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Co-occurrence of Externalizing Behaviors and Internalizing Symptoms in Youth

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Abstract

Co-occurrence of Externalizing Behaviors and Internalizing Symptoms in Youth

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The failure theory suggests that factors related to poor interpersonal relations and academic difficulties may mediate the association between externalizing and internalizing problems. The present study uses youth-, parent-, and teacher-reported longitudinal data on a sample of 486 boys and 430 girls to test the predictive association from externalizing to internalizing problems and to examine the roles and unique effects of peer rejection, parent-child conflict, and academic competence in this association from late childhood to early adolescence. Findings reveal that at fourth grade, externalizing behaviors was higher for boys and the internalizing symptoms was higher for girls. On average, both externalizing and internalizing problems showed a slight decline though variability about the mean trends was significant. Using dual-domain latent growth modeling, no significant predictive association was found either from the intercept or

slope factor of externalizing behaviors to the slope factor of internalizing symptoms. Using three-variable latent growth modeling, conclusive evidence was found for mediation by parent-child conflict. Externalizing behaviors contributed to high rates of increase of parent-child conflict, which in turn contributed to high rates of increase of internalizing symptoms. On the other hand, peer rejection and academic competence were not significant mediators. No significant gender differences were found. In addition, externalizing behaviors also predicted poor academic competence over the years. Implications to prevention and intervention programs for youth with co-occurring problems were discussed.

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CHAPTER ONE

INTRODUCTION

It is not uncommon for youth to experience both externalizing and internalizing symptoms at the same time even though these are qualitatively different types of behaviors and experiences (Angold & Costello, 1999; Capaldi, 1991; Capaldi & Stoolmiller, 1999; Chen & Simons-Morton, 2009; 1992; Vander Stoep, Herting, McCauley, & Rhew, in press; Wolff & Ollendick, 2006). Externalizing behaviors describe a range of disruptive and dysregulated behaviors such as hyperactivity, impulsivity, non-compliance, hostility, aggression and delinquency (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Behaviors in the upper end of the externalizing continuum are often referred to as conduct problems. On the other hand, internalizing symptoms are symptomatic of inwardly directed distress that affects the mood and emotion. These manifest as social withdrawal, somatic complaints, anxiety, and depressive symptoms (Costello et al., 2003; Thorpe, Kamphaus, & Reynolds, 2003). Both types of problems have been extensively investigated, the co-occurrence of these problems, however, is less understood. The aim of the literature review is to examine the development and impact of co-occurring externalizing and internalizing problems in youth and the mechanisms for their associations. When the phrase, “co-occurring problems” is used here, it refers specifically to co-occurring externalizing and internalizing symptoms, and not any other types of co-occurring psychiatric conditions.

The survey of the literature is focused on three main areas. The first discusses the nature and development of externalizing and internalizing problems in relation to salient developmental and transitional milestones and issues that youth experience. The second area identifies the etiological factors and theories for the development co-occurring problems. The third area

considers the implications of experimental data from intervention studies to differentiate among the different theories.

Conceptualization of Externalizing and Internalizing Problems

Before discussing the three major areas of the literature review, it is important to clarify the two approaches for conceptualizing and measuring externalizing and internalizing problems (Vander Stoep et al., 2012). The first approach is the categorical approach that is typically based on the Diagnostic and Statistical Manual of Mental Disorders ("*Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR Fourth Edition (Text Revision)*," 2000). Youth are diagnosed with a particular disorder if they fulfill a specific number of criteria for that disorder. Research on disruptive behavior problems would often include Oppositional Defiance Disorder (ODD) and Conduct Disorder (CD) and research on internalizing problems would include the different forms of depressive disorders such as Major Depressive Disorder and Dysthymic Disorder. Anxiety disorders are excluded since clinically significant level anxiety problems are different from low level anxiety symptoms that are more likely to contribute to the constellation of internalizing symptoms in youth (Prenoveau et al., 2010; Watson, 2005).

The second approach is a dimensional approach where behavioral and emotional problems are conceptualized and measured along externalizing and internalizing dimensions (Oland & Shaw, 2005). From a substantive viewpoint, the dimensional approach is supported by recent studies showing that both emotional and behavioral problems are more accurately conceptualized as two individual dimensions with continuous variations (Hankin, Fraley, & Lahey, 2005; Ingoldsby, Kohl, McMahon, & Lengua, 2006; Markon, Chmielewski, & Miller, 2011; Walton, Ormel, & Krueger, 2011). Factor analytic studies have also demonstrated that general anxiety and depressive symptoms in children are correlated to a significant extent and

can be considered under the broad-band construct of negative affect or general distress (Prenoveau et al., 2010; Watson, 2005). Particularly in young children, anxiety and depressive symptoms are not well differentiated and can be represented by a unified factor comprising both types of symptoms (Hammen & Rudolph, 2003).

It should be noted that these two measurement approaches do not identify exactly the same group of individuals, but overlapping groups of individuals with co-occurring symptoms (Vander Stoep et al., 2012). While both measuring approaches identified youth with high functional impairment, high need for services, and clinical elevations on other symptom scales, the dimensional approach tended to identify more youth with co-occurring conditions. This leads a group of researchers to conclude that “different measurement approaches were likely making inferences about different adolescents with similar levels of clinical need” (Vander Stoep et al., 2012, p. 878).

From a methodology viewpoint, continuous measures of psychopathology can be more reliable and valid as they do not rely on arbitrary cut-offs to determine the presence or absence of a condition (Markon et al., 2011). Dichotomizing continuous variables or applying multiple cut-offs to form two or more categories results in a loss of statistical power and attenuation of effect sizes in subsequent analyses (MacCallum, Zhang, Preacher, & Rucker, 2002; Youngstrom, Findling, & Calabrese, 2003). In addition, dimensional measures are more useful for identifying and investigating problem patterns in community samples with low base rates of symptoms. They also allow for the modeling of growth and elevation of symptomatology that are likely to reach clinical levels over time (Ingoldsby et al., 2006). Many theories of psychopathology describing mechanisms of change are based on continuous variables, rather than diagnosed disorders (Oland & Shaw, 2005; Youngstrom et al., 2003).

When considering school-based interventions, a dimensional approach is also more applicable given the trend toward a multitier and preventive model of support. Under this framework, students with subclinical levels of emotional and behavioral needs are identified before they reach clinical levels of impairment. Students' needs are matched to the appropriate level of intervention which can be universal support for all students (Tier 1), targeted intervention for at-risk students (Tier 2), or/and indicated intervention for students with more serious impairment (Tier 3). A dimensional approach allows for the regular assessment of students' difficulties such that their levels of their emotional and behavioral problems need not reach clinical levels of impairment before some form of school-based intervention is provided.

Given the advantages of the dimensional approach, the current study will be based on this approach. However, research studies using both approaches are equally relevant for review. Hence, studies focused on ODD and CD for the externalizing dimension, and those focused on depressive disorders for the internalizing dimension will be included in the review.

Developmental Issues and Gender Differences in Externalizing and Internalizing Problems

The following sections will briefly review the nature and developmental course of pure forms of externalizing behaviors and internalizing symptoms to provide a basis of understanding co-occurring symptoms. Youth with pure forms of symptomatology are assumed to be those who show elevations in either externalizing behaviors or internalizing symptoms only. Developmental issues and gender differences that impact externalizing behaviors and internalizing symptoms will also be highlighted. As gender differences in psychopathology are closely related to developmental periods and the accompanying differences in socialization experiences (Zahn-Waxler, Crick, Shirtcliff, & Woods, 2006), the interaction between development and gender-linked effects will be important issues for review.

Externalizing Behaviors

At the clinical level of impairment, the general prevalence rate of behavioral disorders according to the DSM-IV criteria is about 7.0% for children between 9 and 16 years of age (Costello et al., 2003). Other estimates from a meta-analysis focused on youth who met the criteria for ODD or CD ranged from 6% to 15% (Angold & Costello, 1999). Even more children are expected to exhibit subclinical levels of externalizing behaviors (Hinshaw & Lee, 2003). During the preschool years, boys are more likely to exhibit externalizing behaviors compared to girls in the ratio of four to one (Hinshaw & Lee, 2003; Zoccolillo, 1993). Notwithstanding individual differences in developmental trajectories, boys tend to show more steeply increasing trend of externalizing behaviors until about late childhood. By adolescence, their overall trend begins to stabilize or shows a slight decline. On the other hand, girls show a lower rate of increase and may stabilize by adolescence (Chen & Simons-Morton, 2009; Ingoldsby et al., 2006; Xie, Drabick, & Chen, 2011). Overall, the ratio of boys to girls with externalizing problems decreases from four to one to two to one by adolescence (Zoccolillo, 1993). Gender differences in externalizing behaviors have been associated with many biological and gender socialization processes (Zahn-Waxler et al., 2006). For example, testosterone has been implicated for the higher level of aggression observed in boys. In addition, externalizing behaviors tend to be tolerated and reinforced more in boys than in girls (Zahn-Waxler et al., 2006).

According to a review by Campbell, Shaw, and Gilliom (2000), the onset of externalizing behaviors can begin as early as two or three years old. During this developmental period, signs of externalizing behaviors are marked noncompliance, aggression toward peers, high activity level, and poor regulation of impulses. At a low level, these symptoms are considered developmentally

appropriate and are likely to attenuate by middle childhood as young children learn better emotional and behavior self-regulation skills (Campbell et al., 2000). However, externalizing problems can remain stable across childhood and even to adulthood if behavior problems during childhood increase in frequency and pervasiveness across settings and time and particularly, in the context of high family adversity such as poor and crime-ridden neighborhoods, limited social and community support for parents, parental psychopathology, marital conflict and single parenting (Campbell et al., 2000; Kraatz Keiley, Bates, Dodge, & Pettit, 2000; Odgers et al., 2008; Slough & McMahon, 2008).

Children's externalizing behaviors are likely to affect their ability to meet the learning and social demands in school. Their symptoms would be maintained or exacerbated when school disciplinary practices are inconsistent, and interactions and communication with teachers and peers are negative. If learning difficulties are not remediated, they can also lead to chronic academic failure, disengagement with school, and school drop-out. With the onset of puberty in adolescence, the increasing salience of peer relations and issues of identity development provide a different context for the emergence and maintenance of externalizing problems (Slough & McMahon, 2008). For example, adolescents who associate with deviant peers are more likely to show externalizing behaviors such as truancy, disobedience, delinquency, and school drop-out. Other adverse adjustment outcomes during this period would include poor self-esteem, internalizing symptoms, acrimonious relationships with parents, poor romantic relationships, pregnancies, substance use, driver's license suspensions and criminal behavior (Capaldi & Stoolmiller, 1999; Odgers et al., 2008; Xie et al., 2011). Overall, externalizing problems show a higher degree of stability across settings and development. Due in a large part to the stability of

the person-environment interactions, many of these problems identified in early adolescence persist to adulthood (Capaldi & Stoolmiller, 1999).

Three distinctive trajectories of elevated externalizing behaviors have been consistently identified (Moffitt, 1993; Odgers et al., 2008; Patterson, DeBaryshe, & Ramsey, 1989; Xie et al., 2011). The first is the life-course persistent group whose externalizing behaviors from childhood persist into adolescence. The second is the childhood limited group which comprises children with equally high levels of early externalizing problems, but the behaviors decline by adolescence. The third group is the adolescent-onset group. Their symptoms begin in adolescence and may be time-limited. Among these three groups, the life-course persistent trajectory is considered to be most severe (Moffitt, 1993). For both genders, this group experiences the most adverse family environment and shows the poorest outcomes (Xie et al., 2011).

Internalizing symptoms

In general, the onset of internalizing symptoms begins in early childhood with a high prevalence of anxiety-related problems estimated to be between 5% and 20%. Anxiety problems are in fact, the most common psychopathology during childhood (Albano, Chorpita, & Barlow, 2003). According to Costello et al. (2003)'s estimate based on the DSM-IV, 6.8% of the children between the ages of 9 and 16 years, experience serious emotional disturbance that is accompanied by significant functional impairment. Early internalizing symptoms show a high degree of stability that predicts later anxiety and depression problems (Angold & Costello, 1999; Costello et al., 2003; Kovacs & Devlin, 1998).

Throughout childhood, the overall rates of internalizing problems continue to increase gradually until late childhood when the onset of depressive symptoms becomes more salient

(Kovacs & Devlin, 1998). During adolescence, girls' internalizing symptoms increase steeply and they outnumber boys significantly in their reports of the symptoms (Chen & Simons-Morton, 2009; Costello et al., 2003; Ingoldsby et al., 2006; Kim, Capaldi, & Stoolmiller, 2003). While it is well-established that the prevalence of depression as a syndrome increases during adolescence, depression as a mood symptom tends to reach a peak and decreases sometime within that period (Chen & Simons-Morton, 2009; Ge & Best, 1996; Harrington, Rutter, & Fombonne, 1996).

In adolescence, the emergence of the cognitive sophistication to self-reflect and ruminate plays a part in sustaining and prolonging the experience of depressive and other internalizing symptoms (Kovacs & Devlin, 1998; Measelle, Hogansen, & Stice, 2006). Adolescents' cognitive appraisals also become more stable and they become more able to take the perspectives of others in viewing themselves. Other contributing factors to internalizing problems also include puberty changes, transition from elementary to middle schools, changing family relationships, reliance on peer status and opinion, and self-esteem issues. These changes often result in stress, thereby increasing the adolescents' vulnerability for mood and behavior problems (Kovacs & Devlin, 1998). Similarly, gender differences in internalizing symptoms also result from a complex interaction between biological and psychological factors that impact an individual's reactivity to social stressors. For example, some evidence suggests that depressive symptoms are related to the levels of female estradiol and testosterone during adolescence. Girls coping styles which tend to be more passive, internalized and ruminative, may make them more vulnerable to interpersonal stressors compared to boys (Hammen & Rudolph, 2003).

