Exposure to Community Violence and the Trajectory of Internalizing and Externalizing Problems in a Sample of Low-Income Urban Youth

Jeremy Jay Taylor

DePaul University, jeremyjaytaylor@gmail.com

Recommended Citation
https://via.library.depaul.edu/csh_etd/62

This Dissertation is brought to you for free and open access by the College of Science and Health at Via Sapientiae. It has been accepted for inclusion in College of Science and Health Theses and Dissertations by an authorized administrator of Via Sapientiae. For more information, please contact wsulliv6@depaul.edu, c.mcclure@depaul.edu.
EXPOSURE TO COMMUNITY VIOLENCE AND THE TRAJECTORY OF
INTERNALIZING AND EXTERNALIZING PROBLEMS IN A SAMPLE OF LOW-INCOME
URBAN YOUTH

A Dissertation
Presented in
Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy

BY
JEREMY JAY TAYLOR, M.A.

JUNE, 2013

Department of Psychology
College of Science and Health
DePaul University
Chicago, Illinois
DISSEETATION COMMITTEE

Kathryn E. Grant, Ph.D.
Chairperson

Jocelyn Smith Carter, Ph.D.

Patrick J. Fowler, Ph.D.

Tracey Lewis-Elligan, Ph.D.

Traci Schlesinger, Ph.D.
ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my dissertation chair Kathry E. Grant and her entire research team, for allowing me to be a part of her team and for the immeasurable guidance and support she offered. I’d also like to thank my committee members Jocelyn Smith Carter, Patrick J. Fowler, Traci Schlesinger, and Tracey Lewis-Elligan for being part of my project and offering support along the way. Finally, I’d like to thank David Meyerson and Sireen Irsheid for their support with data management and manuscript editing.
VITA

The author was born in Spring Valley, Illinois, February 25, 1981. He graduated from St. Bede Academy in May of 1999, received his Bachelor of Arts degree from DePaul University in 2005, and a Master of Arts degree in Psychology from the same university in 2010. The author was admitted to the DePaul University Clinical Psychology doctoral program in the fall of 2007 and was awarded the DePaul Family and Community Services Traineeship in July, 2010. Additionally he will complete his clinical internship at the Kennedy Krieger Institute at Johns Hopkins Medical School in June, 2013, where he also completed Leadership Education in Neurodevelopmental and Related Disabilities (LEND) training.
TABLE OF CONTENTS

VITA ........................................................................................................................................iv

LIST OF TABLES ........................................................................................................................... vii

LIST OF FIGURES .......................................................................................................................... viii

INTRODUCTION ............................................................................................................................. 1

The Trajectory of Internalizing Problems ...................................................................................... 2

The Trajectory of Externalizing Problems ..................................................................................... 4

Stressful Life Events and Psychological Problems ........................................................................ 5

Exposure to Violence and Low-income Youth .............................................................................. 7

Rationale ........................................................................................................................................ 14

Research Questions and Hypotheses ............................................................................................ 17

Research Question 1 ....................................................................................................................... 17

Hypothesis 1 ................................................................................................................................... 18

Research Question 2 ....................................................................................................................... 18

Hypothesis 2 ................................................................................................................................... 18

Hypothesis 3 ................................................................................................................................... 18

METHODS ..................................................................................................................................... 19

Research Participants ..................................................................................................................... 19

Procedures ................................................................................................................................... 19

Measures ....................................................................................................................................... 21

Demographics ............................................................................................................................... 21
LIST OF TABLES

Table 1. Descriptive statistics of psychopathology across three years..................................................25
Table 2. Descriptive statistics of psychopathology over three years, by gender.................................25
Table 3. Descriptive statistics of psychopathology, by exposure to community violence group....26
Table 4. Linear growth model fit statistics and chi-square ($\chi^2$) differences of nested models ....36
Table 5. Model fit indices for the individual linear growth model for each type of outcome, conducted to compare trends in intercepts and slopes by reporter.................................................47
Table 6. Linear growth model fit statistics and chi-square ($\chi^2$) differences of nested of narrowband models ..........................................................................................................................51
Table 7. Intercepts and slopes of psychopathology, by exposure to community violence.............53
LIST OF FIGURES

Figure 1. The percentage of sample in the clinical range (T>59) for each outcome type, at each time point. Horizontal line represents the normative percentile for the clinical cut-off. .......................26

Figure 2. Trajectories of youth-reported internalizing problems and parent-reported externalizing problems. Difference between slopes was statistically significant. ........................................29

Figure 3. Trajectory of youth-reported internalizing problems by gender. Difference in slopes was not statistically significant .................................................................32

Figure 4. Trajectory of parent-reported externalizing problems by gender. Difference in slopes were not significant (p=.08). ..................................................................................................33

Figure 5. Trajectory of youth-reported internalizing problems by ECV. Difference in slopes was statistically significant, as were declines in symptoms for both groups.................................38

Figure 6. Trajectory of parent-reported externalizing problems by ECV. Difference in slopes was not statistically significant, nor were declines in symptoms ..........................................................39

Figure 7. Trajectory of youth-reported externalizing problems by ECV. Differences in slopes were statistically significant, as were declines in symptoms .................................................43

Figure 8. Trajectory of parent-reported internalizing problems, by ECV. Differences in slopes were not statistically significant, nor were changes in symptoms .........................................................45

Figure 9. Trajectory of symptoms by reporter and ECV .................................................................46

Figure 10. Trajectory of symptoms, by type and reporter. Slopes for both youth-reported outcomes were statistically significant. Neither parent-reported slope was significant ............48

Figure 11. Comparison of youth-report and parent-report intercepts (means) by symptom type and time point. Comparisons with asterisk (*) are statistically significant (p<.05) ...............49

Figure 12. Trajectory of narrowband subscales, by exposure to violence group and reporter.......52

Figure 13. Comparison of narrowband scale intercepts (means) by symptom type, reporter, and time point. Comparisons with asterisk (*) are statistically significant (p<.05) .........................54

Figure 14. Trajectories of youth-reported symptoms. Difference between intercepts and slopes were statistically significant ..................................................................................................59
CHAPTER I
INTRODUCTION

Research in the area of developmental psychopathology shows that the transition from childhood to adolescence is a period of increased risk for psychological problems (Cohen, 1992; Garber, Keiley, & Martin, 2002). In fact, a substantial increase in rates for both internalizing and externalizing symptoms occurs during this developmental period, including increases in depression and conduct problems/delinquency (Carlson & Grant, 2008; Compas, Ey, & Grant, 1993a; Overbeek, Vollebergh, Meeus, Engels, & Luijpers, 2001). For example, while the 12-month prevalence rate for major depression prior to adolescence (i.e. before the age of 12) is estimated to be below 2% (Costello, Swendsen, Rose, & Dierker, 2008), the rate balloons to approximately 12.4% by mid-adolescence (Kessler, Walters, & Forthofer, 1998), with youth often sustaining elevated rates of depression into young adulthood. This increase is even more dramatic for minority youth, with 20% experiencing onset of a depressive disorder during adolescence (Brendgen, Wanner, Morin, & Vitaro, 2005).

Increases in prevalence of psychopathology during adolescence are a consistent finding in extant research, as is the variability by gender that is observed in this trend (Carlson & Grant, 2008; Compas, Orosan, & Grant, 1993b; Ge, Lorenz, Conger, Elder, & Zelencik, 2001b; Grant et al., 2003; Twenge & Nolen-Hoeksema, 2002). Previous research in the area of developmental psychopathology indicates that both boys and girls are at increased risk for mental health problems as they transition from childhood into adolescence, but that the type of symptom increasing in risk tends to vary by gender. For example, the substantial increase in depressive symptoms during adolescence may be largely accounted for by increases in internalizing problems for girls (e.g. depression and anxiety related symptoms; Beitchman, Kruidenier, Inglis,
& Clegg, 1989; Carlson & Grant, 2008; M. C. Davis, Matthews, & Twamley, 1999; Lewinsohn, Clarke, Seeley, & Rohde, 1994), whereas increased risk for boys may primarily occur in the area of externalizing problems (e.g. aggression and delinquency).

Some researcher indicates that divergence in rates of internalizing and externalizing symptoms by gender is likely related to differences in how boys and girls perceive stressors that tend to emerge during adolescence (Jose & Ratcliffe, 2004). This would suggest that gender differences are a function of discrepancy in the types of stressors boys and girls perceive as most threatening and the specific types of psychological problems that those stressors precipitate. Alternatively, other research suggests that divergence in rates of symptoms between gender groups is more likely related to differences in the types of stressors to which boys and girls are more likely to be increasingly exposed during adolescence.

The Trajectory of Internalizing Problems

Longitudinal research of the developmental trajectory of internalizing symptoms shows that gender differences tend to be minimal prior to adolescence (e.g. between the ages of 8 and 12 years), with some studies even showing boys with modestly higher rates than girls (Twenge & Nolen-Hoeksema, 2002). However, boys and girls tend to diverge in rates of internalizing problems during adolescence (after the age of 12), with girls typically experiencing a sharp increase in emerging internalizing problems (Daughters et al., 2009; Twenge & Nolen-Hoeksema, 2002), while boys tend to maintain a more stable rate over time (Cole et al., 2002; Costello et al., 2008; Daughters et al., 2009; Twenge & Nolen-Hoeksema, 2002).

A meta-analysis of the trajectory of scores from the Children’s Depression Inventory (CDI) examined the results of analysis from 310 samples (ages 8 to 16 years; Twenge & Nolen-Hoeksema, 2002) and demonstrated diverging depression scores between boys and girls.
Specifically, this study indicated that girls tended to show substantial increase in trajectory of depressive symptoms around the age of 13 years old, compared to boys who’s scores tended to remain relatively stable across adolescence (Twenge & Nolen-Hoeksema, 2002). Additionally, 7 of 9 community (non-clinical) longitudinal studies (used at least 3 time points) from the decade prior to 2012 that examined youth between the ages of 12 and 20 showed that the trajectory of depression in the general adolescent population demonstrated an increasing rate of depression for adolescent girls (Brendgen et al., 2005; Cole et al., 2002; Costello et al., 2008; Ge, Conger, & Elder, 2001a; Letcher, Smart, Sanson, & Toumbourou, 2009; Repetto, Caldwell, & Zimmerman, 2004; Selfhout, Branje, & Meeus, 2009).

By contrast, only 1 of 9 reported a consistently increasing trajectory for boys (Cole et al., 2002), with that study also demonstrating a steep increase for girl participants (Cole et al., 2002). One study showed a “u-shaped” trajectory for both boys and girls, characterized by a brief decrease in symptoms followed by an increase over time (Garber et al., 2002), but it too demonstrated a sharper increase for girls, with that increase also beginning about 1 year earlier (12 years) than it did for boys (13 years; Garber et al., 2002). In the only of these studies with normative samples that showed similar trajectories for boys and girls between the ages of 12 and 20 (Wiesner & Kim, 2006), girls reported higher depression scores at intercept, indicating a higher rate of depressive symptoms overall.

Research also indicates that the gender differences that are clear in the depression literature are also reflected in other types of internalizing problems, such as anxiety and anxiety-related symptoms (Daughters et al., 2009; Lewis, Byrd, & Ollendick, 2012; McLaughlin & Hatzenbuehler, 2009a; McLaughlin, Hatzenbuehler, & Hilt, 2009). Although they are at relatively
lower risk for internalizing problems, there is evidence that boys are at higher risk for other psychopathology, such as externalizing problems (Wiesner & Kim, 2006).

The Trajectory of Externalizing Problems

Studies of the trajectory of externalizing problems (i.e. delinquency and aggression) in the general population of adolescence indicate that rates tend to increase from childhood to mid-adolescence, followed by a gradual decrease through late adolescence (Mason & Windle, 2002; Windle, 2000). However, additional research has found substantial variability in the trajectory of delinquency, especially related to gender (Wiesner & Kim, 2006). Wiesner and Kim (2006) found that adolescent boys and girls differ on both the magnitude of increase in trajectory, as well as the number of latent trajectories that tended to exist within gender groups, as boys demonstrated four latent trajectories (“high level peakers,” “medium level,” “low level,” and “rarely delinquents”) and girls had only three trajectories (“medium level,” “low level,” and “rarely delinquents”; Wiesner & Kim, 2006). Wiesner and Kim (2006) concluded that heterogeneity exists in the trajectories of psychopathology between boys and girls and that future research should explore this variability further.

The variability in trajectory that is observed between boys and girls seems to particularly emerge during adolescence (Twenge & Nolen-Hoeksema, 2002). Longitudinal research indicates that boys tend to have similar rates to girls for both internalizing and externalizing problems during childhood (Twenge & Nolen-Hoeksema, 2002), but become more likely to exhibit externalizing behaviors than internalizing symptoms as they move into adolescence (Nagin, 1999; Wiesner & Kim, 2006). In fact, longitudinal studies of the trajectory of delinquency in the decade prior to 2012 revealed that boys demonstrated an increase in externalizing problems
during adolescence in 7 of 12 studies in which they were included and typically reported more externalizing problems than girls (Wiesner, 2003; Wiesner & Kim, 2006).

By contrast, girls failed to demonstrate an overall significant increase in externalizing problems in the literature. Further, in 5 of 10 studies that they were longitudinally compared, boys showed a significantly stronger increase in externalizing problems over time than their female counterparts (e.g. Mason & Windle, 2002; Wiesner, 2003; Wiesner & Kim, 2006; Wiesner & Silbereisen, 2003). Significant increases were found for girls in 2 sub-samples (Haynie, 2003; Wiesner & Kim, 2006), indicating that girls that experience pubertal development earlier are at substantially increased risk for externalizing problems (Haynie, 2003), as are girls that lack maternal support (Wiesner & Kim, 2006). For boys, having externalizing peers is a particularly salient risk factor (T. Davis, Grant, Taylor, Carleton, & Masini, 2011; Gorman-Smith, Henry, & Tolan, 2004; Hill, Howell, Hawkins, & Battin-Pearson, 1999; P. H. Tolan & Henry, 1996; P. Tolan, Gorman-Smith, & Henry, 2003). For both boys and girls, exposure to community violence tends to have a particularly powerful impact on the trajectory of psychopathology (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a), generally being associated with more risk over time.

