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EFFECTS OF VIOLENT AND NONVIOLENT LIFE STRESSORS AMONG URBAN EARLY
ADOLESCENTS: TESTING COMPETING MODELS OF COMORBID DISTRESS AND
EXTERNALIZING SYMPTOMS

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Abstract

EFFECTS OF VIOLENT AND NONVIOLENT LIFE STRESSORS AMONG URBAN EARLY ADOLESCENTS: TESTING COMPETING MODELS OF COMORBID DISTRESS AND EXTERNALIZING SYMPTOMS

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2020

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Although posttraumatic stress disorder is arguably the most well known diagnosis related to trauma exposure, youth exposed to violent and nonviolent life stressors are commonly diagnosed with co-occurring difficulties. The strong association between stressful life events and the wide-ranging spectrum of psychopathology has led some to advocate for the reconceptualization of traumatic stress. In addition to an increased push for broadening the scope of trauma-related psychopathology, there has been a longstanding debate on whether these symptoms are best represented by using dimensional versus categorical approaches. Advocates of variable-centered approaches argue that traditional categorical classifications of psychopathology obscure important variance of symptom severity and arbitrarily use cut-off points to distinguish those with and without diagnoses. In contrast, advocates of person-centered approaches point to the heterogeneity and intra-individual variability of functioning after experiencing traumatic and stressful life events. Moreover, further understanding of the risk

factors associated with various dimensions or patterns of comorbid emotional and behavioral problems could inform future research and intervention efforts. The current study tested competing variable- and person-centered approaches and examined how stressful life events are associated with different patterns of distress and externalizing symptoms among a predominantly African American and Latinx sample of early adolescents (M age = 12.9, 51% female) living in neighborhoods with high rates of violence. The study was conducted through secondary analysis of data collected from 2,722 early adolescents from a project that evaluated the Olweus Bullying Prevention Program. Consistent with the risk and resilience model of developmental psychopathology and the cultural ecological model, violent and nonviolent life stressors were included as indicators of stressful life events. Distress and externalizing symptoms included re-experiencing of events, avoidance and emotional numbing, hyperarousal, physical aggression, delinquency, and substance use. Gender differences in these relations were also explored. Overall, the findings underscore the notion that African American and Latinx youth exposed to violent and nonviolent events can experience a range of distressing and externalizing symptoms. Results indicated that distress and externalizing symptoms were best represented as separate constructs yet were comorbid among subgroups of adolescents. Additionally, findings suggested that variable- and person-centered approaches provided important yet distinct information regarding the association between exposure to violent and nonviolent life stressors and distress and externalizing symptoms. Next steps should include the examination of protective factors that buffer the effects of violent and nonviolent life stressors on psychopathology, longitudinal analyses that examine moderators and mediators of these relations, as well as the development and examination of interventions aimed to reduce a range of symptoms post-trauma, including comorbid distress and externalizing symptoms.

Effects of Violent and Nonviolent Life Stressors Among Urban Early Adolescents:
Testing Competing Models of Comorbid Distress and Externalizing Symptoms

Exposure to traumatic and stressful life events is associated with a wide range of emotional, biological, and behavioral impairments (Ford, 2011). Adolescence is a particularly salient time to study the relations between stressful life events, particularly victimizing experiences, and emotional and behavioral development. Although some forms of victimization are more common among young children, prevalence rates of most types of victimization are highest among adolescents (Finkelhor, Turner, Shattuck, & Hamby, 2013). Results from a nationally representative survey indicated that almost half of all adolescents (43%) have witnessed violence, 40% have been physically assaulted, and over a quarter of all adolescents (29%) have been a victim of property crime (Finkelhor et al., 2013). Prevalence rates of exposure to violence are even higher among youth living in urban areas (Zimmerman & Messner, 2013). Sadly, homicide is the third leading cause of death among individuals between the ages of 10 and 24 (CDC, 2019).

According to the risk and resilience model of developmental psychopathology (Cicchetti & Rogosch, 2002; Compas & Andreotti, 2013), early adolescence is a particularly critical developmental period for environmental, biological, cognitive, and emotional changes that heighten adolescents' vulnerability to stress. The transition into middle school creates more autonomy and anonymity that put adolescents at increased risk for victimization and engagement in externalizing behaviors (Wigfield, Byrnes, & Eccles, 2006). Early adolescents also begin to develop the capacity for identity formation and understanding of how others view them, which can lead to lower self-esteem, anxiety, and depression (Arnett, 2014). Adolescence is also a time during which symptoms of later diagnosed psychiatric disorders begin to emerge (Copeland,

Shanahan, Costello, & Angold, 2009). A report in *The Lancet* ranked psychopathology as the number one cause of global disease among youth (Gore et al., 2011).

Published research has consistently found strong relations between adolescents' exposure to community violence and a range of internalizing and externalizing symptoms (for a meta-analysis, see Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009). Across 110 studies, Fowler and colleagues found exposure to community violence to have the largest effects on externalizing behaviors, such as delinquent, defiant, and aggressive behavior, and symptoms of posttraumatic stress disorder (PTSD), including hyperarousal, re-experiencing of traumatic events, emotional numbing, and avoidance. In contrast, the authors found a significant but much smaller effect of violence exposure on other types of internalizing symptoms, such as anxiety and depression. The authors surmised that these findings may reflect adolescents' adaptation to chronic exposure through emotional desensitization, which increases adolescents' risk for PTSD and externalizing symptoms but reduces the likelihood of other types of internalizing symptoms. Fowler et al. also hypothesized that emotional numbing and increased hyperarousal associated with PTSD may be particularly salient risk factors for externalizing symptoms. This hypothesis suggests that PTSD and externalizing symptoms may co-occur; however, Fowler and colleagues did not examine the association between these two outcomes.

Although PTSD is arguably the most well known diagnosis related to trauma exposure, traumatized youth are commonly diagnosed with co-occurring difficulties. Comorbidities may include separation anxiety, oppositional defiant disorder, phobic disorders, attention-deficit hyperactivity disorder, substance use, as well as borderline and antisocial personality disorders (for a review, see van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). The Adverse Childhood Experiences (ACE) Study (Anda et al., 2006) provided additional evidence of this

trend. Individuals reported on a range of adverse experiences, including emotional, physical, and sexual abuse, living with adults with substance abuse and other mental health illnesses, witnessing domestic violence, parental separation or divorce, and the incarceration of a household member. Results indicated that exposure to any type of ACE during childhood was significantly correlated with a variety of emotional and behavioral challenges. In addition, compared with individuals who did not endorse any ACEs, those who endorsed experiencing at least seven adverse events were almost three times more likely to struggle with comorbid conditions, including anxiety, depression, substance use, sleep disturbances, risky sexual behavior, and difficulty controlling anger (Anda et al., 2006). This suggests that there may be a more parsimonious structure to trauma-related psychopathology than current nosologies that categorize these emotional and behavioral challenges as separate and distinct disorders.

The strong association between stressful life events and the wide-ranging spectrum of psychopathology has led some to advocate for the reconceptualization of traumatic stress (D'Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012; van der Kolk et al., 2005). Indeed, some researchers of developmental psychopathology have advocated for a new trauma diagnosis for youth that better incorporates symptoms across numerous emotional and behavioral domains, known as developmental trauma disorder (Ford, 2011; van der Kolk et al., 2005). These advocates posit that high comorbidity rates, diagnostic instability, and lack of treatment specificity undermine the hypothesis that various syndromes represent distinct etiologies. Nevertheless, much of the research in the field continues to examine the effects of trauma separately (e.g., Darnell, Flaster, Hendricks, Kerbat, & Comtois, 2019; O'Donnell et al., 2017).

In addition to an increased push for broadening the scope of trauma-related psychopathology, there has been a longstanding debate on whether these symptoms are best

represented by using dimensional versus categorical approaches. Whereas variable-centered (i.e., dimensional) analyses enable us to observe how variables predict unique changes in one another, person-centered (i.e., categorical) approaches allow for the examination of how variables co-occur within individual members of a population. Advocates of dimensional approaches advocate for the use of continuous variables and confirmatory rather than exploratory, data-driven methods (Caspi et al., 2014). In contrast, advocates of categorical approaches assert that dimensional approaches do not adequately represent co-occurrence of symptoms across dimensions (e.g. Renner, Boel-Studt, & Whitney, 2018). Others have argued that both approaches can contribute to our understanding of human development and can be used to complement one another (Masyn, 2013; von Eye, Bogat, & Rhodes, 2006).

The examination of the effects of traumatic and stressful life events has largely relied on variable-centered approaches (e.g., regression analyses) to examine separate outcomes (e.g., PTSD versus aggression versus delinquency). Researchers have only recently started to identify underlying factor structures that aim to explain comorbidity of trauma-related symptoms across multiple domains (e.g., Liu, Mustanski, Dick, Bolland, & Kertes, 2017). Categorical and exploratory approaches have also begun to emerge that identify groups of adolescents by symptom profiles to determine the differential impact of various risk factors on profile membership (e.g., Renner et al., 2018). Importantly, few, if any, studies have directly compared variable- and person-centered models among adolescents to determine how each model differentially informs the trauma literature.

The following section provides background for a study designed to test competing variable- versus person-centered models of psychopathology to account for the relations between violent and nonviolent life stressors, trauma-related distress symptoms, and externalizing

symptoms among a predominantly African American and Latinx urban sample of early adolescents. It first discusses theories of traumatic stress, with an emphasis on frameworks that focus on early adolescents of color who live in under-resourced communities. Literature on the comorbid effects of exposure to violent and nonviolent life stressors is also reviewed.

Review of the Literature

Theories of Traumatic Stress

A developmental psychopathy conceptualization of youth development postulates that traumatic and stressful life events can trigger intense stress responses that overwhelm individuals' capacity to cope (e.g., De Bellis, 2001; Ford & Courtois, 2009; van der Kolk et al., 2005). A basic assumption of developmental traumatology research asserts that although there are a vast number of events that can cause overwhelming stress, there are finite ways that the brain and body can cope with those stressors (De Bellis, 2001). The body's stress response system directly influences brain functionality that diverts resources away from learning and emotion regulation and towards a survival coping style. An expanding body of biological and neuropsychological research suggests that childhood stressors cause long term changes in brain circuits through impairments in cortisol levels, the hippocampus, hypothalamus, the noradrenergic system, as well as through one's ability to generate new neurons (i.e., neurogenesis; for a review, see Anda et al., 2006). Moreover, increased activation of specific neurotransmitters and neuroendocrinological systems appear to mediate the relation between stressful life events and emotional dysregulation (Cicchetti & Toth, 1995). In other words, these biological changes in neural networks can lead to impairments in emotional and behavioral self-regulation, as well as in social interactions (Koenen, 2006). Childhood maltreatment, poor self-control, and emotional dysregulation have also been found to be particularly salient indicators of

comorbidity between internalizing and externalizing symptoms (Caspi et al., 2014). In summary, a survival orientation can result in biological, emotional, and behavioral changes that can have co-occurring and lasting effects on development (Ford, 2011).

Social-cognitive theories offer a complementary explanation for the association between trauma exposure and psychopathology. Exposure to stressful life events can change the way individuals view the world. When automatic processes are organized by stress responses, one's information processing abilities and subsequent reactions are centered around harm avoidance rather than openness to new experiences (Ford, 2005). For example, in a national survey (CDC, 2010), 5% of adolescents reported skipping school in the past 30 days because they felt unsafe at school or on the way to and from school. Youth who have experienced traumatic events tend to interpret neutral behavior as more hostile and aggressive than non-traumatized youth (Dodge & Schwartz, 1997). Self-esteem and self-image are also greatly affected among traumatized youth (Copeland et al., 2009; Kim & Cicchetti, 2003). Negative worldview changes, including hopelessness, loss of control, and decreased sense of safety, have been shown to mediate the relations between PTSD symptoms and a global measure of risky behavior among adolescents and young adults exposed to a mass shooting on a university campus (Blevins, Wusik, Sullivan, Jones, & Hughes, 2006).

Changes in information processing may be particularly salient among racial and ethnic minority groups. For example, African American youth are more likely to report holding a fatalistic view of life, which in turn, is associated with poorer school achievement and internalizing symptoms (Spann, Molock, Barsdale, Matlin, & Puri, 2006). Aspects of Hispanic and Latinx culture can also contribute to negative worldviews that increase symptoms of traumatic stress, including wishful thinking, self-blame (Pole, Best, Metzler, & Marmar, 2005), a

tendency to think events are determined by fate (Ruef, Litz, & Shlenger, 2000), and cognitive avoidance (Marshall, Schell, & Miles, 2009). Overall, changes in information processing provide one explanation for the cascading effects of stressful life events among adolescents, particularly adolescents of color.

Theoretical models that attempt to explain the relations between traumatic events and psychopathology are not mutually exclusive. For example, Schwartz and Proctor (2000) investigated changes in emotion regulation and social information processing after exposure to different forms of community violence and found support for both theories. More specifically, direct *victimization* was linked to emotion regulation difficulties but was not linked to changes in social-information processing (e.g., hostile attribution bias, efficacy of the use of aggression). In contrast, *witnessing* violence was significantly associated with problematic social-cognitive processes but was not linked to impairments in emotion regulation. In their overall model, violent victimization predicted increased frequencies of aggression through emotion dysregulation, whereas witnessing violence predicted increased frequencies of aggression through problematic social-cognitive processes. Together, these findings suggest that both forms of violence exposure are associated with aggression but through different mechanisms.

Traumatic Stress Among Urban Minority Youth

There are multiple theories that account for the unique but stressful experiences of urban, minority youth living in under-resourced communities. The stress process model (Foster & Brooks-Gunn, 2009; Pearlin, 1989) argues that the effects of stressful life events should be conceptualized within developmental and ecological frameworks. Ecological theorists (Bronfenbrenner, 1986) view human development as an interaction between biological, psychological, and environmental factors. Healthy development occurs when one is able to adapt

to the ever-changing demands of one's environment. However, traumatized youth encounter challenges in their ecosystem that can impede their development. Central tenets of the stress process model state that (a) exposure to traumatic and stressful life events are disproportionately experienced within impoverished neighborhoods, (b) stressors accumulate and increase risk for re-victimization, (c) effects of stress are pervasive and affect a broad range of outcomes, and (d) various coping mechanisms may buffer or increase the effects of stress (Foster & Brooks-Gunn, 2009). For example, compared to non-Hispanic White adolescents, non-Hispanic Black and Hispanic adolescents have been shown to experience greater polyvictimization, defined as the total number of different types of traumatic events experienced (Finkelhor, Shattuck, Turner, Ormrod, & Hamby, 2011), which has, in turn, been found to account for the higher rates of delinquency among Non-Hispanic Black and Hispanic adolescents compared to non-Hispanic White adolescents (López et al. 2016). Overall, the stress process model emphasizes the use of a more comprehensive approach to understanding the range of interconnected processes through which stressful life events can influence development among adolescents of color.

According to the cultural ecological model (Garcia Coll et al., 1996), it is vital that we consider the unique roles of social stratification as well as community and cultural factors when examining cognitive, emotional, and behavioral development among racial and ethnic minority youth residing in urban areas. Similarly, Carter (2007) proposed a race-based traumatic stress injury model that posits that trauma is experienced differently across racial and ethnic groups. For example, among a sample of incarcerated African American youth, over a third reported experiencing race-based violence, including property destruction, physical attacks, murder of family members, and anticipation that they may be killed due to their race (Kang & Burton, 2014). Neighborhood contexts can also play a significant role in stress. Martinez and Polo (2018)

found that the fit between Latinx adolescents' cultural values and neighborhood concentration of Latinx and immigrant individuals was associated with fewer externalizing symptoms. In addition, the mechanisms that explain the association between exposure to community violence and maladjustment appear to differ between European American and African American families (Fowler, Toro, Tompsett, & Baltes, 2009). For example, some research has shown that African American youth are more likely to display their distress through externalizing rather than internalizing symptoms (Grant et al., 2005). Relatedly, theoretical work suggests that African American youth may be particularly concerned that exhibiting internalizing symptoms will make them appear weak to others and worry that this will increase their risk of re-victimization (Cooley-Strickland et al., 2011).