Some have argued that the manifestations of depression may be "masked" in young children in the sense that externalizing behaviors can be reflective of underlying depression. However, evidence now shows that with some age-related variations, the basic experience of

depression in children is very similar to that of the adult form (Luby et al., 2003). The presence of sadness and/or irritability, as well as anhedonia, remain important markers of a depressive disorder in childhood, over and above the less sensitive and specific “masked” symptoms such as somatization (Luby et al., 2003). Hence, externalizing behaviors cannot be argued to be “manifestations” of depression if the constellation of symptoms does not suggest the presence of depression.

Research on the developmental trends of internalizing symptoms is still in the early stages. Different studies have investigated children from different age groups and some measured the general construct of internalizing symptoms while others measured only specific depressive symptoms (Mazza, Fleming, Abbott, Haggerty, & Catalano, 2010; Serba, Prinstein, & Cox, 2007; Stoolmiller, Kim, & Capaldi, 2005). Across the studies, there appears to be a trajectory of low symptoms across development, as well as a trajectory showing more persistent level of moderate to high symptoms. Another set of trajectories indicating mild to moderate levels of symptoms shows more variability across the studies. Similar to the life-course persistent group with externalizing behaviors, the persistently high internalizing group can be uniquely differentiated from the other group in terms of risk factors such as SES, parental transitions, childhood academic problems, parental depression, negative life events, and (Mazza et al., 2010; Stoolmiller et al., 2005). The high variability in individuals with mild to moderate level of symptoms may reflect the episodic nature of depressive symptoms (Vander Stoep et al., in press)

Youth with depressive symptoms face different degree of impairment across various domains of functioning. For example, depressive symptoms in early adolescence predict problems in interpersonal relationships. Other more severe maladjustment outcomes include substance abuse, attempted suicide, and suicide (Capaldi & Stoolmiller, 1999). Childhood

anxiety disorders are also associated with significant learning and behavior problems such as poor academic performance, poor social functioning, and premature withdrawal from school (Mychailyszyn, Mendez, & Kendall, 2010). With a high degree of co-occurrence, many children with depression also have anxiety problems and these problems are often associated with other psychiatric conditions such as eating disorders, substance abuse, and conduct problems.

Summary

Across the developmental periods of childhood and adolescence, the individual is confronted with many challenges that are critical for successful adaptation. These challenges across different functioning domains include academic achievement, school participation, and peer and familial relations. To cope with these challenges, the individual would need to develop a wide range of skills such as learning skills, attention and compliance, self-regulation skills, as well as social, communication and interpersonal skills. With the onset of puberty, biological and psychosocial changes would mean negotiation and renegotiation of self-identity and interpersonal relations. Without sufficient skills, challenges can result in high reactivity to social stresses, leading to maladaptation and behavioral and emotional problems.

CHAPTER TWO

LITERATURE REVIEW

Increasingly, clinicians and researchers are recognizing that co-occurring psychological conditions in children is really the norm (Angold & Costello, 1999; Costello et al., 2003). This review will focus specifically on the co-occurrence of externalizing behaviors and internalizing symptoms in youth. To provide effective preventive and therapeutic support for youth with co-occurring problems, it is important to understand the etiology of co-occurring problems. The aims of this chapter are (1) to discuss the concept of comorbidity versus co-occurrence, (2) to summarize salient findings about the phenomenon and impact of co-occurring externalizing behaviors and internalizing symptoms on functioning, (3) to discuss the relevant theories, and (4) to consider the implications of intervention studies. Following the review of literature in these four areas, research questions will be delineated for the current study.

The Concept of Comorbidity Versus Co-occurrence

The concept of *comorbidity* has been controversial (Kaplan, Crawford, Cantell, Kooistra, & Dewey, 2006; Kovacs & Devlin, 1998; Lilienfeld, 2003; Lilienfeld, Waldman, & Israel, 1994; Spitzer, 1994). Comorbidity, a term invented in the field of medicine, refers to the simultaneous existence of two or more medical conditions in an individual that are usually independent of one another (Angold & Costello, 1999; Kaplan et al., 2006). In this case, it is assumed that the medical conditions are distinct and are not caused by the same underlying mechanisms. Several authors have argued that comorbidity is only meaningful when used in the context to describe the associations between diseases since diseases are fairly well understood in terms of their presentations and etiologies (Kaplan et al., 2006). On the other hand, comorbidity is less suitable for use in the psychological field since causal mechanisms of many disorders are still not well-

understood. Hence, assumptions that two or more psychological conditions do not have similar underlying causal mechanisms are difficult to support (Kaplan et al., 2006; Lilienfeld et al., 1994). Alternatively, *co-occurrence* is a better term to describe the associations between different psychological conditions since it makes no assumption about shared causal mechanisms (Kaplan et al., 2006). Co-occurrence simply describes the temporal relatedness between two or more conditions, which may or may not result from similar underlying mechanisms. Following this reasoning, the term *co-occurrence* will more often be used in this dissertation unless studies being described had used the term *comorbidity*.

Accounting for Chance and Methodological Artifacts

The probability of the co-occurring externalizing behaviors and internalizing symptoms has been consistently found to be higher than random chance alone (Chen & Simons-Morton, 2009; Ingoldsby et al., 2006; Vander Stoep et al., 2012). If the co-occurrence of two problems is by chance alone, then the expected prevalence rate is the joint probability of the occurrence of individual problems, which can be obtained by multiplying the base rates of the occurrence of each of the problems (Angold & Costello, 1999). Any observed prevalence rate that is significantly higher than the expected rate would be considered more than a chance event. For example, in a recent study, both the categorical and dimensional approaches were used to estimate prevalence rates of co-occurring depressive and disruptive behavior problems for children in 6th and 9th grades (Vander Stoep et al., 2012). According to the categorical approach, the observed prevalence rate was estimated to be 2.1% which was 1.83 times higher than the expected rate. According to the dimensional approach, the estimate was 11.7%, which was 2.03 times higher than the expected rate (Vander Stoep et al., 2012).

Other supportive evidence to show that the occurrence is more than a chance event comes from the statistically significant correlations between externalizing and internalizing measures, and significant concordance rates or odd ratios between the two forms of disorders. Significant concurrent correlations in the range of .30 to .42 were estimated for youth in 5th to 7th grades (Chen & Simons-Morton, 2009; Ingoldsby et al., 2006). Lower but still significant estimates in the range of .10 to .29 were found for youth in high schools (Wiesner & Kim, 2006). In a survey of community-based epidemiological studies, the degree of association between the different disorders were estimated using odds ratios (Angold & Costello, 1999). Results showed that the odds ratios for CD/ODD and depression were statistically significant for 16 out of 21 studies.

Researchers have also considered if the higher than chance level of observed prevalence rate is an artifact due to methodological and measurement factors (Lilienfeld, 2003; Wolff & Ollendick, 2006). Method covariance that arises from similar assessment methods such as using a questionnaire approach and similar informants for both externalizing and internalizing problems can result in a significant correlation (Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003). However, even after method covariance is taken into account statistically, the significant associations between externalizing and internalizing problems remain (Wolff & Ollendick, 2006). Overlaps in the diagnostic criteria between externalizing and internalizing disorders can also result in a significant association, such as when the presence of one problem partially fulfills the criteria for the other. Examination of the two sets of criteria shows largely clear differentiation between externalizing behaviors and internalizing symptoms. Only the symptom of irritability or agitation in young children may overlap between the two types of problems. Irritability in young children is not only known to be symptomatic of depression, it is also related to several diagnostic criteria of ODD. However, evidence shows that after eliminating

overlapping symptoms between these disorders, the elevated rates of co-occurrence were still not reduced (Wolff & Ollendick, 2006). Hence, symptom overlap cannot account for the higher-than-expected prevalence rate. Other reasons considered are referral, selection, or sampling biases inherent in clinical samples when rates of co-occurrence are estimated from these samples. Clinical samples tend to comprise a higher proportion of individuals with more severe and multiple dysfunctions and would thus, give upwardly biased estimates. However, even when prevalence rates were estimated from community samples, they were still higher than expected. Overall, while many methodological reasons have been considered, they have mostly been ruled out as adequate explanations for the phenomenon (Angold & Costello, 1999; Lilienfeld, 2003).

Outcomes of Co-occurring Externalizing and Internalizing Problems

Co-occurring problems exhibit a high degree of stability over time (Beyers & Loeber, 2003; Capaldi, 1992; Ingoldsby et al., 2006; Vander Stoep et al., in press). Studies have shown that about 46% to 48% of youth with co-occurring problems between 5th and 6th grades continue to show elevations in both types of problems two years later (Capaldi, 1992; Ingoldsby et al., 2006). In comparison, youth with depression only or conduct problem only categories showed lower stability rates, such as 3% and 22%, respectively (Capaldi, 1992). In addition, only 4-9% of youth with co-occurring problems are likely to desist in their symptom presentation, compared to 25-48% of youth with only one type of symptomatology (Capaldi, 1992; Ingoldsby et al., 2006).

Since youth with co-occurring externalizing behaviors and internalizing symptoms have two sets of problems, it is not surprising that many of them fare worse than those with only one set of problems (Ezpeleta, Domènech, & Angold, 2006; Marmorstein & Iacono, 2003; Rockhill, Vander Stoep, McCauley, & Katon, 2009). Specifically, these youth showed more problematic

functioning compared to those with a single type of problems alone, across domains such as school success, substance dependency, peer relationships, age of first sexual intercourse, suicide ideation, and incarceration rates (Capaldi, 1992; Marmorstein & Iacono, 2003). If the number of symptoms alone can explain the higher level of impairment experienced by co-occurring youth, then controlling for this factor should make youth with co-occurring problems comparable to those with single types of problems in terms of adjustment outcomes. In fact, one study investigating suicidality in youth with multiple psychiatric conditions, found that severity of symptom-related impairment and total symptom load, which are measures of total symptom levels regardless of diagnoses, explained the risk for suicidality associated with psychiatric disorders (Foley, Goldston, Costello, & Angold, 2006). Suicidality is the presence of suicidal ideation in terms of thoughts and wishes to be dead or to kill oneself, as well as making a suicide attempt. Hence, the high risk of suicidality associated with comorbid depression and a disruptive behavior disorder was related to the high levels of impairment experienced at high frequency, but not the nature of the psychiatric condition per se (Foley et al., 2006). Future research comparing the functional impairment of groups of individuals with co-occurring conditions with those with single types of problems may consider controlling for total symptom load in order to tease out the effects of co-morbidity per se.

While some studies found that youth with co-occurring problems fared worse than those with one set of problems, others found that their levels of maladjustment were comparable to those with externalizing behaviors only (Fanti & Henrich, 2010; Ingoldsby et al., 2006; Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998; Renouf & Kovacs, 1997). These results showed that 5th and 7th graders with co-occurring conditions performed equally poorly as youth

with externalizing behaviors on academic achievement, social competence, deviant peer association, substance use, engagement in risky behaviors, and peer rejection.

Another group of studies investigating co-occurring trajectories of externalizing and internalizing symptoms provide additional evidence that co-occurring conditions lead to more adverse functional impairment (Beyers & Loeber, 2003; Chen & Simons-Morton, 2009; Measelle et al., 2006; Wiesner & Kim, 2006). Across these studies, results indicate that the presence of a co-occurring condition aggravates the experience of either externalizing behaviors or internalizing symptoms. Overall, there is a decreasing trend of externalizing behaviors for youth between the ages of 13 and 18. This trend was moderated by depressive symptoms such that the rate of decline of externalizing behaviors was less rapid for those with higher levels of depressive symptoms (Beyers & Loeber, 2003; Measelle et al., 2006). In another study, there was a general increasing trend of internalizing symptoms for boys from 15.5 years and older (Beyers & Loeber, 2003). This increasing trend was even more salient for boys who engaged in a wider variety of delinquent behaviors. Consequently, the final depressed mood level for the group with externalizing behaviors was higher than those in the group without co-occurring symptoms (Measelle et al., 2006). Overall, these studies on growth trajectories provided supportive evidence that youth with co-occurring problems experience more adverse outcomes.

Gender Differences

Research has consistently shown that the prevalence rate of externalizing behaviors is higher for boys; and the prevalence rate of internalizing problems is higher for girls. For co-occurring problems, more boys than girls are affected, based on estimates from community samples (Chen & Simons-Morton, 2009; Keiley et al., 2003; Kraatz Keiley et al., 2000; Vander Stoep et al., 2012). Generally, researchers have postulated gender differences in the phenomenon

of co-occurring problems since the etiology of externalizing and internalizing problems are different for the both genders (Wolff & Ollendick, 2006; Zahn-Waxler et al., 2006) According to the gender paradox hypothesis, despite the lower risk for girls to develop externalizing problems, those who do, tend to show higher rates of co-occurrence with other disorders, as compared to boys with externalizing problems (Loeber & Keenan, 1994). The underlying reasoning is that externalizing behaviors in girls represent a more severe condition and are thus, associated with impairment across a wider range of functioning. Given that (1) the prevalence rate of internalizing problems is greater for girls, (2) the prevalence rate of externalizing problems is greater for boys, (3) the prevalence rate of internalizing problems is higher than that for externalizing problems for girls, and (4) the prevalence rate of externalizing problems is higher than that for internalizing problems for boys, the gender paradox hypothesis essentially states that the overlap between externalizing and internalizing problems is greater for girls than it is for boys. Direct evidence for evaluating this hypothesis is limited partly because gender differences in conditional probabilities of co-occurring conditions are not always the primary focus of epidemiological studies. In addition, low base rates of co-occurring problems would require very large sample size for unbiased estimates.