**Stressful Life Events and Psychological Problems**

Research in the area of developmental psychopathology indicates that increases in stressful life events, particularly those severe in nature, consistently predict increases in psychological problems over time (Ge, Conger, & Elder, 2001a; Grant et al., 2003; Grant, Compas, Thurm, McMahon, & Gipson, 2004a). In fact, a review of more than 60 prospective studies of the link between stressors and mental health problems in children and adolescents clearly established that stressful life events predict later mental health problems in young people (Grant, Katz, Thomas,
O'Koon, Meza, DiPasquale, et al., 2004b). Further, results from longitudinal studies suggest that increases in stressful life experiences likely explain the parallel increase in prevalence of psychopathology that is observed during this developmental period (Ge, Conger, & Elder, 2001a; Grant et al., 2003; Grant, Compas, Thurm, McMahon, & Gipson, 2004a).

As recommended by Grant and colleagues (2003), a stressor is defined as "environmental events or chronic conditions that objectively threaten the physical and/or psychological health and/or well-being of individuals of a particular age in a particular society" (Grant et al., 2003). The transition from childhood to adolescence is associated with an increase in various “environmental events or chronic conditions” that may threaten the well-being of youth, such as pubertal development (Ge, Conger, & Elder, 2001a), academic pressures (Grant et al., 2003; S. McMahon, Grant, Compas, Thurm, & Ey, 2003), social/peer pressures (Hankin, Mermelstein, & Roesch, 2007), and increased conflict with parents or family (Hankin et al., 2007; Larson & Richards, 1994; Scaramella, Conger, & Simons, 1999; Wolff & Ollendick, 2006).

Adolescence is also a period of increased independence. Spending more time outside of the home brings risk for exposure to new types of stressors in their neighborhood, such as exposure to community violence (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Stein et al., 2000). This is particularly true of youth that live in urban environments, as research indicates that at least 50% of urban youth are exposed to some type of community violence in their neighborhood (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Stein, Jaycox, Kataoka, & Rhodes, 2003).

While much of the ‘violence’ to which youth are commonly exposed in their neighborhoods tends to be mild and fairly psychologically benign in nature, low-income urban youth are disproportionately exposed to types of community violence that are more severe and
potentially traumatic to witness, such as seeing someone being shot, stabbed, robbed, or even killed (Gorman-Smith et al., 2004). Making matters worse for these youth, exposure to these severe types of stressors seems to be particularly difficult to escape, as extant research indicates that rate of exposure to community violence tends to remain constant over time in an adolescent’s life (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Fowler, Toro, Tompsett, & Baltes, 2009b; Gorman-Smith et al., 2004; Lambert, Ialongo, Boyd, & Cooley, 2005).

To date, the majority of developmental research on psychopathology in adolescent samples was conducted with middle-class and predominantly white youth (Grant et al., 2003; Grant, Katz, Thomas, O’Koon, Meza, DiPasquale, et al., 2004b; S. McMahon et al., 2003). Substantially fewer studies have focused explicitly on trajectories of psychological problems among low-income urban adolescents, a disproportionate amount of which tend to be minority youth (Grant, Katz, Thomas, O’Koon, Meza, DiPasquale, et al., 2004b). Understanding the developmental trajectories of psychopathology in this population is particularly important, given the heightened exposure to stressors that low-income urban youth experience and the increased risk for psychological problems that are associated (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Grant et al., 2003).

**Exposure to Violence and Low-income Youth**

As alluded to above, exposure to severe stressors like community violence are not equitably distributed across all adolescents (Grant et al., 2003). Low-income youth tend to be disproportionately exposed to these especially severe types of stressors (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Fowler, Toro, Tompsett, & Baltes, 2009b; Grant et al., 2003; Grant, Compas, Thurm, McMahon, & Gipson, 2004a; Grant, Katz, Thomas,
O'Koon, Meza, DiPasquale, et al., 2004b). In fact, while at least half of adolescents in the general population are exposed to community violence, as much as 96% of low-income urban youth face community violence in their neighborhood (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a).

The strong association between stressful life experiences and psychological symptoms, combined with their disproportionate level of exposure to especially severe stressful life events (e.g. exposure to community violence), leave low-income urban youth at particularly high risk for psychological problems (Grant et al., 2003; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). In fact, research with low-income urban youth indicates that these youth are up to four-times more likely to develop depressive symptoms (D'Imperio, Dubow, & Ippolito, 2000), compared to the general population. Moreover, the impact of these stressors on externalizing problems may be up to three-times greater in magnitude than that observed on depression (Buka, Stichick, Birdthistle, & Earls, 2001; Gorman-Smith et al., 2004; Lynch, 2003; P. Tolan et al., 2003).

Although exposure to violent events is typically conceptualized as an episodic stressor, community violence is so pervasive in many isolated inner-city neighborhoods that its impact may become characteristic of a chronic stressor for adolescents in these neighborhoods (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a). For low-income urban youth, these types of extreme stressors may be common occurrences in their environment. For example, a recent survey of low-income adolescents showed that approximately 36% of respondents reported having witnessed someone being shot in their neighborhood, and 28% reported having witnessed someone being stabbed, with boys being at particular risk of exposure (White, Bruce, Farrell, & Kliewer, 1998).
A review of extant research indicates that exposure to community violence may have a compounding detrimental impact on the lives of low-income urban youth, due to its dual status as both a severe episodic stressor (which is associated with specific types of distress, such as anxiety, sleep problems, and physiological hyperarousal; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a) and a chronic traumatic stressor (which is associated with emotional dysregulation, interpersonal problems, and conduct problems/delinquency; DSM-IV, 2000; Kerig, Ward, Vanderzee, & Arnzen Moeddel, 2009; Mclaughlin et al., 2009; Mclaughlin & Hatzenbuehler, 2009b; 2009a). Further, meta-analyses also show that community violence may combine with other stressors to exert multiplicative effects on youth (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a), by exacerbating the deleterious impact of other stressors when present. Given that exposure to community violence may exert both episodic and chronic influence, it is not surprising that research has also found that risk among low-income urban youth increases with age, since these youth become more likely to face additional exposure to violence in their community as they enter adolescence and they also may be facing the cumulative impact of the lifelong exposure to community violence that continues to build (Foster & Brooks-Gunn, 2009; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden, Cunningham, & Zelencik, 2011; Hardaway, McLoyd, & Wood, 2012; Stein et al., 2003).

Since the detrimental effect of powerful stressors like exposure to community violence is well-established (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Ge, Lorenz, Conger, Elder, & Zelencik, 2001b; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b), as is the disproportionate exposure of low-income urban youth to those stressors (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Grant et al., 2005; Voisin,
2007), it would follow that studies on the trajectory of psychopathology of low-income urban youth would show exorbitantly high rates of psychological problems over time. In particular, the potential confluence of typical adolescent stress increases, poverty-related stress, an increase in time spent independent of supervision and in the community, and the increased exposure to community violence that follows would result in skyrocketing risk that would produce clear, consistent, and robust findings in the literature. However, results of longitudinal research with this population have produced mixed and sometimes counterintuitive results (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b).

Grant and colleagues (2004) demonstrated how psychological problems might manifest in the lives of low-income adolescents in ways that are both similar and unique to research with the general population. Consistent with previous research, Grant and colleagues (2004) found cross-sectional evidence that high levels of stress faced by low-income urban youth translated into higher risk for psychological problems (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). However, the way those problems manifest themselves was somewhat unique, especially with respect to differences between genders (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). Specifically, they found that gender differences in self-report scores for depression were not as pronounced as is typically found in the general population. Grant and colleagues (2004) suggested that the range of depression scores might have been restricted, due to a hesitation to express emotional distress through depressive symptoms, as it may leave these youth vulnerable to victimization in their neighborhood. Since internalizing symptoms tend to be more prevalent in girls during adolescence, Grant and colleagues posited that the restricted range of depressive scores may serve to reduce or eliminate normative gender differences. These findings replicated previous research by Shaffer, Forehand, and Kotchick (2002), which also
found that the typical diverging rates of psychopathology between boys and girls was not found in their sample of low-income urban African American youth.

Unexpected findings were also observed for girl self-reported scores of aggression, as girls in this sample reported unexpectedly high scores for both aggression and delinquency, relative to their male counterparts (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). Extant literature in the general population consistently shows that boys engage in aggressive and delinquent behavior at a higher rate in adolescence than girls (Harachi et al., 2006). However, Grant and colleagues found that low-income urban girls reported higher scores for externalizing problems, although both boys and girls were higher than the general population (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). Grant and colleagues (2005) suggested that girls living in highly stressed low-income neighborhoods may not face the same social pressures as their more affluent counterparts to avoid externalizing behaviors, due to their need to protect themselves from victimization. Similar to internalizing problems, these findings suggested that the gender-specific trends of developing psychopathology were not as consistent with low-income urban youth as is seen in the general population (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b).

In addition to an apparent reduction in gender differences, Forehand, and Kotchick (2002) also found that boys and girls living in low-income urban neighborhoods reported decreasing scores for depression over time. These findings are consistent with results of other recent studies with low-income urban youth that found similar decreases in internalizing problems (Montague, Cavendish, Enders, & Dietz, 2011; Murphy, Laird, Monson, Sobol, & Leighton, 2000; Updegraff, Umaña-Taylor, McHale, Wheeler, & Perez-Brena, 2012), but represent a departure from findings with the general population, particularly for girls.
Counterintuitive findings also emerged from some research on exposure to community violence. While exposure to violence consistently predicts psychological problems in the extant literature (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Grant et al., 2005), meta-analysis indicates it has also been associated with decreases in depressive symptoms in some circumstances, especially for youth exposed to the highest levels of community violence (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a).

One possible explanation for these counterintuitive findings is that youth who face the highest rates of exposure to community violence may feel vulnerable and at risk for further victimization, causing them to avoid expressing emotional distress through traditional depressive symptoms or internalizing behaviors (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). These youth may see these symptoms as weak and leaving them increasingly in danger (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden et al., 2011; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b; Shaffer, Forehand, & Kotchick, 2002). Instead, these youth might choose to express their psychological distress through externalizing behaviors (e.g. delinquency and/or aggression), which may leave them less vulnerable (Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). In fact, externalizing behaviors, may make these youth feel stronger or more ‘in control’, and less fearful of their environment (Gaylord-Harden et al., 2011; Guerra, Huesmann, & Spindler, 2003; Ng-Mak, Salzinger, Feldman, & Stueve, 2002; Schwab-Stone et al., 1999; Shaffer et al., 2002). This possible explanation is discussed in previous research (Gaylord-Harden et al., 2011; Ng-Mak, Salzinger, Feldman, & Stueve, 2004) and was termed the “Pathological Adaptation” model. In this model, relative levels of exposure to community violence may exert a moderating effect on the trajectory of internalizing problems and externalizing problems in low-income urban youth
living in highly violent neighborhoods. In particular, youth exposed to extreme levels of community violence may avoid the expression of internalizing problems and opt instead to respond with externalizing behaviors in the context of urban poverty, as a means of reducing risk for victimization and gaining a sense of mastery over uncontrollable and threatening circumstances.

In the context of longitudinal research, low-income urban youth transitioning from childhood to adolescence may adapt to their increasingly threatening environment by becoming less willing to express internalizing problems over time and relatively more likely to respond with externalizing behaviors as they spend more time away from home and with their peers in the community. Showing that symptom trajectories may vary based on the level of exposure to community violence may help explain variability in findings found in samples of low-income urban adolescents, since variation in level of exposure to community violence would be expected between samples.

To date, few studies have explored the trajectories of both internalizing problems and externalizing problems in a single sample of low-income urban youth. Even fewer studies compared these types of psychopathology with each other, as a function of exposure to community violence, and using linear growth modeling. The current study will compare the trajectories of internalizing problems and externalizing problems with each other, using a linear growth model (Kline, 2005), while also testing the influence of exposure to community violence on these trajectories using nested models and multi-group analysis (Kline, 2005).

The current study sought to indirectly test the pathological adaptation model in a sample of low-income urban youth by testing the hypothesis that between-person differences in exposure to community violence will influence the trajectories of internalizing problems and externalizing
problems, such that youth that reported the highest rates of exposure to community violence would demonstrate a weaker trajectory (slope; rate of change) for internalizing problems if overall slope is positive, and a stronger (negative) trajectory if overall slope is negative, relative to youth that report comparatively less exposure to community violence. The current study also asserts that youth with higher rates of exposure to community violence will show a steeper (positive) trajectory of externalizing problems if overall slope is positive and a weaker (negative) trajectory if overall slope is negative, relative to youth with lower rates of reported exposure to community violence. The hypothesized effects suggest that variability within trajectories of internalizing problems and externalizing problems found in recent literature focus on low-income urban youth may be explained by differences in exposure to community violence and the moderating effect it may have on the link between time and psychopathology.

Given the commonly observed differences in both internalizing problems and externalizing problems by gender, multi-group analysis will also be used to test for differences in symptom trajectories between gender groups. If significant differences in outcome trajectories are found between boys and girls, the linear growth model will be analyzed separately for each, to determine if the moderating effect of exposure to community violence varied by gender.