Violent Versus Nonviolent Life Stressors

Although community violence, abuse, and neglect are often among the most researched stressors within the trauma field, these are just some of the most extreme forms on a continuous spectrum of stressful life events. The risk and resilience model of developmental psychopathology (Compas & Andreotti, 2013; Grant et al., 2003) asserts that environmental stressors apart from violence, including major life events, daily hassles, and chronic conditions, can produce biological, psychological, and social processing changes that increase adolescents' risk of psychopathology. Chronic stress can include "living in impoverished neighborhoods, living in dilapidated housing, frequently moving, experiencing food insecurity, experiencing racism, limited access to support and medical services, and living in homes with violence, mental health problems, substance abuse, and other instability" (CDC, 2019, p. 1). Neighborhood and family-level stressors may also include crowding, noise, messiness, fluidity and instability of residents, lack of predictability and routines, and unsupervised time (Brooks-Gunn, Johnson, &

Leventhal, 2010), all of which can accumulate over time (De Bellis, 2001). Indeed, over the past 20 years, research has increasingly underscored the negative effects of nonviolent, cumulative stressors and daily hassles on adolescent development (e.g., Allison et al., 1999; Brooks-Gunn et al., 2010; Grant et al., 2003). These unique effects have been found to be particularly strong among minority youth living in under-resourced, low-income communities (Liu, Bolland, Dick, Mustanski, & Kertes, 2016; Liu et al., 2017; Thompson, Coleman, O'Connor, Farrell, & Sullivan, 2019). It is therefore critical to consider nonviolent life stressors when examining the effects of a broad range of stressful life events, above and beyond violent and life-threatening experiences.

Comorbid Trauma-Related Internalizing and Externalizing Symptoms

Exposure to traumatic and cumulative stressors during childhood and adolescence is associated with a wide range of behavioral outcomes. A systemic review revealed that youth exposed to traumatic events were more likely to have cognitive and memory impairments, lower verbal abilities, shorter attention spans, poorer academic performance, behavior problems, traumatic stress symptoms, lower self-esteem, as well as increased grade retention, absences, and suspensions (Perfect, Turley, Carlson, Yohanna, & Saint Gilles, 2016). Furthermore, there is theoretical and empirical support to assert that these associations lead to developmental cascades of negative effects (for a review, see Masten et al. 2005). For example, among an African American sample of adolescents, externalizing symptoms mediated the effects of nonviolent life stressors, community violence, and racial discrimination on internalizing symptoms (Liu et al., 2016). Among a nationally representative sample of 43,093 adults, African Americans were more likely to have comorbid substance use and mood disorders than White adults (Huang et al., 2006). Although cross-sectional in nature, these findings underscore the diffuse impact of

stressful life events and the importance of examining the co-occurrence of symptoms that are often examined separately.

There is a substantial amount of evidence to conclude that there are high comorbidity rates between symptoms of PTSD and externalizing symptoms. A national survey of 5,000 adolescents and adults found that 88% of males and 79% of females with chronic PTSD met criteria for at least one other psychiatric disorder (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). PTSD has been purported as a possible mechanism to explain the relations between trauma exposure and attention problems (Husain, Allwood, Bell, 2008), substance use (Allwood, Esposito-Smythers, Swenson & Spirito, 2014), unprotected sex (Cavanaugh, 2013), conduct problems (Ford, 2002), and aggression (Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004). PTSD is also highly correlated with other internalizing symptoms (Kilpatrick et al., 2003). As such, there is an increasing push to re-conceptualize these aforementioned symptoms as possible effects of trauma rather than as separate difficulties. It is less clear, however, whether some of these effects co-occur in different ways among youth and whether exposure to different types of stressful experiences influences patterns of psychopathology.

Future work is needed to examine the relations between stressful life events (e.g., violent and nonviolent stressors) and comorbid psychopathology among early adolescents. Understanding the risk factors associated with various dimensions or patterns of comorbid emotional and behavioral problems could inform future research and intervention efforts. For example, adolescents with comorbid internalizing and externalizing symptoms are more likely to have serious impairment (Kessler & Wang, 2008). However, the majority of evaluations of trauma-informed interventions have focused exclusively on a reduction in trauma-related distress and internalizing symptoms (e.g., PTSD, anxiety, and depression; Jaycox, Langley, Stein,

Kataoka-Endo, & Wong, 2014; Rolfsnes & Idsoe, 2011). Given theoretical and empirical support to suggest that youth exposed to traumatic and stress life experiences are likely to exhibit a range of behaviors (e.g., Perfect et al., 2016), the investigation of the relations between stressful life events and comorbid distress and externalizing symptoms could inform screening efforts and intervention research.

Competing Models of Psychopathology

Recent efforts to identify latent constructs underlying internalizing and externalizing problems have produced several different conceptual models of psychopathology. Researchers of psychopathology have generally fallen into two separate camps of analyses: (a) variable-centered approaches that use confirmatory factor analyses and (b) person-centered approaches that use latent class and latent profile analyses. Lubke and Muthén (2005) argue that factor modeling, a variable-centered approach, is most appropriate for data from a single homogenous population in which participants are assumed to differ in severity with respect to the factor(s). In contrast, they argue that latent class/profile models, which are person-centered approaches, are most appropriate when the sample consists of multiple, unknown subsamples that differ either qualitatively (e.g., different subtypes of psychiatric disorders) or quantitatively (high versus low score subgroups). In essence, factor models group *items* whereas latent class/profile models group *participants*.

The transdiagnostic literature has informed the classification of comorbid psychopathology using variable-centered approaches. Transdiagnostic researchers have examined comorbidity by cutting across diagnostic boundaries using latent dimensions of multiple conditions. Advocates of this approach argue that traditional categorical classifications of psychopathology obscure important variance of symptom severity and arbitrarily use cut-off

points to distinguish those with and without diagnoses (e.g., Caspi et al., 2014; Eaton, Rodriguez-Seijas, Carragher, & Krueger, 2015). Variable-centered approaches are, thus, valuable in identifying underlying latent dimensions that exist on a continuum.

In contrast, advocates of person-centered approaches point to the heterogeneity and intra-individual variability of functioning after experiencing traumatic and stressful life events (Martinez-Torteya, Miller-Graff, Howell, & Figge, 2017). For example, some youth are able to successfully adapt after experiencing traumatizing and stressful circumstances, whereas for other youth, these events can have cascading negative effects over time (e.g., Masten et al., 2005). Moreover, adolescents who experience different stressful life events exhibit different patterns of externalizing symptoms, underscoring the use of analyses that examine intra-individual differences in risk during adolescence (Arbeit et al., 2014). Person-centered approaches may, therefore, be particularly salient when trying to ascertain whether various types of stressful life events are more strongly associated with different patterns of co-occurring behaviors. However, few, if any studies, have compared these competing models to ascertain their usefulness in explaining adolescents' adjustment.

Variable-Centered Approaches Capturing Comorbidity

Multiple studies using variable-centered approaches have provided evidence for a general underlying dimension of psychopathology among adolescents based on bifactor analyses (e.g., Caspi et al., 2014; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003; Laceulle, Vollebergh, & Ormel, 2015). Bifactor models capture variance of a particular item using both broad general and more narrow, domain-specific factors (for a review of bifactor analyses, see Reise, 2012). Among the aforementioned studies, when comorbidity between internalizing and externalizing factors was modeled using bifactor analyses, symptom loadings on the purely internalizing and

externalizing factors decreased substantially. This finding has been found to be robust across studies, and indicates that a significant portion of the variance across internalizing and externalizing problems is attributable to a shared comorbid factor. Understanding how environmental factors, such as exposure to traumatic and stressful life events, are related to transdiagnostic latent structures could inform future prevention efforts and help clarify why psychotherapeutic and pharmacological interventions often have diffuse impacts on adjustment (Eaton et al., 2015).

Although much of the transdiagnostic work has been conducted among samples of predominantly Caucasian youth, at least one study has examined the dimensional structure of co-occurring internalizing and externalizing problems among African American youth (Liu et al., 2017). Liu and colleagues argued that African American adolescents' expression of mental health symptoms is not well captured by common diagnostic criteria that categorize internalizing and externalizing symptoms into separate diagnoses. Consistent with past research and their hypotheses, Liu and colleagues found that a bifactor model fit best for their sample of adolescents. Their final model included a purely Internalizing factor (i.e., anxiety/depression and somatic complaints), a purely Externalizing factor (i.e., rule breaking and aggression), and a Comorbid factor, which simultaneously included anxiety/depression, rule breaking, and aggression. Interestingly, items representing depression and anxiety loaded higher on the Comorbid factor than on the Internalizing factor, suggesting that anxiety and depression may be particularly comorbid with externalizing symptoms among African American youth. This is consistent with prior research that found that African American youth were more likely to express depression as anger, aggression, and irritability (for a review, see Anderson & Mayes, 2010).

Liu and colleagues (2017) provided further elucidation regarding the impact of multiple types of stressors on internalizing and externalizing factors among African American youth. Their analyses revealed significant associations between comorbid internalizing and externalizing problems and stressful life events (e.g., a close relative or friend died, property was damaged due to a disaster) and racial discrimination. Whereas the separate Externalizing factor was also significantly correlated with exposure to violence and other stressful life events, the Internalizing factor was no longer associated with any of the risk factors after accounting for comorbid externalizing symptoms. This suggests that the impact of stressful life events on internalizing symptoms may be fully attributable to comorbid internalizing and externalizing symptoms among African American adolescents living in economically disadvantaged neighborhoods. The impact of stressful life events on psychopathology among African American youth may, therefore, be misinterpreted when comorbidity is not taken into account.

Given the strong association between stressful life events and PTSD (Fowler et al., 2009), examining how distress symptoms (e.g., avoidance, hyperarousal, re-experiencing of traumatic events) co-occur with externalizing symptoms could shed light on the re-conceptualization of trauma symptomatology more broadly. Researchers have theorized that trauma symptoms are representative of multiple mechanisms operating in concert (Ayer, Cisler et al., 2011). The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5*; American Psychiatric Association [APA], 2013) provides revised diagnostic criteria for the diagnosis of PTSD, including the addition of reckless behavior. Albeit a somewhat vague term, this addition suggests that some types of externalizing symptoms may in actuality be better conceptualized as part of trauma symptomatology rather than separate from, or an effect of, PTSD. A diagnosis of PTSD using *DSM-5* criteria includes four clusters of symptoms: intrusive re-experiencing of

trauma-related events, avoidance of trauma-related stimuli, negative alterations in mood or cognitions, and hyperarousal. Broadening the scope of traumatic stress symptomatology, particularly by including externalizing symptoms, could help shed light on the interconnectedness of the effects of stressful life experiences. However, there has been little to no work evaluating the latent structure of comorbid traumatic stress and various externalizing behaviors using confirmatory factor analyses.

Person-Centered Approaches Capturing Comorbidity

Researchers have increasingly called for further examination of the heterogeneity of PTSD symptoms using latent class and latent profile analyses (Ayer, Danielson et al., 2011; Guffanti et al., 2016). Among a diverse sample of adolescents exposed to at least one potentially traumatic event, Ayer, Danielson et al. (2011) found that a three-class model fit best. Each class was relatively stable across PTSD symptoms (i.e., low, moderate, and severe symptoms). On this basis, advocates of dimensional approaches would most likely argue that these profiles do not provide enough unique information to defend the use of categorical analyses. However, Ayer, Danielson, and colleagues noted that three symptoms of numbing (loss of interest, amnesia, and detachment) and two symptoms of hyperarousal (sleep difficulties and exaggerated startle response) were the strongest symptoms in distinguishing the severe class from the moderate and low symptom classes. This suggests that these symptoms may be particularly relevant in identifying youth at risk for severe psychopathology. Unfortunately, the authors did not investigate whether the PTSD classes were uniquely related to other indicators of maladjustment. For example, emotional numbing caused by desensitization after repeated exposure to violence has been linked to increased violent behavior (Mrug, Madan, & Windle, 2016). It is possible that

youth in the class with the highest levels of emotional numbing and hyperarousal could also be at greatest risk for comorbid externalizing symptoms.

Guffanti and colleagues (2016) found slightly more variation among PTSD symptoms within a wider age range of youth (ages 8 to 21) exposed to the World Trade Center terrorist attacks in New York. Similar to Ayer, Danielson et al. (2011), they found low and high PTSD classes, with relatively little variability across symptoms within each class. However, the best fitting model also included two intermediate classes with more variability, including (a) an avoidant class, which had high recurrent thoughts and moderate-to-high avoidant thoughts, and (b) a sleep problems class, which again had high recurrent thoughts, but also moderate-to-high sleep problems and nightmares. Similarly, four classes emerged among a sample of Chinese adolescents, which included both a high symptom and a low symptom class (Cao, Wang, Cao, Zhang, & Elhai, 2018). However, rather than avoidant and sleep classes, the authors found a re-experiencing/hyperarousal class and a dysphoria class, characterized by moderate-to-high probability of concentration problems and restricted affect (i.e., emotional numbing). This class is somewhat similar to Ayer, Danielson, and colleagues' severe PTSD class, underscoring the unique roles of hyperarousal and emotional numbing within PTSD symptomatology.

Whereas Ayer, Danielson et al. (2011) and Cao et al. (2018) did not investigate predictors of their PTSD classes, Guffanti and colleagues examined differences across classes as a function of age, gender, and exposure type (direct exposure, family exposure, or media exposure). However, they did not find any significant differences in patterns across these characteristics. As Cao and colleagues (2018) pointed out, disaster type and cultural differences may moderate PTSD symptomatology among youth. Examining group patterns of PTSD symptomatology among adolescents of color may be particularly relevant given prior research that found that

African American and Latinx adolescents expressed distress differently than White adolescents (Anderson & Mayes, 2010; Pole et al., 2005).

In addition to unique patterns of PTSD symptomatology, research is beginning to emerge regarding the co-variation of emotional and behavioral difficulties using person-centered approaches (Martinez-Torteya et al., 2017; Renner et al., 2018; Yates & Grey, 2012).

Unfortunately, there is little consistency in findings across studies. Each study included different domains, and profiles revealed somewhat different findings. Using a predominantly White sample (79%) of adolescents aged 12 to 17, Renner and colleagues (2018) examined latent profiles of comorbid anxiety, depression, anger, and delinquency. Four profiles fit the data best, revealing a low problems subgroup, an internalizing subgroup, an externalizing subgroup, and a comorbid subgroup. The authors then examined the association between the four profiles of psychopathology and various forms of victimization, (i.e., conventional crime, child maltreatment, peer and sibling victimization, sexual assault, and witnessing and indirect victimization). Adolescents with high levels on all four constructs (i.e., delinquency, anger, depression, and anxiety) were significantly more likely to have experienced peer/sibling victimization and to have witnessed victimization compared with adolescents in the internalizing profile. These particular findings have important implications for bullying prevention and intervention programs, as they highlight the high risk for a variety of comorbid symptoms after experiencing and witnessing peer victimization. Consistent with prior studies (Evans, Davies, & DiLillo, 2008), boys were more likely to be in the high externalizing subgroup compared to the high internalizing subgroup. No other differences in victimization forms or sex differences were found between the four profiles.

Although Renner and colleagues (2018) used a well-validated measure of traumatic stress (i.e., Trauma Symptom Checklist; Briere, 1996), they did not assess for the symptoms of avoidance, emotional numbing, or hyperarousal separately. Other studies have found differences in the association between traumatic stress and violent behavior to depend upon the type of traumatic stress examined. For example, Allwood and Bell (2008) found that increased frequencies in violent behavior were associated with re-experiencing symptoms for girls, but with hyperarousal symptoms for boys. In addition, as previously mentioned, prior work has found that the patterns of trauma symptoms vary across subgroups (Ayer, Danielson et al., 2011; Cao et al., 2018; Guffanti et al., 2016). It therefore remains unclear how distress and externalizing symptoms co-occur using person-centered approaches.

Using a diverse (50% African American) sample of 12-year olds who had at least one report of suspected maltreatment, Martinez-Torteya and colleagues (2017) examined latent profiles of adolescents' functioning across a range of prosocial and maladaptive competencies, including daily, social, and school activities, parent-child relationships, peer relations, and internalizing and externalizing problems. They found support for five patterns of emotional and behavioral development across self-, parent-, and teacher-reports: consistent maladaptation, consistent resilience, posttraumatic stress problems, school maladaptation/family protection, and low socialization skills. The largest group (school maladaptation/family protection) had relatively typical adaptive functioning, relatively high socialization scores, and good parent-child relationships, but very high levels of problems reported by teachers. The authors surmised that these youth may have particular difficulties in meeting the demands of school, such as sustaining one's attention, adhering to structured rules, and maintaining good peer interactions. This is consistent with past findings regarding the negative effects of traumatic exposure on school-

based outcomes (for a review, see Perfect et al., 2016). The second-to-largest group (low socialization) was characterized by parent-reported low socialization skills but had self- and teacher-reported socialization skills in the normal range. This could be due to caregiver characteristics that result in distorted reports (Youngstrom, Loeber, & Stouthamer-Loeber, 2000) or to maladaptive interactions between caregivers and youth. A smaller group (posttraumatic stress) included those with the highest posttraumatic stress symptoms and the highest frequencies of self-reported emotional and behavioral problems. This suggests that maltreated youth who experience high levels of posttraumatic stress symptoms may be at particularly high risk for developing co-occurring externalizing symptoms. These youth also had higher frequencies of polyvictimization. In contrast, Martinez-Torteya and colleagues found that those with resilient profiles had the lowest rates of polyvictimization. These results are consistent with research that has touted the wide-ranging and toxic effects of polyvictimization (e.g., Ford, Wasser, & Connor, 2011).

