels of familiarity with the victim of community violence differ in their effects on internalizing symptoms among a predominately African American sample of adolescents. They found that witnessing violence against a family member was positively associated with anxiety and depression for the entire sample and with aggression but only for female adolescents. Witnessing violence against a close friend was associated with depressive symptoms for the entire sample and with anxiety but only for male adolescents. Witnessing violence against an acquaintance was positively associated with aggressive behavior for the entire sample and with anxiety only for female adolescents. Witnessing violence against a stranger was positively associated with aggression for male adolescents but not for female adolescents, and not associated with symptoms of depression and anxiety for male or female adolescents. These results suggest that all adolescents might act aggressively as a method of protection when they perceive a threat, although this would not explain why witnessing violence against a stranger was not associated with aggression for female adolescents (Lambert et al., 2012). Although this study suggests that an adolescents' relation to a victim of witnessed community violence impacts internalizing symptoms and externalizing symptoms, it did not control for other forms of community violence (e.g., direct victimization), which could affect associations with distress symptoms. This study was cross-sectional, so it is not clear if knowing a victim of violence exposure has long-term effects on internalizing

symptoms. Finally, this study was limited by assessing community violence as a count of the number of different types of events participants had witnessed (e.g., stabbing, shooting). A study assessing the frequency of exposure or total number of events witnessed might yield different results.

Ward and colleagues (2001) assessed witnessing violence against people either known or not known to adolescents in a sample of from South Africa. Results indicated that witnessing violence against a stranger and a known person was associated with PTSD and depressive symptoms, but only witnessing violence against a known person was associated with anxiety symptoms. Further, both types of witnessing violence were negatively correlated with adolescents' sense of safety. This study contradicts findings from Lambert and colleagues' study by suggesting that witnessing violence against any person contributes to internalizing symptoms. However, it was based on cross-sectional data, and the measure of violence exposure was based on a count of the number of different forms of exposure, rather than frequency of exposure. The measure of violence exposure also included experiences of exposure that occurred in an adolescent's home, which could have a different impact on symptoms than experiencing violence in the community. Results might be different if frequency or number of experiences of violence were assessed.

The few studies that have assessed different levels of familiarity with a victim of community violence and distress symptoms suggest that the relationship or level of familiarity an adolescent has with a victim of community violence might affect distress symptoms. However, these studies have only used a count of the number of different experiences of witnessed violence, rather than the frequency of each type of exposure. Studies have also not compared effects of witnessing violence against victims of different levels of familiarity to the adolescent

to determine if different relations to the victim of violence represent distinct constructs of exposure, or if they are experiences in the same dimension of exposure and have similar impacts on youth distress symptoms. Although there is some evidence that the relation to the victim of community violence is important, more work is needed to determine effects on youth adjustment.

Perceived severity

The proximity model also predicts that the perceived severity of the exposure influences distress symptoms (Duckworth et al., 2000). Traumatic stress processes suggest that experiences involving threat to life or threat of serious injury have a greater influence on internalizing symptoms than less severe experiences. Consistent with theories on traumatic stress, several studies have shown that perceived severity, or perceived lethality of an act of violence, and sense of safety afterwards, have stronger impacts on distress symptoms than the severity of the physical injury from an act of violence (see Overstreet, 2000 for a review). For example, witnessing any act of violence that involves a weapon (e.g., seeing someone stabbed) might be perceived by youth to be more severe than an act of violence without a weapon, regardless of the severity of injury to the victim (Aisenberg et al., 2008). These hypotheses would suggest that the perceived severity of the experience (e.g., whether there was a weapon involved) would have a stronger impact on internalizing symptoms than other dimensions of exposure such as witnessing versus direct victimization. Despite these hypotheses, little research has been conducted to compare the impacts of community violence experiences of different severities on youth adjustment.

Aisenberg and colleagues (2008) examined associations between the perceived and objective severity of life-time community violence exposure and past-month PTSD symptoms in an urban, Latinx and African American sample of adolescents. Objective severity was

determined by the jail sentence associated with an act of violence, and subjective severity was determined by asking participants to write down the most bothersome experience of community violence. Results indicated that only 26% of the participants identified the objectively most severe exposure as their subjectively most severe experience. However, more objectively severe experiences of community violence were positively correlated with PTSD symptoms, and the subjectively most severe experience reported by participants was not correlated with PTSD symptoms. Whether the adolescent was a victim or witness in the act of violence was not associated with differences in PTSD symptoms. These findings contradict findings discussed by Overstreet (2000) that suggest that perceived severity might have an effect on distress symptoms, however they do suggest that the severity of experiences of community violence has a greater impact on distress symptoms than the type of exposure (witnessing versus victimization). The authors used length of jail sentencing to determine "objective severity" of an experience of violence exposure, which might not be a good way to capture severity.

Goldner and colleagues (2015) examined the relation between severity and type of exposure to community violence within the past year and emotional distress in an urban, African American sample of adolescents. Items of community violence exposure were classified into four categories of exposure: moderate witnessing, severe witnessing, moderate victimization, and severe victimization. Both moderate and severe experiences of victimization were associated with depressive symptoms, PTSD symptoms, and parent-reported delinquent behavior. All types and severities of exposure were associated with youth-reported delinquency. Only moderate victimization was associated with anxiety symptoms and aggressive behavior. These results suggest that severity, in addition to the type of exposure, is important in understanding associations with adolescent internalizing and externalizing symptoms. The significant

associations between moderate but not severe victimization and anxiety symptoms and aggressive behavior indicate that desensitization or pathological adaptation might occur at severe levels of victimization. This study dichotomized responses such that violence exposure represented a count of the number of different experiences of violence, which does not take into account the frequency of each type of experience of community violence. Additionally, the authors only measured past-year community violence exposure, which excludes prior events that could continue to impact youth distress symptoms.

The literature is currently lacking strong evidence on whether different severities of exposure to community violence have different effects on youth distress symptoms. A few studies suggest that different severities might have different impacts on internalizing and externalizing symptoms, however these studies are limited by only investigating a few symptoms (Aisenberg et al., 2008), by only assessing past-year exposure, or by only using a count of the number of different violent experiences rather than their frequency (Goldner et al., 2015). Additionally, it is unclear whether different levels of severity of exposure (i.e., life-threatening versus non-life-threatening) differ in their effects on youth distress symptoms and would be better conceptualized as distinct constructs of exposure than as a single construct of exposure. More research is needed to disentangle the effects of different severities of exposure on youth distress symptoms.

Statement of the Problem

Although prior studies have demonstrated associations between exposure to community violence during childhood and adolescence and internalizing and externalizing symptoms (Fowler et al., 2009), there are inconsistencies in those associations. There are many limitations in the current literature regarding how researchers conceptualize community violence exposure

that may be contributing to inconsistent findings across studies. Many previous studies have focused on the number of different types of violence an adolescent experienced rather than the frequencies of exposure. In other words, repeated exposure to the same form of violence is only counted once. Assessing the frequencies of different types of community violence exposure could provide a more accurate representation of adolescents' experiences, and help clarify the effects of experiences on adjustment. Additionally, many studies only measured experiences of community violence exposure in the past-year, which excludes earlier experiences that may impact adolescent adjustment (e.g., Kennedy & Ceballo, 2016). More research is needed on effects of community violence exposure throughout the life-course.

Another limitation of current literature is how researchers have failed to consider different characteristics or dimensions of exposure in their conceptualization of community violence. Although the definition of community violence includes experiences of witnessing violence, direct victimization, and hearing about violence, many studies fail to distinguish between these types of exposures. Many previous studies have combined victimization and witnessing violence, despite evidence that their effects might be different. As previously discussed, several studies have found that direct victimization is more strongly associated with internalizing symptoms compared with other forms of violence exposure (e.g., Elsaesser, 2018; Fowler et al., 2009; Taylor et al., 2018). The research on violence exposure and externalizing symptoms is less consistent, with few studies comparing different types of exposure. However, several studies have found associations between witnessing community violence and externalizing symptoms (e.g., Farrell & Bruce, 1997; Fowler et al., 2009; Gaylord-Harden, So, Bai, Henry, & Tolan, 2017; Gaylord-Harden, So, Bai, & Tolan, 2017), suggesting that witnessing community violence does affect externalizing symptoms. However, none of these

studies compared the effects of witnessing violence and victimization on externalizing symptoms, making it unclear if witnessing violence has unique effects on externalizing symptoms.

Studies using factor analysis to examine the structure of community violence exposure have found support for a model that distinguishes between witnessing violence and direct victimization. One exploratory factor analysis supported a model with three separate constructs representing witnessing acts of violence, direct experiences, and general feelings of unsafety (Martin et al., 2013). However, this study did not examine the relation of each construct with distress symptoms, so it is unclear if the factors differ in their associations with youth distress symptoms. Additionally, this study was conducted with a sample of South African youth ages 8 to 19 year, so the results might not be generalizable to youth in other countries, and results might have been different for adolescents. Brennan and colleagues (2007) conducted a study with an urban, low-income sample of youth and found support for three factors representing route of exposure: experiencing, witnessing, and learning about. The authors also found that aggression, delinquency, anxiety, and depression were more strongly correlated with the victimization factor than with the other factors of exposure. However, this study included youth ages 9 to 19 years, so results might have differed across this broad range of ages. More research is needed to investigate the underlying structure of community violence exposure and associated distress symptoms.

Hastings and Kelly (1997) found that different severities of community violence exposure represented distinct factors. They conducted a factor analysis on experiences of community violence exposure among a predominately African American sample of adolescents living in high-crime neighborhoods. They found that three factors based on the severity of

exposure represented experiences of violence better than factors that differentiated between witnessing and direct victimization. The factors were traumatic violence, including seeing someone get killed, or badly hurt; indirect violence, such as seeing someone get beat up, or hearing about someone getting killed; verbal/physical abuse, including grownups threatening to beat the adolescent up, or being hit by a same-aged peer. Comparing correlations of severities of exposure with internalizing and externalizing symptoms, only physical/verbal abuse was associated with PTSD symptoms, yet all types of exposures were associated with a broad measure of internalizing symptoms. All three factors were significantly associated with anger and youth-reported externalizing symptoms. Because the effects of each type of violence exposure were not controlled for in the correlation analysis, it is possible that youth had high levels of community violence exposure in general, and that total levels of exposure contributed to symptoms because total level of community violence exposure was also significantly correlated with symptoms.

Landis and colleagues (2003) also concluded that community violence exposure was best represented by factors that differed in the severity of exposure. In an urban, African American sample of youth (ages 8 to 15 years), three factors representing indirect exposure, traumatic exposure, and abuse, fit the data better than a one-factor model and a two-factor model that differentiated between witnessing and victimization. This study, however, did not examine youth adjustment in relation to different types of exposure.

There is a need for comprehensive models of community violence exposure that capture nuances in youth experiences to determine if they differ in their effects on distress symptoms, which might not be captured by composite scores of violence exposure. These models could help inform assessment of community violence exposure. Richters and Martinez (1993) suggested

that investigating other dimensions of community violence exposure is important for understanding how exposure impacts youth adjustment. To my knowledge, no studies have investigated models of community violence exposure that included other dimensions of violence exposure (i.e., level of familiarity with the victim of a witnessed act of violence) as distinct factors, despite evidence of differences in associations with distress symptoms. Further, no studies to my knowledge have used factor analyses to identify constructs of different levels of familiarity with a victim of violence and associations with distress symptoms. The lack of research on different dimensions of exposure and the few studies previously mentioned that found subtle differences in adolescent distress symptoms depending on how community violence was measured suggest that more thorough investigations into dimensions or constructs of violence exposure will help elucidate the best way to measure community violence exposure and associated symptoms.

Almost all studies to date have measured community violence exposure by combining all of an adolescent's experiences of violence into a single composite score. Brooks-Gunn and Foster (2009) stated the importance of examining distress symptoms in the context of multiple dimensions of exposure, not just with composite scores of exposure. Further, adolescents' experiences of violence differ along multiple dimensions (e.g., frequency, severity), and between youth, even in high-crime neighborhoods (Fowler et al., 2009). Limitations in capturing nuances in experiences could prevent researchers from understanding how experiences differ in their impact on youth distress, and could contribute to the inconsistent finding of effects of community violence exposure. Identifying youth with similar experiences and comparing their adjustment could help identify which experiences are associated with which distress symptoms, which could inform intervention and prevention efforts.

Person-centered methods such as latent class and profile analysis, have recently been used to investigate the diversity of youths' experiences of community violence. Person-centered analyses can identify patterns and similarities between individuals, and assess differences in individual characteristics (e.g., gender, age) across groups or classes (Masyn, 2013). Gaylord-Harden and colleagues (2016) conducted a latent class analysis of community violence exposure among urban African American adolescents to investigate differences in experiences. They found three subgroups who differed in their patterns of community violence exposure: a "victimization" group of participants who reported moderate rates of direct victimization and low rates of witnessing violence; a "low exposure" group who reported very low rates of witnessing community violence and low rates of direct victimization; and a "high exposure" group who reported high rates of witnessing community violence and being the victim of community violence. Their findings indicated that the high-exposure subgroup had the lowest depression scores compared to the victimization and low-exposure subgroup, but the subgroups did not differ in anxiety scores. This study did not assess externalizing symptoms, and the sample was relatively small (241 participants). Additionally, their measure of community violence exposure only included experiences that occurred within the past three months, which excludes other experiences that affect youth adjustment, and measures a count of different exposures rather than the frequency of exposure.

Kretschmar and colleagues (2016) used a latent class analysis to identify patterns of violence exposure among youth referred to a Department of Justice initiative for youth at risk for violence exposure. They identified three subgroups of violence exposure: those reporting low-victimization, peer and physical assault, and high violence exposure. Their findings indicated that the low victimization subgroup was more likely to meet diagnostic criteria for anxiety

disorder compared with the other subgroups, and the high violence subgroup was more likely to meet diagnostic criteria for mood disorders and externalizing behavior disorders compared with the other subgroups. Although this study suggests that different patterns of experiences are associated with different mental health problems, it only included peer violence in the latent class analysis, which might represent a different type of violence exposure.

Although person-centered analyses show some promise in furthering our understanding of community violence exposure, it is currently unclear whether it provides a more useful approach to conceptualizing exposure to violence than dimensional approaches. For example, if analyses reveal subgroups of individuals that are high on victimization, high on witnessing, high on both, and low on both, this model would be similar to varying levels of exposure on a two-dimensional measure of violence exposure. Additionally, if distress symptoms do not differ across subgroups (e.g., all groups have high levels of anxiety), it would have limited utility in distinguishing between patterns of exposure. Research is needed to determine what information is gained from person-centered analyses.