**Rationale**

Risk for a range of psychological problems increases during adolescence (Garber et al., 2002). According to prior research, girls experience a particular increase in internalizing problems (Garber et al., 2002; Twenge & Nolen-Hoeksema, 2002), while boys are at greater risk for externalizing problems in this developmental period (Mason & Windle, 2002; Windle, 2000).
A prominent explanation for this increase in psychopathology is the increased exposure to stressors associated with adolescence, including: physiological change, increased conflict with peers and family, and increased exposure to community violence (Grant et al., 2003; 2005; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). Exposure to community violence is one of the most detrimental of the stressors that adolescents increasingly face (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a). It has been shown to be a powerful predictor of several major psychological problems, including both internalizing problems and externalizing problems (Mclaughlin et al., 2009; Mclaughlin & Hatzenbuehler, 2009a; 2009b; Repetti, Taylor, & Seeman, 2002). However, not all youth face equal rates of exposure to this powerful stressor (Grant et al., 2003; 2005; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b).

As a result of living in poor and isolated urban neighborhoods, low-income urban youth are exposed to extremely high rates of community violence, relative to the general population (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a). Disproportionate exposure, combined with the powerful effects of community violence, leave low-income urban youth at extremely high risk for psychological problems over time (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Grant et al., 2003; 2005; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). However, results of previous longitudinal studies that examined the trajectories of psychopathology with this population produced mixed and sometimes counterintuitive results.

Extant longitudinal research on the transition from childhood to adolescence with low-income samples produced findings that vary in a couple of ways, including overall direction of the trajectories of symptoms (Burstein, Ginsburg, Petras, & Ialongo, 2010; Grant, Katz, Thomas,
O'Koon, Meza, DiPasquale, et al., 2004b; Sanchez, Lambert, & Ialongo, 2011; 2012; Twenge & Nolen-Hoeksema, 2002), emergence of gender differences in symptom rates and trajectories (i.e. some studies indicate gender differences less pronounced for low-income urban youth), and magnitude of the impact of environmental stressors on psychopathology.

One possible explanation for the emergence of these counterintuitive findings is that rates of particular types of stressors, especially those that are prevalent in the lives of low-income urban youth (such as exposure to community violence), may impact the trajectory of psychopathology uniquely (Gaylord-Harden et al., 2011; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b). Threat associated with severe and chronic community violence may be so overwhelming that youth are forced to express distress in a manner that helps them manage ongoing exposure to violence, a process represented by the *pathological adaptation model* (Gaylord-Harden et al., 2011; Ng-Mak et al., 2004). For youth living in highly stressed and violent neighborhoods, exposure to community violence may be more predictive of externalizing problems than internalizing problems. These youth may adapt their expression of psychological distress/response to environmental stressors as a means of reducing risk for victimization and gaining a sense of mastery over uncontrollable and threatening circumstances (Gaylord-Harden et al., 2011; Ng-Mak et al., 2004). Prior research by Grant and colleagues (2005) asserted that a tendency to avoid expressions of depression and exhibit delinquent behavior instead may explain both unexpectedly low levels of depression and unexpectedly higher rates of delinquency among low-income urban girls, findings that are also reflected in other recent studies of low-income urban youth (Gaylord-Harden et al., 2011; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b; Twenge & Nolen-Hoeksema, 2002).
The current study tested a pathological adaptation model, by testing the hypothesis that exposure to community violence served as a moderator of the trajectories of internalizing problems and externalizing problems. Specifically, linear growth modeling was used to determine if rates of exposure to community violence changed the trajectory (slope; rate of change) of psychopathology. To allow for the testing of between-group differences in the linear growth model, the hypothesized moderator variable (exposure to community violence; ECV) was dichotomized, using a median split. A nested-model multi-group analysis was then used to test for equality between moderator groups, based on both intercept (baseline) and slope (trajectory) of internalizing problems and externalizing problems, holding other parameters (e.g. variance of observed variables) constant between groups when appropriate (when model fit improved) to create the most parsimonious “unconstrained” model (referring to models where latent intercepts and slopes were unconstrained).

Since gender was associated with both of the target outcomes in previous literature, the linear growth model was also tested for differences between gender groups in preliminary analyses. If significant differences were found between boys and girls in the trajectories of either outcome, the linear growth model would be re-examined for boys and girls separately, to determine if the results of multi-group analysis varied by gender.

**Research Questions and Hypotheses**

**Research Question 1**

Do trajectories of internalizing problems and externalizing problems in the current sample provide evidence for the occurrence of pathological adaptation, i.e. showing that symptoms of internalizing problems decline as low-income youth enter adolescence, while symptoms of externalizing problems increase during this developmental period?
Hypothesis 1. The trajectory (slope; rate of change) of internalizing problems and externalizing problems will significantly differ from each other over time, such that report of internalizing problems will decline (negative slope) and report of externalizing problems will increase (positive slope) over time.

Research Question 2

Do low-income urban youth that experience high levels of exposure to violence, relative to their context, have significantly different trajectories of psychopathology than low-income urban youth that experience relatively lower exposure to community violence? If so, what is the nature of that difference?

Hypothesis 2. Constraining the slope of internalizing problems to be equal between low-income youth in the high and low exposure to violence groups will result in a significantly poorer-fitting model than a freely constrained model. Differences in slope will indicate that low-income urban youth that are more exposed to community violence will be less likely to report internalizing problems as they enter adolescence, relative to their less exposed counterparts.

Hypothesis 3. Constraining the slope of externalizing problems to be equal between low-income youth in the high and low exposure to violence groups will result in a significantly poorer-fitting model than a freely constrained model. Differences in slope will indicate that low-income urban youth that are more exposed to community violence will be more likely to report externalizing problems as they enter adolescence, relative to their less exposed counterparts.
CHAPTER II

METHODS

The current study’s methods of data collection and analysis are described subsequently. The following description of methods are that of the longitudinal study from which the data for the current project was obtained. The current author was part of the research team that collected this data, but was not the primary investigator. The data used for the current analysis was archival data from the DePaul University Stress and Coping Project, for which Dr. Kathryn E. Grant was the primary investigator.

Research Participants

Participants in the present study are part of a three-year subset of a larger five-year longitudinal study examining the impact of stressful life experiences on low-income urban youth. Three urban public schools were selected for participation based on high percentages of low-income students. Students were classified as low-income based on eligibility for free/reduced school lunch programs (Chicago Public Schools Office of Accountability, 1995).

Participants included in the present analyses completed measures at three points in time (approximately 1 year apart). This sample began as 392 adolescents (mean age = 13.06; 64% female), although some attrition was observed over time. The sample’s attrition was examined prior to analysis to determine the potential impact it may have on hypothesis testing.

Procedures

The schools that agreed to participate in the present study were recruited by a standard procedure. Introductory phone calls were made to school principals, followed by letters describing the goals and procedures of the study. Once schools agreed to participate in the study, meetings were held with students and classroom teachers to describe the project, coordinate dates
for the data collection, explain confidentiality, answer questions, and distribute parent consent forms. Consent forms also were mailed directly to some parents (at recommendation of school administrators); participation rates did not vary across the two distribution methods. Parent consent forms described the larger project, the voluntary nature of participation, and the confidentiality of the data collected.

Parents were invited to contact the first author and/or school administrators if they had questions and/or wished to see copies of the measures. Participants were given $25 in gift card incentives for completing the measures.

School administrators were given the option of selecting “active” or “passive” consent procedures. Administrators for all three schools that participated in the present study selected passive consent. Thus, parents were advised that their children would be invited to participate in the project if they did not return the consent form. Students whose parents did not return consent forms were given (a) a description of the purpose of the study, (b) the assurance that participation was completely voluntary and refusal to participate would not result in penalties or withdrawal of services, (c) the assurance that their answers would remain confidential, and (d) the option to answer only those questions they wished to answer. Parents were phoned prior to interviews to ensure consent was informed and established. Students who agreed to participate in the study completed assent forms prior to data collection.

Surveys were administered in school classrooms during regular class time at the convenience of participating teachers. Surveys were administered by clinical psychology graduate students, and efforts were made to ensure that at least one research assistant assigned to each classroom identified as a member of the predominant racial/ethnic group represented in that classroom.
Questionnaires were read aloud by research assistants to ensure that students with varying reading levels kept pace with the administration, and students were given assistance if they had difficulty understanding any of the questions. Students recorded answers on their own copies of the survey, which we then collected at the end of the data collection session.

Measures

The measures section describes the characteristics of the measurement instruments used for each construct of the current study. Each measure’s purpose, characteristics (e.g. number of items and when it was developed), and validity information are presented subsequently.

Demographics. Demographic information was first collected from each participant during the paper and pencil portion of the data collection. Participants were asked to indicate the racial or ethnic group with which they most strongly identified, by choosing from a list read aloud by researchers. In addition, subjects were asked to record their age, gender, grade, and immigration status in the same fashion. Current researchers (DePaul University Stress and Coping Project) developed the demographic questionnaire used to collect this information.

Exposure to Violence. Lifetime exposure to violence was assessed using the Exposure to Violence Survey--Screening Version (Martinez & Richters, 1993), a 58-item true or false questionnaire developed on fifth and sixth grade low-income urban African American youth. The measure asks respondents to report whether they have witnessed or experienced 27 types of violence/ crime including gang violence, drug trafficking, burglary, police arrests, assaults, physical threats, sexual assaults, weapon carrying, firearm use, and intentional injuries such as stabbings, gunshots, suicides, and murders. Richters and Martinez (1990) report good test-retest reliability for the measure ($r = .90$) and, in the present sample, internal consistency reliability was good ($\alpha = .89$).
Psychopathology. Based on empirical and theoretical work suggesting that adolescent internalizing symptoms may be more validly assessed via self-report and externalizing symptoms more validly assessed using parent-report (Achenbach & Dumenci, 2001), the Youth Self-Report (YSR) and Children’s Behavioral Checklist (CBCL) were used to assess internalizing and externalizing symptoms respectively. The YSR includes 119 behavior items that adolescents rated on a three-point scale as “not true”, “somewhat or sometimes true”, or “very true or often true” of themselves during the past six months (Youth Self-Report; YSR; Achenbach, 1991; 2001). Sample items from the internalizing problems broadband scale (31 items) include: “I feel nervous or tense”, “I feel worthless or inferior”, and “I cry a lot.”

The CBCL includes 113 behavior items which parents rate on a 3-point scale analogous to the YSR. Thirty-three of these items make up the externalizing broadband scale. Sample externalizing items include “My child gets in many fights”, “My child argues a lot”, and “My child destroys his/her own things.” Normative data for the Child Behavior Checklist – Parent and Youth versions are based on a nationally representative sample of non-referred children and adolescents.

In the present sample, internal consistency for the YSR and CBCL are adequate (α = .79; α = .91). Normative data for the YSR are based on a nationally representative community sample of children and adolescents with separate norms for boys and for girls (Achenbach & Dumenci, 2001). Reliability and validity are well established for the YSR and CBCL (Achenbach & Dumenci, 2001).

Analysis

Analysis for the proposed research was planned in four stages. First, descriptive statistics were examined for the key study variables, including internalizing problems, externalizing
problems, and exposure to community violence. Descriptive statistics were examined in the sample as a whole, as well as between exposure to community violence and gender groups.

The second stage of analysis tested whether rate of change was significantly different between internalizing problems and externalizing problems among low-income urban youth. Specifically, linear growth modeling (an extension of Structural equation modeling [SEM]) was used to estimate the intercept and slope of each outcome (Kline, 2005; Rosseel, 2012). Overall fit of all linear growth models was tested using three common fit statistics from the SEM literature, Chi-Square Fit Statistic ($\chi^2$), Root Mean Error Square of Approximation (RMSEA), and Confirmatory Fit Index (CFI).

Among the three indices that measure model fit, two have common thresholds that indicate a strong fitting model (RMSEA and CFI; Kline, 2005; Rosseel, 2012). Chi-square statistic is the most common measure of model fit, but has no common standard threshold for strong fit, as its value is relative to the number of parameters and sample size used in the analysis (Kline, 2005; Rosseel, 2012). However, smaller chi-square values generally indicate a stronger fit (ideally with a $p$-value less than .05), when comparing equivalent or nested models. Conversely, RMSEA and CFI both have commonly accepted thresholds for strong model fit (Kline, 2005; Rosseel, 2012). Possible values for the RMSEA range from 0 to 1.0, with smaller values indicating stronger fit and values below .08 generally indicating strong fit. Possible values for the CFI also range from 0 to 1.0, but with larger values indicating strong fit and values above .90 generally indicating strong fit (Hu & Bentler, 1999; Kline, 2005; Rosseel, 2012; Vandenberg & Grelle, 2009).

A nested-model was used to test for equivalence of slopes between symptom types. If constraining the slope (rate of change) of internalizing problems and externalizing problems to be equal significantly worsened model fit (Kline, 2005; Rosseel, 2012), as tested by a chi-square
difference test ($\Delta \chi^2$), then the symptom types were declared to have differing trajectories (slope; rate of change).

The third stage of analysis tested the hypothesis that exposure to community violence would moderate the trajectory of psychopathology. Moderation was determined to be present when low-income urban youth from the high exposure to community violence group significantly differed in intercept and slope from their relatively less exposed low-income urban counterparts, as tested via chi-square difference tests of nested-models (i.e. multigroup analysis) that constrained each to be equal respectively. To allow for the testing of between-group differences in the linear growth models, the hypothesized moderator variable (exposure to community violence) was dichotomized, using a median split.

Because of well-established differences between the proposed study outcome variables and gender, the moderating effects of gender were also tested. If significant moderating effects for gender on trajectory (slope; rate of change) were found, hypothesis testing would also occur separately by gender to determine if the results varied between boys and girls. The fourth stage of analyses examined various supplementary analyses to best understand the data and to clarify the interpretation of the primary results.
CHAPTER III

RESULTS

Results are presented in four stages. First, descriptive statistics are presented in Tables 1 through 3 and in Figure 1. Tables 1 through 3 present sample size, mean, and standard deviation for the entire sample, as well as subgroups (gender; exposure to community violence groups).

Figure 1 reports youth-reported internalizing problem and parent-reported externalizing problem t-scores, comparing the percentage of the current sample that reported clinically significant levels of psychological problems to normative data.