Although their findings highlight the comorbid relations between traumatic stress and externalizing problems among polyvictimized youth, Martinez-Torteya and colleagues' (2017) findings should be interpreted within the context of a few limitations. The authors used total scores for broad measures of internalizing and externalizing symptoms. They were, therefore, unable to differentiate between various symptoms, such as differences in symptoms of avoidance and intrusiveness, as well as differences in aggression, delinquency, and substance use. In addition, the authors included neighborhood quality (e.g., adults set good examples for children in this neighborhood) as one of the domains of functioning rather than as a predictor of adolescents' developmental patterns, which obscured the unique patterns of comorbid psychopathology.

Latent profile analysis (LPA) has also provided evidence regarding the association between childhood trauma and adjustment across multiple domains in adulthood. Yates and Grey (2012) sampled emancipated older adolescents and young adults who had previously had contact with the foster care system to determine differences in functioning across education, employment, community engagement, relational well-being, self-esteem, and depressive symptoms. Almost half of the individuals exhibited a resilient profile, with the highest levels of educational, occupational, community, and relational competencies, higher-than-average self-esteem, and below average depressive levels. The second largest group, which encompassed approximately a third of the sample, displayed internal resiliency, with high psychological competence despite behavioral difficulties, including the lowest levels of educational, occupational, and community engagement. A smaller subset of the youth (16%) was characterized as maladaptive, with low levels of educational, occupational, community engagement, problematic interpersonal relationships, low self-esteem, and high depressive symptoms. The remaining individuals (7%) were identified as externally resilient, because they did not report behavioral difficulties; however, they reported significant emotional difficulties as evidenced by the highest depressive symptoms and the lowest reports of self-esteem. Youth with maladaptive profiles were more likely to report aggression, delinquency, drug use, and peer criminality. This is consistent with past research that identified comorbidity across psychological domains as a significant risk factor for cascading effects (Arbeit et al., 2014). Yates and Grey did not find significant differences in age, gender, or ethnicity across the profiles.

Gender Differences in Early Adolescents' Psychopathology

Emotional and behavioral differences between boys and girls start to increase during the transition from childhood to adolescence (Arnett, 2014). Girls begin to strive for greater social

approval compared to boys (Rose & Rudolph, 2006) and are at higher risk for developing psychological distress (Alisic et al., 2014). Girls have also been shown to be more resistant to peer pressure than boys (Sumter, Bokhorst, Steinberg, & Westenberg, 2009), which may contribute to their reduced risk of engaging in externalizing behaviors (for a review, see Card, Stucky, Sawalani, & Little, 2008). Although boys tend to exhibit more externalizing behaviors than girls across most studies, these overall findings may be obscuring important differences across groups. For example, physical aggression and substance use have been shown to occur at similar rates for boys and girls across multiple samples of predominantly African American early adolescents (Bradshaw, Schaeffer, Petras, & Ialongo, 2010; Farrell, Gonyea, Sullivan, & Thompson, 2018). In contrast, African American boys have reported higher overall rates of delinquent behavior than African American girls (Farrell, Gonyea et al., 2018). Regarding comorbid symptoms, at least one study found evidence of a stronger relation between total PTSD symptoms and aggression among boys than among girls (Aebi et al., 2017). Gender differences may also be dependent upon the use of narrow or broad measures. As previously mentioned, girls' re-experiencing of traumatic events is associated with increased frequencies in violent behavior, whereas boys' hyperarousal symptoms are associated with increased frequencies in violent behaviors (Allwood & Bell, 2008). This suggests that the patterns of comorbid psychopathology may differ across African American boys and girls. However, past studies that have examined the underlying structure of comorbid psychopathology among adolescents have failed to test for measurement invariance across gender prior to examining gender differences across constructs.

Current Study

There is strong evidence to suggest a link between exposure to stressful life events and maladjustment. However, the evidence is less clear regarding the ways in which the effects of stressful life events co-occur. One reason for the lack of clarity is the tendency for researchers to focus on a single outcome of traumatic and stressful life events at a time (e.g., PTSD). The complex nature of childhood trauma and stressful life events can manifest in a variety of ways, and multiple approaches to classification of comorbid psychopathology are possible. Using a developmental trauma framework, comorbid emotional and behavioral difficulties are increasingly conceptualized as a reaction to traumatic stress rather than recognized as separate problems (Anda et al., 2006; Ford, 2002; Ford & Courtois, 2009). The co-occurrence of symptoms, including both emotional and behavioral difficulties, could play an important role in explaining the link between stressful life events and overall development. There are currently competing frameworks in the field of traumatic stress to explain how these symptoms are related.

The main goal of the current study was to test competing variable- and person-centered approaches to examine how violent (i.e., violent victimization and witnessing violence) and nonviolent life stressors (e.g., someone in your family was sick, live in a crowded house or apartment) are associated with different patterns of distress and externalizing symptoms among a predominantly African American and Latinx sample of early adolescents living in neighborhoods with high rates of violence. Gender differences in these relations were also explored. The dimensional and categorical models were compared to determine whether a dimensional or categorical approach is more appropriate for understanding how comorbid distress and externalizing symptoms fit within the larger framework of trauma-informed research. Consistent with the risk and resilience model of developmental psychopathology (Compas & Andreotti,

2013; Grant et al., 2003) and the cultural ecological model (Garcia Coll et al., 1996), violent and non-violent life stressors were included as indicators of stressful life events.

Overall, this study aimed to address several gaps in the literature. Variable-centered approaches have focused almost exclusively on anxiety and depression rather than on symptoms associated with PTSD. Moreover, the majority of researchers using person-centered approaches to examine symptoms of trauma-related distress did not also include externalizing symptoms in their analyses (Ayer, Danielson et al., 2011; Cao et al., 2018; Guffanti et al., 2016), or they focused on only one type of behavior (e.g., delinquency; Renner et al., 2018). The current study examined unique indicators of trauma-related distress (i.e., avoidance/numbing, re-experiencing of events, and hyperarousal) and externalizing symptoms (i.e., physical aggression, delinquency, and substance use). These constructs were chosen based on theoretical and empirical support regarding their relations with stressful life events (e.g., Fowler et al., 2009; Perfect et al., 2016). Findings from this study have important implications for etiological theories as well as for future trauma-informed research and intervention efforts by highlighting the comorbidity of psychopathology after exposure to a range of stressful life events among a predominantly African American sample of early adolescents.

Aims and Hypotheses

This study had four primary aims that were informed by previous empirical findings, developmental psychopathology (Compas & Andreotti, 2013; De Bellis, 2001; Ford & Courtois, 2009; Grant et al., 2003) and stress process models (Foster & Brooks-Gunn, 2009; Pearlin, 1989).

Aim 1a

The present study tested competing dimensional models of psychopathology using confirmatory factor analysis to establish the latent structure of distress, externalizing, and comorbid symptoms. Based on past findings (e.g., Liu et al., 2017), it was hypothesized that a three-factor model that included the domain-specific distress and externalizing factors and a bifactor that cut across distress and externalizing symptoms would fit the data best.

Aim 1b

After establishing measurement invariance in the structure of the model, gender differences in reported frequencies of distress, externalizing, and comorbid symptoms were also examined. It was hypothesized that girls would endorse greater frequencies of distress symptoms and that boys would endorse greater frequencies of externalizing symptoms. However, gender differences in reported frequencies of comorbid symptoms were considered exploratory, in that, no hypotheses were provided.

Aim 2a

Second, the present study examined person-centered, exploratory models using latent profiles to determine whether there are distinct groups of early adolescents who differ in their patterns of responses to measures assessing distress and externalizing symptoms. The purpose of these models was to determine how adolescents are best categorized based on their reported frequencies of psychopathology. It was hypothesized that there would be four subgroups: low to minimal psychopathology, high distress, high externalizing symptoms, and comorbid concerns. These hypotheses were based on a small body of research that has found similar groups (Martinez-Torteya et al., 2017; Renner et al., 2018; Yates & Grey, 2012). In addition, it was surmised that trauma-related distress symptoms could differentially vary across the groups based on past person-centered research (Ayer, Danielson et al., 2011; Guffanti et al., 2016). It was

hypothesized that if differences emerged across distress symptoms, higher frequencies of avoidance/numbing would be associated with higher frequencies of externalizing behavior, based on the desensitization theory and prior research (Mrug et al., 2016). However, no other hypotheses were made regarding differences in traumatic stress patterns.

Aim 2b

Subgroup membership was explored separately for boys and girls prior to examining gender differences in subgroups within the full sample model. Based on prior findings (Martinez-Torteya et al., 2017), it was hypothesized that girls would be more likely to be represented in a subgroup (i.e., profile) with high distress symptoms and that boys would be more likely to be represented in a profile with high externalizing symptoms. Gender differences between profiles with high comorbid symptoms were once again considered exploratory.

Aim 3

The latent constructs' relations to violent and nonviolent life stressors were examined. It was hypothesized that high rates of exposure to both violent and nonviolent life stressors would be associated with more co-occurrence of distress and externalizing symptoms in both types of models. No hypotheses were made regarding differences across possible high distress versus high externalizing symptoms.

Method

Settings and Participants

The current cross-sectional study was conducted through secondary analysis of data from a study (Farrell, Sullivan, Sutherland, Corona, & Masho, 2018) that evaluated the Olweus Bullying Prevention Program (Olweus & Limber, 2010) using a multiple baseline design at three schools from 2010 to 2018. The schools were selected based on their location in neighborhoods

with high levels of violence. The Olweus program was implemented in one of the schools beginning in the second year, in a second school beginning in the third year, and in the third school beginning in the sixth year. During Year 1, 313 English-speaking students were randomly selected, with 100 to 110 in each grade distributed across the three schools. Each year a new sample of entering sixth graders was recruited, and additional seventh and eighth graders were recruited to replace students who left the study. Data were not collected during the fall of Years 1 and 6. The majority of students (i.e., 74% to 85%) were eligible for the federal free or reduced lunch program. Student assent and active parent permission were obtained for approximately 80% of all those eligible.

A random sample of students across all cohorts was constructed and used in the current study. Analyses were conducted on 2,722 students who completed measures at one or more waves during the eight years of the project (i.e., 2010-2018). The final sample had a mean age of 12.9 (SD = 1.10) and 51% were female. Seventeen percent identified their ethnicity as Hispanic or Latino/a. The majority of applicants (i.e., 80%) endorsed African American or Black as the sole category (i.e., 72%) or as one of several categories (8%). Eleven percent did not endorse any of the racial categories; most of these (i.e., 91%) described themselves as Hispanic or Latino/a. The remainder of participants described themselves as White (5%), Asian (1%), American Indian or Alaska Native (1%), Native Hawaiian or Other Pacific Islander (1%). A little under half of students (41%) lived with a single mother, 26% with both biological parents, 23% with a parent and step-parent, 7% with a relative without a parent, and 3% with their father without a mother or stepmother. Almost three-quarters of the students (70%) completed measures while at a school that was implementing the intervention.

Procedures

Students were given information about the study and informed consent forms to take to their parents. Participants received a \$5 gift card for returning the consent form whether or not parents provided consent. They also received a \$10 gift certificate at each wave for completing any part of the survey. The project used a planned missing data design (Graham, Taylor, & Cumsille, 2001) to reduce participant fatigue and testing effects given the large number of waves of data collection. Each participant was randomly assigned to complete two of the four waves during each year of participation (i.e., two waves per year for up to six waves across three grades). This resulted in data that were missing completely at random, which removed parameter estimate bias. Participants completed the surveys on computer-assisted interviews. During the school year, research assistants administered the surveys to small groups of students in the schools and in participants' homes or public settings during the summer waves. The University's Institutional Review Board reviewed and approved all procedures.

Measure of Distress Symptoms

The Checklist of Children's Distress Symptoms (CCDS; Richters & Martinez, 1993) was designed to assess the type and frequency of symptoms experienced by youth who live with long-term exposure to community violence. The CCDS is a 28-item measure based on diagnostic criteria for PTSD described in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III-R; APA, 1987)*. The CCDS does not allow for clinical diagnoses of PTSD, as it does not identify the precipitating traumatic event. However, it does provide an index of distress symptoms associated with traumatic stress (Mash & Barkley, 2007). The scale includes three subscales: hyperarousal (e.g., "How often do you watch things around you real closely in order to protect yourself from something bad happening?"), re-experiencing (e.g., "How often do you

feel like something bad or frightening from the past is happening all over again?”), and avoidance/emotional numbing (e.g., “How often do you avoid or try not to go to places or do things that remind you of something bad that happened?”). Responses are rated on a 5-point scale, including 1 = *Never*, 2 = *Seldom*, 3 = *Once in a while*, 4 = *A lot of the time*, and 5 = *Most of the time*. Within the current study, responses were recoded to be more clinically meaningful, such that scores of 1 (*Never*) through 3 (*Once in a while*) indicated absence of a symptom (coded 0), and scores of 4 (*A lot of the time*) and 5 (*Most of the time*) indicated the presence of a symptom at clinically significant levels. Higher scores on each subscale corresponded to the percentage of items endorsed. Internal consistency of the subscales using binary coding has been found to be acceptable (re-experiencing = .62, avoidance/emotional numbing = .70, hyperarousal = .79; Overstreet, Dempsey, Graham, & Moely, 1999). A confirmatory factor analysis using a subsample from the current dataset found support for a 3-factor structure. Within the current study, cronbach’s alpha for the Re-experiencing, Avoidance/Emotional Numbing, and Hyperarousal scales were .77, .84, and .72, respectively.

Measures of Externalizing Symptoms

The Problem Behavior Frequency Scale – Adolescent Report (PBFS-AR; Farrell, Thompson, Mehari, Sullivan, & Goncy, 2018) includes subscales that assess the frequency of aggression, drug use, delinquency, and victimization. Students report how frequently specific behaviors occurred in the past 30 days using an operationally-defined 6-point frequency scale (1= *Never*, 2 = *1-2 times*, 3 = *3-5 times*, 4 = *6-9 times*, 5 = *10-19 times*, 6 = *20 or more times*). The final recommended factor structure (Farrell, Thompson et al., 2018) is a seven-factor model based on ordered categorical confirmatory factor analyses using a large, predominantly African American sample of middle school students. It includes three forms of aggression (in-person

physical, in-person relational), two forms of victimization (in-person and cyber), substance use, and delinquent behavior. Based on an item response theory analysis of the measure, Farrell, Thompson, and colleagues (2018) recommend recoding each item into a 4-point scale by combining the highest three categories. The seven-factor model fit the data well and demonstrated strong measurement invariance across groups that differed on sex and grade. Support was found for concurrent validity of the PBFS-AR based on its relations with school office discipline referrals. The physical aggression (e.g., “Hit or slapped someone”), substance use (e.g., “Use marijuana [pot, hash, reefer, K2]”), and delinquency (e.g., “Taken something from a store without paying for it [shoplifted]”) subscales was used in the current study. Cronbach’s alpha for the Physical Aggression, Substance Use, and Delinquency scales were .77, .85, and .79, respectively.

Measures of Violent and Nonviolent Life Stressors

Violence

The frequency of interpersonal violence, including both violent victimization and witnessing violence, was assessed using some modified items from the Survey of Children’s Exposure to Community Violence (SCEV; Richters & Saltzman, 1990). The current study used an adapted version that assessed the frequency a child had been victimized by violence (10 items; e.g., “How many times have you been chased by gangs or older kids”) or witnessed violence (10 items; e.g., “How many times have you seen someone else being attacked or stabbed with a knife?”) in the past three months. Original items from the SCEV were excluded because they did not represent interpersonal violence (7 items), involved sexual assault which was considered to be too sensitive to be administered the schools (5 items), or were collapsed together (2 items). Respondents indicated on a 6-point scale from *Never* to *20 or more times*. The

original measure has been used in many studies including the National Institute of Mental Health Community Violence Project conducted by Richters and Martinez (1993), and the adapted version has been used in prior studies investigating the relations between violence and adolescent adjustment (Farrell, Thompson, Curran, & Sullivan, 2020; Thompson, Coleman et al., 2019).

Separate witnessing and victimization composite scores were used in the current study.

Cronbach's alpha for the Witnessing Violence and Violent Victimization scales were .86 and .71, respectively.

Nonviolent Life Stressors

The Urban Adolescents Negative Life Experiences Scale (UANLES) was used to measure the frequency with which youth experienced a variety of problem situations. Respondents were asked how often each item had happened to them in the past 3 months. For 20 items (e.g., "Someone in your family you were close to doesn't live with you anymore" and "Someone in your family or living in your house was drunk or high") frequencies were rated on a 5-point scale ranging from *Never* to *Almost every day*. For six less frequent problem situations (e.g., "Lose a job," "Move – change where you live," and "Have someone you were close to die"), respondents were asked whether the event occurred during the last 3 months using *yes* or *no* response choices. Items were drawn from three sources: 11 items from the Urban Adolescents Life Experiences Scale (Allison et. al., 1999), 8 items from the Interpersonal Problem Solving Inventory for Urban Adolescents (Farrell, Ampy, & Meyer, 1998) and 7 items from a qualitative study by Farrell and colleagues (2007) that identified environmental stressors in which interviews were conducted with students and adults with direct knowledge of the lived experience of urban youth. Support for the construct validity of the UANLES was found in two

studies of the same data used in the current study (Thompson, Coleman et al. 2019; Farrell et al., 2020). Cronbach's alpha was .81 for the current study.