The current study

The present study addressed several limitations of previous research examining community violence exposure among adolescents. Previous studies have demonstrated that characteristics of community violence exposure, such as type of exposure, level of familiarity with the victim, and severity of exposure, may differ in their effects on adolescents' aggression and anxiety symptoms. However, no study to my knowledge has conducted a comprehensive comparison of multiple characteristics of exposure and their relations with adolescent aggression and anxiety symptoms. Identifying characteristics of exposure that represent distinct dimensions and determining whether they differ in their associations with adolescent adjustment will inform

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best practices for future studies assessing experiences of community violence and investigating their impact on adolescent aggression and anxiety symptoms. Additionally, to my knowledge no studies have compared dimensional models of community violence exposure with models based on person-centered approaches. Because adolescents may have unique experiences of community violence exposure, identifying groups of adolescents who have different patterns of exposure and determining how these differences are related to internalizing and externalizing symptoms might provide a better way to capture adolescents' experiences of violence than by only assessing the frequency of these experiences. In particular, identifying patterns of exposure that vary in their association with internalizing and externalizing symptoms could provide a better way to identify which adolescents would benefit from particular mental health interventions and treatments.

The present study had three aims designed to address current limitations in the literature. First, in order to determine which dimensions of community violence exposure are relevant for developing a comprehensive conceptual model of exposure, I conducted confirmatory factor analyses to compare the following four competing models of the structure of community violence exposure: *Model A*: a model that represented all forms of exposure to violence by a single factor; this was based on previous studies that have used a composite score to represent adolescents' total community violence exposure. *Model B*: a two-factor model that differentiated between witnessing violence versus victimization, based on previous work that has found support for representing witnessing and victimization as distinct dimensions of exposure that differ in their effects on adolescent aggression and anxiety symptoms; *Model C*: a two-factor model that differentiated between life-threatening and non-life-threatening experiences, based on previous work that has found that severity of exposure represents distinct dimensions of

exposure that differ in their effects on aggression and anxiety symptoms; *Model D*: a three-factor

model that differentiated between witnessing violence against a stranger, witnessing violence

against a familiar person, and victimization; this model was based on previous work that has

found differences in the effects of witnessing violence on aggression and anxiety symptoms

depending on the adolescent's familiarity with the victim.

Second, I conducted a latent class analysis to identify patterns of community violence

exposure reported by adolescents. This analysis addressed the lack of research on variability in

adolescents' experiences of violence to determine if identifying subgroups of individuals who

differ in their experiences is be a better way to capture the differences in violence exposure.

Finally, I compared models from the first (factor analysis) and second (latent class

analysis) aims based on the information they provided, theoretical fit, and practical use in

identifying associations between violence exposure and aggression and anxiety symptoms. I did

this by comparing the associations of community violence exposure with internalizing symptoms

(anxiety) and externalizing symptoms (aggression) for models identified in the first two aims of

this study. This comparison helped determine how best to conceptualize community violence

exposure for future research on the construct. Specific hypotheses for each model were as

follows:

> *CFA Model A.* Based on previous studies (e.g., Fowler et al., 2009) I hypothesized
>
> that violence exposure would have stronger positive associations with physical
>
> aggression than with anxiety symptoms. However, associations between violence
>
> exposure and anxiety symptoms were more difficult to predict. Positive association
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> between violence exposure and anxiety symptoms would have provided support for the

stress-process hypothesis; negative associations between violence exposure and anxiety symptoms would have aligned with the desensitization hypothesis.

   CFA Model B. I hypothesized that both witnessing violence and victimization would have positive associations with physical aggression. I expected the association between witnessing violence and physical aggression would be stronger than the association between direct victimization and physical aggression because of evidence that suggests that social-information processes are the mechanisms that lead to the development of aggressive behavior following violence exposure among adolescents. Based on traumatic stress research, I hypothesized that violence victimization would have stronger associations than witnessing violence with anxiety symptoms. Because research on witnessing violence is less conclusive, it was harder to predict whether witnessing violence would have positive or negative associations with anxiety symptoms. Whereas, positive associations between witnessing violence and anxiety symptoms would have aligned with stress-process and traumatic stress models of violence exposure, negative associations would have aligned with desensitization models of exposure.

   CFA Model C. I hypothesized that life-threatening violence exposures would have a stronger, positive association than non-life-threatening exposures with anxiety symptoms based on prior research on effects of traumatic stress. Research on level of severity and physical aggression is inconclusive, so I was unable to predict the direction and strength of association between life-threatening and non-life-threatening experiences of violence exposure.

   CFA Model D. Based on previous research on the association between the degree of familiarity with a victim of community violence and internalizing symptoms, I

hypothesized that, compared with witnessing violence against a stranger, witnessing violence against a familiar person and victimization would both have stronger positive associations with anxiety symptoms. Similar to Model B, I hypothesized that, compared with victimization, both witnessing violence against a stranger and familiar person would have stronger associations with aggression.

LCA Model. Because LCAs are exploratory, latent classes are not known prior to analysis. Consequently, there was not sufficient information to specify *a priori* hypotheses on the associations between class membership and physical aggression and anxiety. After I determined the final class structure, I developed hypotheses on the nature of the associations between specific classes and physical aggression and anxiety symptoms.

This study addressed several shortcomings in the literature. It was based on a large sample of early adolescents. As previously discussed, adolescence is a time where youth are more vulnerable for exposure to community violence and negative outcomes associated with exposure. However, it is also an ideal time for interventions and preventions, as youth are becoming more emotionally and cognitively mature, and are thus more susceptible to influence from peers and community members (Tolan et al., 2003). Additionally, adolescents in this study lived in an urban, low-income setting, which puts them at greater risk for exposure to violence as previously discussed (Stein et al., 2003).

The measure of community violence in this study addressed several limitations of prior measures. This study measured lifetime community violence exposure to capture a range of community violence experiences that could impact youth adjustment. It also attempted to assess the frequency of community violence exposure rather than using dichotomous measurements

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(yes/no) or counts of number of different experiences. This strategy could have capture nuances in adolescent experiences that are critical to our conceptualization of community violence and how it relates to youth adjustment.

Methods

Participants and Study Setting

The present study conducted a secondary data analysis of cross-sectional data from eighth grade students collected as part of two cluster-randomized studies that evaluated a youth violence prevention program, Responding in Peaceful and Positive Ways (RIPP) in public middle schools located in an urban, southeastern city in the United States. The sample in Study 1 (Farrell et al., 2001) consisted of 405 eighth grade students. Participants ranged in age from 12 to 15 years, 58% identified themselves as girls and 42% as boys (other options were not provided), 95% self-identified as African American, 2% as White, and 0.5% as Latinx. The sample in Study 2 (Farrell et al., 2003) consisted of 276 eighth grade students at two of the three schools that participated in Study 1. Participants ranged in age from 12 to 15 years, 57% were girls, 96% self-identified as African American, 2% as White, and 1% as Latinx. For the present analysis, I used data collected in the Spring of the eighth grade from both studies for consistency and because the surveys administered during these waves included full measures of community violence exposure.

Procedures

Study 1. Sixth-grade non-special education classrooms in three middle schools during the 1995-1996 school year were randomly assigned to either receive the sixth grade RIPP intervention or act as a control classroom. The RIPP sixth grade (RIPP6) intervention consisted of 25 weekly 50-minute sessions focused on teaching social-cognitive problem-solving skills to

prevent violence. Outcome data were collected from sixth-grade students at the beginning and end of the 1995-1996 school year, from seventh-grade students at the beginning and end of the 1996-1997 school year, and from eighth-grade students at the beginning and end of the 1997-1998 school year. All students in non-special education classrooms attending the three schools at each wave were eligible to participate. During the 1996-1997 school year, a subgroup of the sample (27%) received a pilot of a RIPP seventh grade intervention (see Farrell et al., 2001). Participants were excluded from the present analysis if their response pattern met criteria that suggest random responding (Farrell et al., 1991). The present study used the sixth wave of data, which was collected from 405 eighth grade students at the participating schools in the Spring of 1998, two years following implementation of the sixth grade RIPP intervention. Of those, 34% were exposed the RIPP6 intervention, 35% were in the control condition, and 32% had not been in classrooms that were assigned to either the intervention or control group.

All procedures were approved by the University's IRB. This study used passive consent whereby parents were notified of the study and given the opportunity to have their children opt out of the study. Study staff who were unaware of treatment condition administered measures to students during homeroom or a class period scheduled for testing. Students were told that their answers would be kept confidential, and school staff did not handle completed materials. Students who did not want to participate in the surveys were told to return blank survey booklets.

Study 2. Seventh-grade non-special education classrooms in two of the middle schools from Study 1 were randomly assigned to receive either the seventh grade RIPP intervention (RIPP7) or act as a control classroom. RIPP7 consisted of 12 weekly sessions focused on teaching social-cognitive problem-solving skills to prevent violence, and was designed to boost the effects of the RIPP sixth-grade intervention. Outcome data were collected at pretest and

posttest from seventh-grade students at the beginning and end of the 1997-1998 school year, and from eighth-grade students at the beginning and end of the 1998-1999 school year (four waves total). During the 1998-1999 school year, a subgroup of the sample (52%) received a pilot of a RIPP eighth grade intervention (see Farrell et al., 2003). Participants were excluded from the current analysis if their response pattern met criteria that suggested random responding (Farrell et al., 1991). The present analysis used the posttest data collected from 276 participants from all eighth-grade non-special education classrooms collected during the Spring of 1999. Of those, 38% were exposed the RIPP7 intervention, 37% were in the control condition, and 24% were coded as neither the intervention nor control group.

All procedures were approved by the University's IRB. As in Study 1, passive consent was used in this study whereby parents were notified of the study and given the opportunity to have their children opt out of the study. Study staff who were unaware of treatment condition administered all surveys to students during homeroom or a class period scheduled for testing. Students were told that their answers would be kept confidential, and school staff did not handle completed materials. Students who did not want to participate in the surveys were told to return blank survey booklets.

Measures

Exposure to Violence. Participants self-reported lifetime exposure to violence on the Exposure to Violence Scale, which was adapted from Cooley and colleagues' (1995) Children's Report of Exposure to Violence (CREV). The measure includes three subscales, Exposure to Violence-Stranger (6 items), Exposure to Violence-Familiar Person (6 items), and Exposure to Violence-Victimization (7 items). Items from the original scale that asked about violence witnessed in the media were excluded. Items asked participants to report how frequently they

experienced or witnessed specific acts of violence (e.g., "seen a stranger being beaten up," "been robbed or mugged") on a 4-point Likert scale: 1 = "No, Never," 2 = "One time," 3 = "A few times," 4 = "Many times". Previous studies have demonstrated that the CREV has good test-retest reliability, internal consistency, and construct validity (Cooley et al., 1995). The subscales for the CREV demonstrated good reliability with the combined samples from Study 1 and Study 2 (Cronbach's α for stranger = .87, familiar person = .76, and victimization = .77). For the purposes of this study, analyses were conducted on item-level responses rather than subscale or full-scale totals.

Anxiety. Participants reported their anxiety symptoms on the Revised Children's Manifest Anxiety (RCMAS; Reynolds & Richmond, 1979). The RCMAS is a 37-item measure designed to assess current trait and manifest anxiety in youth and adolescents. The RCMAS has three subscales that assess different dimensions of anxiety: physiological symptoms, worry, and concentration. There is also a lie scale. Items are asked in a "yes"/"no" format. White and Farrell (2001) conducted a study where eight experts on childhood anxiety reorganized the RCMAS items into subscales based on concept mapping and theory. They found support for the following four dimensions: dysphoric mood (7 items), social evaluation (6 items), worry (8 items), and anxious arousal (7 items). The expert-derived model fit the data as well as the model representing the original structure of the measure. The four-subscale version was used in the present analyses because it better represents the current conceptualization of anxiety. Subscale scores were calculated by summing the items on each subscale. Higher scores indicate higher levels of anxiety. The RCMAS expert-derived subscales demonstrated acceptable reliability in the combined sample (Cronbach's α for dysphoric mood = .65, social evaluation = .73, worry = .74, and anxious arousal = .64).

Physical Aggression. Physical aggression was assessed using the 7-item Physical

Aggression subscale of the adolescent report of the Problem Behavior Frequency Scale (PBFS;

Farrell et al., 2000). Confirmatory factor analysis provided support for four distinct factors:

physical aggression, nonphysical aggression, delinquency, and drug use (Farrell et al., 2000).

Items on the physical aggression subscale (e.g., "hit or slapped another kid," "threatened

someone with a weapon") were based on the Youth Risk Survey (Kolbe et al., 1993).

Adolescents reported the frequency of engagement in acts of physical aggression within the past

30 days on a Likert scale of 1 = *Never* to 6 = *20 or more times*. The subscale score was

calculated by summing the responses to each item. Cronbach's alpha for the physical aggression

subscale in the combined sample was $\alpha = .87$.

Data Analyses

All analyses were conducted using Mplus Version 8 (Muthén & Muthén, 2017). I used

the weighted least square mean and variance adjusted (WLSMV) estimator with full information

maximum likelihood (FIML) estimation method in Mplus to address missing data. FIML uses all

available data to estimate parameters. I addressed Aim 1 by conducting confirmatory factor

analyses to compare the four competing models. Responses to violence exposure items were

treated as ordered categorical variables. Several measures of fit were evaluated to determine the

best fitting model, as recommended by Hu and Bentler (1999). Comparative fit index (CFI) and

Tucker-Lewis Index (TLI) values above .95, and root mean square error of approximation

(RMSEA) values less than .05 indicate good fit. I did not anticipate differences in the structure of

violence exposure across gender because previous research has not found gender differences in

the structure of community violence exposure or in reporting exposure. Nonetheless, I addressed

potential differences by using multiple group analyses to test for measurement invariance across

boys and girls. Measurement invariance was evaluated by first testing configural invariance, and then testing scalar invariance. An unconstrained model specifying that the factor structure (i.e., number of factors and patterns of loadings onto the factors) was consistent across groups was used to evaluate configural invariance. This unconstrained model was then compared to a model that constrained factor loadings and thresholds for each factor to be equal across group to evaluate scalar or strong measurement invariance. Support for scalar invariance indicates that the identified factor model is consistent across groups. I followed Cheung and Rensvold's (2002) recommendations by using the change in CFI (ΔCFI) to evaluate measurement invariance because it is less sensitive to sample size than χ^2 difference tests, which have the power to detect very small differences in large samples. Therefore, null hypotheses of measurement invariance were not rejected if imposing measurement invariances did not change the CFI by .01 or more. I also conducted multiple group analysis to compare factor models between students who were in classrooms that received the RIPP interventions and those who were not. Because RIPP was a school-based intervention, I did not anticipate that it would have an impact on the structure of the measure of community violence.