Table 1. Descriptive statistics of psychopathology across three years.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>YSR internalizing symptoms -- wave 1</td>
<td>339</td>
<td>14.27</td>
<td>9.453</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 2</td>
<td>257</td>
<td>9.85</td>
<td>7.626</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 3</td>
<td>183</td>
<td>7.29</td>
<td>6.838</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 1</td>
<td>233</td>
<td>7.63</td>
<td>8.146</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 2</td>
<td>189</td>
<td>5.64</td>
<td>6.229</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 3</td>
<td>82</td>
<td>5.01</td>
<td>5.804</td>
</tr>
</tbody>
</table>

Table 2. Descriptive statistics of psychopathology over three years, by gender.

<table>
<thead>
<tr>
<th></th>
<th>Girls</th>
<th></th>
<th>Boys</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 1</td>
<td>220</td>
<td>15.64**</td>
<td>9.62</td>
<td>119</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 2</td>
<td>175</td>
<td>10.99**</td>
<td>8.09</td>
<td>82</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 3</td>
<td>131</td>
<td>8.10**</td>
<td>7.44</td>
<td>52</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 1</td>
<td>154</td>
<td>7.96</td>
<td>8.73</td>
<td>79</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 2</td>
<td>132</td>
<td>6.12</td>
<td>6.70</td>
<td>57</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 3</td>
<td>65</td>
<td>4.93</td>
<td>5.61</td>
<td>17</td>
</tr>
</tbody>
</table>

** = p<.001; * = p<.05
Table 3. Descriptive statistics of psychopathology, by exposure to community violence group.

<table>
<thead>
<tr>
<th>Exposure to Community Violence Group</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 1</td>
<td>162</td>
<td>12.53**</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 2</td>
<td>121</td>
<td>9.29</td>
</tr>
<tr>
<td>YSR internalizing symptoms -- wave 3</td>
<td>91</td>
<td>6.90</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 1</td>
<td>115</td>
<td>5.40**</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 2</td>
<td>98</td>
<td>4.34**</td>
</tr>
<tr>
<td>CBCL externalizing symptoms -- wave 3</td>
<td>44</td>
<td>4.35*</td>
</tr>
</tbody>
</table>

** = p<.001; * = p<.05

Figure 1. The percentage of sample in the clinical range (T>59) for each outcome type, at each time point. Horizontal line represents the normative percentile for the clinical cut-off.
The second stage of analysis tested hypothesis one with a linear growth model of psychological problems, comparing rate of change (slope; rate of change) in youth-reported internalizing problems and parent-reported externalizing problems over time. In preparation for testing hypotheses two and three, the linear growth models for each type of psychopathology were tested for invariance of slopes between boys and girls. If variability in slopes existed between gender groups, analysis of the effects of exposure to violence on the rate of change of psychopathology would be tested separately for boys and girls.

In the third stage of analysis, a linear growth model was used to test hypotheses two and three, by comparing an unconstrained growth model to a series of nested models that constrained parameters to be equal between youth in the high exposure to community violence (ECV) group (high) and low ECV group (low). In the fourth stage of analyses, several supplementary analyses were conducted and are presented subsequently.

Comparing changes in psychopathology by type

Hypothesis one predicted that the slopes of youth-reported internalizing problems and parent-reported externalizing problems would significantly differ from each other over time. To test hypothesis one, a linear growth model that simultaneously estimated both types of psychopathology was estimated with the entire sample (Model 1), and was compared to a nested model that constrained the slopes of youth-reported internalizing problems and parent-reported externalizing problems to be equal (Model 1a). If the constrained model had a significantly higher chi-square fit statistic (p<.05; indicating a poorer-fitting model), compared to the unconstrained model, the slopes were accepted as significantly different between the two types of outcomes (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Kline, 2005; L. K. Muthén & Muthén, 2010). Because the two types of outcomes are on slightly different scales
(different number of items), it did not make conceptual sense to test the equality of intercepts in this model. To estimate the growth model, a robust maximum likelihood estimator was used (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden et al., 2011; L. K. Muthén & Muthén, 2010).

**Model 1. Unconstrained Linear Growth Model** (linear growth model of youth-reported internalizing problems and parent-reported externalizing problems, with the intercepts and slopes freely estimated)\(^1\).

**Model 1a. Constrained Linear Growth Model** (constrained slopes of youth-reported internalizing problems and parent-reported externalizing problems to be equal).

Results of the analysis of Model 1 indicated that a linear growth model of youth-reported internalizing problems and parent-reported externalizing problems fit the data well \(\chi^2=19.68, \text{df}=17, p=.29, \text{CFI}=.92, \text{RMSEA}=.06\). Results of analysis that test the difference in slopes by comparing chi-square fit of the unconstrained and constrained models showed that the fit of Model 1a (constrained slopes of the two types of psychopathology to be equal) was significantly poorer than that of Model 1 \(\Delta\chi^2 [1]=16.89, p<.001\). Significant differences in model fit between Model 1 and Model 1a indicated that youth-reported internalizing problems \((\beta=-3.95, \text{SE}=.91, p<.001)\) and parent-reported externalizing problems \((\beta=-1.10, \text{SE}=.43, p=.01)\) changed at different rates over the course of the study. Figure 2 shows that youth-reported internalizing problems declined more sharply than parent-reported externalizing problems.

---

\(^1\) Final (best fitting) model constrained the variance of all observed outcomes to be equal over time, and constrained the latent intercept and slope to be uncorrelated (orthogonal).
Figure 2. Trajectories of youth-reported internalizing problems and parent-reported externalizing problems. Difference between slopes was statistically significant.
Testing for Invariance by Gender

To determine whether the rate of change in psychological problems was invariant by gender, the intercepts and slopes of youth-reported internalizing problems and parent-reported externalizing problems, respectively, were constrained to be equal between boys and girls. In all, 6 models were estimated (2 freely estimated models and four nested models):

Model 2. Gender YSR Internalizing Unconstrained (unconstrained linear growth model of youth-reported internalizing problems, with participants grouped by gender).²

Model 2a. Gender YSR Internalizing Intercepts (constrained intercepts of youth-reported internalizing problems to be equal between boys and girls).

Model 2b. Gender YSR Internalizing Slopes (constrained slopes of youth-reported internalizing problems to be equal between boys and girls).

Model 3. Gender CBCL Externalizing Unconstrained (unconstrained linear growth model of parent-reported externalizing problems, with participants grouped by gender).³

Model 3a. Gender CBCL Externalizing Intercepts (constrained intercepts of parent-reported externalizing problems to be equal between boys and girls).

Model 3b. Gender CBCL Externalizing Slopes (constrained slopes of parent-reported externalizing problems to be equal between boys and girls).

---

² Final (best fitting) model constrained the variance of internalizing to be equal over time (and across groups), and constrained the variance of the latent intercept and slope to be equal across gender groups.

³ Final (best fitting) model constrained the variance of the latent intercept and slope to be zero for both gender groups.
For each nested model (a and b models), a test of whether the respective chi-square fit was significantly poorer (i.e. higher value) than the chi-square fit of the unconstrained model is presented (Table 4).

Results indicated that the unconstrained linear growth model of youth-reported internalizing problems was a strong fit for the data ($\chi^2=10.66, df =9, p=.31, CFI=.98, RMSEA=.05$), when gender was specified in the model (Table 4, Model 2; Figure 3). With respect to the test of invariance by gender for youth-reported internalizing problems, results indicated that the intercepts of the linear growth model significantly varied by gender, as constraining intercepts to be equal (Model 2a) resulted in a significantly worse fit than the unconstrained model $\Delta \chi^2 [1]=5.33, p=.04$. Figure 3 demonstrates the observed differences in intercept, as girls reported more internalizing problems than boys at baseline. With regard to change over time (Model 2b), no differences by gender were found in slope for youth-reported internalizing problems ($\Delta \chi^2 [1]=.25, p=.62$), as both boys ($\beta=-3.32, SE=.64, p<.001$) and girls ($\beta=-3.69, SE=.39, p<.001$) showed a significant and statistically equivalent decline (to each other) in youth-reported internalizing problems over time.

---

4 Since time was centered at wave one during analysis, comparisons of “intercept” in all linear growth models can be conceptualized as a comparison of symptoms at baseline.
Figure 3. Trajectory of youth-reported internalizing problems by gender. Difference in slopes was not statistically significant.

When gender was specified in the linear growth model for parent-reported externalizing problems (Table 4, Model 3; Figure 4), this model was also a strong fit to the data ($\chi^2=7.85$, df =6, p<.001, CFI=.94, RMSEA=.11). Constraining intercepts to be equal between boys and girls (Model 3a) indicated that significant differences existed at baseline for externalizing problems ($\Delta\chi^2 [1]=14.21$, p<.001). Figure 4 shows that girls had more parent-reported externalizing
problems at baseline, compared to boys. Results from Model 3b indicated that the difference in the rate of change between boys and girls for parent-reported externalizing problems was not significant ($\Delta \chi^2 [1]=3.03$, p=.08). Since differences in slope of psychopathology by gender were not found, further analyses were conducted with the entire sample, instead of tested separately by gender.

Figure 4. Trajectory of parent-reported externalizing problems by gender. Difference in slopes were not significant (p=.08).
Exposure to community violence as a moderator of change in psychopathology

Hypotheses two and three tested whether the intercepts and slopes of psychological problems significantly varied between youth in the low and high groups. To compare groups, linear growth models were estimated for youth-reported internalizing problems (Models 4-4b) and parent-reported externalizing problems (Models 5-5b), with youth separated into two groups according to whether they were above (high) or below (low) the median score for youth-reported ECV. Estimates of intercept and slope were generated separately for each group, to allow for comparison.

Figures 5 and 6 show the trajectories of youth-reported internalizing and parent-reported externalizing problems over time, respectively, with youth separated into low and high ECV groups. In all, four nested models (two for each outcome) were compared to two unconstrained growth model, including:

Model 4. Exposure to Community Violence YSR Internalizing Unconstrained (linear growth model of youth-reported internalizing problems, with participants grouped by ECV, and intercept and slope freely estimated).

Model 4a. Exposure to Community Violence YSR Internalizing Intercepts (constrained intercepts of youth-reported internalizing problems to be equal between low and high groups).

---

5 Comparison of exposure to community violence groups was replicated with a subset of youth from the lowest SES backgrounds (median split) in the current sample. Results did not substantively differ from those reported with the entire sample (less homogenous).

6 Final (best fitting) model constrained the variance of internalizing to be equal over time (and across groups), and constrained the variance of the latent intercept and slope to be equal across exposure to community violence groups.
Model 4b. *Exposure to Community Violence YSR Internalizing Slopes* (constrained slopes of youth-reported internalizing problems to be equal between low and high groups).

Model 5. *Exposure to Community Violence CBCL Externalizing Unconstrained* (unconstrained linear growth model of parent-reported externalizing problems, with participants grouped by ECV)\(^7\).

Model 5a. *Exposure to Community Violence CBCL Externalizing Intercepts* (constrained intercepts of parent-reported externalizing problems to be equal between low and high groups).

Model 5b. *Exposure to Community Violence CBCL Externalizing Slopes* (constrained slopes of parent-reported externalizing problems to be equal between low and high groups).

Fit statistics for each unconstrained model and each nested (constrained) model are presented in Table 4, along with the respective chi-square difference tests for each nested model.

\(^7\) Final (best fitting) model constrained the variance of externalizing to be equal over time (and across groups), and constrained the variance of the latent intercept and slope to be equal across groups. The model was also orthogonal (latent variables were uncorrelated).
Table 4. Linear growth model fit statistics and chi-square ($\chi^2$) differences of nested models\(^8\)

<table>
<thead>
<tr>
<th>Model. Parameter Constraint</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$\Delta M$</th>
<th>$\Delta df$</th>
<th>$\Delta \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2. Gender YSR Internalizing Unconstrained</td>
<td>10.66</td>
<td>9</td>
<td>.98</td>
<td>.05</td>
<td></td>
<td></td>
<td>5.33*</td>
</tr>
<tr>
<td>M2a. Gender YSR Internalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2b. Gender YSR Internalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3. Gender CBCL Externalizing Unconstrained</td>
<td>7.85</td>
<td>6</td>
<td>.94</td>
<td>.11</td>
<td></td>
<td></td>
<td>14.21**</td>
</tr>
<tr>
<td>M3a. Gender CBCL Externalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3b. Gender CBCL Externalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4. ECV YSR Internalizing Unconstrained</td>
<td>11.91</td>
<td>9</td>
<td>.96</td>
<td>.06</td>
<td></td>
<td></td>
<td>3.03</td>
</tr>
<tr>
<td>M4a. ECV YSR Internalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4b. ECV YSR Internalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5. ECV CBCL Externalizing Unconstrained</td>
<td>12.03</td>
<td>11</td>
<td>.95</td>
<td>.06</td>
<td></td>
<td></td>
<td>3.03</td>
</tr>
<tr>
<td>M5a. ECV CBCL Externalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5b. ECV CBCL Externalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplemental ECV Models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M6. ECV YSR Externalizing Unconstrained</td>
<td>15.16</td>
<td>7</td>
<td>.89</td>
<td>.12(^a)</td>
<td></td>
<td></td>
<td>48.28**</td>
</tr>
<tr>
<td>M6a. ECV YSR Externalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M6b. ECV YSR Externalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M7. ECV CBCL Internalizing Unconstrained</td>
<td>9.61</td>
<td>12</td>
<td>1.00(^b)</td>
<td>.00(^b)</td>
<td></td>
<td></td>
<td>3.95*</td>
</tr>
<tr>
<td>M7a. ECV CBCL Internalizing Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M7b. ECV CBCL Internalizing Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $\chi^2$=Robust Chi-square estimate; CFI=Confirmatory Fit Index; RMSEA=Root Mean Square Error of Approximation; ECV=Exposure to Community Violence; YSR=Youth Self-Report; CBCL=Child Behavioral Checklist

\(^a\)=recent research on model fit indices indicates that RMSEA may be artificially inflated when model degrees of freedom is very low, particularly when sample size is not large (Kenny, Kaniskan, & McCoach, 2011).