Data Analysis

All analyses were conducted using *Mplus* Version 8.0. Full information maximum likelihood estimation was used to address missing data. Analyses controlled for gender, grade, ethnicity, and intervention status. To address Aim 1, confirmatory factor analyses were conducted to test three competing models: a model in which all composite scores loaded onto one factor, a two-factor model in which separate composite scores loaded onto Distress and Externalizing factors, and a bifactor model that included Distress and Externalizing factors as well as a factor that loaded all composite scores. The overall fit of each model was evaluated by several measures of model fit, including the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). CFI and TLI values of .95 or greater and RMSEA values of .06 or smaller indicate a good fit (Hu & Bentler, 1999). Tests of measurement invariance on the final models were conducted across gender. Because chi-squared differences can be inflated in large samples, Cheung and Rensvold's (2002) recommendations were followed in which more parsimonious models were favored unless more complex models improved the CFI by more than .01. Mean gender differences across the factors were examined using Cohen's (1992) *d*.

To address Aim 2, latent profile analyses were used to identify subgroups of early adolescents based on their composite scores on the distress and externalizing subscales. Unlike latent class analysis, latent profile analyses do not require conditional independence for the within-profile covariance structure. That is, indicator variables are allowed to covary or be constrained to be equal across profiles, and the variances and covariances are allowed to be

different or held equal across the profiles (Masyn, 2013). Therefore, four different types of profiles were examined: profile-varying versus profile-invariant structures (i.e., indicator variables are allowed to covary or are fixed to zero within a subgroup) and diagonal versus nondiagonal (i.e., the variances and covariances are allowed to be different across the profiles or constrained to be equal across the profiles). Across each approach, the optimum number of profiles was determined based on theory, group size considerations, and comparison of fit indices, including the log likelihood, the Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwarz, 1978), the Lo–Mendell–Ruben test likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001), the bootstrap likelihood ratio test (BLRT; Nylund, Asparouhov, & Muthén, 2007), and the Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT). Smaller AIC and BIC values indicated better fit (Wang & Wang, 2012). The VLMR-LRT was used to determine the point at which increasing the number of profiles no longer significantly improved the fit of the model. A significant VLMR-LRT indicated an improvement in fit (Wang & Wang, 2012). The BIC has been shown to perform best in determining the number of profiles; thus, more emphasis was placed on this statistic (Nylund et al., 2007). Mean difference testing was conducted to determine whether members of each subgroup significantly differed across gender. These analyses were also run separately for boys and girls to determine whether subgroup patterns were different across gender.

To address the third aim, analyses were conducted using both variable- and person-centered approaches to examine the relations between violent and nonviolent stressful life events, distress symptoms, and externalizing symptoms. Although the assumption was that exposure to stressful life events preceded adolescents' development of distress and externalizing symptoms, witnessing violence, violent victimization, and nonviolent life stressors were

regressed on factors from the final confirmatory factor model. This approach was used for two reasons. First, this type of analysis allowed for a theoretical comparison of the CFA and LPA results. Second, by regressing violent and nonviolent events on distress and externalizing symptoms, the unique relations between exposure to stressful life events and distress symptoms could be examined while controlling for externalizing symptoms, and conversely, the relations between exposure to stressful life events and externalizing symptoms could be examined while controlling for distress symptoms. The final LPA model compared mean differences in frequencies of witnessing violence, violent victimization, and nonviolent life stressors using a one-step Bolck–Croon–Hagenaars (BCH) approach (Asparouhov & Muthén, 2014) across the subgroups.

Results

Descriptive Statistics

Means, standard deviations, and correlations among all variables are reported in Table 1. Overall sample means were low across each of the constructs. As expected, violent victimization and witnessing violence were highly correlated ($r = .64$), and both were moderately to highly correlated with nonviolent life stressors ($r_s = .45$ and $.52$, respectively). The three distress symptoms were highly correlated ($r_s = .56$ to $.71$), and the three externalizing symptoms were moderately to highly correlated ($r_s = .38$ to $.54$). There were also small correlations between the distress and externalizing symptoms ($r_s = .13$ to $.24$), except for the correlation between substance use and hyperarousal, which was not significant. Violent victimization and witnessing violence were each moderately correlated with distress ($r_s = .19$ to $.27$) and moderately correlated with adolescents' externalizing symptoms ($r_s = .30$ to $.48$). Nonviolent life stressors were moderately correlated with adolescents' distress ($r_s = .42$ to $.47$), with slightly lower

correlations with externalizing symptoms ($r_s = .27$ to $.44$).

Table 1 also reports d coefficients representing mean differences across gender. There were small differences in frequencies of violence exposure and nonviolent life stressors, such that girls reported significantly lower frequencies of both violent victimization and witnessing violence ($d_s = -.30$ and $-.15$, respectively), but higher levels of nonviolent life stressors ($d = .18$). Compared to boys, girls reported slightly to moderately higher levels of distress ($d_s = .10$ to $.33$), somewhat higher frequencies in physical aggression ($d = .10$), and somewhat lower levels of delinquency ($d = -.10$). There were no significant differences in substance use frequency between boys and girls.

Table 1
Correlations, Unstandardized Means, Standard Deviations, and Gender Differences

	1	2	3	4	5	6	7	8	9
1. Violent victimization	-								
2. Witnessing violence	.64***	-							
3. Nonviolent life stressors	.45***	.52***	-						
4. Intrusive Thoughts	.25***	.25***	.42***	-					
5. Avoidance/ Numbing	.27***	.25***	.47***	.71***	-				
6. Hyperarousal	.19***	.21***	.44***	.56***	.67***	-			
7. Physical aggression	.42***	.48***	.44***	.21***	.24***	.23***	-		
8. Substance use	.30***	.31***	.27***	.15***	.17***	.09***	.38***	-	
9. Delinquency	.39***	.39***	.34***	.16***	.17***	.13***	.52***	.54***	-
Unstandardized means	1.22	1.50	1.87	0.09	0.11	0.20	1.38	1.08	1.14
Standard deviations	0.36	0.50	0.54	0.19	0.18	0.23	0.54	0.26	0.35
<i>d</i> -coefficients									
Girls versus boys	-	-	0.18***	0.29***	0.33***	0.37***	0.10**	0.03	-0.10**
	0.30***	0.15***							

Note. $N = 2,722$.
 ** $p < .01$. *** $p < .001$.

Comparison of Dimensional Models

Confirmatory factor analyses were used to test the hypothesis that symptoms of distress and externalizing behaviors are best represented with three factors: a Distress Symptoms factor, an Externalizing Symptoms factor, and an overlapping general factor of Comorbid Symptoms. First, the fits of the two-factor and one-factor models were compared (models 1 and 2 in Table 2). The initial one-factor model had a poor fit (RMSEA = .21, CFI = .68, TLI = .46). In contrast, the two-factor model, which specified separate factors representing Distress and Externalizing Symptoms, fit the data very well (RMSEA = .05, CFI = .98, TLI = .97) and was a significant improvement in fit compared to the one-factor model ($\Delta\chi^2 = 657.37, p < .001$). A bifactor model, which included the two Distress and Externalizing Symptoms factors and a general Comorbid Symptoms factor, also fit well (RMSEA = .04, CFI = 1.00, TLI = .98; see Model 3). Although the bifactor model ran normally, an error message stated that the standard errors of the model parameter estimates may not be trustworthy. Examining the chi-square difference test between the two-factor and bifactor models was not possible due to the non-nested nature of the models. The fit statistics, however, all improved from the two-factor to the bifactor model (Δ RMSEA = .01, Δ CFI = .01, Δ TLI = .01).

Table 2
Fit Indices Based on Confirmatory Factor Analyses of Competing Models of Distress and Externalizing Symptoms

Model	χ^2	df	RMSEA	CFI	TLI	Comparison	$\Delta\chi^2_a$	Δ CFI	Δ df ^a
<i>Comparison of competing models (N = 2,718)</i>									
1. Two factors	65.55***	8	.051	.983	.968				
2. One factor	1102.30***	9	.211	.675	.458	1	657.37***	-.308	1
3. Bifactor	15.49***	3	.039	.996	.981				
4. Two factors with cross loadings	19.69***	4	.038	.995	.982				
<i>Tests of measurement invariance across gender (2-factor model without cross-loadings; N = 2,689)</i>									
5. Configural invariance	75.99***	16	.053	.982	.966				
6. Metric invariance	84.77*	20	.049	.980	.971	4	12.40*	-.002	4
7. Scalar invariance	119.56***	24	.054	.971	.964	5	119.56***	-.009	5

Note. N = 2,718 except where noted.

RMSEA = Root mean square error of approximation. CFI = comparative fit index. TLI = Tucker-Lewis fit index.

^aDifference in fit for less constrained model (i.e., two-factor model, configural invariance model) versus more constrained model (e.g., two-factor model, metric invariance model).

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

The latent structures and factor loadings for the two-factor and bifactor models were compared (see Figure 1). Within the two-factor model (see Figure 1a), there was a small correlation between the Distress and Externalizing Symptoms factors ($r = .28$). Standardized loadings ranged from .63 to .83 on the Externalizing Symptoms factor and .73 to .92 on the Distress Symptoms factor. Within the bifactor model, each of the indicators loaded significantly on the Comorbid Symptoms factor; however, the three indicators of externalizing symptoms (physical aggression, substance use, and delinquency) had very low loadings on this factor ($\lambda_s = .17$ to $.28$). In contrast, indicators of distress loaded highly on the Comorbid Symptoms factor ($\lambda_s = .78$ to $.90$). After accounting for the Comorbid Symptoms factor (see Figure 1b), re-experiencing of a traumatic event had the only significant loading on the Distress Symptoms factor (i.e., standardized factor loadings for avoidance/emotional numbing and hyperarousal were no longer significant), whereas all three indicators of externalizing symptoms loaded significantly on the Externalizing Symptoms factor ($\lambda_s = .55$ to $.85$). Given that the Distress Symptoms factor represented only one item and the low loadings of externalizing symptoms on the Comorbid Symptoms factor, it appeared that the relations between the distress and externalizing symptoms were better represented as correlations between two factors rather than items on the same bifactor.

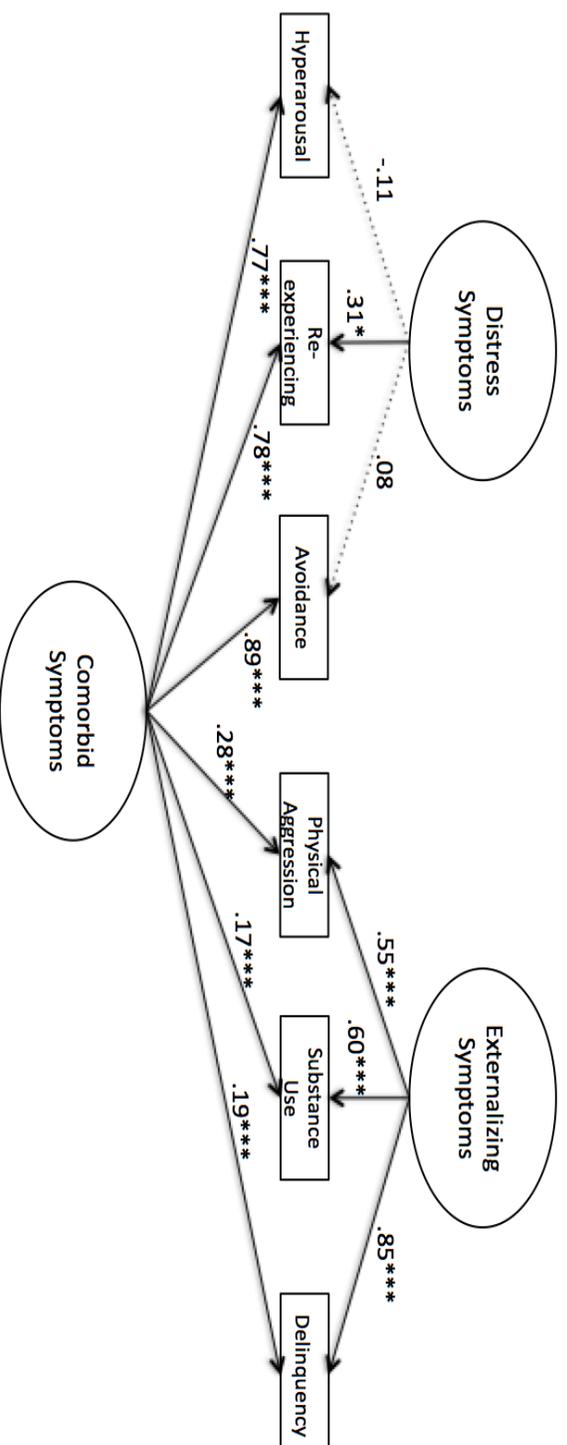
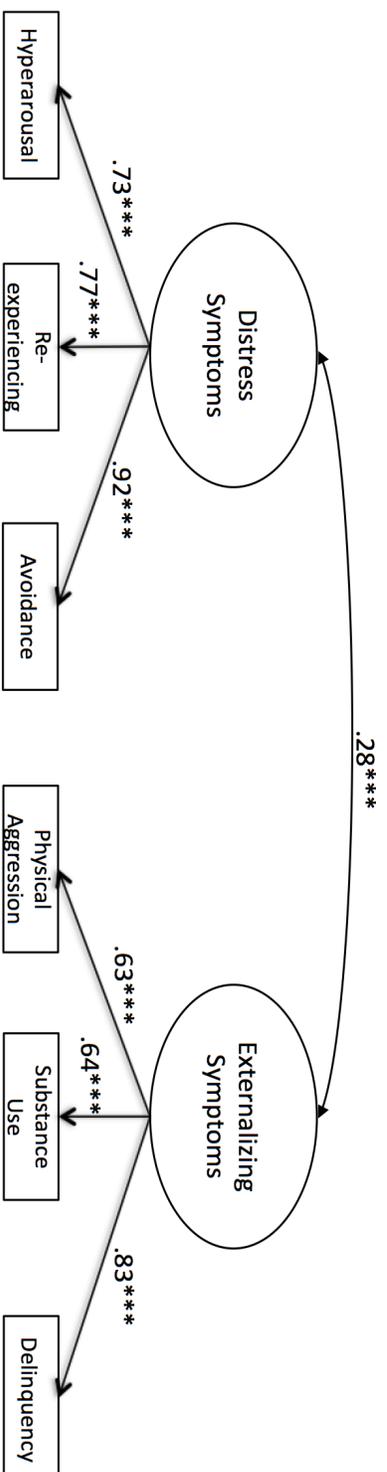


Figure 1. *Alternative confirmatory factor analysis models for the latent structure of trauma-related distress and externalizing symptoms. Parameter estimates are standardized loading. The figure does not display measurement errors.*

Finally, a post-hoc exploratory structural equation model was tested (Asparouhov & Muthen, 2009; Marsh et al., 2009) to determine if there were specific items that were better represented as cross-loadings within a two-factor model (see Model 4 in Table 2). Within this two-factor model with cross-loadings, each item was allowed to load on both factors using a target rotation. The model fit the data very well (RMSEA = .04, CFI = 1.00, TLI = .98), which was not surprising given the exploratory nature of the analyses. Results indicated that physical aggression was the only significant cross-loading item on the Distress Symptoms factor; however, it did not exceed the cutoff of .33 (Comrey & Lee, 1992). Moreover, indicators of distress did not significantly load on the Externalizing Symptoms factor. Based on these results, the two-factor CFA without cross-loadings was chosen as the final measurement model for further analyses.

Measurement Invariance Across Gender

Multiple group analyses were then run to test measurement invariance across gender using the two-factor model. The configural and metric invariant models fit the data well (i.e., $\Delta\text{CFI} < .01$, see models 5 and 6 in Table 2), indicating that the items had the same pattern of loadings and that the loadings were not statistically different for boys and girls. Next, the model that specified metric invariance (Model 6) was compared to a model that specified scalar invariance (i.e., item intercepts were constrained across groups, Model 7), which also had a minimal impact on the fit of the model ($\Delta\text{CFI} < .01$). Imposing strong (i.e., scalar) invariance allowed for the comparison of means for boys and girls. Within this model, there were no significant differences in boys' and girls' scores on the Externalizing Symptoms factor ($d = .04$, $p = .39$); however, boys had significantly lower scores on the Distress Symptoms factor ($d = -.34$, $p < .001$).