I addressed Aim 2 by using a latent class analysis (LCA) to investigate patterns of exposure to violence among youth. LCA is a person-centered analysis that models heterogeneity within a sample by grouping individuals based on similar response patterns (Masyn, 2013). LCA differs from variable-centered approaches, which assume that the relation between variables (independent variable and dependent variable) is the same for each individual (i.e., homogeneous) within a sample (Masyn, 2013). Classes were identified based on participants' frequency of exposure to different experiences of community violence. I identified the best-fitting model and optimal number of classes based on model fit statistics, class size

consideration, classification diagnostics (e.g., entropy), and theory (Masyn, 2013). Model fit statistics that indicate the optimal number of classes include the log likelihood, the Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwarz, 1978), Bayes factor (BF; Masyn, 2013), the approximate correct model probability (cmP; Masyn, 2013). Likelihood ratio tests, including the Lo– Mendell–Ruben test likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001), the bootstrap likelihood ratio test (BLRT; Nylund et al., 2007), and the Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT), were also used to determine the optimal number of classes. Lower AIC and BIC values indicate better fit, and non-significant p-values on the LMR-LRT, BLRT, and the VLMR-LRT indicate that adding an additional does not improve the fit of the model (Masyn, 2013). BF represents the probability that Model A is the correct model compared with the probability that Model B is the correct model when Models A and B are competing models. BF values greater than 10 provide strong evidence that Model A is the correct model (Masyn, 2013). For this analysis, BF was calculated by comparing Model k to Model $k+1$. The cmP allows for a relative comparison of all models under consideration, and all cmP values sum to 1.00 for a set of models. The model with the highest cmP value is considered to be the best fitting model (Masyn, 2013). For solutions that were identified as fitting the data well relative to other solutions, item endorsement probabilities were examined to determine homogeneity within the subgroup. Values above .7 and below .3 indicate homogeneous responses within the subgroup (Masyn, 2013).

Multiple group analyses to determine if the optimal number of classes is consistent across gender and intervention exposure can be conducted by splitting the sample and repeating the enumeration process for boys and girls, and for students exposed to the RIPP interventions and students who were not. However, methodological studies suggest that a sample size of at least

300 is needed for LCA fit indices to function adequately and for sufficient power to identify the optimal number of classes, especially when there are many indicators (Nylund-Gibson & Choi, 2018). For the current study, sample sizes for boys and students exposed to the RIPP intervention were not sufficient to conduct LCA (i.e., Ns < 300). Therefore, I did not conduct further LCA to test for optimal number of classes across gender or intervention status.

Finally, I addressed Aim 3 by comparing the best-fitting CFA models with the best fitting LCA model by evaluating the information provided by each of the models. For the CFA models that demonstrated good fit, partial correlations between identified factors and physical aggression and anxiety scores were compared to determine if associations with aggression and anxiety symptoms differed for different dimensions of community violence exposure. Partial correlations were used to control for associations between covariates (adolescent gender and exposure to the RIPP intervention) and physical aggression and anxiety. This tested the previously stated hypotheses of expected associations for each CFA model. Additionally, physical aggression and anxiety symptoms were regressed on the exposure factors and the covariates to determine each factor's unique association with physical aggression and anxiety, and the overall variance accounted for in aggression and anxiety by exposure factors. I did not anticipate that differences in associations between exposure factors and physical aggression or anxiety based on gender or exposure to the RIPP intervention. The RIPP interventions were conducted at the classroom-level, and students who were in classes that received the RIPP intervention might have differed at baseline, and might therefore might have differed at follow-up. The current analysis used follow-up data during the Spring of the eight grade and did not control for baseline levels of aggression.

Once the optimal number of subgroups was determined, I generated hypotheses regarding

differences between subgroups in their scores of physical aggression and anxiety. I used the three-step Bolck, Croon, and Hagenaars (BCH) approach (Asparouhov & Muthén, 2014) to compare subgroups differences in scores of physical aggression and symptoms of anxiety while controlling for gender and exposure to the RIPP intervention. This was done by regressing physical aggression and anxiety on a variable indicating the most likely subgroup membership, which takes into account uncertainty in classification, and onto gender and intervention variables to control for gender and exposure to the RIPP intervention. Pairwise comparisons were used to determine the extent to which subgroups differed in their mean scores of physical aggression and anxiety.

Results

Descriptive Statistics

The frequency of endorsement on the CREV items is reported in Table 1. The item most frequently endorsed as having occurred at least once was *Seeing someone you know get beaten up* (80.4% of adolescents reported that they had experienced this at least once). The item least frequently endorsed as having occurred at least once was *You have been robbed/mugged*, with only 9.8% of adolescents endorsing this experience at least once. Over half of the sample reported witnessing the following items at least once: *Seen a stranger beaten up, seen a stranger chased/threatened, seen somebody you know beaten up,* and *seen somebody you know chased/threatened.* Less than 10% of the sample reported that they *have been robbed/mugged* at least once. For 13 of the 19 items, less than 5% of the sample endorsed the highest frequency of exposure (*Many times).* Examples of items endorsed *Many times* by less than 5% of the sample are: *Seen a stranger stabbed/killed, seen someone you know robbed/mugged, you have been beaten up, you have been shot/stabbed*. Only 5.1% of adolescents reported that they had never

experienced any form of community violence.

Table 1

Percentages of Participants Endorsement of Each Category for Items on the Children's Report

of Exposure to Violence (CREV)

	No never	One time	A few times	Many times
1. Seen a stranger beaten up	33.9%	22.2%	25.4%	18.5%
2. Seen a stranger chased/threatened	40.0%	22.1%	23.2%	14.7%
3. Seen a stranger robbed/mugged	70.3%	12.8%	11.0%	5.9%
4. Seen a stranger shot	66.6%	18.4%	9.3%	5.7%
5. Seen a stranger stabbed	81.5%	8.3%	5.9%	4.2%
6. Seen a stranger killed	80.4%	10.2%	5.0%	4.4%
7. Seen somebody you know beaten up	19.6%	21.6%	38.4%	20.4%
8. Seen somebody you know chased/threatened	42.9%	22.3%	23.5%	11.4%
9. Seen somebody you know robbed/mugged	77.2%	13.1%	6.6%	3.1%
10. Seen somebody you know shot	72.7%	13.4%	9.3%	4.7%
11. Seen somebody you know stabbed	79.7%	10.8%	5.6%	3.8%
12. Seen somebody you know killed	81.7%	9.2%	5.9%	3.2%
13. You have been beaten up	64.8%	23.2%	10.2%	1.8%
14. You have been chased/threatened	77.7%	14.1%	5.9%	2.3%
15. You have been robbed/mugged	90.2%	7.3%	2.4%	0.0%
16. You have been shot/stabbed	86.6%	9.1%	3.0%	1.2%
17. You have been threatened-kill	76.0%	13.9%	7.5%	2.7%
18. You have been threatened-shoot	79.2%	12.0%	6.2%	2.6%
19. You have been threatened-stab	81.7%	11.1%	4.8%	2.4%

Comparison of Dimensional Models

Confirmatory factor analysis (CFA) was used to compare the four competing models of community violence exposure. For these analyses, all items were recoded into three categories (i.e., 1 = *No, never*, 2 = *One time*, 3 = *More than once*) by combining the two highest frequency categories of *A few times* and *Many times*. This was done because response rates for Category 4 (*Many times*) were low for most items (i.e., < 5% endorsed this response option for 13 out of 19 items). Low frequencies of category endorsement can be problematic for the WLSMV estimator which requires nonzero values in two-way frequency tables of variable pairs.

Four models were tested based on current conceptualization of community violence exposure in the literature: *Model 1* represented all forms of exposure to violence by a single factor; *Model 2* was a two-factor model that differentiated between witnessing violence versus victimization; *Model 3* was a two-factor model that differentiated between life-threatening and non-life-threatening experiences; and *Model 4* was a three-factor model that differentiated between witnessing violence against a stranger, witnessing violence against a familiar person, and victimization. The fit of these four models is reported in Table 2. None had an acceptable overall fit (RMSEAs > .08, CFIs < .95, TLIs < .95). A review of the factor loadings indicated that Item 13 (*You have been beaten up*) had low standardized loadings (i.e., < .30) in all of the models tested. This was likely due to the high endorsement (i.e., 35% of the sample) of categories other than *No, never* for this item relative to the other victimization items. The three-factor model based on level of familiarity with the victim (Model 4) had the best fit of the four models, but was only marginally acceptable based on fit indices (RMSEA = .092, CFI = .923, TLI = .911).

Based on the poor fit of the four hypothesized models, an exploratory factor analysis

(EFA) was conducted using a geomin (oblique) rotation to identify alternative models for the structure of the CREV. Although a scree plot of the eigenvalues suggested three or four factors, only three factors were associated with eigenvalues of 1.00 or higher (i.e., 9.44, 2.16, 2.03, 0.97 for one, two, three, and four factors respectively). Three factors accounted for 71.7% of the variance. The three-factor model fit the data better than the one- and two-factor solutions (three-factor solution RMSEA = .063, CFI = .971, TLI = .958 versus RMSEAs > .08, CFIs < .95, TLIs < .95 for the one- and two-factor solutions). Review of the standardized factors loadings for the three-factor model (Table 3) indicated that each item had a high loading (i.e., loading > .5, bolded in Table 3) on a single primary factor with the exception of item 13 (*You have been beaten up*) and item 15 (*You have been robbed/mugged*). None of the items, with the exception of item 16 (*You have been shot/stabbed*) had high cross loadings on any other factors (i.e., all cross-loadings < .4). This overall pattern suggested a hybrid of the hypothesized models, with separate factors representing witnessing less severe acts of violence (e.g., seen someone being beaten up or chased; 4 items), witnessing severe acts of violence (e.g., seen someone being shot or stabbed; 8 items), and victimization (7 items). A CFA of the hybrid model, with items loading onto factors as suggested by the EFA, fit the data well (see Model 5 in Table 2; RMSEA = .072, CFI = .953, TLI = .946).

The three-factor hybrid model (Model 5) was selected as the final model because it was the best-fitting model based on fit indices and relation to current theories of community violence exposure. The latent structures and factor loadings for the three-factor hybrid model (Model 5) are presented in Figure 1. Within this model, there were medium to large correlations between the latent factors (rs = .45 to .65). Standardized item loadings ranged from .49 to .98 on the Witnessing Less Severe Violence factor, from .81 to .91 on the Witnessing Severe Violence

factor, and .62 to .92 on the Victimization factor, with the exception of *You have been beaten up*, where the loading was .28.

Measurement Invariance Across Gender

Multiple group analyses were conducted to test measurement invariance across gender for the three-factor hybrid model (Model 5). The configural invariance model fit the data well (Model 6 in Table 2), indicating that the overall factor structures (i.e., number of factors and pattern of loadings of items on factors) were not different for boys and girls. Next, the configural model was compared to a model that specified scalar invariance (i.e., thresholds and item loadings were consistent across groups, Model 7). Imposing scalar invariance had minimal impact on model fit (ΔCFI = .001), which provided support for scalar invariance and allowed for the comparison of means for boys and girls. There were significant differences in boys' and girls' average frequency of Witnessing Less Severe Violence and Witnessing Severe Violence (ds = -.21 and -.35, respectively ps = .02) such that girls on average reported lower frequencies of witnessing both forms of violence. However, boys and girls did not differ in their reported frequency of Victimization (d = -.21, p = .31).

Measurement Invariance Across Intervention and Control Groups

Multiple group analyses were also conducted to test measurement invariance between students who were in a classroom that received the RIPP intervention and those who were not based on Model 5. The configural invariance model fit the data well (Model 8 in Table 2), indicating that the factor structures were not significantly different for RIPP participants and non-RIPP participants. Next, the configural model was compared to a model that specified scalar invariance (i.e., thresholds and item loadings were consistent across groups, Model 9). Imposing scalar invariance did not have a significant impact on model fit (ΔCFI = .002, $\Delta\chi^2$ = 42.49, p =

.10), which provided support for scalar invariance and allowed for the comparison of means

between the groups. RIPP participants and non-RIPP participants did not significantly differ in

their reported community violence exposure on any of the factors (ds = .01 to .21).

Table 2

Fit Indices for The Dimensional Models

Model	χ^2	DF	RMSEA	CFI	TLI	Comparison	$\Delta\chi^{2a}$	ΔCFI	Δdf^a
Models based on overall sample									
1. One factor all exposure	1648.89***	152	0.121	0.862	0.845				
2. Two factor witnessing & victimization	1063.72***	151	0.095	0.916	0.905				
3. Two factor life threatening & non-life threatening	1450.01***	151	0.113	0.881	0.865				
4. Three factor level of familiarity	990.61***	149	0.092	0.923	0.911				
5. Three factor hybrid	662.06***	149	0.072	0.953	0.946				
Tests of measurement invariance across gender for the three-factor hybrid model									
6. Configural invariance	746.70	298	0.067	0.957	0.951	7	57.64**	.001	32
7. Scalar invariance	772.66	330	0.064	0.958	0.956				
Tests of measurement invariance across RIPP exposure status									
8. Configural invariance	757.19	298	0.068	0.958	0.951	9	42.49	.002	32
9. Scalar invariance	764.12	330	0.063	0.96	0.958				

Note. $N = 670$ except where noted. RMSEA = Root mean square error of approximation. CFI = comparative fit index. TLI = Tucker-Lewis fit index. CFA = Confirmatory factor analysis. RIPP = Responding in Peaceful and Positive Ways intervention.

[a]Significant chi-square indicates the configural invariance model fits the data better than the scalar invariance model.

*p < .05, **p < .01, ***p < .001.

Table 3

Factor Loadings for the Three-Factor Exploratory Factor Analysis Solution

| Item	Factor 1	Factor 2	Factor 3
Seen stranger beaten up	**0.73***	0.34*	-0.07
Seen stranger chased/threatened	**0.75***	0.38*	0.01
Seen stranger robbed/mugged	0.35*	**0.72***	0.01
Seen stranger shot	0.27*	**0.84***	-0.12
Seen stranger stabbed	0.21*	**0.80***	0.07
Seen stranger killed	0.16*	**0.88***	-0.05
Seen somebody beaten up	**0.67***	-0.18*	0.23*
Seen somebody chased/threatened	**0.65***	0.01	0.35*
Seen somebody robbed/mugged	0.11*	**0.69***	0.15
Seen somebody shot	0.02	**0.82***	0.06
Seen somebody stabbed	-0.02	**0.77***	0.19*
Seen somebody killed	-0.02	**0.83***	0.10
You been beaten up	0.17*	-0.15*	**0.35***
You been chased/threatened	0.11	-0.01	**0.63***
You been robbed/mugged	-0.17*	0.40*	**0.43***
You been shot/stabbed	-0.03	0.43*	**0.57***
You been threatened-kill	0.12	-0.01	**0.91***
You been threatened-shoot	0.14*	0.02	**0.86***
You been threatened-stab	0.02	0.15*	**0.76***

Note: Bolded loadings indicate loading on primary factor is significant at p < .05.