Using mixture modeling that allowed for the identification of trajectory groups, one study found that 34% of the boys in the highest delinquency trajectory group were also in the highest depression trajectory group. On the other hand, 50% of the girls in the highest delinquency trajectory group were in the highest depression trajectory group (Wiesner & Kim, 2006). This result appears to support the gender paradox hypothesis except that the boys in the highest delinquency group showed more severe symptoms than the girls in the highest delinquency group, thus making the numbers not comparable. Using the same methodology, another study

found that the group of adolescents in the highest trajectory group for conduct problems, 6.3% of the boys and 5.9% of the girls were also in the highest trajectory groups for depressive symptoms (Chen & Simons-Morton, 2009). In this case, the boys and girls in the highest group appeared to be comparable in the severity of externalizing behaviors. Hence, the severity of externalizing behaviors can be considered to be “fixed” across the gender. Conditioned on externalizing behaviors, the percentage of boys and girls experiencing depressive symptoms appeared to be similar and this is contrary to the prediction of the gender paradox hypothesis. Girls with externalizing behaviors in this sample did not show a higher risk for internalizing symptoms, compared to boys with externalizing problems. Given the limited number of studies focused on gender differences in co-occurring problems and the inconsistent results, the gender paradox hypothesis remains to be tested. A corollary to the gender paradox hypothesis is that girls’ externalizing behaviors are more likely to contribute to the development of internalizing symptoms. Evidence for this thesis is examined in subsequent sections.

Theories about Co-occurring Problems

Shared Risk Theory

Co-occurring externalizing behaviors and internalizing symptoms may result from common risk factors or etiological factors. It has been estimated that more than two thirds of the shared variance between externalizing behaviors and internalizing symptoms may be accounted for by common risk factors (Fergusson & Lynskey, 1996). At the individual level, examples of risk factors include difficult temperament, deficiencies in cognitive abilities, and low early social competence (Fanti & Henrich, 2010). Children with difficult temperament in terms of negative emotionality tend to display intense and negative emotions, which in turn, lead to dysregulated behaviors (Eisenberg, Fabes, Guthrie, & Reiser, 2000). At the environmental level, examples are

low socioeconomic status, childhood abuse, affiliation with delinquent peers, and poor peer relations. In the context of the family, marital conflicts, family stressful life events, family history of offending, low parent knowledge, harsh parental punishment and high parent-child conflict have been found to be risk factors for both types of problems (Fergusson & Lynskey, 1996; Gooren, Van Lier, Stegge, Terwogt, & Koot, 2011; Lansford et al., 2006; Van Lier & Koot, 2010). However, even after controlling for some of these risk factors, several studies still found that the associations between externalizing and internalizing symptoms remained significant, therefore suggesting that the shared risk theory may not be the only explanation for the associations between the two types of problems (Beyers & Loeber, 2003; Fanti & Henrich, 2010; Wiesner, 2003).

General Psychopathological Factor

The co-occurrence of externalizing and internalizing problems may result from a unitary underlying psychopathological factor or process that leads to children's undifferentiated response to stress, in terms of experiencing both kinds of symptoms (Angold & Costello, 1999; Lilienfeld, 2003). In other words, co-occurring problems is a general syndrome that reflects an individual's generalized vulnerability to psychopathology. Weiss, Susser, and Catron (1998) provided a useful model to operationalize this idea. In their model of childhood psychopathology, childhood disorders are conceptualized in terms of common features, broadband specific features, and narrowband specific features. Common features are characteristic of many disorders while specific features are unique to individual disorders. Hence, it is hypothesized that common features differentiate psychopathology from normality; broadband specific features differentiate externalizing problems from internalizing ones; and narrow-band specific features differentiate among narrowband syndrome such as anxiety versus depression. According to this model, co-

occurring symptoms are common features of psychopathology, and symptoms at this level, indicate “abnormal” functioning. Co-occurring problems are thus, the cumulative result of the interaction between an underlying psychopathological process and the environment (Measelle et al., 2006).

The postulation of an underlying predisposition or vulnerability to psychopathology is mainly supported by hereditary studies (Hammen & Rudolph, 2003; Hinshaw & Lee, 2003; Hirshfeld-Becker, Micco, Simoes, & Henin, 2008). Familial comorbidity describes how certain psychiatric disorders tend to co-occur among family members over generations, especially among those disorders within the broad classes of affective and behavioral disorders. For example, children with depressed parents are more likely to show depression, anxiety, and disruptive behaviors (Hammen & Rudolph, 2003). Paternal substance abuse has been associated with childhood aggression (Hinshaw & Lee, 2003). Parents of children with anxiety problems have been found to meet the criteria for diagnoses of some anxiety disorders (Hirshfeld-Becker et al., 2008). Whether hereditary or environmental in nature, these familial associations speak to some common underlying causal mechanism among different disorders.

At the psychological level, the underlying temperamental trait of *negative emotionality* has been hypothesized to lead to both dysregulation of behaviors and emotions (Eisenberg et al., 2001; Eisenberg et al., 2009; Wolff & Ollendick, 2006). Negative emotionality is defined as emotional reactivity in terms of frequent and intense displays of emotions such as anger, irritability, sadness and fear. This construct has been associated with both externalizing and internalizing symptoms (Eisenberg et al., 2009; Singh & Waidman, 2010).

Failure Theory

One theory to explain the co-occurrence between externalizing behaviors and internalizing symptoms is the *failure theory* (Kiesner, 2002). In its early formulation, the failure theory hypothesized that the disruptive, impulsive, and aggressive nature of externalizing behaviors interferes with the development of social skills and academic competence, termed as *dual failure* by Patterson and Stoolmiller (1991), leading to poor peer and family relationships and poor academic performance. The lack of social competence and appropriate learning opportunities, together with negative reactions from others, may lead to further aggravated outcomes and low self-esteem, which in turn contribute to increasing vulnerabilities for developing internalizing symptoms (Capaldi, 1991, 1992). Several studies using different methodologies have examined this temporal association and have found support for the predictive longitudinal association from externalizing behaviors to internalizing symptoms. Three studies were conducted on adolescent samples (Capaldi, 1992; Kiesner, 2002; Wiesner, 2003) while another two were conducted on childhood samples (Gooren et al., 2011; Moilanen, Shaw, & Maxwell, 2010). Internalizing measures were based on youth-report in the adolescent samples and on teacher- or parent-report in the childhood samples. After controlling for the initial levels of internalizing symptoms, these studies show that externalizing behaviors predicted later internalizing problems, usually about two years later. In contrast to these findings, several other studies did not find statistically significant results when investigating samples from childhood (Van Lier & Koot, 2010), late childhood to early adolescence (Ingoldsby et al., 2006), and adolescence (Beyers & Loeber, 2003; Capaldi & Stoolmiller, 1999). The data was generally based on youth-report or multi-informant report of internalizing symptoms and externalizing behaviors except for study using childhood sample where teacher-report of behaviors and symptoms was used. These studies had followed the youth for between 2 to 6 years.

Investigations of the failure theory have spanned childhood and adolescence but evidence for the externalizing to internalizing pathway leading to the co-occurrence of symptoms is still inconsistent. The studies which found significant results have generally followed youth for shorter periods of time of about 2 years. Only one study has examined the important transition period between childhood and adolescence when youth begin to encounter new developmental tasks and become more at risk of internalizing problems (Ingoldsby et al., 2006). Moreover, as internalizing problems were based solely on parent- and teacher-report in 1 out of 2 childhood samples, there is a need to replicate these studies using youth-report measures of internalizing symptoms.

Due to the limited number of studies that have examined the effects of gender, conclusions about gender differences remain premature. Of the eight studies which have investigated the temporal associations between externalizing and internalizing problems, three of them were focused on boys (Beyers & Loeber, 2003; Capaldi, 1992; Capaldi & Stoolmiller, 1999) and two did not directly test the effects of gender by including the factor in their analytical models (Kiesner, 2002; Wiesner, 2003). In the two studies which tested this factor, no gender differences were found (Gooren et al., 2011; Ingoldsby et al., 2006). Even though it is common for researchers to postulate about gender differences in the experience of co-occurring externalizing behaviors and internalizing symptoms in youth, more research is needed to evaluate these postulations.

Peer rejection.

Apart from examining the predictive association from externalizing to internalizing problems, research has also considered different indirect paths from externalizing to internalizing symptoms. Most of these have largely focused on youth's social competence and peer social

relations. Studies in this area are part of the larger literature exploring the role of peer experiences in psychological maladjustment (Ladd, 2006). Among the different indices of peer relations, peer rejection has been consistently associated with both externalizing behaviors and internalizing symptoms (Kraatz Keiley et al., 2000). Furthermore, several studies following kindergarten students over several years have found that externalizing behaviors predicted peer rejection, low peer acceptance, victimization, and having fewer friends. These factors, in turn, predicted internalizing symptoms in late childhood (Gooren et al., 2011; Ladd & Troop-Gordon, 2003; Van Lier & Koot, 2010). The disruptive, impulsive, and aggressive nature of externalizing behaviors is likely to put youth at risk of peer rejection. Peer rejection will, in turn, deprive children of the opportunities to learn and internalize social norms and rules in interpersonal relationships, leading to inappropriate behaviors during social interactions and difficulties forming and establishing friendships. When rejected children constantly receive negative feedback and responses in their social encounters, they may develop low self-esteem and become at risk of internalizing problems (Cole, Jacquez, & Maschman, 2001; Gooren et al., 2011). The mediating effects of peer rejection were generally found to be similar for boys and girls (Gooren et al., 2011; Troop-Gordon & Ladd, 2005; Van Lier & Koot, 2010). As investigations in this area have used samples of younger children, testing the mediating effects of peer rejection with adolescents will be an important next step, especially as peer relations become more developmentally significant and complex during adolescence.

Additional evidence to support a potential mediating role of peer rejection comes from studies showing significant predictive associations between externalizing and internalizing symptoms one one hand, and interpersonal problems with peers on the other. In longitudinal studies, conduct and depressive disorders diagnosed in early adolescence predicted low social

competence, low peer status, peer rejection, and diminished peer support in late adolescence and young adulthood (Capaldi & Stoolmiller, 1999; Kiesner, 2002; Renouf & Kovacs, 1997; Stice, Ragan, & Randall, 2004). Peer rejection during childhood was also predictive of externalizing and internalizing symptoms during adolescence (Boots, Wareham, & Weir, 2011; Kraatz Keiley et al., 2000).

Parent-child conflict.

The possible mediating role of parent-child relationship quality or conflict in the co-occurrence of externalizing behaviors and internalizing symptoms has not been investigated. Evidence is available to support associations between parent-child relations and both externalizing behaviors and internalizing symptoms. Positive parent-child relationship qualities such as acceptance, trust, and communication predict lower levels of conduct problems in adolescent boys (Capaldi & Stoolmiller, 1999). On the other hand, parent-child conflict and low family cohesion are related to later adolescent delinquency and violence (Boots et al., 2011; Hawkins, Catalano, & Miller, 1992; D. B. Henry, Tolan, & Gorman-Smith, 2001; Marmorstein & Iacono, 2004). The link from parent-child relationship variables to externalizing behaviors is also supported by findings showing that family-based interventions, such as parent training and parent education that strengthen the relationship between parents and children, are effective treatment models for conduct problems and delinquency in adolescents (Curtis, Ronan, & Borduin, 2004; Farrington & Welsh, 1999; D. Henry, 2012).

A variety of parenting and family environment variables are also associated with depressive symptoms in adolescence. Poor parent-child relationship, parent-child conflict, and low family support have been found to be risk factors for adolescent depression (Capaldi & Stoolmiller, 1999; Marmorstein & Iacono, 2004; Stice et al., 2004). In addition, specific

interactional factors such as negativity and aggression, indicative of disruptions in family relationships, contribute to increasing vulnerability for depressive and anxiety symptoms in adolescents (McLeod, Wood, & Weisz, 2007; Schwartz et al., 2012; Sheeber & Hops, 1997). Overall, evidence shows that parent-child conflict is a risk factor for both externalizing and internalizing symptoms. Given the potential mediating role of parent-child conflict, this factor should be tested directly.

Academic competence.

Another possible mediator in the pathway from externalizing to internalizing problems is academic competence. Externalizing behaviors are likely to affect youth's motivation and engagement in the classroom, leading to poor academic learning and negative feedback. Over time, the lack of opportunities and the increases in negative arousal may contribute to the development of internalizing symptoms. Tests of cascade effects models have examined academic competence as a mediator between externalizing and internalizing symptoms. In these models, cascade effects are developmental pathways that refer to the transactions occurring between the individual and environment with effects spreading within and across social-emotional, behavioral, and cognitive functioning, and also across developmental periods (Masten & Cicchetti, 2010). Controlling for IQ, socioeconomic differences, and parenting quality, one study found some evidence for cascading effects from externalizing problems to low academic competence to internalizing symptoms for youth followed for 20 years, from childhood to adulthood (Masten et al., 2005). Another study investigated a sample of at-risk boys, aged between 6 and 12 and found that externalizing behaviors at 6 years predicted low academic competence at 8 years, which in turn predicted internalizing symptoms at 10 years (Moilanen et al., 2010). Another study on a large sample of 6 to 8 year olds also found similar type of

evidence of cascading effects. As only three studies have tested the mediating role of academic competence directly and gender effects were only tested in one study, in part due to small sample sizes, further investigations about the role of academic competence will be needed. A more intense focus on the transition period from late childhood to early adolescence will help to elucidate the links between behavior, emotional, and academic problems, as well as identify any gender differences.