Relations With Violent And Nonviolent Life Stressors

To more directly compare the variable- and person-centered models, violent victimization, witnessing violence, and nonviolent stressful life events were regressed on the Distress and Externalizing Symptoms factors within a series of hierarchical regressions (see Table 3). The four models were distinct, but statistically equivalent, as each included covariances or path coefficients among the variables. Overall, the models fit the data adequately, $\chi^2(50) = 451.88$, RMSEA = .06, CFI = .95, TLI = .91. Within Model 1, the demographic covariates accounted for a significant proportion of the variance in violent victimization, witnessing violence, and nonviolent life stressors (R^2 s = .01 to .04, p s < .05). The Distress Symptoms factor was significantly related to violent victimization, witnessing violence, and nonviolent life stressors prior to controlling for the Externalizing Symptoms factor (Model 2a in Table 3: β s = .34, .32, and .54, respectively). The Externalizing Symptoms factor was significantly related to violent victimization, witnessing violence, and nonviolent life stressors prior to controlling for the Distress Symptoms factor (Model 2b: β s = .53, .57, and .50).

Within Model 3 in Table 3, which accounted for both the Distress and Externalizing Symptoms factors, each construct remained significantly related to both forms of violence exposure and nonviolent life stressors, albeit at lower magnitudes (β_{diff} for Distress = .12 to .16 and β_{diff} for Externalizing Symptoms = .05 to .13). After conducting a Wald test ($\chi^2[3] = 95.62$, $p < .001$), follow-up post-hoc analyses indicated that compared with the Distress Symptoms factor, the Externalizing Symptoms factor had a stronger relation with violent victimization ($\beta_{diff} = .10$, $p < .001$) and witnessing violence ($\beta_{diff} = .19$, $p < .001$). There were no differences in their relations with nonviolent life stressors ($p = .36$).

A Wald test indicated gender differences in the relations between the constructs ($\chi^2 [6] = 25.21, p < .001$). More specifically, compared to girls, boys had stronger relations between Externalizing Symptoms and both forms of exposure to violence ($\beta_{diff} = 0.07$ for both violent victimization and witnessing violence, $ps < .05$). In contrast, there were no gender differences regarding the relations between the Distress Symptoms factor and exposure to violence. Additionally, there were no gender differences among the relations between either Distress or Externalizing Symptoms and nonviolent life stressors ($ps = .38$ to $.51$).

Table 3

Standardized Regression Coefficients (Standard Errors) for Relations Between Distress Symptoms, Externalizing Symptoms, and Violent and Nonviolent Life Stressors

Variables included in the regression models	Dependent variables		
	Violent victimization	Witnessing violence	Nonviolent life stressors
Model 1: Covariates only			
Intervention Status	-0.02 (.02)	-0.06** (.02)	-0.04* (.02)
Latino/a	-0.01 (.02)	-0.07*** (.02)	-0.03* (.02)
Male	0.19*** (.02)	0.11*** (.02)	-0.03 (.02)
7th versus 6th grade	-0.10*** (.02)	-0.08*** (.02)	-0.03 (.02)
8th versus 6th grade	-0.10*** (.02)	-0.11*** (.02)	0.001 (.02)
R^2	0.05***	0.03***	0.004***
Model 2a: Distress added to covariates			
Distress	0.34*** (.03)	0.32*** (.02)	0.54*** (.02)
R^2	0.16***	0.13***	0.29***
Model 2b: Externalizing symptoms added to covariates			
Externalizing symptoms	0.53*** (.03)	0.57*** (.03)	0.50*** (.03)
R^2	0.33***	0.35***	0.26***
Model 3: Distress and externalizing symptoms added to covariates			
Distress	0.07*** (.01)	0.08*** (.01)	0.23*** (.02)
Externalizing symptoms	0.17*** (.01)	0.26*** (.02)	0.20*** (.02)
R^2	0.36***	0.38***	0.42***
Model 4a: Distress, externalizing symptoms, and their interaction added to covariates			
Distress	0.17*** (.03)	0.16*** (.03)	0.42*** (.03)
Externalizing Symptoms	0.46*** (.03)	0.54*** (.03)	0.38*** (.03)
Distress x Externalizing Symptoms	0.06* (.03)	-0.04* (.02)	-0.01 (.02)
R^2	0.35***	0.40***	0.42***
Model 4b: Boys			
Distress	0.22*** (.05)	0.17*** (.04)	0.39*** (.04)
Externalizing Symptoms	0.49*** (.04)	0.58*** (.03)	0.40*** (.04)
Distress x Externalizing Symptoms	0.07* (.03)	-0.06** (.02)	-0.03 (.03)
R^2	0.36** (.03)	0.43*** (.04)	0.40*** (.04)
Model 4c: Girls			
Distress	0.17*** (.04)	0.17*** (.04)	0.44*** (.04)
Externalizing Symptoms	0.17*** (.04)	0.49*** (.06)	0.35*** (.05)
Distress x Externalizing Symptoms	0.09 (.05)	0.01 (.03)	0.00 (.04)
R^2	0.27*** (.04)	0.35*** (.05)	0.44*** (.04)

Note. $N = 2,549$. All models included covariates but parameter estimates for covariates are only reported for Model 1.

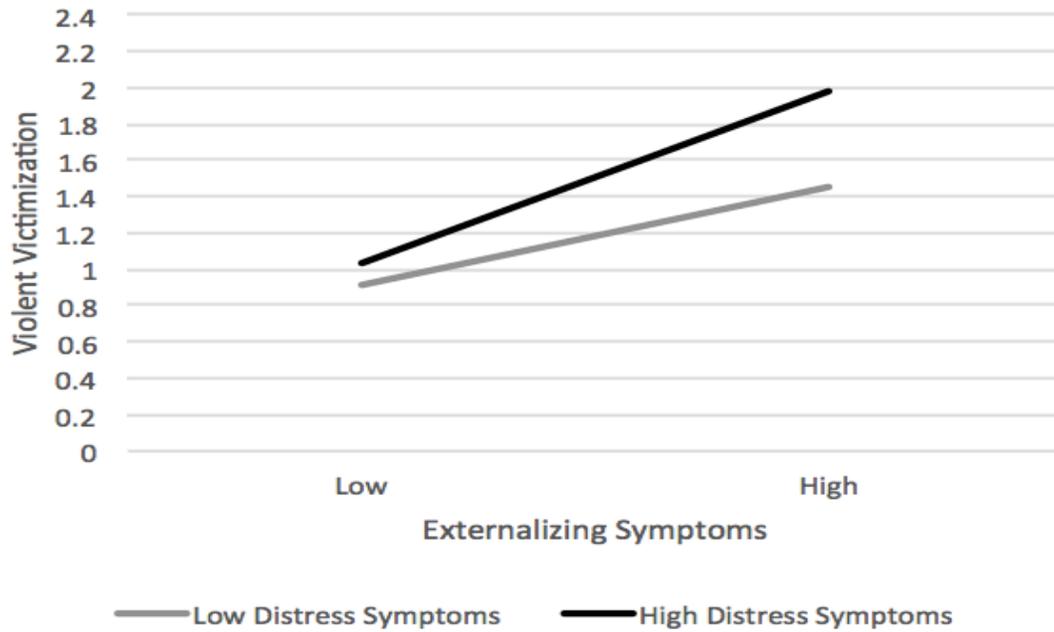
* $p < .05$. ** $p < .01$. *** $p < .001$.

Moderation

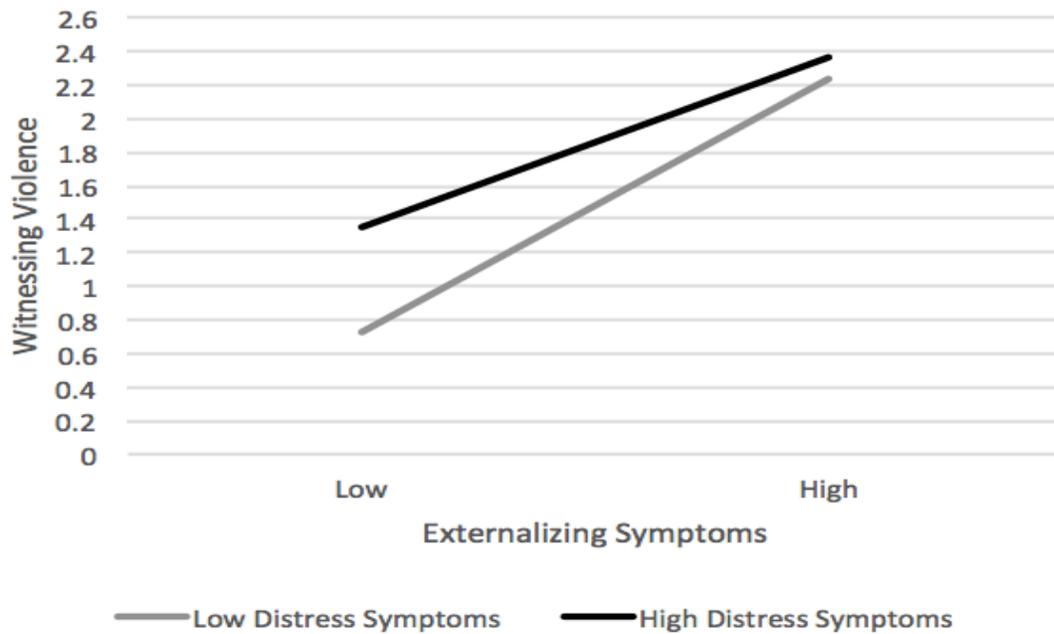
The two-factor model did not account for the possibility of comorbidity between distress and externalizing symptoms. Therefore, another set of post-hoc models were run to assess the extent to which there was an interaction effect between the Distress and Externalizing Symptoms factors and the three outcomes. Results indicated a significant interaction effect between the factors' relations with violent victimization and witnessing violence, but not with nonviolent life stressors (see Model 4a in Table 3). More specifically, as adolescents reported higher levels of Distress Symptoms, the relations between violent victimization and Externalizing Symptoms became stronger ($\beta = .06, p < .05$). In contrast, as adolescents' reported Distress Symptoms increased, the relations between witnessing violence and Externalizing Symptoms became weaker ($\beta = -.04, p < .05$).

Gender Differences

Models were run separately for boys and girls to examine whether interaction effects differed across gender. Overall, interaction effects on violent victimization and witnessing violence were statistically significant for boys but not for girls (See models 4b and 4c in Table 3 and Figure 2). That is, the relations between violent victimization and the Externalizing Symptoms factor became stronger as adolescents reported higher levels on the Distress Symptoms factor ($\beta = .07, p < .05$), whereas the relations between witnessing violence and Externalizing Symptoms weakened as adolescents reported higher levels on the Distress Symptoms factor ($\beta = -.06, p < .01$).



(a) Violent victimization among boys



(b) Witnessing violence among boys

Figure 2. *The relations between types of exposure to violence and Externalizing Symptoms by Distress Symptoms among boys. 2a: Violent victimization. 2b: Witnessing violence. Low and high Externalizing Symptoms were defined as two standard deviations above and below the mean.*

Exploration of Person-Centered Models

Another goal of this study was to determine whether early adolescents could be reliably categorized into distinct subgroups based on their patterns of hyperarousal, re-experiencing of traumatic events, avoiding or emotional numbing symptoms, physical aggression, delinquency, and substance use. LPAs were used to test a series of models specifying increasing numbers of profiles (i.e. subgroups) ranging from one through seven across four different types of models. The four models tested whether variances and covariances could be constrained to be equal across profiles (i.e., profile-invariant versus profile-varying and nondiagonal versus diagonal; see Table 4). The diagonal and non-diagonal, profile-varying models failed to converge after one profile, with both profile-varying models having higher AIC, BIC, and aBIC than the profile-invariant models. This suggested that models with constrained variances fit the data better; profile-varying models were therefore not considered further.

Based on the correct model probabilities, the non-diagonal, profile-invariant models were favored (i.e., both variances and covariances were constrained to be equal across the profiles). The VLMR-LRT, LMR-LRT, and BLRT remained significant across all non-diagonal, profile-invariant models. Visual comparison of fit statistics across solutions indicated that the LL, AIC, BIC, and aBIC continued to decrease within the non-diagonal, profile-invariant models, with a more gradual decrease starting at a five-profile model (See Figure 3). The smallest profile within the five-profile non-diagonal, profile-invariant model included only 1.0% of the overall sample ($n = 28$). In comparison, the smallest subgroup within the four-profile solution was approximately 3% of the sample ($n = 70$). Although 5% is often used as a “rule-of-thumb” for cut-off thresholds (Hipp & Bauer, 2006), Masyn (2013) suggests that overall sample size (i.e., power), separation of profiles, and generalizability to other samples should be main

considerations rather than the use of concrete guidelines on subgroup proportions. To determine the threshold for smallest sample size, prior empirical work was examined. Among adolescents aged 12 to 17, approximately 5% of youth ages 12 to 17 meet criteria for PTSD (McLaughlin et al., 2013) or a substance use disorder (Substance Abuse and Mental Health Services Administration, 2012). An epidemiologic study of a representative sample of children from the United States found that approximately 35% of children with PTSD also met criteria for another lifetime psychiatric disorder (Copeland, Keeler, Angold, & Costello, 2007). Given the large overall sample size ($n = 2,718$), the focus on early adolescents, and the clinical nature of group membership, it was deemed appropriate to include a profile with at least 2% of the sample (i.e., $35\% \text{ of } 5\% = 2\%$).

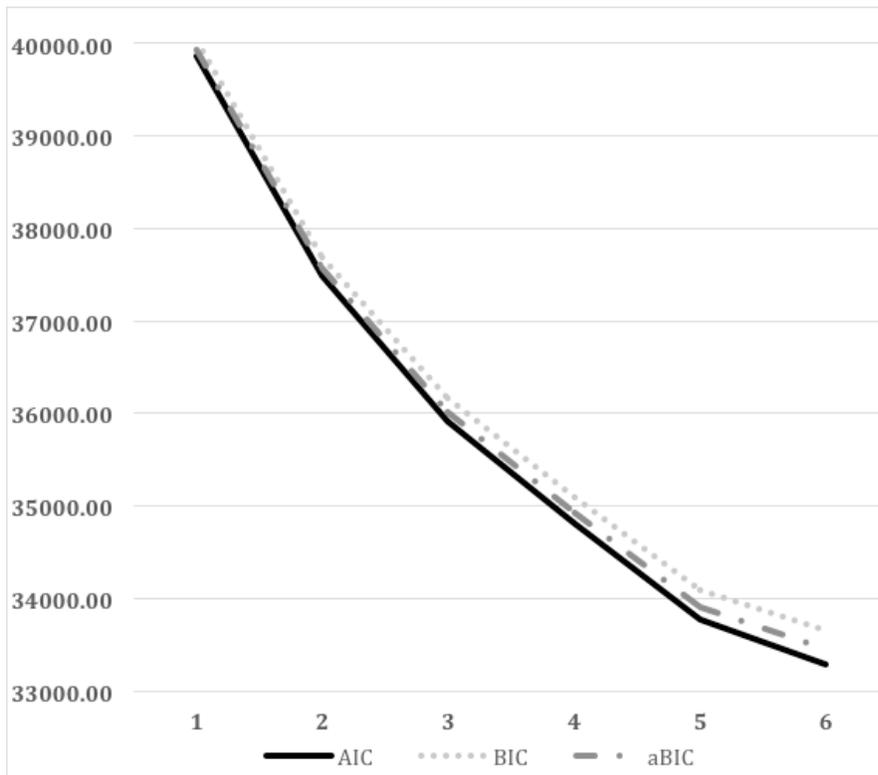


Figure 3. *Fit statistics across non-diagonal, profile-invariant one- through six-profile models. AIC = Akaike information criterion. BIC = Bayesian information criterion. aBIC = Sample size adjusted bayesian information criterion.*

Cohen's d s were calculated to examine separation among the four-profile model to examine how dissimilar adolescents were across profiles in their responses on each of the indicators of distress and externalizing symptoms. Overall, each of the four profiles had a high degree of separation with respect to at least one indicator (i.e., $d > |2|$; Masyn, 2013). This comparison was calculated by examining standardized mean differences across the profiles. Each of the indicators was also highly separated between at least two profiles (d s $> |2|$), excluding physical aggression and hyperarousal, which had slightly lower separation between two profiles (d s = $|1.9|$ and $|1.8|$, respectively). Additionally, substance use had very high separation across most of the profiles (d s ranged from $|5.9|$ to $|14.6|$), excluding separation between two of the subgroups, in which members reported low levels of substance use ($d = |.2|$). The four-profile solution also had excellent degree of fit among the profiles (i.e., the average posterior profile probabilities $\geq .97$ for one subgroup and $< .03$ for all other subgroups). The four-profile solution was therefore retained for further analyses.