* *p* < .05.

Figure 1

Factor Structure of the Final CFA Model, the Three-Factor Hybrid (Model 5)
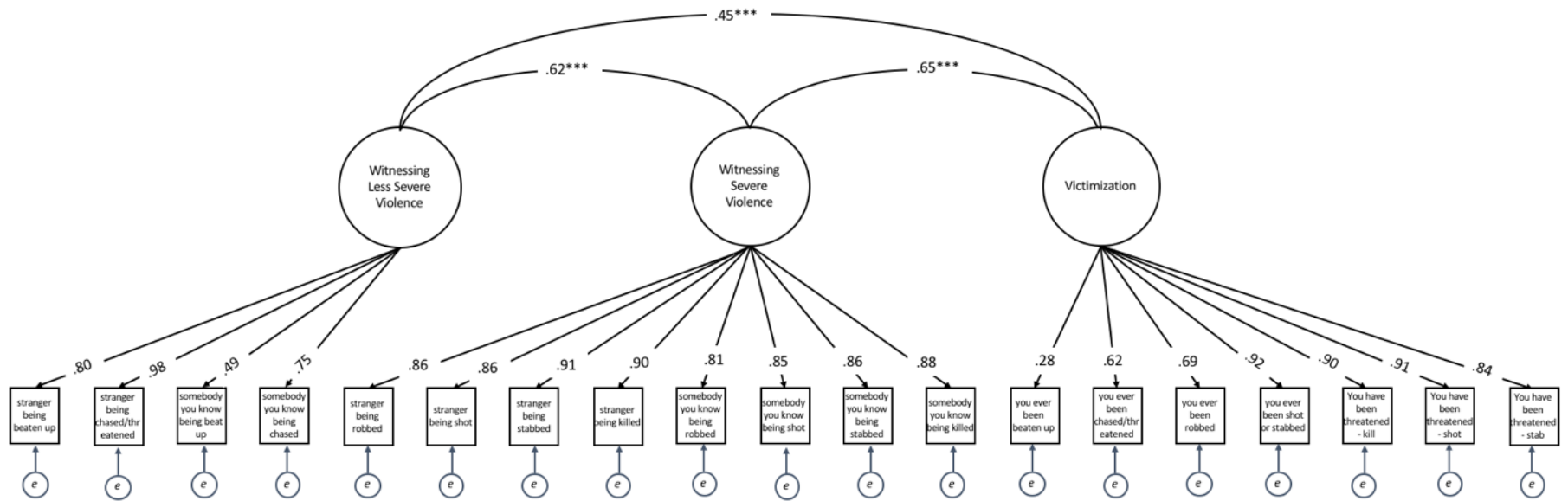
Note: All loadings and correlations are significant at *p* < .001.

Person-Centered Models

The second aim of this study was to identify classes or subgroups of urban adolescents with distinct patterns of community violence exposure. LCA was used to test a series of models, with each model increasing the number of classes from the previous model using random starting values starting at 100 and increasing to 1,000 (Table 4). Similar to the Aim 1 analysis, I combined the two response options with the lowest response rates (*A few times* and *Many times*) so that the indicators each had three categories (*Never, One time, More than once*) because of low endorsement of the category representing the highest frequency of exposure. A model specifying eight classes failed to converge (i.e., failed to replicate maximum log likelihood value) so no further classes were added. With the addition of each class, the LL continued to increase, and the AIC and adjusted BIC continued to decrease. Additionally, the BLRT remained significant across all models tested. Support was found for the four-class model based on the BIC, cmP, BF, and the VLMR and LMR likelihood ratio tests. With the addition of subsequent classes after the four-class model, the VLMR- and LMR-LRT were non-significant, which suggests that the addition of subsequent classes did not significantly improve model fit. The maximum log likelihood value was replicated 34 times in the four-class model out of 559 random starts that converged. The four-class model had high separation of classes (i.e., entropy = .895), and the smallest class represented 14.2% of the sample ($n = 95$). Because the four-class model was indicated as the "best contender" by multiple fit indices, the BF value of the four-class model compared to the three-class model was also calculated. The BF value for the four-class model compared to the three-class model was > 10 which suggests that the four-class model had a higher probability of being the "correct model" than the three-class model. Therefore, the model specifying four subgroups was retained for further analyses. The four-class

model had entropy of .90 and average posterior class probabilities ranging from .92 to .96, indicating high degree of class separation and classification precision. The odds of correction class ratios ranged from 30.34 to 141.13, indicating good classification separation and high assignment accuracy (Masyn, 2013).

The estimated probability plot for the four-class model (see Figures 2a-2c) was investigated to determine if the subgroups were consistent in regard to their responses to indicator items. Probability plots indicated that adolescents in all four subgroups were consistent in not endorsing category 2, experiencing an act of violence *One time*. There were only a few exceptions where subgroups varied in their endorsement of category 2, but their probability of endorsement was still unlikely (i.e., probability $< .5$ for all items). Due to low probabilities of endorsement of category 2 across all subgroups, I decided that category 2 was not helpful in distinguishing between subgroups of adolescents with different patterns of community violence exposure.

An additional LCA with binary indicators was therefore conducted (Table 5). Indicators for the additional LCA were dichotomized responses to violence exposure items such that category 1 represented a response of *never* experiencing that act of violence, and category 2 represented *ever* experiencing that act of violence. A model specifying nine classes failed to converge (i.e., failed to replicate maximum log likelihood value) so no further classes were added. With the addition of each class, the LL continued to increase, and the AIC and adjusted BIC continued to decrease. Additionally, the BLRT remained significant across all models tested. The five-class model was supported by the BIC, cmP, and BF. Further, the BF was > 100 when the five-class solution was compared to the four-class solution, suggesting that the five-class solution has a higher probability of being the "correct" model than the four-class solution.

For the five-class model, the maximum log likelihood value was replicated 97 times out of 686 random starts that converged. The five-class model had entropy of .87 and average posterior class probabilities ranging from .88 to .95, indicating high degree of class separation and classification precision. The odds of correction class ratios ranged from 24.33 to 149.11, indicating good classification separation and high assignment accuracy (Masyn, 2013). However, the VLMR and LMR likelihood ratio tests were not significant for the five-class model, suggesting that the addition of the fifth class did not significantly improve model fit. Both the four-class and five-class solutions had high separation of classes (i.e., entropy = .85 and .87 respectively), and adequate class sizes (i.e., lowest class sizes = 15% and 12% respectively).

The item probability plots for the four- and five-class models were investigated to determine the extent to which subgroup violence exposure patterns related to current theories of exposure. Review of the four-class model item probability plot (Figure 3) revealed that the most prevalent subgroup, which I labeled *Low Violence Exposure* (41.8% of participants), included adolescents who were consistent in reporting that they had never experienced community violence (i.e., < .30 probability of ever experiencing), with the exception of items *Seen a stranger beaten up* and *Seen someone you know beaten up*. The second most prevalent subgroup, labeled *Witnessed Less Severe Violence* (26.9%), included adolescents who were consistent in reporting that they had witnessed less severe acts of violence (i.e., probability > .70) on items such as *Seeing a stranger* or *someone you know chased* or *threatened*. They were also consistent in reporting that they had never witnessed severe acts of violence nor experienced most acts of victimization, but varied (i.e., probability between .30 and .70) in their reports on three victimization items: *You have been beaten up*, *you have been chased/threatened*, *you have been threatened-killed*. The third most prevalent subgroup, labeled *Mixed Witnessing* (16.9%)

included adolescents who were consistent in reporting that they had witnessed five of the twelve witnessing items and had not experienced six of the seven victimization items, but varied in their reports on the remaining seven witnessing items and one victimization item. The least prevalent subgroup, labeled *High Violence Exposure* (14.5%), included adolescents who were consistent in reporting that they had experienced eleven out of the twelve witnessing violence item and four out of the seven victimization items.

Within the 5-class model (see Figure 4) the most prevalent subgroup (32.2%), labeled *Low Violence Exposure,* was consistent in reporting that they had never experienced any of the acts of violence, with the exception of *Seen someone you know beaten up*. The second most prevalent subgroup, labeled *Witnessed Less Severe Violence* (27.2%), included adolescents who were consistent in reporting witnessing three of the less-severe acts of community violence (e.g., *Seen a stranger get beaten up*), but never witnessing the other acts of violence, with the exception of *Seen someone you know chased or threatened* and *You have been beaten up*. The third subgroup, labeled *Witnessed Mixed Severity* (16.1%), included adolescents who were consistent in reporting that they had witnessed four of the six items of witnessing violence against a stranger, and that they had never experienced direct victimization, with the exception of one item (*You have been beaten up*). This subgroup showed variability (i.e., probabilities between .30 and .70) in reporting that they had witnessed violence against a known person, with the exception of *Seen someone you know beaten up*. The fourth subgroup, labeled *Mixed Victimization, Less Severe Witness* (12.1%, referred to as "Mixed Victimization" from here on), included adolescents who varied in their reports on four victimization experiences. This subgroup was consistent in reporting that they had witnessed four items involving less-severe acts of community violence against a stranger and a known person, and one experience of

victimization (*You have been threatened – killed*), and had never experienced the eight items involving witnessing severe violence against a stranger and a known person. The final subgroup, labeled *High Violence Exposure* (12.4%), included adolescents who were consistent in reporting that they had witnessed all different types of community violence against a stranger and a known person. They were also consistent in reporting that they had experienced four of the victimization items.

Crosstabulation of most likely class membership between the 4-class and 5-class models conducted in SPSS revealed that *Witnessed Less Severe Violence* subgroup in the 5-class model largely consisted of adolescents from two different subgroups in the 4-class model (*Less Severe Witnessing* and *Low Violence Exposure*). The *Mixed Victimization* subgroup in the 5-class model included the remainder of the adolescents from the *Less Severe Witnessing* subgroup. The *Low Violence Exposure* subgroup in the 5-class model included the remainder of the *Low Violence Exposure* subgroup from the 4-class model. The movement of adolescents between subgroups suggests that the additional subgroup in the 5-class model better represented these adolescents' patterns of exposure than the patterns represented by either of the subgroups in the 4-class model. Accordingly, the 5-class model was retained for subsequent analysis.

Table 4

Fit Indices for Latent Class Analysis Models with Indicators with Three Categories

k	Par	LL	AIC	BIC	Adj. BIC	VLMR-LRT (*p*)	LMR-LRT (*p*)	BLRT (*p*)	Entropy	Smallest class (%)	BF (K, K+1)	cmP
1	38	-9354.2	18784.4	18955.6	18835.0	NA	NA	NA	NA	100%	< .001	< .001
2	77	-8162.0	16478.0	16825.1	16580.6	0.000	0.000	0.000	0.908	31%	< .001	< .001
3	116	-7852.5	15937.1	16459.9	16091.6	0.007	0.007	0.000	0.867	20%	< .001	< .001
4	155	-7679.8	15669.6	**16368.2**	15876.1	**0.001**	**0.001**	0.000	0.895	14%	**> 100**	**.999**
5	194	-7560.1	15508.2	16382.6	15766.7	0.487	0.488	0.000	0.895	10%	> 100	.001
6	233	-7447.6	15361.1	16411.3	15671.5	0.761	0.761	0.000[a]	0.906	5%	> 100	< .001
7	272	-7372.1	**15288.2**	16514.2	**15650.6**	0.762	0.762	0.000[a]	0.903	5%	NA	< .001
8	nonconvergence											

Note. $N = 670$. k = Number of classes, Par = number of parameters, LL = log likelihood, BIC = Bayesian information criterion, VLMR-LRT = Vuong–Lo–Mendell–Rubin likelihood ratio test, LMR-LRT = Lo–Mendell–Rubin likelihood ratio test, BLRT = Bootstrap Likelihood Ratio Test, BF = Bayes Factor, cmP = approximate correct model probability, NA = Not Applicable. VLMR-LRT, LMR-LRT, BLRT, and Entropy not applicable for one-class models. Values in bold for the AIC, BIC, adj. BIC indicate the model with the minimum value. Value in bold for the BF indicates the model with the smallest number of classes that is favored over a model with an additional class. Value in bold for the cmP(K) indicates value above .10.

[a]For the 6- and 7-class models, there was a warning in the Tech 14 output stating that 0 of the bootstrap draws converged during the BLRT. The LRT starts command did not fix the warning.

Figure 2

4-Class Model with Three-Category Indicators Estimated Probabilities of Item Endorsement by