\(^b\)=when chi-square fit statistic is below model degrees of freedom, a zero value for RMSEA and 1.0 value for CFI is produced (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden et al., 2011; Ng-Mak et al., 2002; 2004; Rosseel, 2012).

*p<.05; **p<.001

\(^8\) Analysis of all ECV linear growth models were replicated, with gender, grade, and school added to the model as time-invariant covariates of symptoms. Results did not substantively differ in the “covariate models”. Results are presented in **Appendix A**.
Results of analysis that tested hypothesis two (comparing YSR internalizing problems between ECV groups) indicated that the *Exposure to Community Violence YSR Internalizing Unconstrained Model* (Model 4) fit the data well ($\chi^2=11.91$, df = 9, $p=.22$, CFI=.96, RMSEA=.06). Chi-square difference tests ($\Delta\chi^2$) indicated that the low group and high group significantly differed (Table 4) on both intercept (Model 4a; $\Delta\chi^2 [1]=5.31$, $p=.02$) and slope (Model 4b; $\Delta\chi^2 [1]=5.67$, $p=.01$). Figure 5 depicts differences between groups, showing that youth in the high ECV group reported more internalizing problems at baseline (intercept), compared to youth in the low ECV group, but youth in the high ECV group declined significantly more sharply (slope) in their report of internalizing problems over time ($\beta=-4.27$, SE=0.52, $p<.001$), compared to their counterparts in the low ECV group ($\beta=-2.79$, SE=0.40, $p<.001$). Both groups’ decline in youth-reported internalizing problems was statistically significant ($p<.001$).
Figure 5. Trajectory of youth-reported internalizing problems by ECV. Difference in slopes was statistically significant, as were declines in symptoms for both groups.

Model 5 tested hypothesis three by comparing the linear growth of parent-reported externalizing problems of youth from the low and high ECV groups. Results (Table 4) indicated that the linear growth model fit the data well ($\chi^2=12.03$, df 11, p=.36, CFI=.95, RMSEA=.05). Chi-square difference tests ($\Delta\chi^2$) indicated that the low group and high group did not significantly differ on intercept or slope (Table 4). Although Figure 6 suggests that the high ECV
group had more parent-reported externalizing problems throughout the course of the study, the difference at baseline was not statistically significant and the two groups did not change at differing rates over time. Further, results indicated that neither groups slope (change over time; decline) was statistically significant.

**Figure 6. Trajectory of parent-reported externalizing problems by ECV. Difference in slopes was not statistically significant, nor were declines in symptoms.**
Supplemental Analyses: Comparing Results by Reporter

Several supplemental analyses were performed to explore questions that arose during analysis. First, two additional sets of linear growth models were performed (two unconstrained models and four nested models) and compared to the primary exposure to violence models (Models 4-4b and Models 5-5b), to determine whether the effects of ECV on the trajectory of psychopathology were consistent across reporter types. If the varying effects of ECV on trajectories in Models 4 and 5 were indicative of the different ways that it may influence different types of psychopathology, as opposed to being attributed to reporter or other contextual factors, then we’d expect that the results for each type of outcome should be consistent across reporters.

To test if results varied by reporter, linear growth models were conducted, along with nested models, of parent-reported internalizing problems (Models 6-6b) and youth-reported externalizing problems (Models 7-7b).

**Model 6.** *Exposure to Community Violence YSR Externalizing Unconstrained* (linear growth model of youth-reported externalizing problems, with participants grouped by ECV and intercept and slope freely estimated).

**Model 6a.** *Exposure to Community Violence YSR Externalizing Intercepts* (constrained intercepts of youth-reported externalizing problems to be equal between low and high groups).

---

9 Final (best fitting) model constrained the variance of externalizing to be equal over time (and across groups).
Model 6b. *Exposure to Community Violence YSR Externalizing Slopes* (constrained slopes of youth-reported externalizing problems to be equal between low and high groups).

Model 7. *Exposure to Community Violence CBCL Internalizing Unconstrained* (unconstrained linear growth model of parent-reported internalizing problems, with participants grouped by ECV).

Model 7a. *Exposure to Community Violence CBCL Internalizing Intercepts* (constrained intercepts of parent-reported internalizing problems to be equal between low and high groups).

Model 7b. *Exposure to Community Violence CBCL Internalizing Slopes* (constrained slopes of parent-reported internalizing problems to be equal between low and high groups).

Results indicated that the *Exposure to Community Violence YSR Externalizing Unconstrained Model* (Model 6) fit the data moderately-well ($\chi^2=15.16$, df=7, $p=.03$, CFI=.89, RMSEA=.12), with results that were more consistent with the previously reported youth-reported internalizing problems models (Models 4-4b), than the parent-reported externalizing problems models (Models 5-5b). Specifically, results indicated that the low and high ECV groups significantly differed (Table 4) for both intercept ($\Delta \chi^2 [1]=48.28$, $p<.001$) and slope ($\Delta \chi^2 [1]=9.09$, $p<.001$), which was also true for the YSR internalizing models (Models 4a and 4b), while no significant differences were previously found (Table 4) for the parent-reported externalizing models

---

10 Final (best fitting) model constrained the variance of CBCL internalizing to be equal over time (and across groups), and constrained the variance of the latent intercept and slope to be equal across exposure to community violence groups, with the variance of the latent slope being constrained to zero in both groups. The model was also orthogonal (constrained latent slope and intercept to be uncorrelated).
(Models 5a and 5b). Further, the nature of the differences between groups for the youth-reported externalizing model (Figure 7) were parallel to those from the youth-reported internalizing model, as youth in the high ECV group reported more externalizing problems at baseline than youth from the low ECV group, while also declining more rapidly over time ($\beta=-3.09$, SE=.44, $p<.001$) than youth from the low ECV group ($\beta=-1.45$, SE=.39, $p<.001$). Both groups’ decline was statistically significant.

To test whether the differences that remained between ECV groups at W3 was statistically significant, the model was re-run with time centered at W3, instead of W1. Results indicated that a significant difference remained in youth-reported externalizing problems at W3 ($\Delta \chi^2 [1]=7.63$, $p=.005$), while no significant difference remained for youth-reported internalizing problems at W3 ($\Delta \chi^2 [1]=.001$, $p=.97$).
Figure 7. Trajectory of youth-reported externalizing problems by ECV. Differences in slopes were statistically significant, as were declines in symptoms.

Results from the linear growth model of parent-reported internalizing problems (Model 7; Table 4; Figure 8) showed a strong model fit (χ²=9.61, df=12, p=.65, CFI=1.00, RMSEA=.00). Like the parallels observed in the youth-report models, the parent-reported internalizing model results generally paralleled the parent-report externalizing model reported earlier, with some modest differences. First, chi-square difference tests indicated that the low and high ECV groups
did not differ in slopes ($\Delta \chi^2 [1]=1.64, p=.21$), with neither group significantly changing over time on parent-reported internalizing problems (low group: $\beta=-.75$, SE=.68, $p=.27$; high group: $\beta=.23$, SE=.44, $p<.61$). Although similar in trend, the results for the parent-reported externalizing models (models 5-5b) and the parent-reported internalizing models (models 7-7b) were not entirely parallel. Though they were found to be small and somewhat counter-intuitive, the differences in intercept between the low and high ECV groups (model 7b) were right at the threshold of statistical significance ($\Delta \chi^2 [1]=3.95, p=.05$).

To test whether the differences in parent-reported symptoms that remained between ECV groups at W3 were statistically significant, models were re-run with time centered at W3, instead of W1. Results indicated that no significant differences remained for parent-reported internalizing problems at W3 ($\Delta \chi^2 [1]=.76, p=.38$), nor parent-reported externalizing problems at W3 ($\Delta \chi^2 [1]=.25, p=.61$).

Figure 8 presents the intercepts and slopes of parent-reported internalizing problems over time, for the low and high ECV groups, showing that youth from the low ECV group had higher parent-reported scores at baseline than youth from the high ECV group.
Figure 8. Trajectory of parent-reported internalizing problems, by ECV. Differences in slopes were not statistically significant, nor were changes in symptoms.

Figure 9 presents the intercepts and trajectories for all four sets of growth models tested (youth-reported internalizing, youth-reported externalizing, parent-reported internalizing, parent-reported externalizing), with the model for parent-reported models layered on the models of youth-reported models, to more clearly compare the differences in ECV effects by reporter.
The two plots in Figure 9 indicate that report of psychopathology in the current sample seems to be more consistent within reporter, than by type of psychopathology, as the difference between youth-report and parent-report (youth tended to report high symptoms) was the only trend that held across both types of psychopathology. A trend toward the high ECV group reporting more symptoms than the low ECV group also emerged, but the findings for parent-reported internalizing problems conflict with this trend (Figure 9, left).

To further explore the differences by reporter in the current sample, the intercepts and slopes of the four outcome models (not grouped by ECV) were estimated, and plotted in Figure 10. Since estimates for youth-reported internalizing problems and parent-reported externalizing problems were obtained in model 1 by simultaneous estimation, both models were re-estimated in their own model, to make comparisons easier with the two additional (supplementary) linear growth models that were also conducted (youth-reported externalizing problems and parent-
reported internalizing problems). In all, four models were estimated and model fits are presented in Table 5.

Table 5. Model fit indices for the individual linear growth model for each type of outcome, conducted to compare trends in intercepts and slopes by reporter.

<table>
<thead>
<tr>
<th>Models/Outcomes by Reporter</th>
<th>Model Fit Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models/Outcomes by Reporter</td>
<td>χ²</td>
</tr>
<tr>
<td>A. Youth-Reported Internalizing Model</td>
<td>5.57</td>
</tr>
<tr>
<td>B. Youth-Reported Externalizing Model</td>
<td>10.32*</td>
</tr>
<tr>
<td>C. Parent-Reported Internalizing Model</td>
<td>1.640</td>
</tr>
<tr>
<td>D. Parent-Reported Externalizing Model</td>
<td>2.51</td>
</tr>
</tbody>
</table>

Note: χ²=Robust Chi-square estimate; CFI=Confirmatory Fit Index; RMSEA=Root Mean Square Error of Approximation

a=recent research on model fit indices indicates that RMSEA may be artificially inflated when model degrees of freedom is very low, particularly when sample size is not large (Kenny, Kaniskan, & McCoach, 2011).

b=when chi-square fit statistic is below model degrees of freedom, a zero value for RMSEA and 1.0 value for CFI is produced (Epkins, 2000; Herjanic & Reich, 1997; Rosseel, 2012).

*p<.05; **p<.001

Intercepts and slopes for models A through D are depicted in Figure 10. Results further support the trend that both intercept and slope appear to be more closely tied to type of reporter than type of symptom (Figure 10), while earlier results also indicated that reporter may be more predictive of both intercept and slope in the current sample than ECV (Figure 9). Additionally, Figure 11 indicates that reporter differences T1 internalizing problems, T3 internalizing problems, and T1 externalizing problems were statistically significant11. Among the six comparisons, only T3 internalizing problems had a higher score for parent-report.

---

11 Reporter differences were estimated by conducting a series of linear growth models on each outcome’s t-score and with time centered at each time point. Values in bar graph represent estimated intercepts and significance test was conducted using nested-models as in the primary analyses.
Figure 10. Trajectory of symptoms, by type and reporter. Slopes for both youth-reported outcomes were statistically significant. Neither parent-reported slope was significant.
Figure 11. Comparison of youth-report and parent-report intercepts (means) by symptom type and time point. Comparisons with asterisk (*) are statistically significant (p<.05).

Supplemental Analyses: Growth of Narrowband Scales

In addition to comparing results by reporter, ten additional growth models were analyzed to test whether the results of the broadband scales that were used in the primary analyses (internalizing and externalizing) accurately depicted the growth of the types of psychological problems they broadly represent. To test the internalizing results, six additional linear growth models were analyzed, one for each narrowband subscale that composes the broadband scale.
(anxiety-depression, withdrawn, and somatic complaints; run separately for youth-report and parent-report). Similarly, four additional linear growth models were analyzed to test the externalizing results, one for each of the narrowband subscales that compose the broadband scale (delinquency and aggression; run separately for youth-report and parent-report). Model fit statistics and results of chi-square difference tests for all ten models (E-P2) are presented in Table 6.