Evidence for the separate associations between academic achievement and externalizing and internalizing symptoms have been found in several studies but results regarding gender differences remain inconsistent. In one study, boys with high levels of externalizing and internalizing symptoms were more likely than girls to experience school problems (Boots et al., 2011). In another study, low academic achievement at age 10 predicted school failure experiences (i.e., suspensions, expulsions, not graduating on time) in adolescence and the likelihood of a major depressive episode in young adulthood for girls but not for boys (McCarty et al., 2008). Results of these studies suggest possible gender differences in the associations between academic competence and psychological adjustment variables (Masten et al., 2005). It has been suggested that girls may be more psychologically vulnerable to school failure, compared to boys, since girls are less likely to experience school failure compared to boys (Cole & Martin, 1997; McCarty et al., 2008). Furthermore, girls tend to underestimate their academic competence relative to boys (Cole & Martin, 1997) and given their increased vulnerability for depressive symptoms, they may be more affected by academic failure.

Research identifying the mediators in the association between externalizing and internalizing problems is presently limited in number. Additionally, investigations following youth over a longer period of time will test the longer term cascading effects. It is also critical to

focus on the transition from late childhood to adolescence. During this period, youth experience biological and psychosocial changes that require them to negotiate self-identify and self-esteem issues, experience shifts in interpersonal relationships with peers and family, as well as cope with increased academic demands and personal responsibilities. These changes in developmental tasks and social stressors are likely increase vulnerability for emotional and behavioral problems. Hence, the use of longitudinal data over this developmental period will provide a window for observing the emergence and development of externalizing behaviors and internalizing symptoms (Cole, 2006). As few studies have investigated the effects of gender, gender differences need to be tested more directly through its inclusion as a moderating factor in statistical models. Lastly, as parents' and teachers' perceptions of internalizing problems in youth may not always be an unbiased assessment of youth's emotional difficulties, the measure of internalizing problems should best be reported by youth themselves to the extent possible given their developmental skills.

Acting Out theory

The failure theory emphasizes the temporal relationship and dynamic interaction between externalizing behaviors and internalizing symptoms. According to this theory, impairment in one domain increases an individual's vulnerability or creates the context for impairment in the second domain to develop (Capaldi, 1991, 1992; Wolff & Ollendick, 2006). The initial formulation of the theory was focused on the pathway from externalizing behaviors to internalizing problems. Subsequent formulations of the theory hypothesized that as youth progressed in development, internalizing symptoms would further aggravate initial externalizing behaviors (Patterson, Reid, & Dishion, 1998; Wolff & Ollendick, 2006). These hypothesized pathways are consistent with *transactional models* where characteristics of the person and the

environment are interrelated and in constant exchange, and pathways are reciprocal and mutually influential (Emde & Spicer, 2000). More recently, these developmental pathways have also been described as *cascading effects*, a concept that refers to the transactions occurring between the individual and environment with effects spreading within and across social-emotional, behavioral, and cognitive functioning, and also across developmental periods. Multiple pathways are encompassed in cascade models, including those that are direct and unidirectional, direct and bidirectional, and indirect (Masten & Cicchetti, 2010). Applying *cascading effects* to co-occurring externalizing and internalizing symptoms suggests that one type of impairment may create a context for the other to develop (Masten & Cicchetti, 2010). Hence, the externalizing to internalizing and the internalizing to externalizing pathways are both plausible explanatory models for the co-occurrence of symptoms.

For some individuals, the pathway from internalizing to externalizing behaviors may be more applicable. For example, depression may impair and reduce concerns for adverse consequences, thereby increasing risk for antisocial behaviors (Capaldi, 1991). When youth experience irritability and distractibility associated with internalizing problems, they may also experience difficulties thinking through alternative behaviors and responding appropriately to social situations. The negative affect associated with internalizing symptoms may be annoying or irritating to others, resulting in interpersonal conflicts and poor relationships (Oland & Shaw, 2005).

In support of the internalizing to externalizing pathway, (Kofler et al., 2011) found that in their sample of adolescents between 12 to 17 years, early depressive symptoms predicted age-related changes in delinquent behaviors significantly better than the reverse. It should be noted that Kofler et al. (2011) had used phone interviews to assess youth-reports of externalizing

behaviors and internalizing symptoms but interviewing youth over the phone is not the common method used in other comparable studies. Two other studies found support for the internalizing to externalizing pathways. More importantly, they also found support for the externalizing to internalizing pathway (Beyers & Loeber, 2003; Wiesner, 2003). These results provide evidence for the more general concepts of transactional and cascading effects, where effects of psychopathology are hypothesized to spread within and across social-emotional, behavioral, and cognitive functioning, and also further increasing the severity of the initial impairment.

Regarding gender differences, Wiesner (2003)'s results revealed that the predictive association from internalizing to externalizing problems was significant only for girls. Girls' internalizing symptoms were more likely to predict future externalizing behaviors than did boy's internalizing symptoms. However, this difference was not tested directly.

Summary

Four theories are put forward to explain the phenomenon of co-occurring externalizing behaviors and internalizing symptoms in youth: shared risk theory, general psychopathological factor, failure theory and acting out theory. The shared risk factors theory emphasizes common risk factors between the two types of problems, thus leading to the development of externalizing and internalizing symptoms. The presence of common risk factors in the relationship between externalizing and internalizing symptoms is akin to identifying a third variable that results in the association between two variables. Hence, it is important to take into account common risk factors in the investigation of the relationship between externalizing and internalizing symptoms. In fact, many studies have taken the step to control for common risk factors and still found the significant association between externalizing and internalizing measures (Beyers & Loeber,

2003; Fanti & Henrich, 2010; Wiesner, 2003), which suggests that common factors alone do not account for all the variance in the association.

The general psychopathological factor theory suggests that co-occurring externalizing behaviors and internalizing symptoms result from an underlying general predisposition for psychopathology which is biological and genetic in origin. Hereditary evidence from familial comorbidity of psychopathology and the identification of a general temperamental trait of negative emotionality may support the theory. The failure theory and the acting out theory describe the dynamic associations between the two types of problems. In the failure theory, externalizing behaviors increase the vulnerability of an individual to develop internalizing symptoms; in the acting out theory, internalizing problems contribute to the development of externalizing behaviors. Furthermore, the failure theory also hypothesizes indirect pathways where psychosocial factors such as peer and family relations, and academic competence likely mediate the pathway from externalizing to internalizing problems. Comparing the two theories, the failure theory, thus far, has received more empirical support than the acting out theory.

It should be noted that the theories discussed here may not completely antithetical to one another. It is possible that different mechanisms are involved, paralleling the concept of equifinality, where different pathways lead to the same eventual outcome of co-occurring problems (Shirk, Talmi, & Olds, 2000). For example, co-occurring problems may be the result of the cumulative effects of a hereditary component related to an underlying predisposition for psychopathology, plus the presence of common risk factors, and the continual transactions between externalizing behaviors and internalizing symptoms with the environment.

Implications of Intervention Studies

Another way to evaluate the different theories may be to consider experimental data from treatment studies where intervention in one or more areas of functioning results in symptom reduction (Lerner, 1998). If a particular treatment is effective in reducing the problems, then the theory behind the treatment can be considered to be supported. Few treatment studies have focused specifically on co-occurring externalizing behaviors and internalizing symptoms. Most treatment studies investigated one type of disorder. For those that focused on co-occurring problems, their aims were mainly to establish the validity and effectiveness of their treatments for targeted youth with an additional condition. In order to increase the literature base under consideration, treatment studies which measured both externalizing behaviors and internalizing symptoms were identified even though they might not be investigating co-occurring problems. The objectives of this brief survey are (1) to identify if both externalizing behaviors and internalizing symptoms were affected by the treatments, and (2) to consider the mechanism of the intervention effects in order to shed light on the theories of co-occurring externalizing behaviors and internalizing symptoms in youth.

Interventions for Co-occurring Problems

Of the treatment studies identified in the literature, two studies specifically targeted youth with co-occurring problems. In Weiss, Harris, Catron, and Han (2003), the participants showed elevations in both externalizing behaviors and internalizing symptoms that were at least one standard deviation above the sample means. Weiss et al. (2003)'s school-based RECAP intervention program was designed to target children with these two types of problems. The RECAP program was developed by combining and modifying treatment techniques that were used for treating either externalizing behaviors or internalizing symptoms. The three main components of intervention were (1) coping skills training, (2) problem-solving skills training,

and (3) parent training. The results showed that the program was effective in reducing the participants' externalizing behaviors and internalizing symptoms, or in preventing further deterioration of the problems. The authors concluded that these results provided some validity to their treatment model of combining treatment programs for concurrent forms of psychopathology. The RECAP intervention model subscribed to the shared risk theory since it was designed to target risk factors associated with both externalizing behaviors and internalizing symptoms, such as social skill deficits, attributional biases, and poor adult-child communication and relationships. Targeting these common factors was hypothesized to improve both types of symptoms.

In Levy, Hunt, and Heriot (2007), the participants were 8 to 14 year-old children and their parents. The children were diagnosed with anxiety disorders and had scored above the 90th percentile on both the Aggression subscale and the Externalizing scale of the Child Behavior Checklist (Achenbach & Rescorla, 2001). The study compared two types of treatment. The first was the Cool Kids program, a cognitive-behavioral therapy program for anxiety problems. In this program, parents learned about anxiety and behavioral management strategies and how to facilitate adaptive coping skills in their children. Children were taught to monitor their physical sensations associated with anxiety, use cognitive and problem-solving strategies to calm down, and resolve problems in anxiety-provoking situations. The second was a combined program for anxiety and aggression and it integrated components from the Cool Kids program and included specific strategies for anger and aggression. Examples of the strategies used were behavior management techniques, discussion of anger-provoking situations, as well as coping strategies for anger and aggressive behaviors. Results revealed no significant difference between the two treatment groups. Many of the children improved on their externalizing behaviors and

internalizing symptoms. The authors concluded that the combined treatment was not significantly better than the anxiety treatment program alone. It appears that improvement in anxiety symptoms contributed to improvement in aggressive symptoms even though specific shared risk factors were not systematically targeted. Systematically focusing on all areas of impairment in the combined program did not confer additional benefits. However, the authors suggested that their combined program contained more curriculum materials than the anxiety program and therefore would have required more time to cover in order for the added benefits of the combined treatment to be salient.

Interventions for Internalizing Symptoms

As interventions such as cognitive-behavioral therapy for anxiety and depressive symptoms, and parent-training programs for conduct problems, become established as evidence-based programs, researchers have begun to turn their attention to consider if these treatments retain their effectiveness for those targeted youth with additional co-occurring problems (Kendall, Brady, & Verduin, 2001). In fact, several studies have evaluated whether anxiety and depression interventions produced similar outcomes for anxious and depressed youth with co-occurring externalizing behaviors. It is relevant to consider these treatment studies here as they provide data on both externalizing and internalizing measures and how they change as a result of intervention.

Flannery-Schroeder, Suveg, Safford, Kendall, and Webb (2004) investigated if anxiety disordered 8 to 13 year-old youth with co-occurring externalizing behaviors would benefit from cognitive-behavioral therapy (CBT) treatment to the same extent as those without the co-occurring condition. Their results indicated that children with and without co-occurring conditions showed comparable improvement in internalizing symptoms at post-treatment. The

authors concluded the CBT program remained effective for youth with anxiety problems even if they had a co-occurring externalizing condition. Similar to Levy et al. (2007), they also found that the CBT program improved the externalizing symptom of their participants. The authors suggested that the coping skills that the children learned may help them with their externalizing behaviors.

In Jacobs et al. (2010), CBT treatment of depression was compared to medication treatment using Fluoxetine. Participants were between the ages of 12 and 17 years and were clinically depressed. Their overall mean level of oppositionality was in the clinical range and 13 of them were also diagnosed with ODD. The participants were assigned to four groups – medication group, CBT group, combined treatment group, and placebo group. At post-treatment, all groups showed clinically significant reductions in their depressive, as well as oppositional symptoms. Furthermore, the medication and combined groups showed more reduction in oppositionality compared to the CBT group. The authors suggested that the reduction of oppositionality symptoms with the depression treatment was due to the alleviation of the effects of shared risk factors leading to reduction in both types of problems.

Overall, CBT treatments of anxiety and depression appear to benefit externalizing problems. Liber et al. (2010) termed this, “positive spin-off effects”. Authors typically cited shared risk factors as the basis for the improvement on externalizing behaviors. Hence, when a shared risk factor is alleviated, both externalizing behaviors and internalizing symptoms would be reduced. An alternative interpretation may be that given sufficient time, improvement in one domain can lead to improvement in another, which is the mechanism of cascading effects. For example, youth may adapt and generalize the problem-solving skills they learned to address internalizing problems and apply the skills to their externalizing problems, thus leading to an

attenuation in both types of problems. Another possibility is that improvement in depressive symptoms, including irritability and distractibility, may facilitate more adaptive thought processes and appropriate responding in social interactions, thus reducing the likelihood of interpersonal conflicts and externalizing behaviors (Capaldi, 1991).