Most Likely Class for Categories (a) Never, (b) One Time, and (c) Multiple time

2a. Probabilities of Item Endorsement for Category Never
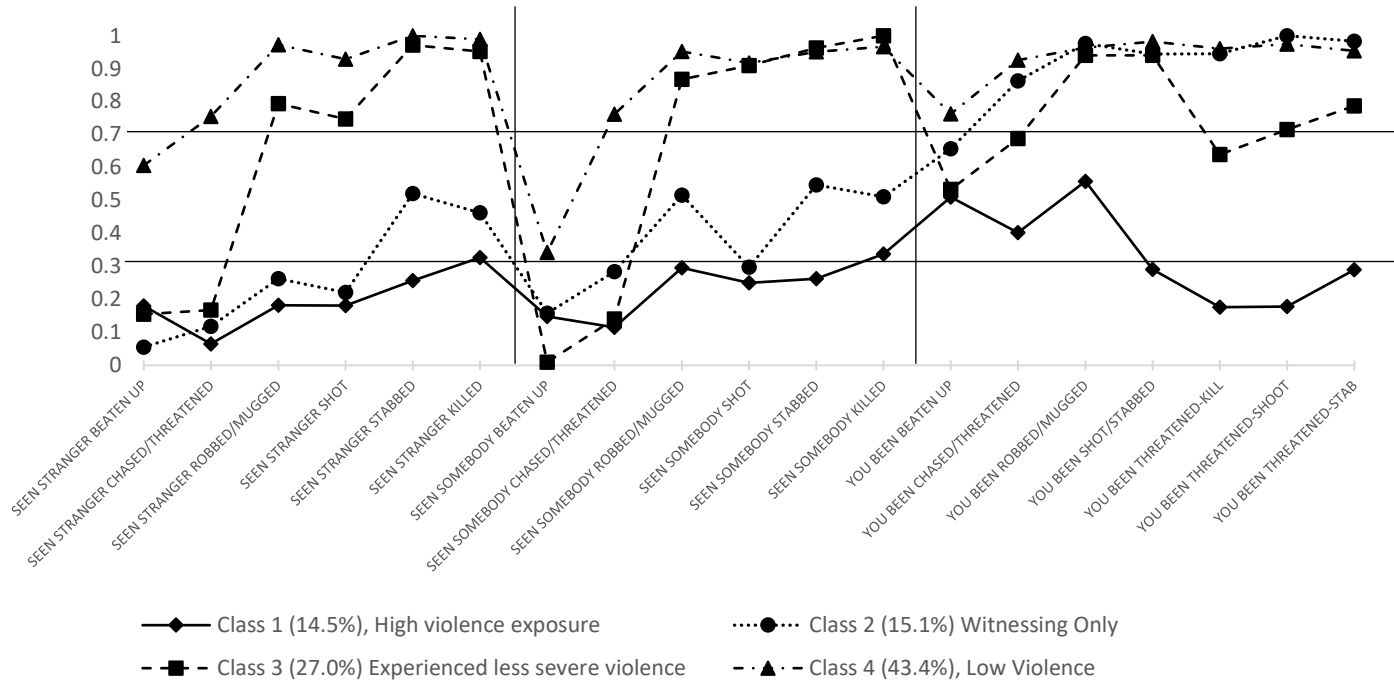
2b. Probabilities of Item Endorsement for Category One Time
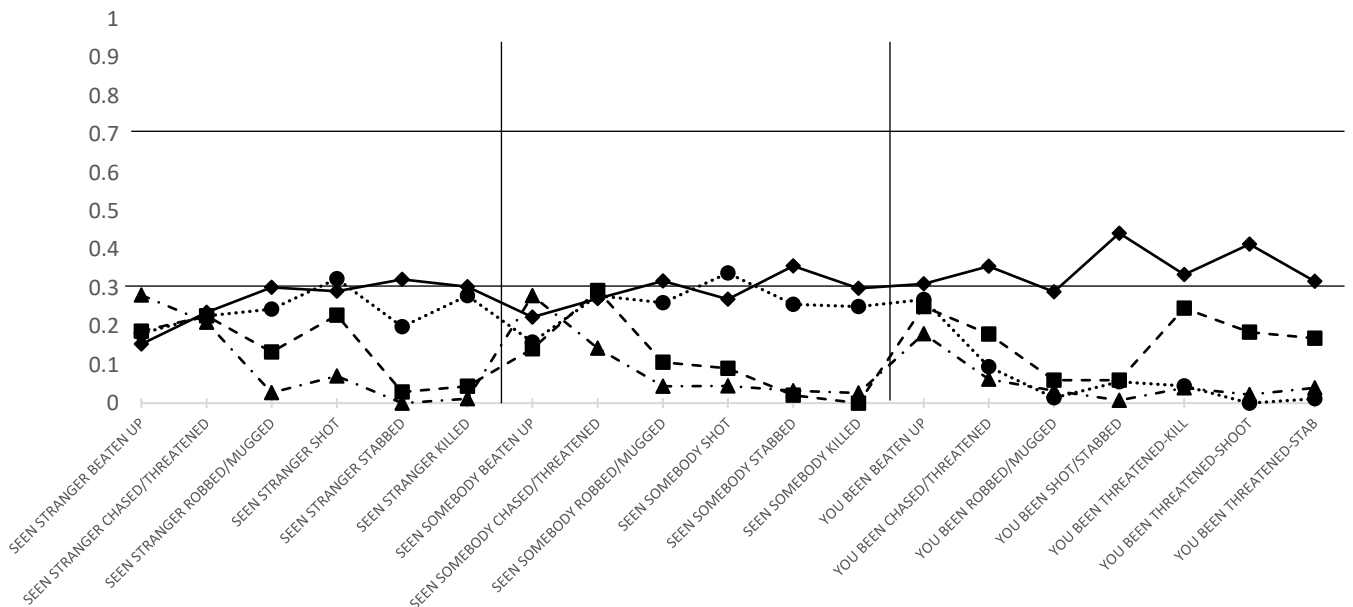
2c. Probabilities of Item Endorsement for Category Multiple Times

Note: For all figures, probabilities < .3 and >.7 indicate high level of consistency in category endorsement among members of that subgroup.

Table 5

Fit Indices for Latent Class Analysis Models with Dichotomous Indicators

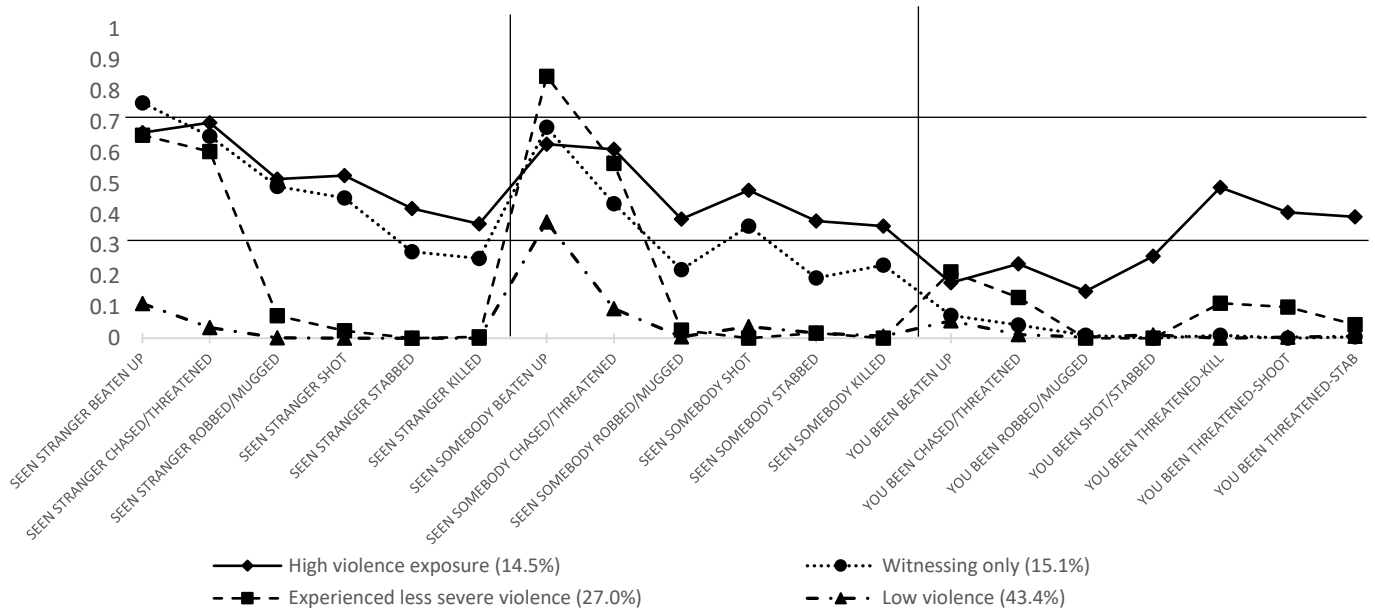| k	Par	LL	AIC	BIC	Adj. BIC	VLMR-LRT (p)	LMR-LRT (p)	BLRT (p)	Entropy	Smallest class (%)	BF (K, K+1)	cmP
1	19	-6766.7	13571.3	13657.0	13596.7	NA	NA	NA	NA	100%	< .001	< .001
2	39	-5669.9	11417.8	11593.6	11469.8	0.000	0.000	0.000	0.902	30%	< .001	< .001
3	59	-5424.0	10966.1	11232.0	11044.7	0.000	0.000	0.000	0.843	19%	< .001	< .001
4	79	-5268.0	10694.0	11050.0	10799.2	**0.001**	**0.001**	0.000	0.851	15%	< .001	< .001
5	99	-5159.0	10516.0	**10962.2**	10647.9	0.086	0.088	0.000	0.865	12%	**> 100**	**1.000**
6	119	-5103.8	10445.6	10982.0	10604.2	0.009	0.009	0.000	0.859	9%	> 100	< .001
7	139	-5053.4	10384.7	11011.2	10569.9	0.014	0.015	0.000	0.858	5%	> 100	< .001
8	159	-5016.0	**10350.0**	11066.7	**10561.9**	0.194	0.194	0.000	0.870	4%	NA	< .001
9	nonconvergence											

Note. N = 670. *k* = Number of classes, Par = number of parameters, LL = log likelihood, BIC = Bayesian information criterion,

VLMR-LRT = Vuong–Lo–Mendell–Rubin likelihood ratio test, LMR-LRT = Lo–Mendell–Rubin likelihood ratio test, BLRT =

Bootstrap Likelihood Ratio Test, BF = Bayes Factor, cmP = approximate correct model probability, NA = Not Applicable. VLMR-

LRT, LMR-LRT, BLRT, and Entropy not applicable for one-class models. Values in bold for the AIC, BIC, adj. BIC indicate the

model with the minimum value. Value in bold for the BF indicates the model with the smallest number of classes that is favored over

a model with an additional class. Value in bold for the cmP(K) indicates value above .10.

Figure 3

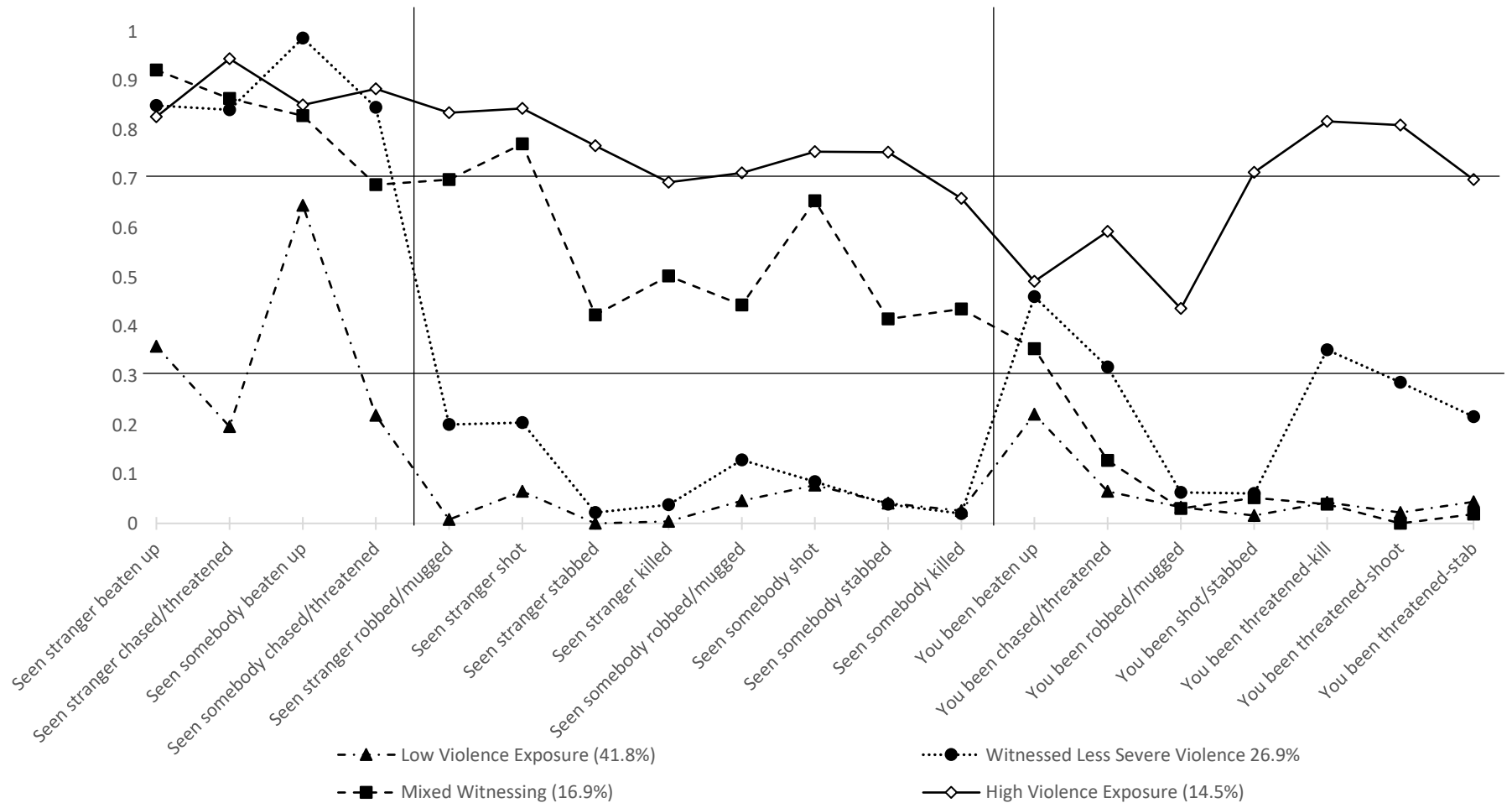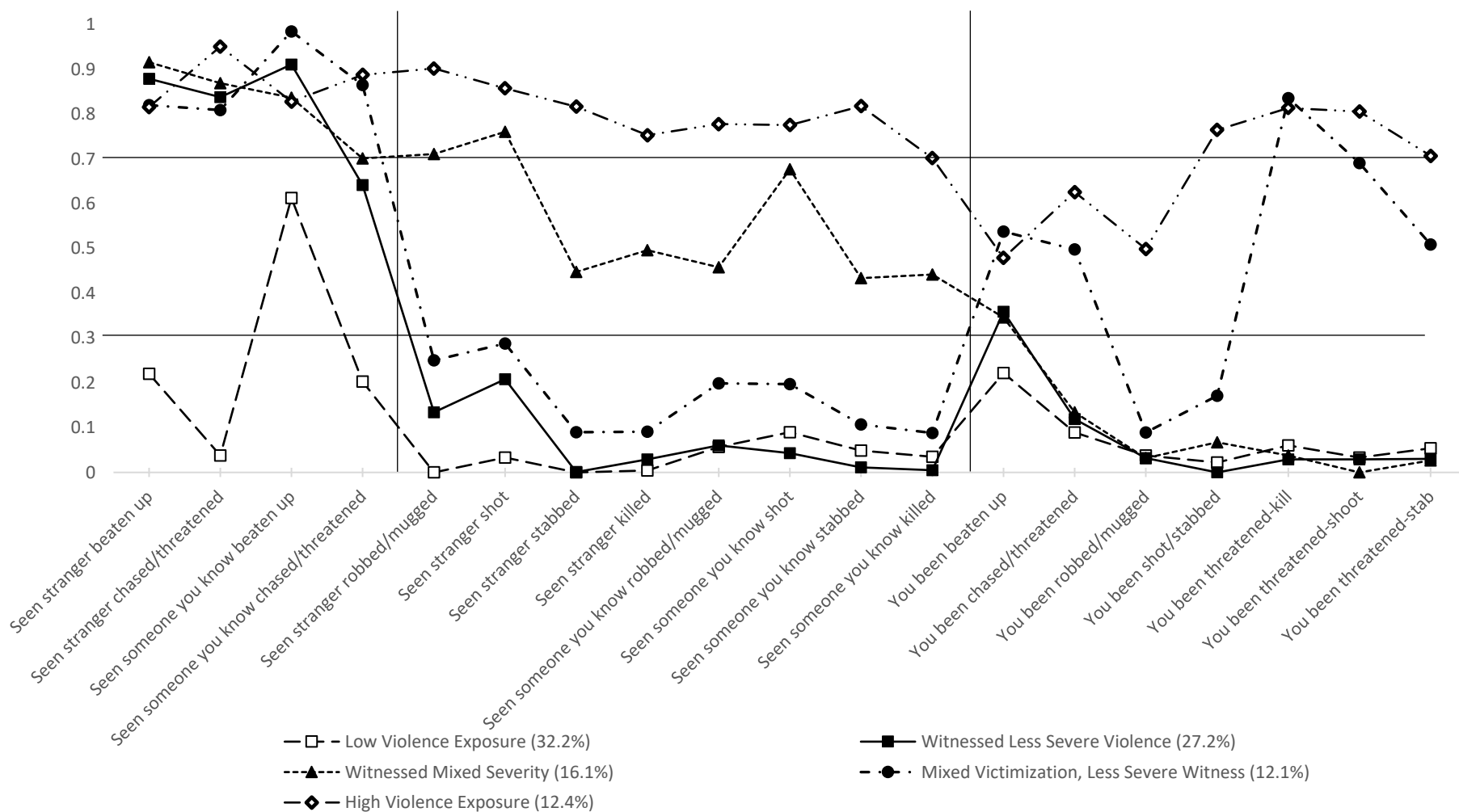*Estimated Probability of Item Endorsement for the Binary 4-Class Solution*