Table 4
Fit Indices for Latent Profile Analysis Models

Profile Type	k	Par	LL	AIC	BIC	ABIC	VLMRT- LRT p	LMR- LRT p	BLRT p	Entropy	SP n	SP %
Profile Invariant, Diagonal	1	12	-22,657.45	45,338.90	45,409.79	45,371.66	NA	NA	NA	NA	2,718	100%
	2	19	-20,359.43	40,756.85	40,869.10	40,808.73	.00	.00	.00	.97	313	12%
	3	26	-19,039.47	38,130.94	38,284.54	38,201.93	.08	.08	.00	.97	144	5%
Profile Invariant, Nondiagonal	4	33	-18,350.20	36,766.39	36,961.34	36,856.49	.21	.21	.00	.97	76	3%
	5	40	-17,852.92	35,785.83	36,022.14	35,895.05	.63	.63	.00	.95	72	3%
	6	47	-17,413.36	34,920.72	35,198.38	35,049.05	.23	.23	.00	.95	63	2%
	7	54	-17,099.41	34,306.81	34,625.82	34,454.25	.19	.19	.00	.95	36	1%
Profile Invariant, Nondiagonal	1	27	-19,906.69	39,867.38	40,026.89	39,941.10	NA	NA	NA	NA	2,718	100%
	2	34	-18,708.82	37,485.64	37,686.50	37,578.47	.00	.00	.00	.99	161	6%
	3	41	-17,917.46	35,916.91	36,159.13	36,028.86	.00	.00	.00	.98	150	5%
	4	48	-17,356.31	34,808.61	35,092.18	34,939.67	.02	.02	.00	.98	70	3%
Profile Varying, Diagonal	5	55	-16,827.99	33,765.98	34,090.90	33,916.15	.01	.01	.00	.99	28	1%
	6	62	-16,580.24	33,284.48	33,650.76	33,453.76	.03	.04	.00	.98	28	1%
	7	Nonconvergence										
Profile Varying, Diagonal	1	12	-22,657.45	45,338.90	45,409.79	45,371.66	NA	NA	NA	NA	2,718	100%
	2	Nonconvergence										
Profile Varying, Nondiagonal	1	27	-19,906.69	39,867.38	40,026.89	39,941.10	NA	NA	NA	NA	2,718	100%
	2	Nonconvergence										

Note. $N = 2,718$. Bolded model was chosen as final model.

k = Number of profiles, Par = number of parameters, LL = log likelihood, BIC = Bayesian information criterion, LMR-LRT = Lo-Mendell-Rubin likelihood ratio test, VLMR-LRT = Vuong-Lo-Mendell-Rubin likelihood ratio test. BLRT = Bootstrap Likelihood Ratio Test, SP = Smallest Profile, NA = Not Applicable. LMR-LRT, VLMR-LRT, and Entropy not applicable for one-profile models.

Description of the Four-Profile Solution

The unstandardized means and z scores for each profile are provided in Table 5 and graphically depicted in Figure 4. Both unstandardized means and z scores were provided to distinguish between a subgroup's average reported frequencies for each construct (i.e., unstandardized means) versus the number of standard deviations below or above the sample mean (i.e., z scores). The unstandardized means for the distress symptoms range from 0 to 1.0 based on their binary coding, indicating the number of items endorsed at clinically significant levels, whereas the unstandardized means for the externalizing symptoms ranged from 1 to 4 (*Never to 6 or more times* in the past three months). In contrast, z scores highlighted the difference between a subgroup's mean frequencies and the overall sample's means for each construct.

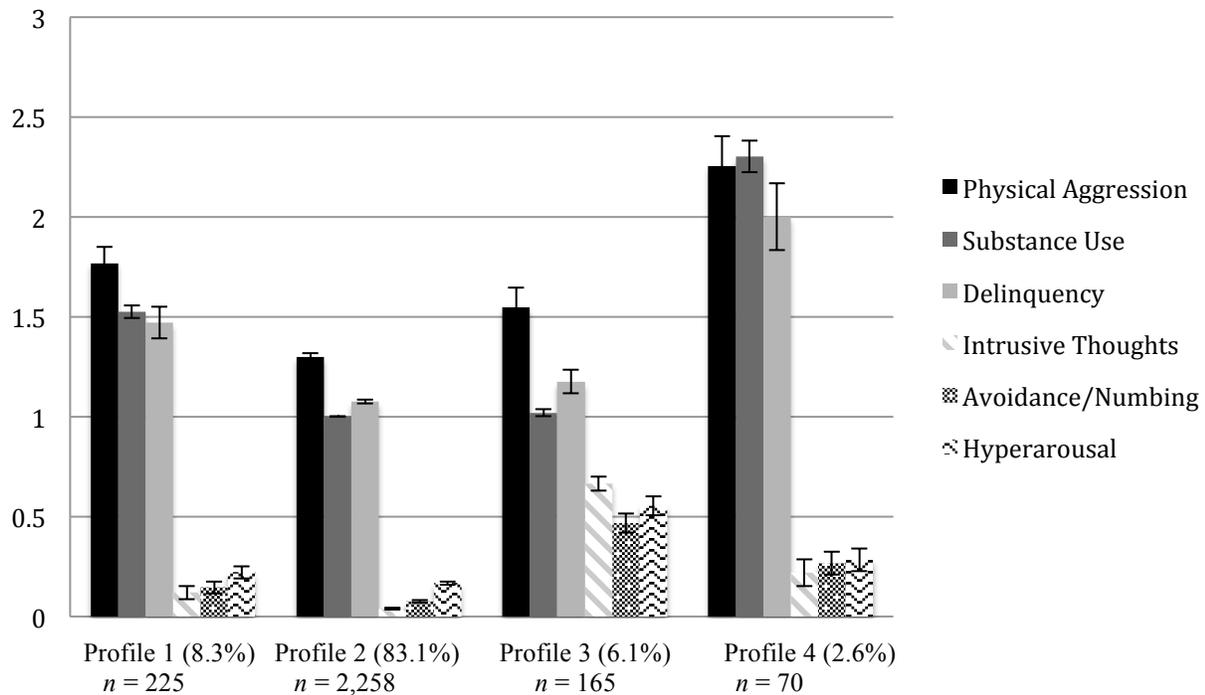
Profile 1 (8%) included youth who reported engaging in slightly to moderately higher physical aggression, substance use, and delinquency than the overall mean (z s ranged from .73 to 1.71), with significantly higher-than-average reports of substance use compared to their reports of physical aggression and delinquency. Non-standardized means for the externalizing symptoms ranged from 1.47 to 1.77, indicating that adolescents in this profile reported that on average, they engaged in externalizing behaviors slightly less than 1 to 2 times in the last 30 days. In contrast, individuals in Profile 1 reported very little difference in distress symptoms compared to the overall sample means (z s ranged from .10 to .20), with the subgroup reporting clinically significant symptoms on one to two items per indicator of distress. This group was labeled "Some Externalizing Symptoms." Profile 2 (83%) reported slightly lower than average frequencies in each of the indicators (z s ranged from -.14 to -.30). This profile was labeled "Low Symptoms." Adolescents in Profile 3 (6%) had slightly higher physical aggression ($z = .31$,

unstandardized $M = 1.30$), slightly lower to no differences in substance use and delinquency compared to the mean ($z_s = -.23$ and $.11$, unstandardized $M_s = 1.00$ and 1.08 , respectively), and significantly higher distress symptoms, particularly re-experiencing (z_s ranged from 1.5 to 3.0 , unstandardized M_s ranged from $.47$ to $.67$). This indicated that on average, adolescents in this group reported clinically significant levels of distress on 4 to 6 items in each symptom cluster. This profile was labeled “High Distress Symptoms.” Finally, Profile 4 (3%), which was the smallest profile, included youth with much higher reported frequencies of externalizing symptoms, particularly substance use (z_s ranged from 1.6 to 4.7 , unstandardized M_s ranged from 2.00 to 2.30), and slightly to moderately higher levels of distress (z_s ranged from $.37$ to $.88$, unstandardized M_s ranged from $.22$ to $.28$). Adolescents endorsed between 1 and 4 of the items on the distress subscales at clinically significant levels. Overall, this profile was characterized with much higher substance use, moderately higher physical aggression and delinquency, and slightly to moderately higher symptoms of re-experiencing and avoidance compared to the overall mean. For brevity, this profile was labeled “Substance Use Experimenters with Some Comorbid Symptoms.” Notably, although adolescents within this subgroup reported much higher frequencies of substance use compared to the overall mean as reflected in the z -score (see Figure 4b), their overall frequencies in terms of the anchor points on the rating scale were similar to their reported frequencies of physical aggression and delinquency (i.e., 1-2 times per month, see Figure 4a).

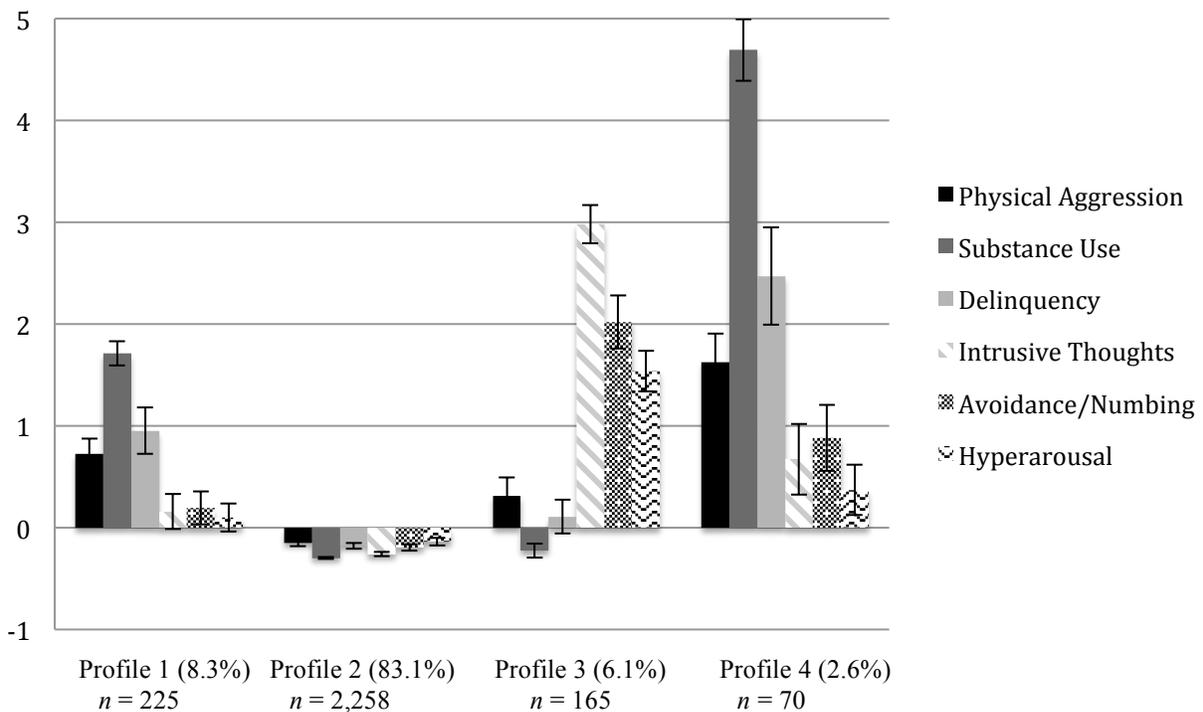
Table 5
Means (Standard Error) Across the Four Profiles of Distress and Externalizing Symptoms

Indicators	Profiles			
	Some externalizing symptoms	Low symptoms	High distress symptoms	Substance use experimenters with some comorbid symptoms
Physical aggression	0.73 (.08)	-0.15 (.02)	0.31 (.09)	1.63 (.14)
Substance use	1.71 (.06)	-0.30 (.01)	-0.23 (.04)	4.69 (.15)
Delinquency	0.95 (.12)	-0.18 (.02)	0.11 (.09)	2.47 (.25)
Re-experiencing	0.16 (.09)	-0.26 (.01)	2.98 (.10)	0.67 (.18)
Avoidance/Numbing	0.20 (.08)	-0.19 (.02)	2.02 (.13)	0.88 (.17)
Hyperarousal	0.10 (.07)	-0.14 (.02)	1.54 (.10)	0.37 (.13)
Sample size (Percent)	225 (8.27)	2,258 (83.08)	165 (6.07)	70 (2.58)

Note. $N = 2,718$.



(a) Full sample four-profile solution with unstandardized means



(b) Full sample four-profile solution with z scores

Figure 4. Full sample four-profile solution depicted by (a) unstandardized means and (b) z scores. Profile 1 = Some Externalizing Symptoms. Profile 2 = Low Symptoms. Profile 3 = High Distress Symptoms. Profile 4 = Substance Use Experimenters with Some Comorbid Symptoms.

Gender Differences in Subgroup Membership

Comparison of posterior profile probabilities within the overall sample revealed significant gender differences in subgroup membership, $\chi^2(3) = 28.17, p < .001$. Relative to girls, boys had higher odds of being in the Some Externalizing Symptoms ($OR = 1.11, p < .001$) and the Low ($OR = 1.33, p < .001$) subgroups. In contrast, males had lower odds of being in High Distress and Substance Use Experimenters with Some Comorbid Symptoms subgroups compared with female adolescents ($ORs = -0.40$ and $-0.63, ps < .001$, respectively). There were no differences in subgroup membership across intervention status, $\chi^2(3) = 5.98, p = .11$, or across ethnicity ($\chi^2(3) = 4.64, p = .20$).

Subgroup Differences in Violent and Nonviolent Life Stressors

Means of violent victimization, witnessing violence, and nonviolent life stressors for each subgroup are displayed in Figure 5.

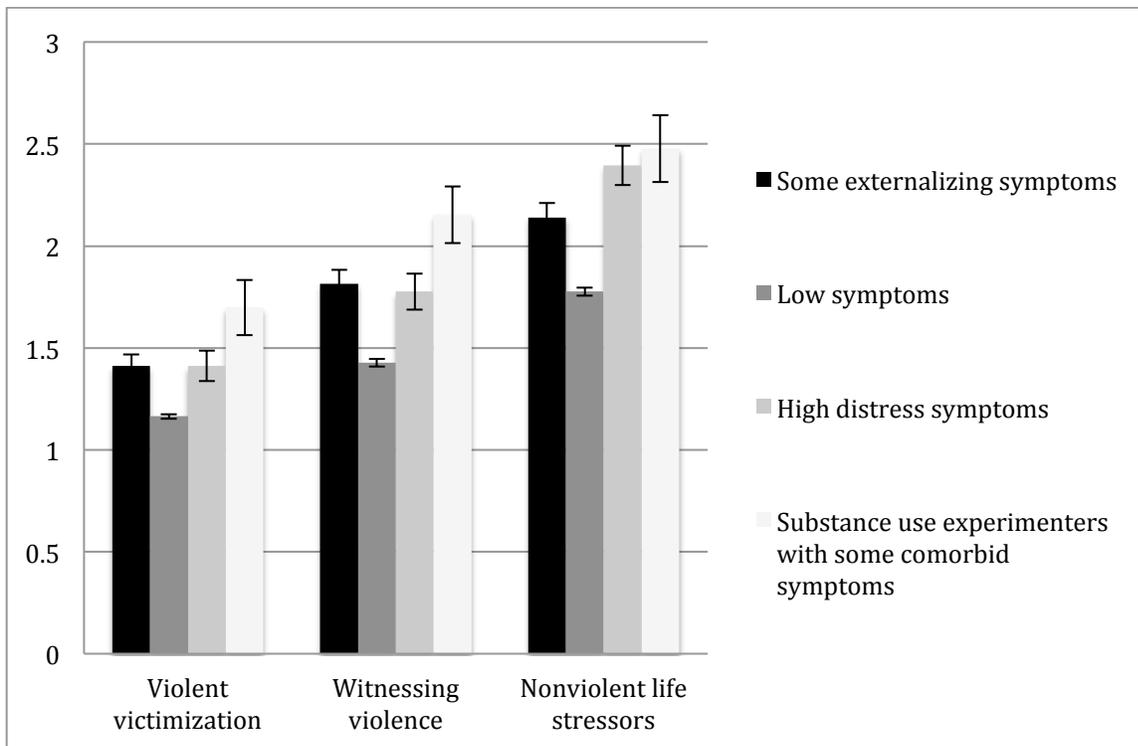


Figure 5. Mean of violent victimization, witnessing violence, and nonviolent life stressors for each subgroup with confidence intervals.

Violent Victimization

There were significant differences across subgroups in their reported frequency of violent victimization, $\chi^2(3) = 188.97, p < .001$. Adolescents in the Some Externalizing Symptoms, High Distress, and Substance Use Experimenters with Some Comorbid Symptoms subgroups reported more frequent violent victimization than those in the Low Symptoms subgroup ($d_s = .73, .82$ and $1.66, ps < .001$, respectively). Adolescents in the Some Externalizing Symptoms and High Distress subgroups reported less frequent violent victimization than those in the Substance Use Experimenters with Some Comorbid Symptoms subgroup ($d_s = -.93$ and $-.84, ps < .001$). However, there were no significant differences between the Some Externalizing Symptoms and High Distress subgroups ($d = -.09, p = .53$).