Results generally indicated a strong fit for the ten narrowband subscale growth models, but the patterns of significant chi-square differences in the nested models were not entirely consistent across the narrowband subscales with those observed in the results of the broadband scales. For example, although significant differences in both intercept and slope were found between ECV groups for the broadband YSR internalizing model (Table 4), differences between the ECV groups in intercepts and slopes were largely non-significant (Table 6) in the narrowband models that compose the broadband scale (Anxiety-Depression, Withdrawn, and Somatic Complaints), with only two exceptions. Significant difference in intercept were found for the YSR Somatic Complaints model and a significant difference in slopes was found for the YSR Anxiety-Depression model (difference in intercept for the YSR Anxiety-Depression model also approached significance ($\Delta \chi^2 [1]=3.22$, $p=.07$).
Table 6. Linear growth model fit statistics and chi-square ($\chi^2$) differences of nested of narrowband models

<table>
<thead>
<tr>
<th>Model. Parameter Constraint</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$\Delta M$</th>
<th>$\Delta df$</th>
<th>$\Delta \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. YSR Anxiety-Depression Unconstrained</td>
<td>14.15*</td>
<td>6</td>
<td>.90</td>
<td>.12</td>
<td></td>
<td></td>
<td>3.22</td>
</tr>
<tr>
<td>E1. YSR Anxiety-Depression Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E–E1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>E2. YSR Anxiety-Depression Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E–E1</td>
<td>1</td>
<td>6.14*</td>
</tr>
<tr>
<td>F. YSR Withdrawn Unconstrained</td>
<td>9.05</td>
<td>11</td>
<td>.00</td>
<td>.00</td>
<td></td>
<td></td>
<td>.64</td>
</tr>
<tr>
<td>F1. YSR Withdrawn Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F–F1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>F2. YSR Withdrawn Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F–F2</td>
<td>1</td>
<td>.95</td>
</tr>
<tr>
<td>G. YSR Somatic Complaints Unconstrained</td>
<td>13.83</td>
<td>9</td>
<td>.95</td>
<td>.08</td>
<td></td>
<td></td>
<td>4.23*</td>
</tr>
<tr>
<td>G1. YSR Somatic Complaints Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>G–G1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>G2. YSR Somatic Complaints Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>G–G2</td>
<td>1</td>
<td>.98</td>
</tr>
<tr>
<td>H. CBCL Delinquency Unconstrained</td>
<td>10.63</td>
<td>10</td>
<td>.96</td>
<td>.05</td>
<td></td>
<td></td>
<td>.09</td>
</tr>
<tr>
<td>H1. CBCL Delinquency Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H–H1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>H2. CBCL Delinquency Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H–H2</td>
<td>1</td>
<td>-.03</td>
</tr>
<tr>
<td>I. CBCL Aggression Unconstrained</td>
<td>10.37</td>
<td>11</td>
<td>1.00</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I1. CBCL Aggression Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I–I1</td>
<td>1</td>
<td>.13</td>
</tr>
<tr>
<td>I2. CBCL Aggression Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I–I2</td>
<td>1</td>
<td>.07</td>
</tr>
<tr>
<td>J. CBCL Anxiety-Depression Unconstrained</td>
<td>10.19</td>
<td>7</td>
<td>.91</td>
<td>.14</td>
<td></td>
<td></td>
<td>3.56*</td>
</tr>
<tr>
<td>J1. CBCL Anxiety-Depression Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>J–J1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>J2. CBCL Anxiety-Depression Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>J–J1</td>
<td>1</td>
<td>.29</td>
</tr>
<tr>
<td>K. CBCL Withdrawn Unconstrained</td>
<td>5.89</td>
<td>12</td>
<td>1.00</td>
<td>.00</td>
<td></td>
<td></td>
<td>4.58</td>
</tr>
<tr>
<td>K1. CBCL Withdrawn Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>K–K1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>K2. CBCL Withdrawn Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>K–K2</td>
<td>1</td>
<td>.22</td>
</tr>
<tr>
<td>L. CBCL Somatic Complaints Unconstrained</td>
<td>6.31</td>
<td>9</td>
<td>1.00</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1. CBCL Somatic Complaints Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L–L1</td>
<td>1</td>
<td>3.21</td>
</tr>
<tr>
<td>L2. CBCL Somatic Complaints Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L–L2</td>
<td>1</td>
<td>5.49*</td>
</tr>
<tr>
<td>O. YSR Delinquency Unconstrained</td>
<td>10.63</td>
<td>10</td>
<td>.96</td>
<td>.05</td>
<td></td>
<td></td>
<td>16.37**</td>
</tr>
<tr>
<td>O1. YSR Delinquency Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O–O1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>O2. YSR Delinquency Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O–O2</td>
<td>1</td>
<td>2.23</td>
</tr>
<tr>
<td>P. YSR Aggression Unconstrained</td>
<td>9.87</td>
<td>6</td>
<td>.95</td>
<td>.08</td>
<td></td>
<td></td>
<td>78.61**</td>
</tr>
<tr>
<td>P1. YSR Aggression Intercepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P–P1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P2. YSR Aggression Slopes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P–P2</td>
<td>1</td>
<td>10.28**</td>
</tr>
</tbody>
</table>
Figure 12. Trajectory of narrowband subscales, by exposure to violence group and reporter.
Table 7. Intercepts and slopes of psychopathology, by exposure to community violence.

<table>
<thead>
<tr>
<th>Model/Subscale</th>
<th>Low ECV Group</th>
<th></th>
<th>High ECV Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_0$ est</td>
<td>$\beta_0$ se</td>
<td>$\beta_1$ est</td>
<td>$\beta_1$ se</td>
</tr>
<tr>
<td></td>
<td>$\beta_0$ est</td>
<td>$\beta_0$ se</td>
<td>$\beta_1$ est</td>
<td>$\beta_1$ se</td>
</tr>
<tr>
<td>YSR Anxiety-Depression</td>
<td>4.69</td>
<td>.33</td>
<td>-1.15**</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>5.65</td>
<td>.39</td>
<td>-1.65**</td>
<td>.22</td>
</tr>
<tr>
<td>YSR Withdrawn</td>
<td>4.44</td>
<td>.22</td>
<td>-.79**</td>
<td>.143</td>
</tr>
<tr>
<td></td>
<td>4.82</td>
<td>.22</td>
<td>-1.06**</td>
<td>.15</td>
</tr>
<tr>
<td>YSR Somatic Complaints</td>
<td>3.32</td>
<td>.23</td>
<td>-.95**</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td>4.54</td>
<td>.28</td>
<td>-1.33**</td>
<td>.16</td>
</tr>
<tr>
<td>CBCL Delinquency</td>
<td>1.59</td>
<td>.16</td>
<td>-.15</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>3.22</td>
<td>.32</td>
<td>-.56*</td>
<td>.26</td>
</tr>
<tr>
<td>CBCL Aggression</td>
<td>3.61</td>
<td>.33</td>
<td>-.63*</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>5.91</td>
<td>.49</td>
<td>-1.04*</td>
<td>.38</td>
</tr>
<tr>
<td>CBCL Anxiety-Depression</td>
<td>3.07</td>
<td>.28</td>
<td>-.61**</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>2.63</td>
<td>.26</td>
<td>-.53*</td>
<td>.17</td>
</tr>
<tr>
<td>CBCL Withdrawn</td>
<td>2.38</td>
<td>.65</td>
<td>-.33*</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>2.31</td>
<td>.19</td>
<td>-.37*</td>
<td>.16</td>
</tr>
<tr>
<td>CBCL Somatic Complaints</td>
<td>1.99</td>
<td>.21</td>
<td>-.42*</td>
<td>.14</td>
</tr>
<tr>
<td></td>
<td>2.48</td>
<td>.25</td>
<td>-.51*</td>
<td>.26</td>
</tr>
<tr>
<td>YSR Delinquency</td>
<td>3.45</td>
<td>.21</td>
<td>-.39*</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>6.28</td>
<td>.33</td>
<td>-.97**</td>
<td>.19</td>
</tr>
<tr>
<td>YSR Aggression</td>
<td>5.86</td>
<td>.31</td>
<td>-1.24**</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>9.81</td>
<td>.41</td>
<td>-2.22**</td>
<td>.22</td>
</tr>
</tbody>
</table>

$*=p<.05; **=p<.001; \beta_0=$intercept; $\beta_1=$slope; est=estimate; se=standard error

Results indicated that 19 of 20 estimated slopes (10 outcomes, 2 groups) were significant and negative (Table 7; Figure 12), with only the low ECV group in the CBCL delinquency model having a non-significant slope. As Figure 12 demonstrates, the high ECV group had more symptoms for most types of psychopathology, though chi-square differences only found the differences to be significant for youth-reported delinquency, youth-reported aggression, and parent-reported anxiety-depression (with the parent-reported outcome being higher in the low ECV group). Figure 12 also further highlights that youth tended to report higher scores than their parents across all outcome types, regardless of their level of exposure to violence, and despite the fact that the parent-scales have additional items in the instances of Somatic Complaints (one item difference), Delinquency (two additional items), and Aggression (one additional item)\(^\text{12}\).

\(^{12}\)Twelve additional growth models were run using t-scores, to compare scales, accounting for the number of items in the scales. Results supported the trend that youth reported more problems than their parents, and trends for youth-report were consistent with raw score models.
Figure 13. **Comparison of narrowband scale intercepts (means) by symptom type, reporter, and time point.** Comparisons with asterisk (*) are statistically significant ($p < .05$).
Supplemental Analyses: Testing a Dual Growth Processes

The hypotheses of the current research were built on a foundation of extant literature that indicated that ECV tends to be stable over time (Beidas, Suarez, Simpson, Read, & Zelencik, 2012; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a), and that much of the psychological damage done by ECV emerges in-part from the additive effects of prolonged exposure. For example, some research suggests that prolonged exposure to severe and frequent community violence may increase feelings of vulnerability and subsequently decrease kids willingness to express emotional distress over time (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden et al., 2011; Stein et al., 2003), which may leave them less likely to obtain needed treatment. Alternatively, other studies have suggested that youth may gradually become desensitized to the effects of ECV over time (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Fowler, Toro, Tompsett, & Baltes, 2009b; Gaylord-Harden et al., 2011; Ng-Mak et al., 2002; 2004).

The rationale to measure ECV cross-sectionally, allowing us to utilize multi-group analyses in combination with linear growth models, was based on the tenets that ECV is stable in kids’ lives and that prolonged exposure is likely to have an additive effect. However, if change in psychopathology over time can be wholly explained by parallel changes in ECV, then the conclusions that could be drawn about the additive effects of prolonged ECV (estimated from our cross-sectional grouping variable of ECV) would be substantially limited.

Two additional growth models were estimated to test if the generally declining rates of youth-reported psychopathology over time could be wholly explained by a “dual growth process” (i.e. parallel decline) with ECV. To test these models, the growth of ECV was modeled with youth-reported internalizing problems and youth-reported externalizing problems,
respectively (only the two youth-reported symptom models were tested, because they were the only broadband linear growth models that had significant differences in slope between the ECV groups).

Results of the linear growth model that specified ECV and youth-reported internalizing problems as dual growth processes (modeled growth simultaneously) fit the data well ($\chi^2=16.84$, df=11, p=.11, CFI=.98, RMSEA=.06)\(^{13}\). Results indicated that ECV (youth-reported) significantly decline over time ($\beta=-2.21$, SE=1.01, p<.001), and that the slope of ECV was significantly correlated with both the intercept ($r=-.54$, p=.007) and slope ($r=.91$, p<.001) of youth-reported internalizing problems. Although the correlation between the slope of ECV and both the slope and intercept of youth-reported internalizing problems make it difficult to conclude whether differences in ECV at baseline were explicitly linked to differences in the longitudinal trajectory of youth-reported internalizing problems, it should be noted that a reasonably strong fitting model remained when the correlations between the slopes and intercepts of ECV and youth-reported internalizing problems were constrained to zero ($\chi^2=41.61$, df=15, p<.001, CFI=.90, RMSEA=.10). Moreover, a significant and negative slope remained for youth-reported internalizing problems ($\beta=-3.62$, SE=.35, p<.001), which suggests that it is unlikely that the decline in internalizing problems can be wholly explained by a dual growth (decline) process with ECV.

Results also indicated that the linear growth model that specified ECV and youth-reported externalizing problems as dual growth processes fit the data well ($\chi^2=20.16$, df=11, p=.04, CFI=.96, RMSEA=.07), showing that ECV decreased over time ($\beta=-2.11$, SE=.96,

\(^{13}\) The variances of symptoms and ECV were constrained to be equal over time, in both of the “dual growth processes” models that were tested. Additionally, both models were replicated with gender, grade, and school as time-invariant covariates, producing virtually identical results to the models without covariates.
p<.001), and that the slope of ECV was significantly correlated with both the intercept (r=-.45, p=.006) and slope (r=.94, p<.001) of youth-reported externalizing problems. However, as was true with youth-reported externalizing problems, a reasonably strong fitting model remained when the correlations between the slopes and intercepts of ECV and youth-reported externalizing problems were constrained to zero (χ²=38.45, df=14, p<.001, CFI=.90, RMSEA=.10). Moreover, a significant and negative slope remained for youth-reported internalizing problems (β=-2.38, SE=.31, p<.001), which suggested that it is unlikely that the decline in externalizing problems that was observed in our growth models can be wholly explained by a dual growth (decline) process with ECV.

**Supplemental Analyses: Comparing broadband scales within reporter**

Since hypothesis one was tested by comparing internalizing and externalizing as endorsed by youth and parents, respectively, and because differences in scores were evident by reporter-type, supplementary analyses were also conducted to compare the broadband scales within-reporter. Because earlier-reported results suggest that parents may have under-reported symptoms in the current sample, youth-report was used in this supplementary analysis. Youth-reported internalizing problems and youth-reported externalizing problems were simultaneously estimated and nested models were tested.

Results indicated that the linear growth model of youth-reported psychopathology was not a strong fit to the data (χ²=57.34, df=7, p<.001, CFI=.81, RMSEA=.21). Since we know that a linear growth model of youth-reported internalizing problems fits the data well (from earlier reported results), these results indicate that youth-reported externalizing problems may not change in a linear way over time.
When intercepts and slopes were compared, results indicated that both significantly differed by outcome type. Typically, the internalizing and externalizing broadband scales’ intercepts would not be compared, due to the different number of items in the scales (externalizing problems has one more item than internalizing problems). However, these results were of particular note because youth reported significantly higher scores at baseline for internalizing problems than externalizing problems ($\Delta \chi^2 [1] = 7.41, p<.001$), despite the fact that the internalizing scale had one fewer item. The nested model that tested the equality of slopes indicated that youth declined more sharply in their report of internalizing problems ($\beta=-3.52$, SE=.75, $p<.001$) than externalizing problems ($\beta=-2.22$, SE=.29, $p<.001$) over time ($\Delta \chi^2 [1] = 17.23, p<.001$). In fact, Figure 14 shows that youth-report of internalizing problems dropped below that of externalizing problems by W3, though the difference between the W3 scores was not significant ($\Delta \chi^2 [1] = 1.38, p=.24$).  

\[14\] The nested growth model that constrained intercepts to be equal between outcome types was re-estimated with time centered at T3, to test the significance of the differences in scores. The difference was not significant.
Figure 14. Trajectories of youth-reported symptoms. Difference between intercepts and slopes were statistically significant.
CHAPTER IV

DISCUSSION

This research contributes to the current body of developmental psychopathology literature by: 1) demonstrating a differential between youth and parents in their report of the development of psychopathology among low-income urban youth, such that youth tended to report more psychological problems than their parents, 2) showing that low-income urban youth have unique trajectories of psychopathology during the period from late childhood to adolescence, compared to previous studies with normative samples, 3) demonstrating that gender-specific trajectories of psychopathology that typically emerge in adolescent samples may not be as prevalent in samples of low-income urban youth, 4) showing that exposure to extreme amounts of community violence may alter low-income urban youths’ trajectory of psychopathology, which may provide some evidence for pathological adaptation, and 5) demonstrating that the influence of ECV on the trajectory of psychopathology varied by symptom type, which may provide even more support for the pathological adaptation model.