Figure 4

Estimated Probability of Item Endorsement for the Binary 5-Class Solution

Dimensional Model Associations with Adolescent Aggression and Anxiety

Because Model 5, the three-factor hybrid model that emerged as the final model from the CFA was not one of the hypothesized models, I had not formulated specific hypotheses for its associations with other constructs. I therefore developed hypotheses regarding the associations between the factors of community violence exposure and physical aggression and anxiety prior to examining these relations. I hypothesized that Witnessing Severe Violence would have the strongest association with physical aggression, Witnessing Less Severe Violence would have the second strongest association with physical aggression, and Victimization would have the weakest association with physical aggression. With respect to relations between exposure factors and anxiety, I hypothesized Victimization would have the strongest associations with anxiety symptoms, Witnessing Less Severe Violence would have the second strongest associations with anxiety symptoms, and Witnessing Severe Violence would have the weakest associations with anxiety symptoms.

Partial correlations between the exposure factors and physical aggression and anxiety were calculated to compare associations between each of the factors and physical aggression and anxiety while controlling for gender and intervention condition. These were calculated by models in which physical aggression and anxiety were regressed onto gender and intervention status and correlated with each of the exposure factors. Partial correlations, means, and standard deviations between factors and dependent variables are reported in Table 6. Witnessing Less Severe Violence was positively correlated with physical aggression, dysphoric mood, worry, and anxious arousal. Witnessing Severe Violence was positively correlated with physical aggression, dysphoric mood, and anxious arousal. Victimization was positively correlated with physical aggression and all anxiety subscales. A Wald test indicated that the three factors differed in their

associations with aggression and anxiety, χ^2 (10) = 30.50, $p < .001$. I conducted follow-up

pairwise comparisons using the model constraint command to test previously stated hypotheses

of differences between the factors in their associations with physical aggression and anxiety (see

Table 7). Contrary to my hypothesis, the three factors did not differ in their associations with

physical aggression ($prs = .40$ to .45). Consistent with my hypothesis, Victimization had the

strongest relations with all subscales of anxiety ($prs = .20$ to .37), and was more strongly

associated with all subscales compared with the two witnessing factors. However, in contrast to

my hypothesis, the two witnessing factors did not significantly differ in their associations with

any of the subscales of anxiety.

Structural equation modeling was used to determine the total percentage of variance in

physical aggression and anxiety symptoms accounted for by the three exposure factors and the

unique contribution of each variable, while controlling for gender and intervention status.

Physical aggression and anxiety subscale scores (dysphoric mood, social evaluation, worry, and

anxious arousal) were regressed on each of the community violence exposure factors and the

covariates. Regression coefficients and standard errors of the structural equation model are

presented in Table 8 and Figure 5. This model fit the data adequately (χ^2 (267) = 840.26, $p <$

.001, RMSEA = .056, CFI = .950, TLI = .939). The factors and covariates in this model

accounted for significant portions of the variances in physical aggression ($R^2 = .28$, $p < .001$) and

anxiety symptoms (R^2s = 08. to .14, $ps < .01$). Regression weights were examined to determine

the extent to which each exposure factor contributed to the variance in physical aggression and

anxiety after controlling for the other exposure factors and covariates. The three exposure factors

accounted for a total of 26% of the variance in physical aggression after controlling for the two

covariates. Witnessing Less Severe Violence and Victimization both accounted for unique

portions of the variance of physical aggression (βs = .27 and .30 respectively, ps < .001), but Witnessing Severe Violence did not (β = .03).

The three exposure factors accounted for a total of 12% of the variance in dysphoric mood, 6% of the variance in social evaluation, 11% of the variance in worry, and 14% of the variance in anxious arousal after controlling for the two covariates. Victimization accounted for unique portions of the variance of all four anxiety subscale scores (βs = .32 to .43, ps < .001). Witnessing Less Severe Violence did not account for unique portions of the variance on any subscales of anxiety (βs = .03 to .09). Witnessing Severe Violence accounted for a unique portion of the variance in social evaluations (β = -.22, p = .007) and worry (β = -.24, p = .009). These negative associations suggest that Witnessing Severe Violence acted as a suppressor variable because it was not correlated with social evaluation and worry in the correlation matrix. Witnessing Severe Violence did not account for unique portions of the variance in dysphoric mood or anxious arousal (β = -.15 and -.11 respectively).

There were significant gender differences such that girls reported lower frequencies of physical aggression (d = -.16, p = .04), and higher levels of social evaluation (d = .25, p = .002), and worry (d = .22, p = .01). Intervention status also had a small effect on physical aggression (d = .22, p = .006). Participants who were in classrooms that received the RIPP interventions reported higher frequencies of physical aggression than those with no exposure to the RIPP interventions. However, because this analysis did not control for baseline levels of aggression, differences in physical aggression and anxiety based on RIPP exposure could be due to baseline differences not accounted for in the current analysis.

Table 6

Partial Correlations, Means, and Standard Deviations Among Violence Exposure Factors and Physical Aggression and Anxiety with

Adolescent Gender and Intervention Exposure controlled for

	1	2	3	4	5	6	7	8
1. Witnessing Less Severe Violence	--							
2. Witnessing Severe Violence	.62***	--						
3. Victimization	.44***	.64***	--					
4. Physical Aggression[a]	.43***	.40***	.45***	--				
5. Dysphoric Mood[a]	.17***	.16**	.34***	.20***	--			
6. Social Evaluation[a]	.05	.01	.20***	-.06	.51***	--		
7. Worry[a]	.13**	.08	.30***	.07	.60***	.66***	--	
8. Anxious Arousal[a]	.15***	.18***	.37***	.14**	.58***	.49***	.64***	--
Mean	.00	.00	.00	15.33	2.36	2.10	2.61	1.65
SD	1.00	1.00	1.00	7.90	1.81	1.85	2.18	1.66

Note: $N = 675$. SD = Standard deviation. Means were set to zero and standard deviations to 1.00 for the three violence exposure

factors. [a]Partial correlations between physical aggression, anxiety, and factors reported. Partial correlations were calculated by

regressing physical aggression and anxiety on gender and intervention status and then correlating the residuals with exposure factors.

p < .05, **p* < .01, ***p* < .001.

Table 7

Differences Between Exposure Factors in their Partial Correlations with Physical Aggression and Anxiety Controlling for Gender and Intervention Exposure

	Victimization v Wit Less	Victimization v Wit Severe	Wit Less v Wit Severe
Physical Aggression	.02	.05	.04
Dysphoric Mood	.17**	.18***	.01
Social Evaluation	.15**	.19***	.04
Worry	.17**	.22***	.05
Anxious Arousal	.22***	.19***	-.03

Note: $N = 675$. Wit Less = Witnessing Less Severe Violence, Wit Severe = Witnessing Severe Violence. Differences in associations calculated by taking the difference in partial correlations between exposure factors. Pairwise comparisons were conducted to test for significant differences.

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 8

Standardized Regression Coefficients (Standard Errors) for Relations Between Community Violence Exposure Factors, Physical

*Aggression, Symptoms of Anxiety, and Covariates*

Predictor	Aggression and Anxiety Variables				
	Physical Aggression	Dysphoric Mood	Social Evaluation	Worry	Anxious Arousal
Female gender	-.08 (.04)*	.00 (.04)	.13 (.04)**	.11 (.04)**	.02 (.04)
Intervention condition	.10 (.04)**	.04 (.04)	.04 (.04)	.02 (.04)	.00 (.04)
R^2 from covariates	.02 (.01)	.00 (.00)	.02 (.01)	.01 (.01)	.00 (.00)
Witnessing Less Severe Violence factor	.27 (.05)***	.09 (.06)	.04 (.07)	.09 (.06)	.03 (.06)
Witnessing Severe Violence factor	.03 (.07)	-.15 (.09)	-.22 (.08)**	-.24 (.09)**	-.11 (.09)
Victimization factor	.30 (.06)***	.39 (.07)***	.32 (.07)***	.41 (.08)***	.43 (.07)***
ΔR^2	.26***	.12***	.06*	.11**	.14***
R^2 total	.28 (.03)***	.13 (.03)***	.08 (.03)**	.13 (.04)**	.14 (.03)***

Note: $N = 675$. ΔR^2 = variance accounted for by the three exposure factors above and beyond the variance accounted for by the

covariates (i.e., R^2 total - R^2 from covariates)

*p < .05, **p < .01, ***p < .001.

Figure 5

Structural Equation Model of the Effects of the Factors on Adolescent Aggression and Anxiety Symptoms
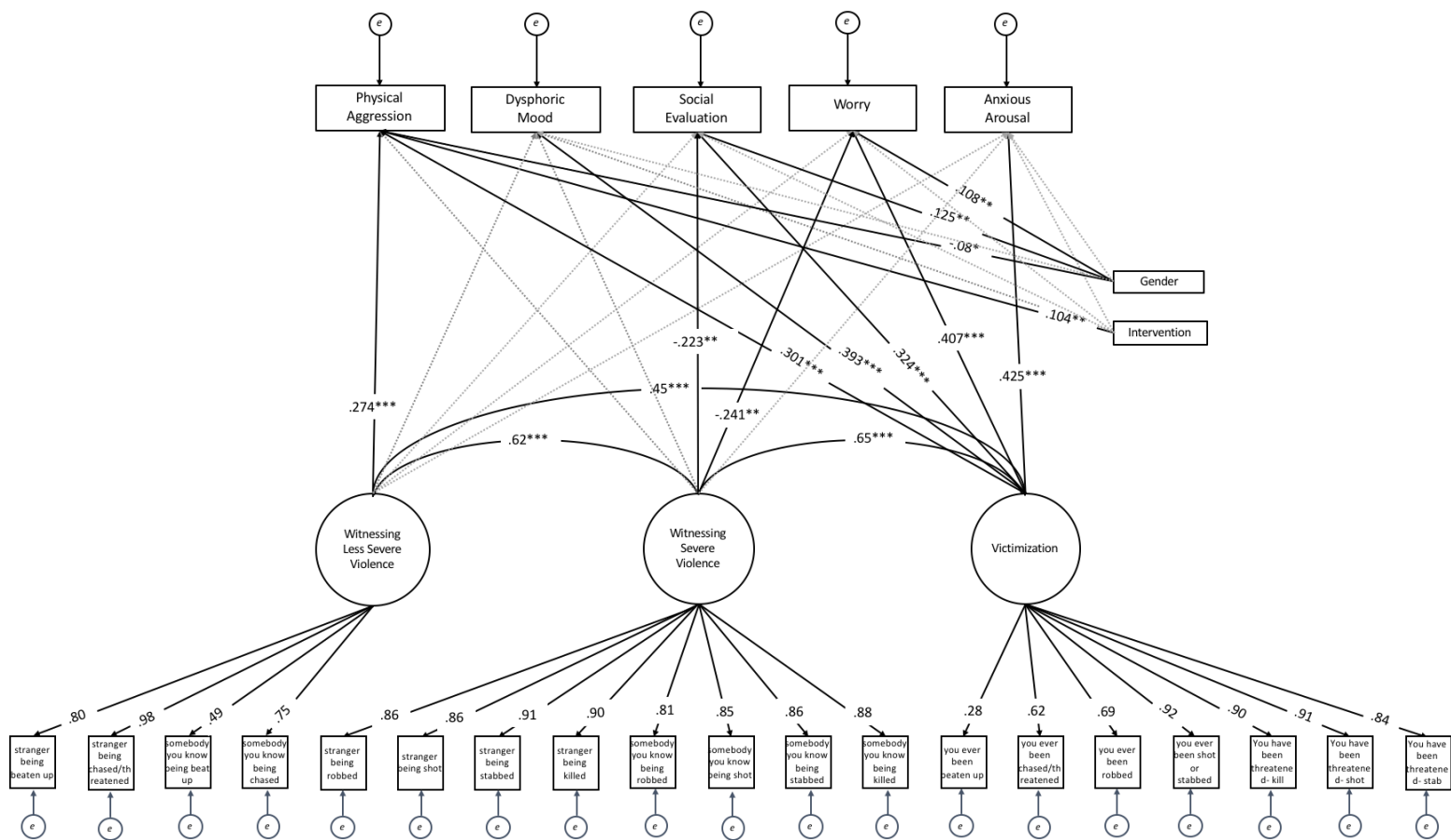
Note: N = 675. Significant associations are shown in black with beta weights; non-significant beta-weights are shown in light grey.

Correlations between outcomes not shown.

p < .05, **p* < .01, ***p* < .001.

LCA Model Subgroup Differences in Adolescent Aggression and Anxiety

The 3-Step BCH approach was used to compare physical aggression and symptoms of anxiety across subgroups identified in the 5-Class LCA model while controlling for gender and intervention status. A Wald test was used to compare mean subgroup differences in physical aggression and anxiety symptoms, using the Low Violence Exposure subgroup as a reference group. Follow-up pairwise comparisons between the subgroups in their reports of physical aggression and anxiety symptoms were conducted using the model constraint command in Mplus. The mean frequencies of physical aggression and symptoms of anxiety for each subgroup are reported in Table 9. Standardized means frequencies of physical aggression and symptoms of anxiety for each subgroup are displayed in Figure 6. Wald tests revealed significant subgroup differences on all measures of aggression and anxiety. Effect size estimates (d-coefficients) for pairwise comparisons of each subgroup are reported in Table 10.