Witnessing Violence

There were similar differences across subgroups in their levels of witnessing violence, $\chi^2(3) = 276.95, p < .001$. Adolescents in the Some Externalizing Symptoms, High Distress, and Substance Use Experimenters with Some Comorbid Symptoms subgroups reported more frequent witnessing of violence than those in the Low Symptoms subgroup ($d = .81$ and $.76$ and $1.61, ps < .001$, respectively). Adolescents in the Some Externalizing Symptoms and High Distress subgroups reported less frequent witnessing of violence than those in the Substance Use Experimenters with Some Comorbid Symptoms subgroup ($d = -.80$ and $.85, ps < .001$). However, there were no significant differences between the Some Externalizing Symptoms and High Distress subgroups ($d = .05, p = .68$).

Nonviolent Life Stressors

A wald test indicated subgroup differences in levels of exposure to nonviolent life stressors, $\chi^2(3) = 285.80, p < .001$. Adolescents in the Some Externalizing Symptoms, High

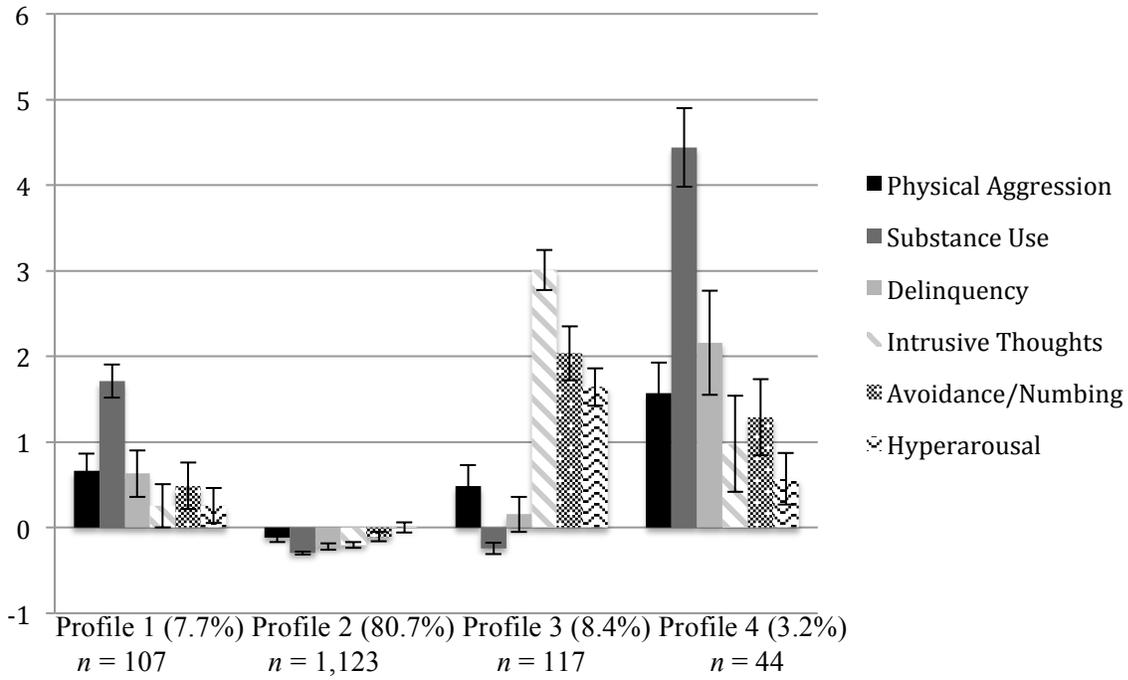
Distress, and Comorbid Symptoms subgroups reported more frequent nonviolent life stressors than those in the Low Symptoms subgroup ($d = .69$ and 1.18 and 1.38 , $ps < .001$, respectively). Adolescents in the Some Externalizing Symptoms subgroup were less likely to experience nonviolent life stressors than High Distress and Comorbid Symptoms subgroups ($ds = -.69$ and $-.48$, $ps < .001$, respectively). However, there were no significant differences between the High Distress and Comorbid Symptoms subgroups ($d = -.21$, $p = .27$).

Measurement Invariance Across Gender

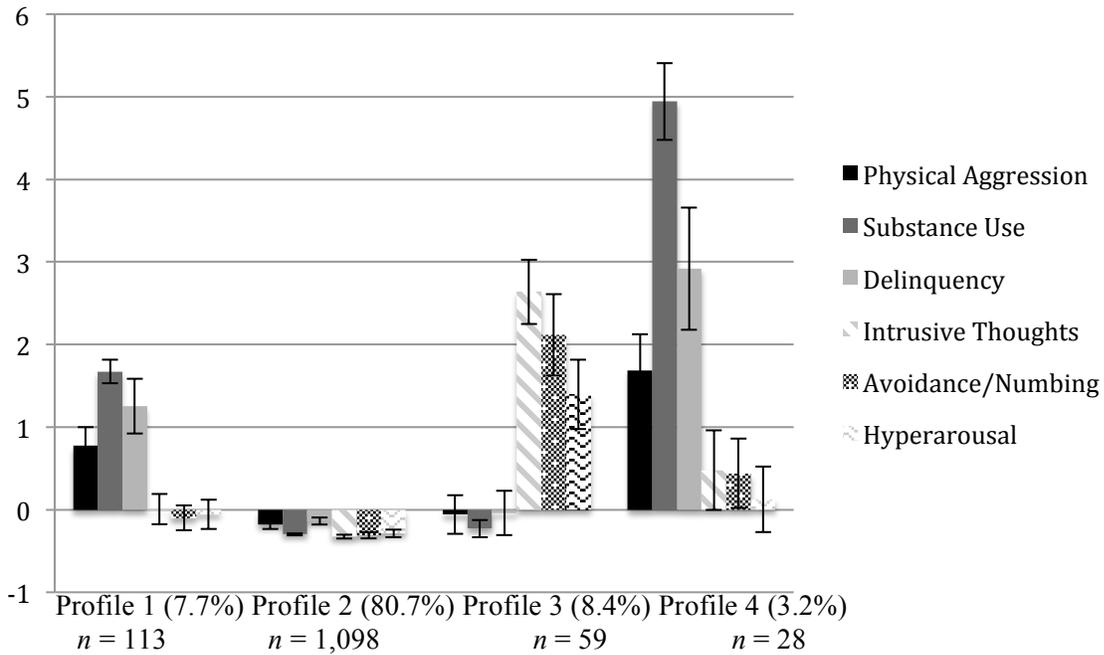
The LPAs were run separately by gender to determine whether a four-profile solution was supported for both boys and girls. Similar to the full sample models, the correct model probabilities suggested further examination of the non-diagonal, profile-invariant models. Comparison of fit statistics across solutions indicated that the LL, AIC, BIC, and aBIC continued to decrease within the non-diagonal, profile invariant models, without a clear “elbow.” The five-, six-, and seven-profile models for girls and six- and seven-profile models for boys were removed from further examination due to nonconvergence or low sample size (i.e., $\leq 1\%$). Although the VLMR-LRT and LMR-LRT were no longer significant within the four- and five-profile models for either boys and girls, the LL, AIC, BIC, aBIC continued to decrease and the BLRT remained significant across all non-diagonal, profile-invariant models. The four-profile solution was chosen for girls, which had excellent degree of fit among the profiles (i.e., the average posterior profile probabilities revealed $\geq .96$). The smallest profile had 3% of the sample. The smallest profile sizes for both the four- and five-profile solutions within the boys’ models had 2%. Examination of the average posterior profile probabilities revealed less separation between subgroups and homogeneity within the five-profile model as compared to the four-profile model

for boys (i.e., $< .90$ for at least one profile within the five-profile model). Therefore, the four-profile non-diagonal, profile-invariant solution was chosen for both boys and girls.

Inspection of sample means and z scores for the profiles revealed very similar patterns to the full sample four-profile model (see Figure 6). More specifically, for both boys and girls, there were three groups that could be described as “Some Externalizing Symptoms,” “Low Symptoms,” and “High Distress Symptoms.” However, the main difference across gender involved the smallest profile. For girls, this profile was very similar to the full sample, with higher substance use, moderately higher physical aggression and delinquency, and slightly to moderately higher symptoms of re-experiencing and avoidance compared to the overall sample mean (i.e., “Substance Use Experimenters with Some Comorbid Symptoms”). For boys, this profile was also characterized by higher substance use and moderately higher physical aggression and delinquency; however, in contrast to the full sample and girls’ models, distress symptoms were not substantively different from the means in the overall sample (i.e., “Substance Use Experimenters with Some *Externalizing* Comorbid Symptoms”).



(a) Four-profile solution with z scores among girls



(b) Four-profile solution with z scores among boys

Figure 6. *Four-profile solutions for (a) girls and (b) boys. Profile 1 = Some Externalizing Symptoms. Profile 2 = Low Symptoms. Profile 3 = High Distress Symptoms. Profile 4 for girls = Substance Use Experimenters with Some Comorbid Symptoms. Profile 4 for boys = Substance Use Experimenters with Some Externalizing Symptoms*

Gender Differences in Violent and Nonviolent Life Stressors

Overall, the examination of the relations between violent and nonviolent life stressors and the subgroups resulted in similar findings to the full sample model. That is, boys and girls in the Low Symptoms subgroup reported lower levels of violent victimization, witnessing violence, and nonviolent life stressors than the other three subgroups (*ds* ranged from -.3 to -2.16, *ps* < .001). Boys and girls in the Some Externalizing Symptoms and High Distress subgroups reported less frequent violent victimization and witnessing violence than those in the Substance Use Experimenters subgroups (*ds* ranged from -.65 to -1.36, *ps* < .05). There were also no significant differences in exposure to violence between the Some Externalizing Symptoms and High Distress subgroups for either boys and girls when examined separately (*ps* > .24). Similar to the full sample model, adolescents in the Some Externalizing Symptoms subgroup were less likely to experience nonviolent life stressors than High Distress and Substance Use Experimenters subgroups (*ds* ranged from -.43 to -.69, *ps* < .05). No significant differences across nonviolent life stressors were found between the High Distress and Substance Use Experimenters subgroups when examined separately for boys and girls (*ps* > .29).

Discussion

Early adolescence is a particularly salient time to study the relations between violent and nonviolent stressful life events and maladjustment. Although there is an increasing push to expand the conceptualization of traumatic stress to account for the wide-ranging effects of exposure to trauma, the majority of past research has focused on PTSD, internalizing, and externalizing symptoms separately (e.g., for reviews, see O'Donnell et al., 2017; Perfect et al., 2016). The lack of research in this area makes it difficult to understand how symptoms of psychopathology interact with one another. Moreover, there continues to be an ongoing debate

on whether symptomatology is better represented by latent dimensions or categorical subgroupings. The purpose of the current study was to test competing variable- and person-centered models of psychopathology to account for the relations between violent and nonviolent stressful life events and comorbid symptoms of psychopathology, including re-experiencing of traumatic events, symptoms of avoidance and emotional numbing, hyperarousal, physical aggression, delinquency, and substance use among a predominantly African American and Latinx sample of early adolescents. Gender differences were also examined but were considered exploratory.

First, exploratory and confirmatory factor analyses were conducted to examine four competing models of distress and externalizing symptoms. It was hypothesized that a bifactor model would fit best, which would account for the covariance among the items in terms of (a) a broad factor of psychopathology reflecting the overlap across all items, and (b) domain-specific factors reflecting the uniqueness among distress versus externalizing symptoms. Latent profiles were also examined to determine whether early adolescents could be reliably categorized into distinct subgroups based on their patterns of distress and externalizing symptoms. It was hypothesized that four profiles would emerge, with at least one subgroup of adolescents reporting comorbid distress and externalizing symptoms. The relations between distress and externalizing symptoms and violent and nonviolent life stressors were then examined using both variable- and person-centered approaches. Within these models, it was hypothesized that in both models, comorbidity would be associated with increased reported frequencies in community violence and nonviolent life stressors. Overall, the hypotheses were partially supported. Results indicated that distress and externalizing symptoms are indeed separate constructs yet co-occur among subgroups of individuals. Additionally, findings suggested that both approaches provided

important yet distinct information regarding the association between exposure to violent and nonviolent life stressors and distress and externalizing symptoms.

Measurement Models of Psychopathology

The first aim of the current study was to investigate the relations between trauma-related distress symptoms and externalizing symptoms using a variable-centered approach (i.e., confirmatory factor analyses). Advocates of this approach argue for the value of identifying distinct, underlying latent dimensions as opposed to the categorical approach used in the *DSM-5* that assume diagnoses are (a) present or absent and (b) independent entities. Furthermore, transdiagnostic researchers highlight the ability to examine comorbidity of constructs through the use of bifactor analyses (Eaton et al, 2015). There is robust evidence to assert that comorbidity is the rule rather than the exception, with increasing evidence that highlights the link between PTSD and other psychiatric disorders, including aggression (Thompson & Farrell, 2019), substance use (Allwood et al., 2014), and conduct problems (Ford, 2002). Although the bifactor model did indeed fit the data best based on fit statistics, findings did not provide strong evidence for a transdiagnostic construct of comorbid distress and externalizing symptoms. This is contradictory to Liu and colleagues' (2017) results, which showed evidence of a bifactor model that represented comorbid internalizing and externalizing symptoms among a sample of African American adolescents. Liu and colleagues examined items representing anxiety, depression, and somatic complaints, whereas the current study included trauma-related distress, including re-experiencing, and avoidance/emotional numbing, and hyperarousal. Current findings are consistent, however, with prior internalizing-externalizing transdiagnostic factor models that highlight the comorbidity *within* disorder categories (e.g., anxiety, depression, and PTSD;

substance use and antisocial personality disorder), yet continue to model distress and externalizing disorders as separate latent constructs (for a review, see Eaton et al., 2015).

Advocates of person-centered approaches argue that dimensional approaches, such as CFAs, do not account for the heterogeneity and intra-individual variability of functioning (Masyn, 2013). In contrast to variable-centered approaches, person-centered approaches examine subgroups of individuals exhibiting different patterns of psychopathology. Indeed, multiple studies have found subgroups of individuals with different patterns of psychopathology, including different patterns of distress symptoms (Ayer, Danielson et al., 2011; Guffanti et al., 2016) and comorbid internalizing and externalizing symptoms (Martinez-Torteya et al., 2017; Renner et al., 2018). Results from the current study echo these prior findings. That is, results revealed multiple subgroups of individuals including those with (a) low levels of symptoms, (b) those with externalizing symptoms, (c) distress symptoms, and (d) comorbid symptoms of distress and externalizing symptoms. Unlike prior studies that found similar levels of symptoms across constructs (e.g., Renner et al., 2018), the comorbid profile within the current study was characterized with much higher levels of substance use compared to the overall sample as well as compared to the levels of physical aggression, delinquency, and distress symptoms.

Examinations of substance use among individuals often reveal high frequencies of comorbid symptoms. For example, twin studies have supported the shared vulnerability hypothesis of trauma, PTSD, and alcohol dependence among adults (McLeod et al., 2001; Sartor et al., 2011). The current findings are consistent with the self-medication hypothesis (Khantzian & Albanese, 2008), which asserts that individuals use substances as a maladaptive way to cope with and avoid distressing feelings, such as re-experiencing of traumatic events. Indeed, meeting criteria for PTSD has been associated with increased odds of a substance use disorder (Bender,

Ferguson, Thompson, Komlo, & Pollio, 2010), particularly among African American adults (Huang et al., 2006) and Latinx youth (Chasser, 2016). Empirical work has also revealed bidirectional relations between distress and substance use among youth (Davis et al., 2019), providing further evidence for the self-medication hypothesis, but also evidence of experience-driven risk models that emphasize the cascading effects of risky behavior, such as greater exposure to potentially dangerous situations when under the influence of substances (Danielson et al., 2006). It is important to point out that within the current study, the comorbid group reported, on average, using illegal substances approximately 1 to 2 days in the preceding 30 days. Although this does not meet the threshold for a substance use disorder (APA, 2013), initiation and experimentation of illegal substances within middle school has been shown to increase youth's risk for later substance dependence (King & Chassin, 2007). Given the bidirectionality of PTSD and substance use, this group may be at increased risk for exposure to re-victimization and additional stressful life events, creating cyclical relations between trauma exposure, PTSD, and externalizing symptoms. Future work should investigate adolescents' motivations for substance use within this comorbid subgroup. For example, among undergraduates, trauma-related drinking to cope has been found to partially mediate the relations between PTSD symptoms and alcohol use disorder (Hawn, Bountress, Sheerin, Dick, & Amstadter, 2020).