CBT treatments for internalizing problems were not always effective for externalizing behaviors. Rhode, Clarke, Mace, Jorgensen, and Seeley (2004)'s CBT treatment for highly disordered youth between 13 and 17 years were effective only for internalizing but not externalizing behaviors. The participants had co-occurring diagnoses of MDD and CD, as well as other diagnoses such that the average number of diagnoses at intake was more than four. The intervention program called Adolescent Coping With Depression (CWD-A) was a course conducted for groups of adolescents with depression. Participants learned strategies for monitoring mood, increasing pleasant activities, decreasing anxiety and depressive symptoms, social and communication skills, and other problem-solving skills. Compared to the control group which engaged in a general life skill intervention, the treatment group showed improvement in depressive symptoms at post-treatment although this was not maintained at the 6- and 12-month follow-up. No improvement in externalizing behaviors was found. It is possible that the effectiveness of CBT treatment on externalizing behaviors is moderated by the severity of the conditions (Liber et al., 2010). In severe cases, positive spin-off effects may not be easily achieved or longer intervention time is needed.

Interventions for Externalizing Behaviors

In another group of treatment studies which targeted externalizing behaviors, similar positive spin-off effects were documented. These intervention programs were initially designed to target externalizing behaviors and they were found to have positive effects on internalizing

symptoms. Examples of these interventions are the Incredible Years, Parent-Child Interaction Therapy, and the Check, Connect, and Expect program.

The Incredible Years (IY) was an evidence-based treatment program developed for children with externalizing behaviors who were between 4 and 8 years (Herman, Borden, Reinke, & Webster-Stratton, 2011; Webster-Stratton & Herman, 2008; Webster-Stratton, Reid, & Hammond, 2004). Apart from the program's effectiveness in reducing externalizing behaviors, emerging evidence showed that the parent training program might also be effective in reducing children's internalizing symptoms (Webster-Stratton & Herman, 2008). In Webster-Stratton and Herman (2008), participants were assessed to experience clinically significant levels of externalizing behaviors such as ODD or CD. Among these children, 47% had elevated levels of internalizing symptoms that were measured by a T-score of 60 and above on the CBCL. For children in the treatment group, internalizing symptoms generally reduced from baseline to post-intervention. Specifically, about 49% of the children with elevated internalizing symptoms improved to the normal range at post-treatment. On the other hand, only 37% of the control children improved to normal range. This difference, however, was not statistically significant.

Herman et al. (2011) extended this line of investigation to examine the effects of various components of the IY program on internalizing symptoms. The components were parent training, teacher training, and child training. Children and their families were randomly assigned to different treatment and control groups. The treatment groups were combinations of the different components. Results showed that children in any of the treatment groups were more likely to show lower mother-rated internalizing symptoms. However, it should be noted that even though all the participants showed clinically significant elevations on the externalizing measure, only some of them showed clinical significant elevations on the internalizing measure. In fact, the

baseline mean T-scores of all the groups were within the normal range and the post-treatment reduction of internalizing symptoms were also within the normal range. For a more convincing demonstration of the positive effects of the IY program on internalizing symptoms, future studies would need to include children with clinically significant elevations on both externalizing and internalizing measures. The authors of the study theorized that the intervention components of the IY program also targeted the common risk factors associated with internalizing problems such as negative parenting style, child social skills deficits, and poor teacher-child communication and interaction, thereby resulting in the improvement in internalizing symptoms.

In another treatment study, Chase and Eyberg (2008) used parent-child interaction therapy (PCIT) for 3 to 6 years old children diagnosed with ODD. Among these children, 41% showed clinically significant elevation in internalizing symptoms on the CBCL. PCIT is an evidence-based program for families of young children with disruptive behaviors. In fact, the PCIT and the IY programs have similar origins with theoretical foundation grounded in behavioral theory (McMahon & Forehand, 2003). Parents were taught basic behavioral principles for managing child behavior such as ignoring maladaptive child behaviors and rewarding adaptive child behaviors with positive attention. At post-treatment, children with ODD and internalizing symptoms showed significant improvement in externalizing behaviors and internalizing symptoms that were reduced to be within the normal range. The authors theorized that maladaptive parent-child interactions and negative parenting behaviors increased the risks for externalizing behaviors as well as internalizing symptoms. In addition, the basic behavioral principles that parents learned in PCIT were not problem-specific because the general focus was to increase desirable behaviors and decrease undesirable ones. Hence, quiet behaviors in disruptive children and assertive behaviors in withdrawn children were both likely to be

reinforced during treatment. In other words, PCIT was hypothesized to be effective for co-occurring externalizing behaviors and internalizing symptoms because of shared risk factors between the two types of problems that relate to parent-child interactions.

The school-based Check, Connect and Expect program (CCE) was developed for elementary children with externalizing behaviors (Cheney et al., 2009). The main intervention component was a mentor-based check-in and check-out system where students checked-in with an adult mentor or coach to review their behavioral goals that were listed on their daily progress report card. Throughout the day, the students received verbal and written feedback individually from their teachers. They checked-out with the mentor at the end of the school day. The CCE also included other intervention components such as self-monitoring, academic tutoring, and social skills instructions. In a randomized control trial, Cheney et al. (2009) found CCE to be effective over a 2-year period in reducing externalizing behaviors in about 60% of the children in the treatment group. The therapeutic elements of the program were hypothesized to be regular and consistent monitoring, feedback and reinforcement of appropriate behaviors, as well as a positive relationship with a mentor. Although not the focus of the program, these children's internalizing symptoms as reported by teachers also showed a significant reduction. The authors suggested that students with internalizing symptoms were able to benefit from the program as it encouraged depressed and withdrawn students to increase their behavioral interactions with adults through the use of the daily progress report. Thus, these students were provided with more opportunities to interact positively and to improve academically thereby increasing their overall functioning.

Summary

A review of treatment studies suggests that treatments targeting internalizing symptoms may be helpful in alleviating externalizing problems (Flannery-Schroeder et al., 2004; Jacobs et al., 2010; Kendall et al., 2001). Similarly, treatments targeting externalizing behaviors may also benefit internalizing symptoms (Chase & Eyberg, 2008; Cheney et al., 2009; Herman et al., 2011; Webster-Stratton & Herman, 2008). The most common reason cited by the authors to account for the positive spin-off effects is based on the shared risk theory. Treatments had either systematically or inadvertently focused on common risk factors shared by externalizing behaviors and internalizing symptoms, thus improving both types of symptoms at the same time. Across the treatments, the common factors targeted by treatments included social skill deficits, cognitive biases, poor adult-child communication and relationship, and ineffective problem-solving skills.

Another reason for the positive spin-off effects might have been the enhancement of relationships with significant adult figures and increases in positive social experiences and feedback which are likely to lead to improvement in overall functioning and reduction of symptoms. Specifically, parent-training and mentorship might help youth build positive relationships with significant adult figures. Youth were also coached to learn positive skills and adaptive behaviors. These factors appear to be related to the mediating variables hypothesized in the failure theory, such as interpersonal relations and academic functioning. It is possible that positive spin-off effects of treatment programs are linked to the indirect pathways. When mediator factors improve, they also lead to improvement of symptoms in other domains.

Research Objectives and Hypotheses

Overall, there appears to be more support for the externalizing to internalizing pathway, compared to the internalizing to externalizing pathway. However, further clarifications to the

failure theory are still needed in terms of testing the theory over a longer longitudinal period and focusing on the transition from late childhood to adolescence. As studies had used adult-report of internalizing symptoms when investigating childhood samples, it is important to replicate the findings using youth-report of internalizing problems. In addition, as research to identify the mediators in the associations between externalizing and internalizing problems is sparse, more investigations in this area are needed to contribute to the theoretical basis for effective treatments of youth with co-occurring problems. Gender differences should also be evaluated as few studies have focused on this and the little evidence so far has been inconsistent.

Considering these gaps in the literature, the first objective of the current study was to test the externalizing to internalizing pathway using a sample of youth followed from late childhood to early adolescence. The 5-year period from 4th to 8th grade was chosen to identify meaningful long-term effects of problem behaviors across an important transition period that coincides with the onset of puberty. The use of latent growth models would allow for the estimations of mean trajectories and their variabilities of externalizing behaviors and internalizing symptoms over the course of five years. Furthermore, dual growth models also would allow for tests of the associations between externalizing and internalizing trajectories, while controlling for the potential confounding factor of socioeconomic status and any significant correlations among the residuals of the measures. The second objective was to examine the role of peer rejection, parent-child conflict, and academic competence as mediating variables in the predictive association from externalizing behaviors to internalizing symptoms. These measures are related to the broader constructs of interpersonal relationships with peers and parents, and academic learning. The third objective was to use a large enough sample to identify possible gender differences in the pathways being investigated.

Research hypotheses

Given some evidence for the externalizing to internalizing pathway, externalizing behaviors in late childhood are hypothesized to predict internalizing symptoms in early adolescence, after controlling for the initial levels of externalizing behaviors. Following the gender paradox theory which suggests that girls with externalizing behaviors are more likely to experience another co-occurring condition, girls' externalizing behaviors are hypothesized to be more predictive of internalizing symptoms. In general, peer rejection, parent-child conflicts, and academic competence are expected to be mediators in the path from externalizing to internalizing symptoms following the postulations of the dual failure theory. Similar to results from childhood samples, no gender differences are anticipated for the paths through peer rejection. However, girls are hypothesized to be more adversely affected by poor academic competence than boys because some research has shown that girls may be more psychologically vulnerable to school failure (Cole & Martin, 1997; McCarty et al., 2008). No specific gender difference is hypothesized for the paths with parent-child conflict as a mediator since no research has examined the effect of parent-child relationship in the association between externalizing and internalizing symptoms.

CHAPTER THREE

METHOD

Sample

The sample used in the current study was from the Raising Healthy Children project (RHC; Catalano et al., 2003). The RHC is a study of the etiology of prosocial and antisocial behavior, as well as a multicomponent preventive intervention trial. The intervention comprised of instructional development for teachers, parenting workshops, summer camps, and study clubs for students, as well as home-based consultation with high-risk students with learning or behavioral problems. The project was conducted in a suburban school district north of Seattle, Washington. Participants and their families were recruited from 10 schools in a suburban Pacific Northwest school district when the students were in first and second grades. They were eligible if one of the parents spoke English, Spanish, Korean, or Vietnamese.

In 1993, 938 (76%) parents of 1,239 eligible students provided written consent for their participation. In 1994, an additional 102 (78%) second-grade students out of 131 eligible and newly-enrolled second-grade students were recruited and their parents provided consent. Hence, the total enrollment was 1,040 students and their families. Students in the analysis sample have no missing data on family income measured at second grade. In addition, they must have data on externalizing or internalizing symptoms in at least one time point. This resulted in an analytic sample of 916 (486 boys and 430 girls). The excluded and included participants did not differ significantly ($p > .05$) on **gender** and low-income status at the beginning of the project, or experimental condition. Based on self-report of race and ethnicity, the sample comprises 75.3% White, 3.5% Black, 6.7% Asian or Pacific Islander, 2.3% Native American, and 12.2% mixes; 8.6% of the sample reported that they were Hispanic.

Procedure

Prior to data collection, parents provided written consent for their children's participation. Data was collected annually using student and teacher surveys. Student interview surveys were administered in a group format or individually during regular school hours. Students who were absent at the time of data collected were administered the survey at another time, through the phone or mail. Even if students left the school district, their data continued to be collected through various methods. For completing the surveys each year, students received tokens in the form of gifts, gift cards, or cash. Between 4th and 8th grades, over 95% of the students were surveyed each year. Teacher mail-in surveys for individual students were completed by their primary teachers in the elementary schools and the Language Arts teachers in the middle schools. Teacher surveys were completed for over 92% of the analysis sample in each year.

Measures

Externalizing Measure

The externalizing scale was based on 13 teacher-report items which measured a range of disruptive and anti-social behaviors such as not participating well in class, being rude and disrespectful, and being verbally and physically aggressive. These items came from the Teacher Observation of Classroom Adaptation-Revised (Werthamer-Larsson, Kellam, & Wheeler, 1991). They were also similar to those items in the Rule-breaking behavior and Aggressive behavior subscales of the Teacher report form of the ASEBA (Achenbach & Rescorla, 2001). Examples of the items are "can't sit still", "argues a lot," "talks back to adults, is disrespectful," "threatens people" and "fights." Each item was rated on a 3-point scale: 1 = rarely true, 2 = sometimes true, and 3 = often or always true. For each student, the mean of at least 7 out of the 13 items was obtained, with higher scores indicating higher levels of externalizing behaviors. The internal

consistency of the scale, as measured by Cronbach's alpha, ranged from .89 to .91 for boys and from .87 to .90 for girls. Table 1 provides the complete list of the scales and items used in the analyses.

Internalizing Measure

The internalizing scale was based on 10 student-report items which were derived from the Seattle Personality Questionnaire that measured students' anxiety and depressive symptoms (Greenberg & Kusche, 1990; Kusche & Greenberg, 1988). The items asked about students' thoughts, affect, and somatic symptoms that were indicative of internalizing problems. Examples of these items are "Do/did you feel that you do/did wrong a lot at school", "Do you feel afraid a lot of the time", "Do you worry that a lot of other kids might not like you", "Do you have trouble falling asleep or staying asleep," and "Do you feel tired a lot of the time?" Each item was rated on a 4-point scale: 1 = "YES!", to 2 = "yes", 3 = "no", and 4 = "NO!" Items were reversed coded. At each time point, scale scores were the means of at least 6 out of the 10 items and high scores indicating higher levels of internalizing symptoms. The internal consistency of the scale for boys ranged from .79 to .81. For girls, the range was .82 to .87.