Differences in youth-report and parent-report of psychopathology

Among the most robust findings of the current research was that youth tended to self-report higher rates of psychopathology than their parents, across all symptom types. Although reporter-discrepancy was not the intended focus of this research, the difference was so pervasive across types of psychopathology, that these findings must be enumerated before the results of the primary analyses can be adequately discussed. Results indicated that youth reported more psychological problems than their parents on both of the broadband scales (internalizing problems and externalizing problems; Figure 11 & Figure 12), as well as the five narrowband syndrome scales (anxiety-depression, withdrawn, somatic complaints, delinquency, and
aggression; Figure 13), despite the fact that the parent-report scales have more items on them than the youth-reported scales, and regardless of whether they were in the low or high exposure to violence group (Figure 12). Additionally this trend remained when supplementary analysis converted both parent-report and youth-report scores to t-scores and re-estimated growth models.

Although this finding is inconsistent with previous research with normative samples that indicated that parents are typically better equipped to identify externalizing problems, while youth may tend to under-report (R. D. Conger, Ge, Court, Lorenz, & Simons, 1994; Epkins, 2000; Herjanic & Reich, 1997; McLoyd & Wilson, 1992), other recent research with low-income urban youth have found similar trends (e.g. Beidas et al., 2012; Wadsworth & Compas, 2002).

Given the substantial body of literature that indicates that youth living in impoverished neighborhoods are at high risk for psychopathology, and the relatively low rate of psychopathology reported by parents for all types of symptoms in the current research, it is likely that parents in the current sample underreported symptoms. It is not entirely clear why parents in the current sample might have underreported the psychopathology of their children, but a few possible explanations exist.

One possible explanation for the apparent underreporting by parents may be that low-income urban youth tend to spend more time away from home and parental supervision as they enter adolescence, spending increasingly more of their time with peers (Brody & Flor, 1997; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Stein et al., 2003). As youth spend more time away from their parent’s immediate supervision, parents may become less aware of their day-to-day functioning, and thus be less equipped to accurately report symptomatology. An alternative hypothesis may be the intense stress that low-income families encounter. Previous research indicates that poverty-related stress is associated with poorer
parental monitoring (Fowler, Toro, Tompsett, & Baltes, 2009b; Hardaway et al., 2012; Leventhal & Brooks-Gunn, 2003; Montague et al., 2011; Santiago, Wadsworth, & Stump, 2011), increased risk for parental mental health problems (R. D. Conger et al., 1994; McLoyd & Wilson, 1992; Shaffer et al., 2002), higher rates of interpersonal conflict within the family (McCart et al., 2007; Mrug, Loosier, & Windle, 2008; Wadsworth & Compas, 2002), and a higher likelihood to be living in a single-parent led household (Brody & Flor, 1997; Montague et al., 2011), all of which may threaten a parent’s ability to effectively monitor their child and thus may threaten the validity of a parent’s report of psychopathology. Additionally, the current sample had an especially high rate of missing data by W3 for parent-report, compared to youth-report, with parent data being nearly twice as likely to be missing at W3 (further threatening the validity of the parent-report data). Due to the potential threat to validity of parent-report in the current sample, subsequent discussion of the differences between problem types will focus on youth-reported scales.

Trajectories of psychopathology unique to low-income urban youth

Results of growth models of youth-reported psychopathology indicated that the unique confluence of stressors experienced when living in an impoverished urban neighborhood alter the trajectories of psychopathology. These analyses were run to test hypothesis one of the current research, which predicted that low-income urban youth would differ in their trajectory of internalizing and externalizing problems, such that youth would report more externalizing problems over time and fewer internalizing problems. These effects would be consistent with the pathological adaptation model, given the increase in stress and exposure to community violence that is associated with transitioning from childhood to adolescence. In the strictest sense, results failed to fully support hypothesis one, due to the negative slope found for externalizing problems
over time. However, close examination of the results indicated that hypothesis one might have been merely overstated, rather than totally off-base.

Although both types of psychopathology were found to significantly decline over time in the current sample, results also found that the rate of decline was different between internalizing problems and externalizing problems, with the decline in internalizing problems occurring more rapidly. In fact, differences in both baseline scores (intercepts) and change over time (slopes) were found, with youth reporting more internalizing problems than externalizing problems at baseline and then rapidly converging in their scores over time. These trajectories do suggest that low-income urban youth may be increasingly more likely to report externalizing problems than internalizing problems as they enter mid-adolescence, while the higher rates of exposure to community violence and other poverty-related stressors left them at particular risk for internalizing problems during childhood.

The current research might have overstated hypothesis one due to an implicit assumption that the change in different types of psychopathology would have a one-to-one relationship with each other, due to the powerful and persistent effects of poverty-related stress. In making this assumption it was believed that youth avoiding the expression of internalizing problems would experience a proportional increase in externalizing problems. However, the current results and other recent longitudinal findings suggest that overall reports of psychopathology might decline for low-income urban youth, as they enter adolescence (Education, 2006; Hardaway et al., 2012; Leventhal & Brooks-Gunn, 2003; Montague et al., 2011; Santiago et al., 2011).

Overall, our sample of low-income urban youth tended to decline in self-reported psychopathology of various types from late childhood (when they reported rates higher than normative samples) to mid-adolescence. Significant declines in problem reports were reflected
both in the broadband scales and in the five narrow-band syndrome scales (i.e. anxiety-depression, withdrawn, somatic complaints, delinquency, and aggression) that make-up the broadband scales. These findings are divergent from previous research with normative youth, which indicated that risk for psychopathology tends to increase from late childhood and reach its peak in mid-adolescence. However, these findings are consistent with other recent longitudinal studies with low-income urban youth (Education, 2006; Hardaway et al., 2012; Leventhal & Brooks-Gunn, 2003; Montague et al., 2011; Santiago et al., 2011). Shaffer and colleagues (2002) found evidence of declines in depressive symptoms in low-income urban youth, which led them to speculate that these youth may learn to express emotional distress in ways that are adaptive to their environment (Shaffer et al., 2002). Findings from more recent longitudinal studies of low-income urban youth (e.g. McCart et al., 2007; Mrug et al., 2008; Sweeney, Goldner, & Richards, 2011) have indicated that being exposed to severe and chronic community violence may lead these youth to become desensitized to its emotional impact, resulting in less reported psychological distress over time.

Montague and colleagues (2011) also found that psychopathology steadily declined over time in their sample of low-income urban youth, which they suggested may show that low-income youth experience an earlier peak in psychopathology, due to early and prolonged exposure to community violence and other poverty-related stressors. If this is true, the decline in reported psychological problems that typically begins during mid-adolescence (Carlson & Grant, 2008; Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b; Hardaway et al., 2012; Montague et al., 2011), might have already begun in the current sample (mean age at baseline was approximately 12.5 years). Findings from a study by the Florida Department of Education (2006) further supported this possible explanation, indicating that minority youth, a
disproportionate amount of which are from low-income families, experienced a peak in
externalizing behaviors significantly earlier than their white counterparts, after which they
experienced a gradual decline during their high school years (Basow & Rubin, 1999; Education,
2006).

An additional possible explanation for the overall decline in all types of psychopathology
is the possible influence of a *measurement effect*. Previous methodological research indicates a
decline in reported psychopathology could be an artifact of the repeated use of survey measures
(Twenge & Nolen-Hoeksema, 2002; Vasquez & las Fuentes, 1999). Nolen-Hoeksema and
colleagues indicated youth tend to report fewer psychological problems when given repeated
survey measures, with a particularly substantial decline likely to occur between W1 and W2.
Recent findings by Sweeney and colleagues were consistent with this decline in survey scores
(for internalizing problems, externalizing problems, and exposure to violence) with low-income
urban youth, though they did not speculate about a possible cause of the decline (Basow &
Rubin, 1999; Sweeney et al., 2011).

**Testing gender-specific trajectories of internalizing problems and externalizing problems**

Results of growth models 2 through 3b provided support for recent studies that found that
normative gender-specific developmental patterns of psychopathology may not emerge as
prominently in samples of low-income urban youth (Anderson, 1990; Carlson & Grant, 2008;
Grant, Katz, Thomas, O'Koon, Meza, DiPasquale, et al., 2004b; Hardaway et al., 2012). While
research on majority samples show that gender rates of psychopathology tend to diverge during
adolescence, with girls tending to become more likely than boys to report internalizing problems,
and boys becoming more likely than girls to externalize, we failed to find gender differences in
the trajectory of either type of psychopathology.
These results are consistent with findings by Carlson and Grant (2008), who suggested that high rates of ECV and risk for victimization may lead low-income urban girls to avoid expressing internalizing problems, which they might perceive as leaving them more vulnerable, instead opting to handle stress more aggressively (e.g. through externalizing behaviors), in ways that are more commonly associated with adolescent boys. Shaffer, Forehand, and Kotchick (2002) also found that low-income urban African American boys and girls in their sample also did not differ in their reports psychopathology, depressive symptoms specifically, which they hypothesized may be related to a lower likelihood for African American girls to experience self-esteem problems (e.g. Basow & Rubin, 1999; Vasquez & las Fuentes, 1999) and/or body image problems (Basow & Rubin, 1999), relative to Caucasian adolescent girls. Carlson and Grant (2008) also posited that girls in low-income communities might not face as many social pressures to avoid externalizing behaviors, compared to the majority samples predominantly reflected in the existing adolescent literature. Carlson and Grant (2008) likened these findings to what Anderson (1990) called “street wisdom”, which found behavior that showed one to be self-assured and having the upper hand reduced likelihood of victimization, among African Americans frequently exposed to community violence (Anderson, 1990; Twenge & Nolen-Hoeksema, 2002). In fact, no gender differences were found in the trajectory of either type of psychopathology in the current sample, which may further indicate that living in a highly violent environment may reduce the gender-differences that are typical in the development of adolescent psychopathology. This finding may be related to a greater need for girls in the low-income environment to protect themselves by avoiding any potential signs of weakness or vulnerability (Grant et al., 2005).

Testing the influence of exposure to community violence on the trajectory of symptoms
Hypotheses two and three of the current research sought to discover evidence for the pathological adaptation model by testing the influence of exposure to community violence on the psychopathology of low-income urban youth, and specifically on the trajectories of internalizing problems (hypothesis 2) and externalizing problems (hypothesis 3). Results showed that youth in our sample that were exposed to the most community violence also reported the most internalizing and externalizing problems at baseline, and generally throughout the three years of the study. A particularly notable finding from hypotheses 2 and 3 was that the low and high exposure to community violence groups had a narrower gap at baseline and converged more quickly over time in their report of internalizing problems than externalizing problems. In fact, Figure 5 shows that the two groups converge completely by W3 in their report of internalizing problems, whereas a significant gap remained in their report of externalizing problems at W3 (Figure 7).

The finding that youth in the high exposure to community violence group of our sample were generally at particular risk for elevated rates of psychopathology at baseline, was consistent with research by Fowler and colleagues (2009), which reported a strong link between childhood psychopathology and chronic exposure to community violence. Additionally, the complete convergence between the high and low exposure to community violence groups in internalizing problems from W1 to W3, along with the comparatively more gradual convergence of externalizing problems provides support for recent studies that indicated that low-income urban youth may become less willing to express feelings of depression or anxiety as they enter adolescence (pathological adaptation; Gaylord-Harden et al., 2011; Ng-Mak, Salzinger, Feldman, & Stueve, 2004), because they may see them as leaving them more vulnerable to victimization (Cooley-Strickland et al., 2009; Hankin et al., 1998; Hart, Hodgkinson, Belcher, & Zelencik,
The effect of exposure to community violence on the trajectory of narrowband scales

Although linear growth models of youth-reported broadband scales were found to fit reasonably well, especially when exposure to community violence group membership was specified, additional supplementary analyses were conducted to see if the results of the narrowband subscales were fully consistent with the results of their broadband scale. If variability of results was found within the narrowband scales of a broadband scale, the findings may have important implications on how the different types of psychological problems should be researched and assessed in clinical settings. Results of the youth-reported narrowband syndrome scales were generally consistent with the results of the broadband scales that they compose, though more variability in results emerged from within the youth-reported internalizing scales than externalizing scales.

Figure 12 shows that larger gaps existed both at baseline and overtime between exposure to community violence groups for the externalizing narrowband scales, Delinquency and Aggression, compared to the internalizing narrowband scales, Anxiety/Depression, Withdrawn, and Somatic Complaints. In fact, of the three youth-reported internalizing narrowband subscales, only Somatic Complaints exhibited a significant difference at baseline (when the gap was largest), whereas both Delinquency and Aggression were significantly higher in the high exposure to community violence group, both at baseline and throughout the course of the study. Although the exposure to community violence groups did converge at a modest rate over time in their report of Aggression, the difference between groups at W3 remained significant and larger than the gap between groups on any internalizing narrowband scale at any wave. Additionally,
these results held for both the primary analyses with raw scores, as well as with the supplementary analyses using t-scores.