I hypothesized that the High Violence Exposure subgroup would have the highest mean frequency of physical aggression, the Mixed Victimization subgroup would have the second highest mean frequency, the Witnessed Less Severe Violence and Witnessed Mixed Severity would have the third highest mean frequencies and be similar to each other, and the Low Violence Exposure subgroup would have the lowest frequency of physical aggression. Partial support for this hypothesis was found (see Figure 6). The High Violence Exposure subgroup reported a higher frequency of physical aggression than all subgroups (ds = .50 to 1.29, ps < .01) with the exception of the Mixed Victimization subgroup. The Mixed Victimization subgroup reported a higher frequency of physical aggression compared with the Witnessed Less Severe Violence and Low Violence Exposure subgroups (ds = .77 and 1.09 respectively, ps < .001), but reported similar frequencies of physical aggression compared with the Witnessed Mixed Severity

subgroup. In contrast to my hypothesis, the Witnessed Mixed Severity subgroup reported higher

frequencies of physical aggression compared with the Witnessed Less Severe Violence subgroup

($d = .47$, $p < .01$). Finally, consistent with my hypothesis, all subgroups reported higher

frequencies of physical aggression than the Low Violence Exposure subgroup (ds = .32 to 1.29,

ps < .01).

      In regard to anxiety, I hypothesized that the High Violence Exposure subgroup would

report the highest levels of anxiety, the Mixed Victimization subgroup would report the second

highest levels of anxiety, the Witnessed Mixed Severity subgroup would report the third highest

levels of anxiety, the Witnessed Less Severe Violence subgroup would report the fourth highest

levels of anxiety, and the Low Violence Exposure subgroup would report the lowest levels of

anxiety. Partial support was found for hypothesized differences in anxiety symptoms between the

subgroups. Contrary to my hypothesis, the High Violence Exposure subgroup did not report the

highest levels of anxiety as there were no differences in reported symptoms of anxiety between

the Mixed Victimization and High Violence Exposure subgroups. However, the High Violence

Exposure subgroup did report higher levels of anxiety on all subscales compared with the

Witnessed Mixed Severity and Low Violence Exposure subgroups (ds = .32 to .94, ps < .05), and

higher levels of dysphoric mood, worry, and anxious arousal compared with the Witnessed Less

Severe Violence subgroup (ds = .44 to .80, ps < .01). Consistent with my hypothesis, the Mixed

Victimization subgroup reported higher levels of anxiety on all subscales than the Witnessed

Mixed Severity, Witness Less Severe Violence, and Low Violence Exposure subgroups (ds = .58

to .85, ps < .001). In contrast to my hypothesis, the Witnessed Mixed Severity, Witnessed Less

Severe Violence, and Low Violence Exposure subgroups did not differ from each other in their

reported levels of anxiety on any of the subscales.

Table 9

Adjusted Means (Standard Error) of Physical Aggression and Symptoms of Anxiety Across the Five Classes

	Low Violence Exposure (32.2%)	Witnessed Less Severe Violence (27.2%)	Witnessed Mixed Severity (16.1%)	Mixed Victimization (12.1%)	High Violence Exposure (12.4%)
Physical aggression	11.39 (0.41)	13.82 (0.55)	17.60 (0.93)	19.94 (1.01)	21.50 (1.07)
Dysphoric mood	1.93 (0.13)	1.98 (0.15)	2.36 (0.20)	3.51 (0.23)	3.06 (0.22)
Social evaluation	1.93 (0.14)	1.95 (0.16)	1.78 (0.18)	2.98 (0.22)	2.36 (0.24)
Worry	2.15 (0.16)	2.45 (0.19)	2.33 (0.24)	3.83 (0.28)	3.22 (0.25)
Anxious arousal	1.20 (0.11)	1.43 (0.13)	1.47 (0.16)	2.48 (0.23)	2.72 (0.22)

Note: $N = 670$. Means were adjusted for covariate effects.

Figure 6

Standardized Means of Physical Aggression and Symptoms of Anxiety for the Five Subgroups with Confidence Intervals.
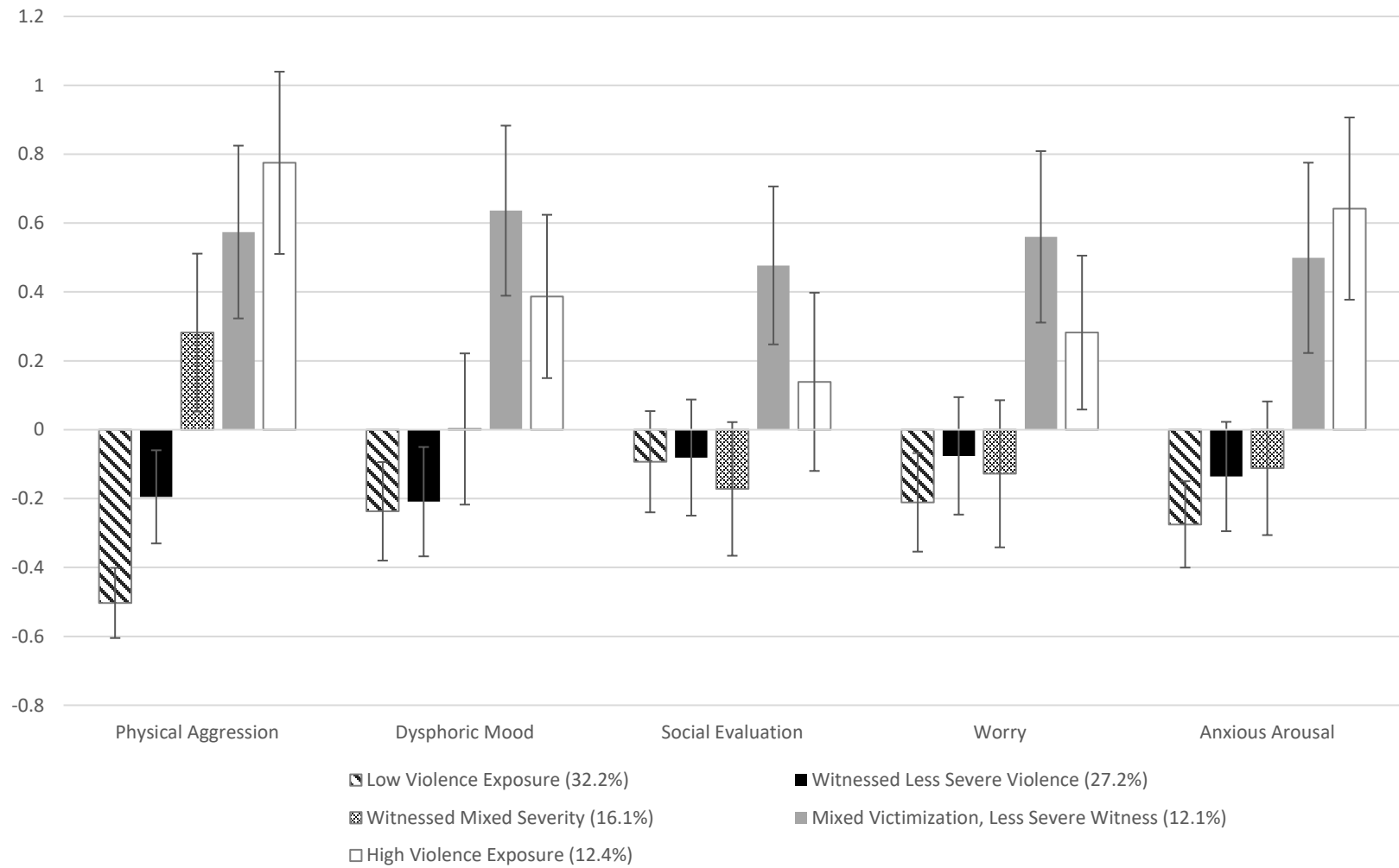
Table 10

Effect size estimates (d-coefficients) for pairwise comparisons of each subgroup (class)

	WLV v LV	WMS v LV	MV v LV	HV v LV	WMS v WLV	MV v WLV	MV v WMS	HV v WLV	HV v WMS	HV v MV
Physical aggression	0.32**	0.79***	1.09***	1.29***	0.47**	0.77***	0.30	0.97***	0.50**	0.20
Dysphoric mood	0.04	0.25	0.85***	0.65***	0.21	0.81***	0.60***	0.61***	0.40*	-0.20
Social evaluation	0.02	-0.03	0.58***	0.32*	-0.05	0.56***	0.61***	0.31	0.35*	-0.26
Worry	0.14	0.15	0.75***	0.58***	0.01	0.61***	0.60***	0.44**	0.43**	-0.18
Anxious arousal	0.12	0.15	0.75***	0.92***	0.02	0.63***	0.61***	0.80***	0.77***	0.17

Note: N = 670. LV = Low Violence Exposure, WLV = Witnessed Less Severe Violence, WMS = Witnessed Mixed Severity, MV =

Mixed Victimization; HV = High Violence Exposure.

*p < .05, **p < .01, ***p < .001.

Discussion

Although some previous studies have suggested that characteristics of community violence exposure, such as type, severity, and level of familiarity with the victim, might differ in their associations with adolescents' aggression and anxiety symptoms, few studies have addressed this question. The extent to which characteristics of exposure differ in their associations with symptoms is crucial to our conceptualization of community violence exposure, and can inform how we measure it. Further, few studies have investigated the extent to which subgroups with different patterns of exposure differ in their aggression and anxiety symptoms. The purpose of this study was to address limitations of prior studies by using both dimensional and person-centered approaches. To test the dimensional approach, models of community violence exposure that corresponded to competing theories of exposure were compared, and models that fit the data well were further explored to determine their associations with physical aggression and anxiety symptoms. To test the person-centered approach, LCA was used to identify subgroups of adolescents who differed in their patters of lifetime community violence exposure. Differences in means of physical aggression and anxiety symptoms were compared between the identified subgroups. Analyses were conducted using data from an urban, predominately African American sample of early adolescents, a population that has an increased risk for exposure to violence and associated negative consequences.

Dimensional Approach

The first aim of this study was to determine which dimensions of community violence exposure are relevant for developing a comprehensive conceptual model of exposure. Using confirmatory factor analysis, I investigated competing models based on theories that defined factors based on type of exposure, level of severity of exposure, and degree of familiarity with

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the victim of violence. None of these hypothesized models fit the data well. However, an exploratory factor analysis suggested that adolescents' reports on items of exposure were best represented by weakly to moderately correlated factors that represented a hybrid of the hypothesized models. These factors differentiated among witnessing less severe violence against stranger and known person, witnessing severe violence against a stranger and known person, and victimization. A confirmatory factor analysis demonstrated that this factor structure fit the data well.

This structure of community violence exposure was consistent with prior studies that have demonstrated that witnessing community violence and being directly victimized by community violence represent distinct constructs. Studies by Martin and colleagues (2013) and Brennan and colleagues (2007) identified distinct factors for witnessing violence and victimization by violence. However, both studies also identified separate factors for other dimensions of exposure that were not assessed in the present study and do not represent exposure to community violence (e.g., feelings of unsafety and learning about violence). Unlike studies by Martin and colleagues (2013) and Brennan and colleagues (2007), the current study found support for distinct factors that differentiate between witnessing violence of different levels of severity. This finding is consistent with a study by Hastings and Kelly (1997) that found support for separate constructs representing the severity of violent incidents. However, in contrast to the results of the present study, Hastings and Kelly's results indicated that witnessed severe acts of violence fell under the same construct as severe acts of victimization. Differences in results between the present study and previous studies could be due to differences in acts of violence reflected in the items and scales, or the amount of time assessed by the measure of exposure (e.g., past-year exposure compared to lifetime exposure). For example, Hastings and Kelly

(1997) included items such as *I have seen the police arrest someone* and *Someone has pulled a gun on me*, which were not among the items of the current study. Additionally, the measure of exposure used by Hastings and Kelly (1997) assessed violence exposure experienced within the past year, whereas the present study assessed lifetime exposure. Perhaps the three-factor conceptualization of community violence exposure identified by the present study better represents lifetime exposure to violence whereas a different conceptualization might better represent exposure within the past year alone.

Surprisingly, the level of familiarity with the victim of violence did not emerge as a characteristic of exposure relevant for conceptualizing community violence. This finding is inconsistent with previous studies such as Lambert and colleagues (2012) that found that associations between witnessing violence and anxiety, depression, and aggression differed based on the adolescents' level of familiarity with the victim of violence. Although they also used the CREV to measure witnessing violence, they did not conduct a factor analysis on the measure, so it is possible that witnessing violence against victims with varying levels of familiar to the adolescent do not correspond to distinct latent constructs. The findings in the current study suggests that type of exposure (i.e., witnessing versus victimization) and severity of exposure are more salient characteristics in conceptualizing exposure.

Investigating associations with physical aggression and anxiety provided further insight into the utility of the dimensions of exposure identified in this study. Results of a structural equation model indicated that all three factors were significantly correlated with physical aggression, and that their correlations did not significantly differ. However, victimization and witnessing less severe violence were the only factors with unique contributions to the variance of physical aggression. This could be due to the high correlation between witnessing severe

violence and victimization. Significant associations between victimization and physical

aggression are consistent with prior studies (e.g., Fowler et al., 2009) and provides support for a

conceptualization of traumatic stress that include externalizing symptoms such as physical

aggression. Associations between witnessing less severe violence and physical aggression could

be indicative of social information processing/social learning theories. Adolescents who witness

less severe acts of violence might develop beliefs that normalize the use of violence and

aggression, and might view violence as a means of achieving their goals.

Victimization had the strongest associations with all four anxiety scales, which is

consistent with Fowler and colleagues (2009) who found the effects of victimization on

internalizing symptoms were larger than the effects of witnessing on internalizing symptoms.

Associations between victimization and anxiety are consistent with traumatic stress theories and

the proximity model of exposure (Duckworth et al., 2000). The findings regarding associations

between witnessing community violence and anxiety were more difficult to interpret. Although

witnessing less severe violence was correlated with three of the four anxiety subscales, it was not

uniquely associated with any of the anxiety symptoms. Witnessing severe violence demonstrated

a surprising association with anxiety symptoms. It appeared to act as a suppressor variable in its

associations with social evaluation and worry because it was not correlated with the two

measures of anxiety, but demonstrated significant negative associations with them in the overall

model with victimization and witnessing less severe violence. It is possible that when

victimization is controlled for, witnessing severe violence has an inverse association with anxiety

symptoms. Findings of positive correlations between the two witnessing factors and anxiety

symptoms are consistent with the findings of Fowler and colleagues (2009) who also found

positive associations between witnessing violence and internalizing symptoms.