Household Income

Household income was considered a potential confound in the associations between externalizing and internalizing symptoms and was therefore included as a covariate. Parents reported the total household income at the beginning of the study when the students were in second grade. The options for the item were the following: (1) less than \$10,000; (2) \$10,000 to \$19,999; (3) \$20,000 to \$29,999; (4) \$30,000 to \$39,999; (5) \$40,000 to \$49,999; (6) \$50,000 to \$59,999; (7) \$60,000 to \$69,999; (8) more than \$70,000. The scale of this item was assumed to be continuous or at least ordinal in nature.

Peer Rejection

The peer rejection scale was comprised of four items measuring student-report of loneliness and peer rejection (Asher & Wheeler, 1985). Examples of items are “I feel left out of things at school,” and “I have nobody to talk to in class.” Each item was rated on a 4-point scale: 1 = “YES!”, to 2 = “yes”, 3 = “no”, and 4 = “NO!” Items were reversed coded and the mean of at least 2 out of the 4 items was obtained for the scale score. Higher scores indicated higher levels of peer rejection. The internal consistencies of the scale ranged from .78 to .87 for boys and .74 to .81 for girls.

Parent-Child Conflict

The parent-child conflict scale measured a student’s sense of conflict with his/her parent using a 4-point rating scale: 1 = “YES!”, to 2 = “yes”, 3 = “no”, and 4 = “NO!” Students reported whether they got into arguments or disagreements with their parents on various issues such as getting ready for school, helping out at home, and about completing homework. This scale was previously used in the Communities That Care Youth Survey, as well as the Seattle Social Development Project (Glaser, Horn, Arthur, Hawkins, & Catalano, 2005; Hill, Howell, Hawkins, & Battin-Pearson, 1999). After reverse scoring, higher scores on the scale indicated higher levels of parent-child conflict. Scale scores were from the means of at least 2 out of the 3 items. The internal consistencies of the scale ranged from .69 to .74 for boys, and from .64 to .71 for girls.

Academic Competence

The academic competence scale was comprised of three items about the competence of students in Language Arts, Math, and Reading. Elementary teachers and Language Arts teachers in middle schools rated their students using a 5-point rating: (1) above average; (2) slightly above average; (3) average; (4) slightly below average; and (5) needs improvement. In middle

schools, the Language Arts teachers only rated 2 items regarding competencies in Language Arts and Reading. After reverse scoring, high scores on the scale indicated higher academic competence and low scores indicated low competence. The measure of academic competence was obtained from the mean of at least 2 out of 3 items. The high degree of internal consistencies ranged from .92 to .96 for boys and .94 to .97 for girls.

Analyses

After examining the descriptive statistics and correlations, as well as the unconditional dual-domain latent growth models, conditioned latent growth models were used to test the predictive association from externalizing to internalizing symptoms. Household income at second grade was entered into the models as a covariate. Initial models were estimated as multiple-group models with structural paths constrained to equality across gender. If these constrained models differ significantly from the freely estimated models, then modification indices and theoretical considerations were used to guide the freeing of specific paths to improve model fit. Using Mplus (Muthén & Muthén, 1998-2011), the first set of multiple-group latent growth models simultaneously modeled and estimated the latent trajectories of externalizing and internalizing symptoms as well as the covariations between the two sets of symptoms. The second set of these dual-domain growth models tested the predictive associations from externalizing to internalizing symptoms. The specific predictive associations were either from the externalizing intercept factor or the externalizing slope factor to the internalizing slope factor, or both. The third set of models tested the mediating variables of peer rejection, parent-child conflict, and academic competence one at a time. In each of these models, the trajectories of three measures were modeled simultaneously and two mediation paths were assessed while controlling for the initial levels of behaviors. The first possible mediation path is from the externalizing intercept

factor, to the mediator slope factor, and to the internalizing slope factor. The second possible mediation path is from the externalizing slope factor, to the mediator slope factor, and to the internalizing slope factor. Testing mediation in latent growth models has been done in several studies (Jagers, Morgan-Lopez, Howard, Browne, & Flay, 2007; Roesch et al., 2009). In these studies, the independent variable was dichotomous and represented the treatment versus control group, and the mediator and outcome measures were continuous. Cheong (2011) recommended further that the independent measure could be a continuous variable measured at the initial time point. Since data for the independent variable of externalizing behaviors was available at all the time points, instead of using only the externalizing measure at the first time point, all the data was used. Hence, the mediation models tested were three-domain latent growth models. To test the significance of indirect effects, confidence intervals based on the distribution of the product of coefficients were computed using the RMediation package of the R software program (Tofighi & MacKinnon, 2011).

To adjust for non-normal distributions in some variables and missing data for some cases, maximum likelihood estimation with robust standard errors (MLR) estimators was used for all the models. A model was considered to attain a good fit if its chi-square was nonsignificant (or when $\chi^2/df < 2$), root mean square error of approximation (RMSEA) was .06 or less, or the comparative fit index (CFI) was .95 or greater (Hu & Bentler, 1999). To compare differences in fit between nested models, the Satorra-Bentler scaled chi square difference test (Satorra & Bentler, 2001) was used.

Less than 5% of the sample was missing data on all the variables. Missing data was handled by using full information maximum likelihood estimates so that all available data was used to estimate the model and data was assumed to be missing at random. Intervention

condition was not related to all the measured variables except for Grade 4 academic competence ($r = .09, p < .01$) and household income ($r = .07, p < .05$). Compared to the control group, students in the intervention group tended to score higher in academic competence at fourth grade. Their families also reported higher levels of average income. To determine if the intervention may have an effect on the measured variables in this current study, multiple-group models were run to test if models constrained across the intervention and control groups differed significantly from unconstrained models. Results showed that the intervention and control groups did not differ along structural paths in all the different models being tested. The constrained model was compared with the configural model – dual growth model ($\Delta\text{MLR}\chi^2 = 2.49, \Delta df = 6, p > .05$), predictive model ($\Delta\text{MLR}\chi^2 = 4.36, \Delta df = 5, p > .05$), peer rejection mediation model ($\Delta\text{MLR}\chi^2 = 12.65, \Delta df = 15, p > .05$), parent-child conflict mediation model ($\Delta\text{MLR}\chi^2 = 17.54, \Delta df = 16, p > .05$), and academic competence mediation model ($\Delta\text{MLR}\chi^2 = 7.35, \Delta df = 15, p > .05$). Hence, students in both the intervention and control groups were included in the analysis.

CHAPTER FOUR

RESULTS

Descriptive Statistics

Descriptive statistics and the correlation matrix for 11 measured variables are presented in Table 2 for the subsamples of boys and girls. These include the externalizing and internalizing measures at 5 time points and family income measure. At all grade levels, the mean values of boys' externalizing behaviors were higher than those for girls ($ps < .01$). Girls rated high on internalizing symptoms at Grades 5 ($t = 2.28, p < .05$) and 8 ($t = 3.51, p < .01$). The gender groups did not differ in the internalizing measure at Grades 4, 6 and 7 ($p > .05$). All the distributions of the measured variables exhibited skewness and kurtosis values that were within acceptable limits, where skewness was 2.0 or less, and kurtosis was 6.0 or less, except for girls' externalizing measures at Grades 5 (Skewness = 2.08, $SE = .12$), 7 (Skewness = 2.56, $SE = .12$; Kurtosis = 8.16, $SE = .24$), and 8 (Skewness = 2.10, $SE = .12$).

Examining the correlation matrices in Table 3, boys' externalizing behaviors at all grades levels were significantly associated with their internalizing symptoms (from $r = .10$ to $r = .18$), except for the correlations with Grade 8 internalizing symptoms, and the correlation between Grade 4 internalizing symptoms and Grade 8 externalizing. For girls, the association between externalizing behaviors and internalizing symptoms were all statistically significant ($r = .11$ to $r = .28$). Externalizing behaviors at almost all grade levels were negatively associated with household income for both boys and girls (from $r = -.04$ to $r = -.20$). Only boys' Grade 8 externalizing behaviors was not significantly associated with household income. For boys, internalizing symptoms were not associated with income. On the other hand, for girls,

internalizing symptoms at Grades 4, 5, and 6 were significantly associated with income ($r = -.14$ and $r = -.15$, respectively).

Unconditional Multiple-Group Models

For all the models, loadings for the intercept factor were fixed at 1, 1, 1, 1, and 1; those for the slope factor were fixed at 0, 1, 2, 3, and 4. These specifications correspond to a linear change, with intercepts set at Grade 4. The constrained unconditional multiple-group model for externalizing behaviors did not fit the data well. After releasing the cross-gender constraints on the mean of the intercept factor, the model attained a good fit ($\chi^2(24, N = 981) = 31.67, p > .05$, CFI = .99, RMSEA = .03). Hence, the intercept factor of externalizing behaviors was significantly higher for boys ($M = 1.41, SE = .01, p < .01$) than girls ($M = 1.25, SE = .01, p < .01$). On average, the sample showed a slight decline in externalizing behaviors over grades 4 to 8 ($M = -.01, SE = .00, p < .01$), with significant variability about the mean slope ($M = .001, SE = .001, p < .05$). The Mplus codes for all the final models can be found in Appendix A.

The constrained unconditional multiple-group model for internalizing symptoms attained a reasonable fit to the data ($\chi^2(23, N = 996) = 95.72, p < .05$, CFI = .96, RMSEA = .08). According to the modification indices, releasing the constraint on the intercept factor improved the model fit significantly ($\Delta MLR\chi^2 = 8.54, \Delta df = 1, p < .01$). The final model attained an adequate fit ($\chi^2(22, N = 996) = 87.63, p < .05$, CFI = .96, RMSEA = .08). The mean of the intercept factor for girls ($M = 2.07, SE = .03, p < .01$) was significantly higher than that for boys ($M = 2.00, SE = .02, p < .01$). On average, there was a slight decline of internalizing problems from grades 4 to 8 ($M = -.03, SE = .01, p < .01$), with significant variability ($M = .01, SE = .00, p < .01$).

Dual Domain Growth Models

The next constrained multiple-group model was a dual domain growth model with growth factors conditioned on household income. Following the results from the unconditional single domain growth models, the intercept factors of the externalizing and internalizing measures were allowed to be freely estimated. Hence, the model had 6 covariances and the 2 slope factors constrained to equality across gender and this model attained a good fit to the data ($\chi^2(106, N = 916) = 180.79, p < .00, CFI = .98, RMSEA = .04$). Figure 1 provides an illustration of the model and Table 7 provides the detailed results. The growth factors were all significantly correlated with one another ($-.72 < r < .27$). To understand the predictive associations from externalizing behaviors to internalizing symptoms, the subsequent analyses were conducted.

Dual Domain Predictive Growth Models

Figure 2 illustrates the predictive multiple-group model that was tested where externalizing behaviors were specified to be predictive of internalizing symptoms. This model, constrained across gender for 11 parameter estimates, including externalizing and internalizing intercept factors, attained a good fit ($\chi^2(107, N = 916) = 191.85, p < .00, CFI = .97, RMSEA = .04$). According to the results in Figure 3 and Table 5, there was no evidence that externalizing behaviors were predictive of internalizing symptoms across the period from Grades 4 to 8 since the intercept factor of externalizing behaviors was not predictive of the internalizing slope factor ($b = .00, SE = .02, p > .05$) and the externalizing slope factor was also not predictive of the internalizing slope factor ($b = .34, SE = .29, p > .05$). As expected, the intercept factors were negatively predictive of the slope factors, for both externalizing ($b = -.08, SE = .01, p < .01$) and internalizing symptoms ($b = -.14, SE = .01, p < .01$).

Peer Rejection Mediation Model

Even though there was a lack evidence that externalizing behaviors predicted internalizing symptoms after controlling for the initial levels of internalizing symptoms, further analyses were conducted to test for indirect effects since methodologists have argued that mediation can occur even when total effects are nonsignificant (MacKinnon & Fairchild, 2009; Zhao, Lynch, & Chen, 2010). Evidence for mediation should be determined by the significance of indirect effects. The descriptive statistics and the correlation matrices that included peer rejection, parent-child conflict, and academic competence are presented in Tables 9 to 12.

A multiple-group model with peer rejection as the mediating variable was specified as illustrated in Figure 4. After allowing the residual variances of the internalizing and peer rejection measures to covary at each time point, the model constrained across gender for 20 parameters, fit the data well ($\chi^2(225, N = 916) = 385.59, p < .00, CFI = .97, RMSEA = .04$). As shown in Table 13 and Figure 5, only the slope factor of peer rejection was significantly predictive of the slope factor of internalizing symptoms ($b = .69, SE = .06, p < .00$). Hence, high rates of increase of peer rejection were predictive of high rates increase of internalizing symptoms. However, both the intercept and slope factors of externalizing behaviors were not predictive of the rate of change of peer rejection. Overall, there was no evidence of mediation through peer rejection.

Parent-Child Conflict Mediation Model

The next multiple-group model tested parent-child conflict. Similarly, a constrained model on 23 parameters was specified as in Figure 4. Additionally, the residual variances of the parent-child conflict and internalizing measures were allowed to covary at each time point as well as those between internalizing measures at Grades 5 and 6, and between Grades 6 and 7. This model attained a good fit to the data ($\chi^2(222, N = 916) = 284.98, p < .00, CFI = .98$,

RMSEA = .03). In Table 14 and Figure 6, the intercept factor of externalizing behaviors was significantly predictive of the slope factor of parent-child conflict ($b = .11, SE = .04, p < .01$). Parent-child conflict slope factor was in turn predictive of internalizing slope factor ($b = .36, SE = .06, p < .01$). This significant indirect effect suggests that boys' and girls' high levels of externalizing behaviors predicted high positive rates of parent-child conflict, which in turn predicted high positive rates of internalizing symptoms (indirect effect = .04, 95% CI: .01, .08).