Relations with Violent and Nonviolent Life Stressors

In addition to differences in explaining how distress and externalizing symptoms are related, the two approaches shed light on how the co-occurrence of these symptoms are differentially linked to violent (i.e., violent victimization and witnessing violence) and nonviolent life stressors (e.g., someone in your family was sick, didn't get enough to eat, live in a

crowded house or apartment). Within the variable-centered models, the Distress and Externalizing Symptoms factors were associated with increased exposure to both forms of violence and with nonviolent life stressors. This was similar to the findings in the LPAs, which revealed that compared to those who did not report emotional or behavioral concerns, early adolescents who reported distress or externalizing symptoms (or both) were more likely to report increased exposure to violent and nonviolent life stressors. These findings are consistent with study hypotheses and with prior work highlighting the deleterious effects of violence (Fowler et al., 2009) and other stressful life events (Liu et al., 2016; Liu et al., 2017).

The two approaches provide some consistency and some disagreement in the examination of the differing strengths in association between violent and nonviolent life stressors and psychopathology. Within the CFAs (i.e., the variable-centered approach), results showed that compared to the Distress Symptoms factor, the Externalizing Symptoms factor was more strongly associated with both types of violence exposure, but no differences were found between the two factors and nonviolent life stressors. This was somewhat consistent with the LPA models; however, it was more difficult to compare the two approaches, as the LPA model had two subgroups with externalizing symptoms. More specifically, adolescents in the Substance Use Experimenters with Some Comorbid Symptoms subgroup were more likely to report exposure to violence than adolescents in any of the other three subgroups. There were no differences found in the relations between exposure to violence and the High Distress versus Some Externalizing Symptoms subgroups. In contrast, adolescents in the High Distress subgroup were more likely to report nonviolent life stressors than those in the Some Externalizing subgroup, although unlike exposure to violence, adolescents in the High Distress and Substance Use Experimenters with Comorbid Symptoms subgroups were just as likely to report high frequencies of nonviolent life

stressors. Taken together, these results suggest that on average, exposure to violence is more strongly related to externalizing symptoms than to distress symptoms, but that exposure to violence and nonviolent life stressors are risk factors for comorbid symptoms, particularly substance use.

To account for the possibility of comorbid symptoms within the CFA models, the relations between violent and nonviolent life stressors and externalizing symptoms were examined as a function of adolescents' frequencies in distress symptoms. Results showed that there was a stronger relation between exposure to violent victimization and adolescent boys' reports of externalizing symptoms at higher levels of distress symptoms. In contrast, as boys' reports of distress increased, relations between witnessing violence and externalizing symptoms weakened. These findings may be indicative of boys' higher likelihood of experiencing emotional desensitization after witnessing increasing rates of violence, whereas they may be more likely to experience comorbid symptoms of distress and externalizing symptoms after experiencing repeated exposure to violent victimization.

According to the Pathologic Adaptation Model (Ng-Mak, Salzinger, Feldman, & Stueve, 2002), youth may show "pathologic adaptation" after repeated exposure to violence, which results in reduced symptoms of internalizing symptoms but increased engagement in risky behaviors, such as aggression. This has been supported empirically within two longitudinal studies (Mrug et al., 2016; Gaylord-Harden et al., 2017) that found that exposure to violence was linked to higher rates of internalizing symptoms up to a certain point of exposure, at which point their levels of internalizing symptoms decreased while their reports of violent behavior increased. Unlike prior work however, the current study examined violent victimization and witnessing violence separately and also examined aggression, delinquency, and substance use

rather than solely focusing on aggression or violence more broadly. The current results suggest that the relations between externalizing symptoms and exposure to witnessing violence versus victimization differ across boys' reported levels of distress symptoms. This is consistent with work conducted by Schwartz and Proctor (2000), who found that violent victimization was linked to aggression through emotion regulation difficulties (i.e., distress), whereas witnessing violence was linked to aggression through maladaptive social-cognitive processes. Future work should investigate whether similar mechanisms (i.e., emotion regulation versus social-cognitive processes) explain the results from the current study and why this occurred for boys but not for girls.

Gender Differences

The current results also revealed other gender differences. Girls reported lower levels of community violence and delinquency but higher levels of nonviolent life stressors, distress, and physical aggression. This is consistent with prior work that has shown boys to be at greater risk of community violence exposure (for a review, see Fowler et al., 2009) and girls to be at higher risk for PTSD symptoms (Alisic et al., 2014). Within the variable-centered approach, relations between exposure to violence and the Externalizing Symptoms factor were stronger among boys compared to girls. Similarly, boys who engage in high-risk behaviors (i.e., substance use and delinquent behaviors) have been shown to be at higher risk of physical assault and witnessing violence compared to girls (Begle et al., 2011).

There were also some gender differences within the LPA models. Within the full sample model, boys had higher odds of being in the Some Externalizing and Low Symptoms subgroups, whereas girls had higher odds of being in the High Distress and Substance Use Experimenters with Some Comorbid Symptoms subgroups. When the subgroups were modeled separately for

boys and girls, the smallest subgroup of boys consisted of high frequencies of substance use and moderate delinquency and physical aggression compared to the overall sample mean but did not include higher than average frequencies in distress as was found in the full sample and girls' subgroups. These results are consistent with prior work that has found comorbidities between substance dependency and PTSD to be higher among girls (Chasser, 2016); however, it is inconsistent with research linking distress symptoms and aggression among both boys and girls (Miller & Marsee, 2019; Thompson & Farrell, 2019).

It is somewhat perplexing that the CFA models revealed an interaction effect between distress and externalizing symptoms among boys but not for girls, whereas boys were less likely to exhibit comorbid symptoms of distress and externalizing symptoms within the LPA model. This could be indicative of the different modeling techniques. Although the CFA models accounted for loading differences between each of the indicators, the two factors represented broad constructs of distress and externalizing symptoms. In contrast, the LPAs revealed differences in symptom frequencies across individuals. It is possible that boys may be less likely to exhibit comorbid symptoms of distress and externalizing symptoms; however, the CFA results suggest that comorbid symptoms are more influential on exposure to violence among boys than girls.

Implication for Future Research and Clinical Practice

The findings highlight the importance of examining the role of nonviolent life stressors on adolescent development. Environmental and economic characteristics often associated with poverty, such as crowding, noise, and residential instability clearly play a role in adolescents' emotional and behavioral development. The current results are consistent with the stress process model (Foster & Brooks-Gunn, 2009) which emphasizes the transactional nature between

environmental factors such as living in an impoverished neighborhood, the accumulation of stressors, coping mechanisms, and adjustment. Prior work has shown the unique association between nonviolent life stressors and adolescent maladjustment, even after controlling for exposure to violence (Thompson, Coleman et al., 2019). Longitudinal analyses could shed light on how violent and nonviolent life stressors predict changes in distress and externalizing symptoms over time. Researchers should consider expanding their definition of trauma exposure to determine what mechanisms explain the similarities in maladjustment across violent and nonviolent stressors. Additional research could also examine whether perceptions of discrimination and racism play a role in explaining the relations between nonviolent stressors and maladjustment among adolescents of color.

Further examination of potential mediators and moderators of the current findings could also shed light on the mechanisms that explain when and why some youth are more likely to display distress and/or externalizing symptoms. For example, strong family support has been shown to be a protective factor against the development of externalizing behaviors after exposure to community violence (Ozer, Lavi, Douglas, & Wolf, 2017). At least two studies have examined patterns of psychopathology and prosocial behaviors (Martinez-Torteya et al., 2017; Yates & Grey, 2012). It is well established that not all adolescents who experience stressful life events will develop emotional or behavioral problems. Conversely, the presence of indicators of positive development does not necessarily imply the absence of risk factors or psychopathology (Phelps et al., 2007). Furthermore, the majority of traumatized children develop healthy competencies in at least one domain (Cicchetti, Rogosch, Lynch, & Holt, 1993), which can be a protective factor against future behavior problems. For example, the development of prosocial behaviors within adolescence is associated with decreased substance use (Coyle, Bramham,

Dundon, Moynihan, & Carr, 2016) and aggression, as well as increased academic achievement (Caprara, Kanacri, Zuffliano, Gerbino, & Pastorelli, 2015). Future studies could examine how protective factors buffer adolescents' risk of developing different patterns of distress and externalizing symptoms.

The current findings also highlight the importance of assessing for and targeting an array of symptomatology after exposure to violence and nonviolent life stressors. Much of the research investigating the effects of trauma exposure on psychopathology has focused primarily on anxiety, depression, and PTSD. The focus on PTSD symptomatology, for example, captures only one aspect of posttraumatic psychopathology among children and adolescents (Schmid, Petermann, & Fegert, 2013; van der Kolk et al., 2005). This results in trauma-informed interventions that fail to evaluate the association between exposure to traumatic events and adolescents' externalizing symptoms. Unfortunately, the findings are still mixed on whether current trauma-informed interventions are effective in reducing not only PTSD but also externalizing symptoms. For example, whereas some school-based interventions focused on past trauma exposure have been found to significantly reduce adolescents' frequencies in externalizing symptoms (e.g., Dorado et al., 2016; Kliwer et al., 2011; Tol et al., 2008), others have not (e.g., Powell & Thompson, 2016; Santiago et al., 2015; Stein et al., 2003). Similarly, the field of youth violence prevention research has often failed to consider the effects of violence within a trauma-informed or stress process paradigm. For example, a synthesis of systematic reviews and meta-analyses of school-based violence prevention programs excluded trauma-informed interventions that examined aggression as an outcome (Farrington, Gaffney, Losel, & Ttofi, 2017). These parallel efforts have led to separate strands of trauma-informed and violence intervention research, although some work has been conducted within the juvenile-justice system

to combine trauma-informed and violence intervention frameworks (Charak, Ford, Modrowski, Crosby, & Kerig, 2019).

The medical field is indeed moving towards a more trauma-informed, public health approach through the increased screening of Adverse Childhood Events (ACE; e.g., Kia-Keating et al., 2019). Critics of this push, however, point to the loss of information when using total ACE scores and the lack of evidence-based treatment that encompasses the range of symptoms adolescents may experience (Finkelhor, 2018). Findings from the current study underscore the fact that examining ACE scores alone would not tell us how youth are affected by trauma exposure or what kinds of symptoms they may be experiencing. Developmental trauma researchers have advocated for new interventions that target the pervasive developmental impairments of traumatized youth (van der Kolk et al., 2005). The current findings provide additional evidence for the importance of interventions aimed to reduce a range of symptoms post-trauma, including both distress and externalizing symptoms.

Limitations

Several limitations within the current study warrant discussion. The study's sample was predominantly African American (80%) middle school students living in neighborhoods with high levels of violence, with a smaller subset of youth identifying as Hispanic or Latinx (17%). Our findings may not generalize to other racial or ethnic groups. Nonetheless, focusing on youth of color living in communities with high violent rates is an important focus of research given their unique experiences, strengths, and overall underrepresentation in epidemiological studies using national surveys. Although ethnicity was controlled for in the CFAs and LPAs, subgroups were not examined separately for Hispanic or Latinx youth. Future work should investigate

differences in comorbid symptoms among more ethnically diverse samples to establish measurement invariance across ethnicity.

Additionally, the current study was cross-sectional. It remains unclear, for example, whether the CFAs and LPAs are measurement invariant across time or whether the relations change as youth enter middle to late adolescence. Prevalence rates of psychopathology increase during adolescence (Costello, Copeland, & Angold, 2011), and it may take longer for comorbidities to occur. Moreover, causation could not be explored. Prior work has shown reciprocal relations between violent and nonviolent life stressors and aggression (Farrell et al., 2020) as well as between PTSD and substance use (Davis et al., 2019). Future longitudinal work should investigate factors that explain transitions from one subgroup to another through the use of latent transition analyses. For example, although African American youth are less likely to drink alcohol than White adolescents, they continue to use alcohol after the age of 30 at much higher rates than other racial/ethnic groups (Chen & Jacobson, 2012). Therefore, identifying adolescents who move into the Some Externalizing Symptoms and Substance Use Experimenters subgroups could be particularly important in reducing adolescents' risk of poor outcomes.

The decision to include a subgroup with less than 3% of the overall sample may be considered controversial. Many researchers have abided by the “5% rule of thumb,” which suggests that subgroups any smaller than 5% are better explained as outliers. In contrast, Masyn (2013) argued that overall sample size (i.e., power), separation of profiles, and generalizability to other samples should be main considerations rather than the use of concrete guidelines on subgroup proportions. Others have advocated for the identification of substantively important, yet not highly prevalent, subgroups, such as identifying different subgroups of psychopathology (Dziak, Lanza, & Tan, 2014). Relatedly, Lubke (2010) argued against the use of a rules related to

sample size, noting that “sample size requirements depend on subgroup separation, model complexity, [and] response format” (p. 208) and that “analyses for very simple latent class models may be carried out probably with as few as 30 subjects, whereas other analyses require thousands of subjects” (p. 209). Given the low prevalence rates of psychopathology, particularly comorbidity rates, the smallest subgroup is arguably not merely a subgroup of outliers that should be collapsed into another subgroup, but is in fact a subgroup of adolescents experiencing more severe symptoms of psychopathology that is worth investigating. Within clinical practice, it is considered good practice to use measures that identify youth with clinically significant symptoms after they are above the 97th percentile (e.g., Child Behavior Checklist; Achenbach & Rescorla, 2001). Moreover, although adolescents’ scores within the Substance Use Experimenters with Comorbid Symptoms subgroup were much higher than the overall sample, they did not report unreasonably high levels of symptoms (e.g., use substances one to two times per month), providing further evidence that the subgroup does not represent extreme responding. However, model sensitivity to sampling fluctuation limits the generalizability of the model structure found for the given sample (Masyn, 2013), and a different number of profiles may have been chosen if the sample size had been smaller or larger.

The aim to compare the findings between the two approaches led to the decision to use manifest variables rather than investigate the constructs at the item level. As such, the variable-centered approach examined the relations between distress and externalizing symptoms more broadly. For example, within the regression analyses, this approach did not allow for the examination of differences in the relations between exposure to violence and hyperarousal versus aggression. Additionally, the CFAs regressed exposure to violence and nonviolent life stressors on the Distress and Externalizing factors to provide a similar approach as the LPAs. This allowed

for the examination of the relations between exposure to violent and nonviolent life stressors and distress symptoms, controlling for externalizing symptoms, and conversely, relations between exposure to violent and nonviolent life stressors and externalizing symptoms, controlling for distress symptoms. However, it did not allow for the examination of the unique contribution of exposure to violence, controlling for nonviolent life stressors, or the unique contribution of nonviolent life stressors, controlling for violence. A study conducted using data from the same larger project as the current study (Thompson, Coleman et al., 2019) found that there was a significant drop in the strength of the relations between violence exposure and distress after controlling for nonviolent life stressors. Although this was not examined in the current study, the findings provide additional information regarding the ways in which distress and externalizing symptoms interact that have not been examined in prior studies.

Finally, the constructs used in the current study were based on adolescents' self-report. Self-report is the most commonly used method to assess adolescents' emotional and behavioral health (Furlong, Sharkey, Felix, Tanigawa, & Green, 2010); however, it is not without its limitations. Studies have found low to moderate agreement across different methods of assessment (e.g., Youngstrom et al., 2000), which may reflect measurement bias or differences in the context of observation. Nonetheless, the use of only one approach, such as self-report, may not provide a complete picture of adolescents' experiences or behaviors. This may be particularly true for adolescents engaging in behaviors directly resulting from a stress response (e.g., flight, fight, freeze), which may lead to lower recall of those behaviors. Further work is needed to explore whether other approaches to measuring stressful life events, emotional distress, and externalizing symptoms, (e.g., parent- and teacher-report, disciplinary referrals) would lead to

similar findings.

Conclusion

The current findings underscore the notion that African American and Latinx youth exposed to violent and nonviolent life stressors experience a range of distressing and externalizing symptoms, including re-experiencing of events, avoidance and emotional numbing, hyperarousal, physical aggression, delinquency, and substance use. Compared to their White counterparts, youth of color are more likely to live in neighborhoods with concentrated disadvantage, lack access to youth services, and be exposed to violence (Zimmerman & Messner, 2013). These disproportionalities underscore the importance of examining the ways in which minority youth experience and are affected by stressful events. The current study also highlights the unique information obtained from the examination of variable- and person-centered approaches. It is arguably not a fair comparison to examine differences across CFAs and LPAs, as the CFAs assume linear incremental changes in each of the constructs as opposed to the LPAs, which compare differences across subgroups with varying levels of reported distress and externalizing symptoms. Indeed, advocates of person-centered approaches have cautioned against the juxtaposition of these two types of analyses as a “false dichotomy” and have instead described them as complementary investigations using bottom-up and top-down approaches (Masyn, 2013). Given the similar yet distinct findings from the current study, future researchers should take both approaches into consideration rather than conceptualize them as “either/or” choices.

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Vita

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