Overall, results from the dimensional model provide support for a conceptualization of community violence exposure that distinguishes between witnessing violence and victimization by violence. Victimization was the only exposure construct uniquely positively associated with anxiety symptoms, even though all exposure factors were correlated with anxiety. In contrast, all exposure factors were significantly correlated with physical aggression. Physical aggression following victimization by community violence might develop through different processes compared to physical aggression following witnessing violence (e.g., traumatic stress responses vs. social information processing). However, results from the present study provide only partial support for a conceptualization of community violence exposure that differentiates between severity of witnessed acts of violence. Witnessing severe and less severe violence did not differ in their associations with physical aggression or anxiety. More research is needed to determine whether different severities represent distinct constructs of witnessed community violence.

Person-Centered Approach

The second aim of the present study was to use an approach different from that of a dimensional approach to identify subgroups of adolescents who differed in their exposure to community violence. Results from LCA indicated that there was heterogeneity in adolescents' patterns of experiences of community violence that could be modeled by five subgroups: Low Violence Exposure, Witnessed Less Severe Violence, Witnessed Mixed Severity, Mixed Victimization, and High Violence Exposure. The subgroups differed in their patterns of exposure and in their agreement in reports of community violence exposure. The present study identified more subgroups than the few previous studies that have conducted person-centered analysis. For example, Gaylord-Harden and colleagues (2016) identified three subgroups using latent class analysis: victimization, low exposure, and high exposure. Differences in the number of

subgroups identified could be due to a larger sample size in the present study ($N = 670$ compared to $N = 241$ in Gaylord-Harden et al., 2016), or more or different items included in the present study (19 compared to 10 in Gaylord-Harden et al., 2016), which could allow for more variation in patterns.

Comparison of mean differences in physical aggression and anxiety revealed subgroup differences in measures of aggression and anxiety. As expected, the Low Violence Exposure subgroup had the lowest levels of physical aggression out of all the subgroups. This finding suggests exposure to community violence, regardless of the type of exposure, is positively associated with physical aggression, and is consistent with numerous prior studies (e.g., Fowler et al., 2009). The two subgroups that reported experiencing witnessing violence, but not victimization (Witnessed Less Severe Violence and Witnessed Mixed Severity) differed in their frequencies of physical aggression, but not anxiety. The Witnessed Mixed Severity subgroup was consistent in endorsing more witnessed violence items and was more inconsistent in endorsing the remainder of the witnessed violence items compared to the Witnessed Less Severe Violence subgroup, which could explain the higher levels of physical aggression reported by the Witnessed Mixed Severity subgroup. However, the two witnessing violence subgroups were similar to the Low Violence Exposure subgroup in their reported levels of anxiety symptoms. This finding is consistent with social information processing theories (as opposed to traumatic stress theories; Crick & Dodge, 1994), suggesting that more experiences of witnessing violence could normalize the use of violence and promote physically aggressive behavior.

Subgroup comparisons also revealed that the two subgroups reporting victimization (Mixed Victimization and High Violence Exposure) did not differ from each other on measures of physical aggression and anxiety, but reported higher levels on both measures than the other

subgroups, with the exception of levels of social evaluation between the High Violence Exposure and Witness Less Severe Violence subgroups. This result was surprising because the High Violence Exposure subgroup, compared to the Mixed Violence subgroup, consistently reported more experiences of violence. Further, adolescents in the Mixed Violence subgroup were similar in their reports of witnessing violence to the Witnessed Less Severe Violence subgroup. Taken together, these findings suggest that victimization by community violence, compared to witnessing community violence, might have unique associations with physical aggression and anxiety. These results are partially consistent with results from Fowler and colleagues (2009) who found that victimization, compared with witnessing community violence, had stronger associations with internalizing symptoms. The results of the present study also differ from those of Gaylord-Harden and colleagues (2016) who did not find differences in anxiety symptoms between their identified subgroups with different patterns of exposure.

Overall, results of the person-centered analysis suggest that, although five subgroups of adolescents who differed in their patterns of community violence exposure were identified, not all five subgroups are necessary in determining whether subgroups of adolescents who differ in their experiences of community violence differ in their symptoms of aggression and anxiety. Distinguishing between three subgroups of adolescents, those without exposure, those with exposure only through witnessing, and those with victimization, might be sufficient. These person-centered results suggests that adolescents with little to no violence exposure will likely have low levels of aggression and anxiety, adolescents with exposure only through witnessing will likely have higher levels of physical aggression compared to those with no exposure, and those who have been victimized will likely have higher levels of physical aggression and anxiety compared to their peers with no experiences of victimization. However, it is also possible that all

five subgroups differ on variables not measured in the present study (e.g., substance use, measures of delinquency, traumatic stress), which would warrant the distinction between five subgroups.

Comparison of the two approaches

The final aim of the present study was to compare dimensional and person-centered models of violence exposure based on the information they provide, theoretical fit, and use in identifying associations between violence exposure and aggression and anxiety symptoms. Results from both the dimensional and person-centered approaches were similar in some respects. Both approaches suggested that witnessing violence and victimization are both associated with physical aggression. These results are consistent with those of Fowler et al. (2009) and suggest that both witnessing community violence and victimization by community violence puts adolescents at risk of developing problem behaviors such as physical aggression. Results from both models also suggested that direct victimization, compared with other forms of exposure, has a stronger association with anxiety symptoms. Associations between victimization and anxiety were consistent with proximal models of violence exposure and traumatic stress theories that suggest that victimization might result in traumatic stress, and, compared to witnessing violence, have a stronger association with symptoms.

Both approaches suggest that witnessing community violence is associated with physical aggression, but not uniquely associated with anxiety to the same extent as victimization. These results are consistent with the pathological adaptation theory, and are similar to those of Gaylord-Harden, So, Bai, Henry, and Tolan (2017), and Gaylord-Harden, So, Bai, and Tolan (2017), who demonstrated that most adolescents who had experiences of witnessing violence and low levels of internalizing symptoms had increasing levels of violent behavior over time. The

cross-sectional design of the present study does not provide a strong basis for testing desensitization. A study would need to assess chronic exposure and changes in symptoms over time to adequately assess desensitization. Longitudinal studies investigating the effects of chronically witnessing community violence are needed to determine if it results in desensitization. Findings from both approaches could indicate that different mechanisms underly the associations between witnessing violence and physical aggression (i.e., social information processing) compared with the association between victimization and aggression (i.e., traumatic stress). Differences in underlying mechanisms could indicate that subgroups of adolescents could benefit from interventions that target different underlying mechanisms depending on whether they have been a victim of community violence or exclusively a witness.

The dimensional and person-centered approaches did differ in respects to some of their conclusions. Lanza and Rhoades (2013) describe potential advantages of person-centered analyses over traditional dimensional approaches, including the ability to identify subgroups of adolescents who differ on unobservable characteristics, and the ability to investigate higher-order interactions that would be more difficult in traditional subgroup analyses based on dimensional approaches. Moreover, person-centered analyses can help identify these higher-order interactions that might not be examined in dimensional approaches by modeling subgroup patterns on variables of interest (i.e., indicators). Both of these advantages were evident in the present study.

The person-centered approach identified five latent subgroups of adolescents with distinct patterns of community violence exposure. These patterns reflected differences in adolescents' responses to measures of community violence exposure. Patterns emerged that generally reflected differences on the same constructs of exposure identified by the dimensional approach (i.e., witnessing less severe violence, witnessing severe violence, victimization). However, these

subgroups would have been difficult to identify with traditional subgroup analyses used in dimensional approaches (e.g., conducting a median split of the sample on constructs of exposure, grouping into high and low exposure). Using a dimensional approach, all possible subgroups with all possible patterns of constructs (i.e., combinations of levels of exposure) would be examined (Lanza & Rhoades, 2013). However, not all possible patterns of variables might be present in a population or represent meaningful differences in subgroups of adolescents. In the present study, LCA indicated that five subgroups were the optimal number of subgroups for this sample, which is fewer than the total number of possible combinations of patterns on the three factors identified by the dimensional approach. For example, in the present LCA analysis, no subgroups were identified that were high in victimization and low on indicators of witnessing violence, which indicates that this pattern is not prevalent in this population.

Similar to the previous point, LCA makes it easier to examine higher-order interactions compared with dimensional approaches (Lanza & Rhoades, 2013). This was evident in the present study by the identification of two subgroups of adolescents who reported similar patterns of witnessing less severe violence (and not witnessing severe violence) but different patterns of victimization (*Witnessed Less Severe Violence* and *Mixed Victimization, Less Severe Witnessed*). Identification of these two subgroups demonstrated an interaction between witnessing less severe violence and victimization such that some adolescents who reported experiences of witnessing less severe violence were more likely to also report experiences of victimization, while other did not report victimization. Further, these two subgroups differed in their reported frequency of physical aggression and symptoms of anxiety which suggests that Witnessing Less Severe Violence x Victimization interaction is salient when investigating differences in associations between community violence exposure and outcomes. In contrast, this interaction would not

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have been identified in the dimensional approach unless it was suspected prior to data analysis and tested for. However, some theories of community violence exposure and more broader models of risk (e.g., cumulative stress models; Foster & Brooks-Gunn, 2009) might argue that this finding reflects an accumulation of violence exposure and stressful life experiences rather than an interaction of experiences.

One difference in the person-centered approach results, compared to those of the dimensional approach, was the lack of finding of the suppressor effect of witnessing severe violence. Of the subgroups identified, only two included adolescents who were likely to report witnessing severe acts of violence. One of these subgroups reported high frequencies of exposure on almost all items of exposure, and they reported relatively high levels of anxiety symptoms. However, the other group that was likely to report experiences of witnessing severe violence (Witnessed Mixed Severity) but not victimization reported levels of anxiety symptoms similar to those reported by the subgroup that had only witnessed less severe violence. These results suggest that witnessing severe violence does not have a strong association with anxiety symptoms, but does not suggest the presence of a suppressor effect. Perhaps the suppressor effect demonstrated by the dimensional approach does not reflect any patterns between variables that exist in this sample of adolescents, which would explain why it was not found in the LCA.

The two approaches provided information regarding other characteristics of community violence exposure. The dimensional model suggested that witnessing severe violence and witnessing less severe violence represent distinct constructs as reflected by their differences in unique associations with physical aggression. In contrast, the results from the person-centered approach did not provide much support for distinguishing between experiences of witnessed community violence with differing levels of severity. One subgroup of adolescents was

identified that was more likely to report witnessing severe violence (Witnessed Mixed Severity) compared with the witnessing less severe violence subgroup, and these two subgroups differed in their reported frequency of physical aggression but not anxiety symptoms. However, it is possible that the Witnessed Mixed Severity subgroup's higher reported frequency of physical aggression is due to more experiences of witnessing community violence compared with the Witnessed Less Severe Violence subgroup. As previously discussed, these interaction in patterns would be difficult to examine using a dimensional approach if not previously hypothesized beforehand. Surprisingly, an adolescent's level of familiarity with a victim of violence did not emerge as a salient characteristic of exposure to violence in either approach.

Limitations

Although the present study addressed several gaps in the literature on community violence exposure, there are several limitations that need to be considered. First, this study relied on adolescent self-report, which might be biased or inaccurate. However, adolescents might be better informants than their parents or teachers on certain measures, particularly behavioral measures. Parents and teachers would not be likely to see adolescents engaging in behaviors outside of the home and school. Second, this study examined cross-sectional data, which precludes conclusions regarding the direction of relations between community violence exposure and youth anxiety and physical aggression. However, a cross sectional design was sufficient for the primary aim of this study, which was to analyze the structure of lifetime exposure to community violence. Third, because the sample of the present study was urban, low-income, predominately African American adolescents, the results of this study might not generalize to youth of other races, ethnicities, or context (i.e., rural or suburban contexts). Additionally, the data for this analysis were collected over 20 years ago, which could mean that the results are not

generalizable to youth currently growing up in urban, low-income neighborhoods. However, recent surveys on youth community violence exposure indicate that youth continue to experience the same acts of community violence as youth did 20 years ago, indicating that results from this study would still be generalizable to present-day youth. Another limitation resulted from having to collapse response categories on the measure of community violence exposure, particular for the LCA. Although this approach is consistent with some prior studies investigating community violence exposure, it fails to determine whether adolescents with different frequencies of exposure develop and display different symptoms of aggression and anxiety. Alpha levels for two of the subscales on the RCMAS were low (i.e., .64 and .65), which could indicate that those subscales are not reliably measuring dysphoric mood and anxious arousal. A final limitation of the current study is the inability to assess relations between community violence exposure and youth distress other than anxiety because the original study did not include measures of other symptoms in the surveys. Previous research suggests that community violence might have differential effects on different symptoms of distress (e.g., PTSD, depression, anxiety) yet the original study only included a measure of anxiety symptoms. Therefore, in the current study I was not able to determine if the final models of community violence exposure have relevant associations with other constructs of youth distress.

Conclusions

The findings of the present study addressed gaps in the literature regarding the extent to which different characteristics of community violence exposure are salient for the conceptualization of exposure, and the extent to which adolescents differ in their experiences of community violence. Findings have implications for both measurement of community violence exposure and intervention efforts. Results underscore the importance of distinguishing between

witnessing community violence and victimization by community violence in conceptual models and when investigating associations with symptoms of aggression and anxiety. The person-centered approach highlighted the utility of subgroup analyses in identifying higher-order interactions that would be more difficult to test and potentially missed by dimensional approaches to measuring community violence exposure. Further, identified subgroups of adolescents differed in their symptoms of aggression and anxiety, underscoring the need to distinguish between experiences and to consider higher-order interactions when assessing adolescents who are at risk for community violence exposure. Future studies should use person-centered approaches to identify subgroups of adolescents that differ in their patterns of exposure, and identify patterns of variables (i.e., interactions) that inform our conceptualization of community violence exposure. Further research is also needed to determine whether the severity of witnessed acts of community violence differentially impacts symptoms of aggression and anxiety.

Adolescents with different patterns of exposure might benefit from different interventions depending on whether they have histories of victimization by community violence. Adolescents who experience victimization, regardless of their histories of witnessing violence, would likely benefit from interventions that target both internalizing and externalizing symptoms. In contrast, adolescents who have witnessed community violence, but not been victimized by community violence, might benefit from interventions that target externalizing symptoms, and underlying mechanisms such as beliefs about aggression. Adolescents with patterns of higher-order interactions of variables might also benefit from tailored interventions, but more research is needed to determine which types of interventions. Future research should continue to investigate differences between witnessing community violence and victimization by violence in their

associations with aggression and anxiety. In particular, longitudinal studies focusing on subgroup differences are needed to understand how adolescent adjustment is impacted by different experience of community violence. Finally, person-centered analysis could be used to investigate patterns of community violence exposure and other risk factors (e.g., negative life events) and their associations with adolescent adjustment.

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Vita

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