Academic Competence Mediation Model

To test if academic competence was a significant mediator, a multiple-group model was specified as in Figure 4. In addition, externalizing and academic competence measures at each time point were allowed to covary with each other. The variance of the slope factor of academic competence for boys was constrained to zero to allow unbiased estimates of the parameters (when the covariance matrix remained positive definite). The constrained model attained a good fit ($\chi^2(227, N = 916) = 484.46.08, p < .00, CFI = .95, RMSEA = .05$). The results of this model are presented in Table 15 and Figure 7. Both the intercept and slope factors of externalizing behaviors was predictive of the slope factor of academic competence. Hence, high levels of 4th grade externalizing behaviors predicted low rates of increase of academic competence ($b = -.31, SE = .09, p < .01$). In addition, high rates of increase of externalizing behaviors predicted low rates of increase of academic competence over 5 years ($b = -2.63, SE = .99, p < .01$). Academic competence does not appear to be a significant mediator for this sample as the change in academic competence did not predict change in internalizing symptoms. Gender differences were tested to be non-significant.

CHAPTER FIVE

DISCUSSION

The current study contributes to the literature by using a longitudinal sample that followed participants for 5 years through an important transition period from late childhood to early adolescence, to investigate the predictive association from externalizing behaviors to internalizing problems. Importantly, it also attempts to identify possible mediators in this association in order to elucidate the mechanisms for their associations, as well as to test for gender differences. Investigations in these areas have so far been scarce or non-existent. The use of latent growth modeling in the general framework of structural equation modeling allowed for statistical controls of method covariance between youth-report internalizing measure and other youth-report measures, namely, peer rejection and parent-child conflict measures at each time point, as well as control of a common risk factor, household income. Specifying the intercept factors of the latent growth model to be predictive of the slope factors allowed for the control of baseline levels of problems when examining rates of change of problems across this developmental period. Overall, these statistical controls allowed for more conservative tests of the pathways under investigation.

The first objective of the study was to test the externalizing to internalizing pathway. Externalizing behaviors in late childhood were hypothesized to predict internalizing symptoms in early adolescence, after controlling for the initial levels of externalizing behaviors. This hypothesis was not supported because neither the initial level nor rate of change of externalizing behaviors predicted the rate of change of internalizing symptoms. This result is consistent with several studies which also failed to find a significant predictive association (Beyers & Loeber, 2003; Capaldi & Stoolmiller, 1999; Ingoldsby et al., 2006). Some researchers have suggested

that the predictive associations may be dependent of the developmental periods being investigated. For example, Capaldi & Stoolmiller (1999) postulated that externalizing behaviors might be more predictive of internalizing problems at an earlier age period, at least earlier than 6th grade, which is the level of their sample of boys. Yet, Ingoldsby et al. (2006) and the current study investigating a younger sample before 6th grade did not find a significant predictive association from externalizing to internalizing symptoms.

As the studies which found the significant predictive association had followed youth for shorter periods of time, of about two years, it is possible that the effects of externalizing behaviors on internalizing symptoms are more salient within a shorter range of time. The difference in findings may also be due to the different approaches used to measure externalizing and internalizing problems. Some researchers have cautioned that levels of symptomatology based on self-report questionnaires may not be isomorphic with clinical syndromes which are often based on categorical type measures (Wiesner & Kim, 2006). In fact, Vander Stoep et al. (2012) found that the dimensional and categorical approaches did not identify exactly the same group of individuals, but overlapping groups, even though both identified individuals with significant levels of impairment and clinical need. Other researchers have cautioned that the type of measures used may contribute to differences in results (Ingoldsby et al., 2006; Wiesner & Kim, 2006). As most studies used a dimensional approach or a combination of approaches to measure youth symptoms, it is difficult to differentiate the results from these two approaches. Future studies directly comparing these two approaches may be needed to clarify this issue.

The hypothesis that girls' externalizing behaviors are more predictive of internalizing symptoms compared to boys' externalizing behaviors derives partly from the gender paradox hypothesis (Loeber & Keenan, 1994). Findings from the current study do not support this

hypothesis. Both the baseline level and the rate of change of externalizing behaviors did not predict the rate of change of internalizing symptoms for both genders. The gender paradox hypothesis concerns the overlap between those with externalizing and those with internalizing symptoms even though the overall prevalence rate of co-occurring problems has consistently been found to be higher for boys than for girls (Chen & Simons-Morton, 2009; Keiley et al., 2003; Kraatz Keiley et al., 2000; Vander Stoep et al., 2012). The hypothesis states that this overlap is greater for girls than for boys, relative to the prevalence rates of externalizing behaviors for each gender. Evidence in the literature remains inconsistent and the results of the current study cannot contribute to clarifying this issue since no predictive associations were found in the first place.

As expected, the baseline level of externalizing behaviors was higher for boys and the baseline level of internalizing symptoms was higher for girls. The rates of change of these problems did not differ for both genders. Both externalizing and internalizing problems showed overall decreasing trends across late childhood to early adolescence although variations about these mean trends were significant. The decreasing level of externalizing behaviors is somewhat consistent with the literature showing that the behavior problems generally tend to peak in late childhood and stabilize or decline for both boys and girls going into adolescence (Chen & Simons-Morton, 2009; Ingoldsby et al., 2006; Xie et al., 2011). On the other hand, the overall decreasing level of internalizing symptoms is consistent with some studies and inconsistent with others that show that internalizing problems tend to increase in adolescence, especially for girls (Chen & Simons-Morton, 2009; Costello et al., 2003; Ingoldsby et al., 2006; Kim et al., 2003). This difference in findings has been attributed to different measurement approach. Researchers have suggested that the trend for depressive symptoms and depression as a syndrome may differ

because depressive symptoms tended to peak, then decline over adolescence even though the diagnosis of depression generally increases (Chen & Simons-Morton, 2009; Harrington et al., 1996). Empirical studies directly comparing the trends of these two approaches of measuring depression will for useful in clarifying these differences.

The second objective of the study was to evaluate the role of peer rejection, parent-child conflict, and academic competence as mediating factors in the predictive association from externalizing to internalizing symptoms. Although the predictive association was not significant in the current study, subsequent analyses continued to evaluate the possible indirect effects. Traditionally, the lack of a significant overall association would have precluded further investigations about indirect effects (Baron & Kenny, 1986). However, more recently, methodologists have argued that mediation can occur even in the absence of a significant overall association and that it should be investigated through the strength and significance of indirect effects (MacKinnon & Fairchild, 2009; Zhao et al., 2010). Among the hypothesized potential mediators, only parent-child conflict was a significant mediator. Academic competence and peer rejection were not found to be significant mediators.

Peer Rejection

The current study did not find that peer rejection was a significant mediator during the developmental period from late childhood to early adolescence. Externalizing behaviors were not predictive of peer rejection even though the rate of change of peer rejection was predictive of the rate of change of internalizing symptoms. It is possible that the increasingly complex and multifaceted nature of peer relationships during late childhood and adolescence reduces the likelihood of absolute peer rejection if youth have plentiful opportunities to affiliate with different groups of peers with different characteristics. For example, youth with externalizing

behaviors may be rejected by some, but accepted by others who also show externalizing behaviors. In fact, deviant peer association has been widely investigated and is an important risk factor for delinquency (Hawkins et al., 1992; Patterson et al., 1989). Further studies will need to investigate this conjecture and if this developmental difference is robust. Another reason for the difference with previous studies may be due to other studies' use of sociometric measures of peer rejection, which were based on peer or teacher nominations and ratings within the context of a classroom, while the present study used youth self-report of being rejected by peers. Given that youth with externalizing behaviors may have inaccurate or biased perceptions of their social status (DuBois & Silverthorn, 2004), differences between self-report and sociometric measures may contribute to differences in findings.

Parent-Child Conflict

This is the first study to demonstrate that parent-child conflict played a mediating role in the development of co-occurring externalizing and internalizing symptoms from late childhood to early adolescence. Baseline levels of externalizing behaviors in late childhood predicted the higher rates of increase of parent-child conflict, which predicted the higher rates of increase of internalizing symptoms in early adolescence. These results are consistent with studies showing that children with externalizing behaviors experience relatively higher levels of parent-child conflict (Campbell et al., 2010; R. Chen & Simons-Morton, 2009) and that poor-quality parent-child relationship increases vulnerability for adolescent depression (Capaldi & Stoolmiller, 1999; Marmorstein & Iacono, 2004; Stice et al., 2004).

Evidence for the mediating role of parent-child relationship concurs with recent literature showing that evidence-based parent training interventions initially designed to target externalizing behaviors have been found to have a positive effect on internalizing symptoms

(Chase & Eyberg, 2008; Herman et al., 2011; Webster-Stratton & Herman, 2008). However, these studies investigated treatments for young children between the ages of 2 and 8 years. One study on multisystemic therapy, a family and parent-focused therapy for adolescents with externalizing behaviors, measured both externalizing and internalizing symptoms but found only positive outcomes for externalizing but not internalizing symptoms (Henggeler & Rowland, 1999). Although experimental evidence is presently limited for adolescents, the results of the current study suggest that parent training or family-focused programs effective in alleviating externalizing behaviors and improving parent-child relationship during late childhood and early adolescence may also have an additional effect of reducing risks for internalizing symptoms.

Academic Competence

Contrary to the dual failure hypothesis that externalizing behaviors are likely to lead to poor academic competence, which in turn, increases the individual's vulnerability for internalizing problems, the findings did not support this hypothesis and were inconsistent with two other studies (Masten et al., 2005; Moilanen et al., 2010). While the path from externalizing behaviors to low academic competence was significant, but the path from academic competence to internalizing problems was not. One reason for the inconsistent result may be due to the conservative test of mediation in the current study which had relied on the multiple group procedure to evaluate gender differences. Though not statistically significant, when gender differences were tested for the paths from externalizing behaviors to academic competence, girls with externalizing behaviors consistently showed poorer academic competence than boys.

Considering the pathway from academic competence to internalizing symptoms, the lack of consistent findings may reflect the possibility that the effects of academic competence on internalizing symptoms are indirect and mediated or moderated by factors such as perceived

control (Herman et al., 2008), social status, self-perception (Pelkonen, Marttunen, & Aro, 2003), parental rejection, and conflicting parental relationships (X. Chen et al., 1995).

Gender Differences

The third objective was to examine gender differences in the pathways. Overall, there was a lack of statistically significant gender difference in all the paths tested. As discussed in the specific sections previously, both the hypotheses about girls being more vulnerable to externalizing behaviors and low academic competence were not supported. The conservative nature of the models that included stringent statistical controls may contribute to this findings. It may also be more difficult to observe significant gender differences in models focused on long-term effects as in latent growth curve models. Another possible reason for the lack of gender differences in this study may be related to the developmental period being examined. It is possible that the effects of gender differences become more salient later in adolescence than earlier.

Overall, the significant indirect effects through parent-child conflict provide supportive evidence for cascading effects where externalizing behaviors increase parent-child conflict and the risk for internalizing symptoms, thus leading to a co-occurring condition. This effect is found to be salient during the developmental period from late childhood to early adolescence when parent-child relationship would be undergoing qualitative changes in terms of shifts and changes in responsibilities and expectations. Externalizing behaviors may contribute to a higher than average level of parent-child conflict, which in turn, increase the risk of internalizing symptoms. In view of these findings, intervention programs for externalizing behavior problems are recommended to focus directly on reducing parent-child conflict and improve parent-child relations in order to prevent impairment from further spreading to other domains of functioning.

More generally, interventions need to adopt a developmental stance that caters to the consequences or repercussions of problems on different aspects of development.

Limitations and Future Directions

Keeping in mind that the study was based on a community sample of students from a Pacific Northwest school district which was composed of slightly less than 80% Caucasian students, generalizing the findings to other populations should be done with caution.

The relatedness between the peer rejection and internalizing measures may lead some to challenge that the measures may not be distinct and peer rejection may really be symptoms of internalizing problems. However, the correlations which ranged from .25 to .59, were largely in the moderate range. The peer rejection measure was based on Asher and Wheeler (1985)'s loneliness scale and the four items were specifically focused on interpersonal issues as distinct from internalizing issues, such as being left out, having no one to talk to, feeling lonely, and having difficulties getting other kids to like the self. Moreover, statistical controls introduced in the model provide additional assurance about the validity of the findings since method covariance was controlled by allowing the residual variances of individual peer rejection and internalizing measures to be correlated at each time point. In addition, controlling for the initial levels of mediators provide a conservative test of mediation. In fact, peer rejection had not appeared to be a significant mediator in this study. Possible reasons for this finding have been discussed earlier.

Another limitation is that the externalizing and internalizing measures were not as well validated as more standardized scales such as the Childhood Behavioral Checklist (Achenbach & Rescorla, 2001) and the Mood and Feelings Questionnaire (Angold et al., 1987). However, it is noted that many items were similar to these standardized scales and they have been used in other

studies (Greenberg & Kusche, 1990; Kusche & Greenberg, 1988; Werthamer-Larsson et al., 1991), thus providing evidence for the validity of the measures. Another limitation with respect to the measures used is that even though teachers are good reporters of youth's externalizing behaviors in the earlier grades (Severson, Walker, Hope-Doolittle, Kratochwill, & Gresham, 2007), their observation of externalizing behaviors may become limited by 8th grade due to the widening range of settings in which adolescents may exhibit behavior problems.