The variability found within the youth-reported internalizing scales, as well as the relatively narrow gap between exposure to community violence groups for internalizing scales and larger gap between groups for the externalizing scales, offer more support for recent studies that indicated that youth exposed to higher rates of community violence may avoid expressing traditional depressive and anxiety symptoms (Bacow, May, Choate-Summers, Pincus, & Mattis, 2010; Cooley-Strickland et al., 2009; Hart et al., 2012; Reynolds et al., 2001; Sanchez et al., 2011; White et al., 2010). These findings are consistent with the “Pathological Adaptation Model”, which suggests that youth who are most exposed to community violence, and thus feel most threatened by their environment, may learn to adapt the way they express emotional distress to keep themselves safe from further victimization (Gaylord-Harden et al., 2011). This model indicates that these youth may find it adaptive to express psychological distress in ways that are aggressive and/or physiological in nature (Gaylord-Harden et al., 2011; Gross, Julion, & Fogg, 2001), rather than in ways that project vulnerability and weakness (e.g. Anhedonia, sadness, low self-esteem, and social withdraw).

Limitations and Implications

Prior to discussing the possible research and clinical implications of the current research, some methodological limitations of the current study should also be acknowledged. First, the current sample of low-income urban youth experienced substantial attrition across time, as the low-income housing development in which many of our sample’s youth resided was torn down during the course of the study. Although an analysis of attrition showed that participant’s likelihood to drop-out was not related to any key study variables at baseline (youth-reported
internalizing problems, parent-reported externalizing problems, and exposure to community violence), and steps were taken to minimize the effect of any potential bias (avoiding listwise deletion, in favor of maximum likelihood estimation), the true bias of attrition is never completely measureable, since the level of internalizing and/or externalizing problems of dropouts cannot be known at the time of dropout.

Second, although there are possible theoretical explanations to explain the across-the-board decline in psychopathology in the current sample (enumerated earlier), previous discussion also acknowledged the possibility of a *measurement effect* that could bias results (Forehand, Middlebrook, Rogers, & Steffe, 1983; Gross et al., 2001; Haggerty et al., 2002; Spoth, Goldberg, & Redmond, 2004; Twenge & Nolen-Hoeksema, 2002; Weinberger, Tublin, Ford, & Feldman, 2005). Twenge and Nolen-Hoeksema (2002) presented a strong argument for existence of measurement effects in survey measures of psychopathology, in their meta-analysis of longitudinal depression studies. In their analysis, they found that studies with 6 months between data collections had significantly lower scores one year after baseline (3rd survey collection) than studies with 12 months between data collections (2nd survey collection). These findings emerged for both boys and girls. Additionally, Twenge and Nolen-Hoeksema (2002) also indicate that declines in psychopathology are not generally evident in studies that use diagnosis and/or clinical interview as their means of measurement (Hankin et al., 1998). Further, Twenge & Nolen-Hoeksema (2002) reported that declines in depression are also not found when cross-sectional survey measures are examined across age groups, which would be expected if the longitudinal declines were representative of developmental shifts in depressive symptoms.

Future methodological research should further explore the longitudinal measurement of psychopathology in samples of low-income urban youth, particularly with samples that are larger
in size and over longer periods of time, in order to determine if the longitudinal decline across all types of outcomes in our sample is better explained by a measurement effect, than by actual declines in emerging psychopathology during adolescence. If support can be found for a measurement effect, future research should also identify statistical and/or methodological strategies for ameliorating potential bias in measurement from repeated survey measurements, allowing for a more accurate and interpretable longitudinal assessment of psychological functioning.

Also from a measurement perspective, it should be considered that measurements of all survey constructs at each wave were generally collected at a single collection in one day. If the pathological adaptation model does exert a psychological influence on the expression and/or report of psychological symptoms, then survey measures of symptoms could conceivably be either inflated or deflated if the same psychological mechanisms are activated when respondents answer questions about stressors (e.g. exposure to community violence) in their lives. Measuring these cognitive mechanisms is beyond the scope of this study, but future research should consider whether a pathological adaptation effect, should it exist, could threaten the validity of survey measures of symptoms when activated.

Measurement issues with exposure to community violence should also be considered. First, the current study relies on self-report assessments of lifetime exposure to community violence, which could confound results to some degree, since it will like share variance with our outcome measures that are also self-report. Additionally, some research indicates that timing (i.e. when in life exposure begins/ends), duration/chronicity (i.e. how long youth are exposed), and proximity (i.e. how close to the youth did violence occur: hear about violence, see violence, or victimized themselves) are also important factors to consider when estimating the influence of
exposure to community violence on youth (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gorman-Smith et al., 2004; Hardaway et al., 2012), none of which are the focus of the current study. Future research should consider how the possible emergence of pathological adaptation effects might be influenced by these factors (timing, duration/chronicity, and proximity).

From a measurement and assessment perspective, the finding that youth reported substantially higher symptoms on every scale, at every wave, suggests that the outcome-specific reliability that is associated with each reporter in previous literature may not be safe to assume for low-income urban families. Additional research should determine whether this symptoms differential can be consistently replicated in other samples of low-income families. Additionally, both reporters’ endorsement of symptoms can be compared to other modalities of assessment (e.g. clinical assessment), to determine if the accuracy and reliability differences that are seen in the general population hold with samples of low-income families.

Clinically, these findings also highlight the importance of obtaining multiple reports of functioning, whenever possible, during assessment. If low-income parents are in fact, less able to remain aware of their youth’s behaviors and/or daily functioning, relying solely on parent-report may result in a substantial over-estimation of functioning. Recent findings by Hart and colleagues (2012) provide additional support to the hypothesis that parents living amidst urban poverty may have particular difficulty identifying symptoms in their children, as they found low agreement in youth and child reports of somatic symptoms and only self-report was associated with other stressors that are typically predictive of symptoms (Hart et al., 2012). The current study also obtained teacher reports of socio-emotional functioning, but the attrition rate for that
type of measurement was even higher than that of parent-report and was not usable to obtain reliable estimates with linear growth modeling.

The findings of the current study also highlight the need for further development of efficient and effective methods of multi-modal data collection and assessment of low-income urban youth in both research and clinical practice. While much work has been done on various modalities of assessment in the normative population (e.g. Bacow et al., 2010), fewer studies have focused specifically on low-income urban samples. Focusing on this population is particularly critical, given the many challenges that face researchers that are inherent in doing research with low-income urban families. For example, extant literature indicates that low-income youth and families tend to be substantially more difficult to engage and more difficult to track than normative samples, which leads to higher rates of attrition (Gross et al., 2001). Research indicates that the factors that likely contribute to the challenges in doing research with low-income families are many of the same that are associated with the poor psychological outcomes in this population, such as unstable living situations, economic strain, low levels of parental education, and distrust of institutions (Forehand et al., 1983; Gross et al., 2001; Haggerty et al., 2002; Spoth et al., 2004; Weinberger et al., 2005).

The findings that suggest that developmental shifts in the trajectory of psychopathology might occur earlier in low-income youth, compared to normative adolescents, highlight the need for early intervention and prevention. Few resources exist in low-income communities, and those that are available often focus on the adolescent period of development, as it is thought to be a time of highest risk (Compas et al., 1993b; Grant, 1995). However, our findings suggest that the chronic and pervasive nature of community violence may impact youth far before adolescence, and low-income youth may even already become desensitized to their violent surroundings by
the time they reach adolescence. If this is true, not only has emotional damage likely already occurred, but the impact of prolonged exposure to community violence may also hamper the ability of interventions to improve the lives of the youth they serve. Additional research is needed on the trajectory of psychopathology over a longer period of time, and that starts at an earlier age than the current study, to determine if resources to help low-income urban youth are better used on interventions and preventions at an earlier age than is typical in the general adolescent population.
CHAPTER V

SUMMARY

The present study examined the impact of exposure to community violence on the trajectories of internalizing problems and externalizing problems, in a sample of low-income urban adolescents. More specifically, analyses tested whether relative level of exposure to community violence was related to have different trajectories of each psychopathology as youth transition from childhood to adolescence. The current study sought to demonstrate support for the Pathological Adaptation model, indicating that youth living in highly violent environments may avoid expressing internalizing symptoms, instead responding to distress with externalizing behaviors, which they may perceive as leaving them less vulnerable to victimization (Gaylord-Harden et al., 2011; Ng-Mak, Salzinger, Feldman, & Stueve, 2004). The current study also posited that the presence of Pathological Adaptation might explain recent mixed findings in research with low-income urban adolescents, including studies that failed to find expected gender differences in rates of psychopathology, as well as unexpected declines in psychopathology during adolescence.

Results found some evidence supporting the presence of Pathological Adaptation. Youth that reported being exposed to the most community violence also reported higher scores at baseline for both internalizing problems and externalizing problems consistent with previous literature on the risk during childhood exposure to community violence. Providing possible evidence of Pathological Adaptation, the baseline difference in youth-reported internalizing symptoms between the exposure to community violence groups was diminished as youth progressed into adolescence, with no significant difference remaining two years after baseline. Conversely, the significant baseline differences that were present for youth-reported
externalizing problems remained significant at wave 3, though the two groups did significantly converge over time. In tandem, these two findings suggest that the influence of exposure to community violence on youth living in poverty may be more robust for externalizing problems, compared to internalizing problems, which may indicate a hesitance to react to distress in ways that project weakness or vulnerability (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009a; Gaylord-Harden et al., 2011; Ng-Mak, Salzinger, Feldman, & Stueve, 2004).

The current study also indicated that the high rates of exposure to community violence may reduce or eliminate the gender-differences in the emergence of psychopathology that are typically observed in the general adolescent population. The current study failed to find differences in the trajectories of symptoms between boys and girls, though differences were found for symptoms at intercept, with girls reporting higher symptoms for both internalizing problems and externalizing problems. Perhaps the most robust finding of the current research was that which indicated that youth tended to report higher levels of psychopathology than their parents. Despite previous research that suggests that youth tend to under-report externalizing problems, while parents tends to be more reliable reports, youth in the current sample reported greater levels of both types of psychopathology. These findings may reflect threats to validity of parent-reported psychopathology, in samples of low-income urban youth. Low-income adolescent’s greater likelihood to spend more time away from parents, in combination with low-income parent’s higher risk for psychological problems and greater exposure to their own life stressors, all may threaten parent’s ability to monitor their child’s behavior and ultimately accurately report their child’s functioning. Clinical implications, directions for future research, and study limitations are also described.
REFERENCES


cognition, and aggression among urban elementary school children. *Child Development, 74*
(5), 1561–1576.


Hankin, B. L. B., Abramson, L. Y. L., Moffitt, T. E. T., Silva, P. A. P., McGee, R. R., & Angell,
K. E. K. (1998). Development of depression from preadolescence to young adulthood:
emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal
Psychology (1906), 107* (1), 128–140.


(2006). Aggressive behavior among girls and boys during middle childhood: Predictors and


Mason, W., & Windle, M. (2002). Reciprocal Relations Between Adolescent Substance Use and Delinquency* 1:: A Longitudinal Latent Variable Analysis. Journal of Abnormal*


doi:10.1007/s10464-011-9440-3


Appendix A

Fit statistics and chi-square ($\chi^2$) differences of nested models for the linear growth models with gender, school, and grade as time invariant covariates
Appendix A. Fit statistics and chi-square ($\chi^2$) differences of nested models for the linear growth models with gender, school, and grade as time invariant covariates

<table>
<thead>
<tr>
<th>Model. Parameter Constraint</th>
<th>Model Fit</th>
<th>Model Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>df</td>
</tr>
<tr>
<td>$M_{4c}$. ECV YSR Internalizing Unconstrained$^2$</td>
<td>45.06*</td>
<td>30</td>
</tr>
<tr>
<td>$M_{4a_c}$. ECV YSR Internalizing Intercepts$^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{4b_c}$. ECV YSR Internalizing Slopes$^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{5c}$. ECV CBCL Externalizing Unconstrained$^3$</td>
<td>30.61</td>
<td>27</td>
</tr>
<tr>
<td>$M_{5a_c}$. ECV CBCL Externalizing Intercepts$^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{5b_c}$. ECV CBCL Externalizing Slopes$^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supplemental ECV Models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{6c}$. ECV YSR Externalizing Unconstrained$^4$</td>
<td>29.89</td>
<td>21</td>
</tr>
<tr>
<td>$M_{6a_c}$. ECV YSR Externalizing Intercepts$^4$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{6b_c}$. ECV YSR Externalizing Slopes$^4$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{7c}$. ECV CBCL Internalizing Unconstrained</td>
<td>32.99</td>
<td>32</td>
</tr>
<tr>
<td>$M_{7a_c}$. ECV CBCL Internalizing Intercepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M_{7b_c}$. ECV CBCL Internalizing Slopes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $\chi^2$=Robust Chi-square estimate; CFI=Confirmatory Fit Index; RMSEA=Root Mean Square Error of Approximation; ECV=Exposure to Community Violence; YSR=Youth Self-Report; CBCL=Child Behavioral Checklist; c-subscript identifies these models as the “covariate models” and distinguishes them from their “original” counterparts.

* $p<.05$; ** $p<.001$

1= Models generally achieved their best fit with the same constraints as the original (non-covariate) models, with some additional constraints added to achieve optimal fit. The effect of the three time-invariant covariates (gender, grade, and school) were generally constrained to be equal over time, as well as equal between ECV groups, with only two excepts (ECV YSR Externalizing Models and ECV CBCL Externalizing models).

2= Significant covariate effects were also found for gender on T1 YSR Internalizing models, though the effects did not vary by group (boys: m=11.72, sd=8.54; girls: m=15.59, sd=9.59).

3= The effect of gender was allowed to vary over time and between groups, with significant effects found for the high ECV group on T1 CBCL Externalizing (boys: m=7.74, sd=7.82; girls: m=11.16, sd=10.57) and T2 CBCL Externalizing (boys: m=4.67, sd=5.62; girls: m=8.18, sd=8.01).

4= The effect of school was allowed to vary over time and between groups (to achieve strong model fit).