Although the current study focused on examining the externalizing to internalizing pathway of the failure theory, questions about the possibility of examining the reverse pathway from internalizing to externalizing problems may arise. Focusing on the specifications of the multiple-group mediation models in Figure 4, the temporal ordering of the externalizing intercept factor to the mediator slope factor may be argued to support a causal relationship. However, the lack of a true temporal ordering from the slope factor of the mediator to the slope factor of internalizing symptoms weakens the causal relationship argument for that pathway. Hence, it would be difficult to statistically differentiate between the externalizing to internalizing and the internalizing to externalizing pathway convincingly using the present statistical technique of latent growth modeling. Future studies on the predictive temporal associations between externalizing and internalizing problems will need to consider more suitable statistical procedures such as the latent change score modeling to compare alternative direction of predictive associations.

The study has focused on investigating psychosocial variables pertinent in youth's lives during the transition from childhood to adolescence. However, it is acknowledged that individual internal process variables such as temperamental disposition, cognitive styles, and emotional reactivity, may also be mediators and moderators in the association between externalizing and

internalizing problems. For example, negative emotionality has been associated with both externalizing and internalizing problems (Eisenberg et al., 2009; Singh & Waidman, 2010) and it may moderate the association between co-occurring problems such that those high in negative emotionality and have externalizing problems are more at risk of internalizing problems than those lower in negative emotionality. According to the acting out theory constructs such as irritability, distractibility, negative affect, poor problem-solving skills, and interpersonal skills may also mediate these associations. Research in this area is presently sparse and would warrant some attention.

It has been uncommon for treatment studies to measure both externalizing and internalizing symptoms since treatments are often developed to target either one or the other. This trend, however, appears to be changing as more attention is given to co-occurring problems and the effects of treatments in the presence of other co-occurring psychopathology (Kendall et al., 2001; Levy et al., 2007). As many treatments focused on improving parent-child relationships are designed for children, there is a need for similar types of treatment which are developmentally appropriate for adolescents. It is also recommend that treatment studies take into account co-occurring problems in youth and measure outcomes related to both externalizing and internalizing conditions of behaviors. As research continues to clarify the longitudinal associations between externalizing and internalizing problems in youth and their associations with other social and developmental processes, increasing knowledge in this area will provide a stronger theoretical basis for effective treatments of youth with co-occurring problems.

REFERENCES

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA School-Age Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Albano, A. M., Chorpita, B. F., & Barlow, D. H. (2003). Childhood anxiety disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology (2nd ed.)*. (pp. 279-329). New York, NY US: Guilford Press.
- Angold, A., & Costello, E. J. (1999). Comorbidity. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 40(1), 57.
- Angold, A., Weissman, M. M., John, K., Merikangas, K. R., Prusoff, B. A., Wickramaratne, P., . . . Warner, V. (1987). PARENT AND CHILD REPORTS OF DEPRESSIVE SYMPTOMS IN CHILDREN AT LOW AND HIGH RISK OF DEPRESSION. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 28(6), 901-915. doi: 10.1111/1469-7610.ep11447082
- Ansary, N. S., & Luthar, S. S. (2009). Distress and academic achievement among adolescents of affluence: a study of externalizing and internalizing problem behaviors and school performance. *Development And Psychopathology*, 21(1), 319-341.
- Asher, S. R., & Wheeler, V. A. (1985). Children's Loneliness: A Comparison of Rejected and Neglected Peer Status. *Journal of Consulting and Clinical Psychology*, 53(4), 500-505.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal Of Personality And Social Psychology*, 51(6), 1173-1182.

- Beyers, J. M., & Loeber, R. (2003). Untangling Developmental Relations Between Depressed Mood and Delinquency in Male Adolescents. *Journal of Abnormal Child Psychology*, 31(3), 247.
- Boots, D. P., Wareham, J., & Weir, H. (2011). Gendered perspectives on depression and antisocial behaviors: An extension of the failure model in adolescents. *Criminal Justice and Behavior*, 38(1), 63-84. doi: 10.1177/0093854810388504
- Campbell, S. B., Shaw, D. S., & Gilliom, M. (2000). Early externalizing behavior problems: toddlers and preschoolers at risk for later maladjustment. *Development And Psychopathology*, 12(3), 467-488.
- Campbell, S. B., Spieker, S., Burchinal, M., & Poe, M. D. (2006). Trajectories of aggression from toddlerhood to age 9 predict academic and social functioning through age 12. *Journal of Child Psychology & Psychiatry*, 47(8), 791-800. doi: 10.1111/j.1469-7610.2006.01636.x
- Capaldi, D. M. (1991). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: I. Familial factors and general adjustment at Grade 6. *Development and Psychopathology*, 3(3), 277-300. doi: 10.1017/S0954579400005319
- Capaldi, D. M. (1992). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: II. A 2-year follow-up at Grade 8. *Development and Psychopathology*, 4(1), 125-144. doi: 10.1017/S0954579400005605
- Capaldi, D. M., & Stoolmiller, M. (1999). Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: III. Prediction to young-adult adjustment. *Development And Psychopathology*, 11(1), 59-84.

- Catalano, R. F., Mazza, J. J., Harachi, T. W., Abbott, R. D., Haggerty, K. P., & Fleming, C. B. (2003). Raising healthy children through enhancing social development in elementary school: Results after 1.5 years. *Journal of School Psychology, 41*(2), 143. doi: 10.1016/s0022-4405(03)00031-1
- Chase, R. M., & Eyberg, S. M. (2008). Clinical presentation and treatment outcome for children with comorbid externalizing and internalizing symptoms. *Journal of Anxiety Disorders, 22*(2), 273-282. doi: 10.1016/j.janxdis.2007.03.006
- Chen, R., & Simons-Morton, B. (2009). Concurrent changes in conduct problems and depressive symptoms in early adolescents: a developmental person-centered approach. *Development And Psychopathology, 21*(1), 285-307.
- Cheney, D. A., Stage, S. A., Hawken, L. S., Lynass, L., Christine, M., & Waugh, M. (2009). A 2-Year Outcome Study of the Check, Connect, and Expect Intervention for Students At Risk for Severe Behavior Problems. *Journal of Emotional & Behavioral Disorders, 17*(4), 226-243.
- Cheong, J. (2011). Accuracy of Estimates and Statistical Power for Testing Mediation in Latent Growth Curve Modeling. *Structural Equation Modeling, 18*(2), 195-211. doi: 10.1080/10705511.2011.557334
- Cole, D. A. (2006). Coping with longitudinal data in research on developmental psychopathology. *International Journal of Behavioral Development, 30*(1), 20-25. doi: 10.1177/0165025406059969
- Cole, D. A., Jacquez, F. M., & Maschman, T. L. (2001). Social Origins of Depressive Cognitions: A Longitudinal Study of Self-Perceived Competence in Children. *Cognitive Therapy & Research, 25*(4), 377-395.

- Cole, D. A., & Martin, J. M. (1997). A Competency-based Model of Child Depression: A Longitudinal Study of Peer, Parent, Teacher, and Self-evaluations. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 38(5), 505-514. doi: 10.1111/1469-7610.ep9709033844
- Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives Of General Psychiatry*, 60(8), 837-844.
- Curtis, N. M., Ronan, K. R., & Borduin, C. M. (2004). Multisystemic Treatment: A Meta-Analysis of Outcome Studies. *Journal of Family Psychology*, 18(3), 411-419. doi: 10.1037/0893-3200.18.3.411
- . *Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR Fourth Edition (Text Revision)*. (2000): American Psychiatric Association.
- DuBois, D. L., & Silverthorn, N. (2004). Bias in Self-Perceptions and Internalizing and Externalizing Problems in Adjustment During Early Adolescence: A Prospective Investigation. *Journal of Clinical Child & Adolescent Psychology*, 33(2), 373-381.
- Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., . . . Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, 72(4), 1112-1134.
- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional Emotionality and Regulation: Their Role in Predicting Quality of Social Functioning. *Journal of Personality & Social Psychology*, 78(1), 136-157. doi: 10.1037//0022-3514.78.1.136
- Eisenberg, N., Valiente, C., Spinrad, T. L., Liew, J., Zhou, Q., Losoya, S. H., . . . Cumberland, A. (2009). Longitudinal relations of children's effortful control, impulsivity, and negative

- emotionality to their externalizing, internalizing, and co-occurring behavior problems. *Developmental Psychology*, 45(4), 988-1008.
- Emde, R. N., & Spicer, P. (2000). Experience in the midst of variation: new horizons for development and psychopathology. *Development And Psychopathology*, 12(3), 313-331.
- Ezpeleta, L., Domènech, J. M., & Angold, A. (2006). A comparison of pure and comorbid CD/ODD and depression. *Journal of Child Psychology & Psychiatry*, 47(7), 704-712. doi: 10.1111/j.1469-7610.2005.01558.x
- Fanti, K. A., & Henrich, C. C. (2010). Trajectories of Pure and Co-Occurring Internalizing and Externalizing Problems From Age 2 to Age 12: Findings From the National Institute of Child Health and Human Development Study of Early Child Care. *Developmental Psychology*, 46(5), 1159-1175. doi: 10.1037/a0020659
- Farrington, D. P., & Welsh, B. C. (1999). Delinquency prevention using family-based interventions. *Children & Society*, 13(4), 287-303.
- Fergusson, D. M., & Lynskey, M. T. (1996). Origins of comorbidity between conduct and affective disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(4), 451.
- Flannery-Schroeder, E., Suveg, C., Safford, S., Kendall, P. C., & Webb, A. (2004). Comorbid Externalising Disorders and Child Anxiety Treatment Outcomes. *Behaviour Change*, 21(1), 14-25. doi: 10.1375/bech.21.1.14.35972
- Foley, D. L., Goldston, D. B., Costello, E. J., & Angold, A. (2006). Proximal psychiatric risk factors for suicidality in youth: the Great Smoky Mountains Study. *Archives Of General Psychiatry*, 63(9), 1017-1024.

- Ge, X., & Best, K. M. (1996). Parenting behaviors and the occurrence and co-occurrence of adolescent depressive symptoms and. *Developmental Psychology*, 32(4), 717.
- Glaser, R. R., Horn, M. L. V., Arthur, M. W., Hawkins, J. D., & Catalano, R. F. (2005). Measurement Properties of the Communities That Care[®] Youth Survey Across Demographic Groups. *Journal of Quantitative Criminology*, 21(1), 73-102. doi: 10.1007/s10940-004-1788-1
- Gooren, E. M. J. C., Van Lier, P. A. C., Stegge, H., Terwogt, M. M., & Koot, H. M. (2011). The Development of Conduct Problems and Depressive Symptoms in Early Elementary School Children: The Role of Peer Rejection. *Journal of Clinical Child & Adolescent Psychology*, 40(2), 245-253. doi: 10.1080/15374416.2011.546045
- Greenberg, M. T., & Kusche, C. A. (1990). *Manual for Seattle Personality Scale for Children (Revised)*. Seattle: University of Washington.
- Hammen, C., & Rudolph, K. D. (2003). Childhood mood disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology (2nd ed.)*. (pp. 233-278). New York, NY US: Guilford Press.
- Hankin, B. L., Fraley, R. C., & Lahey, B. B. (2005). Is Depression Best Viewed as a Continuum or Discrete Category? A Taxometric Analysis of Childhood and Adolescent Depression in a Population-Based Sample. *Journal of Abnormal Psychology*, 114(1), 96-110. doi: 10.1037/0021-843x.114.1.96
- Harrington, R., Rutter, M., & Fombonne, E. (1996). Developmental pathways in depression: Multiple meanings, antecedents, and endpoints. *Development and Psychopathology*, 8(4), 601-616. doi: 10.1017/s095457940000732x

- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bulletin*, *112*(1), 64-105.
- Henggeler, S. W., & Rowland, M. D. (1999). Home-Based Multisystemic Therapy as an Alternative to the Hospitalization of Youths in. *Journal of the American Academy of Child & Adolescent Psychiatry*, *38*(11), 1331.
- Henry, D. (2012). Mediators of Effects of a Selective Family-Focused Violence Prevention Approach for Middle School Students. *Prevention Science*, *13*(1), 1-14. doi: 10.1007/s11121-011-0245-2
- Henry, D. B., Tolan, P. H., & Gorman-Smith, D. (2001). Longitudinal family and peer group effects on violence and nonviolent delinquency. *Journal Of Clinical Child Psychology*, *30*(2), 172-186.
- Herman, K. C., Borden, L. A., Reinke, W. M., & Webster-Stratton, C. (2011). The impact of the incredible years parent, child, and teacher training programs on children's co-occurring internalizing symptoms. *School Psychology Quarterly*. doi: 10.1037/a0025228
- Hill, K. G., Howell, J. C., Hawkins, J. D., & Battin-Pearson, S. R. (1999). CHILDHOOD RISK FACTORS FOR ADOLESCENT GANG MEMBERSHIP: RESULTS FROM THE SEATTLE SOCIAL DEVELOPMENT PROJECT. *Journal of Research in Crime & Delinquency*, *36*(3), 300-322.
- Hinshaw, S. P., & Lee, S. S. (2003). Conduct and oppositional defiant disorders. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology (2nd ed.)*. (pp. 144-198). New York, NY US: Guilford Press.

- Hirshfeld-Becker, D. R., Micco, J. A., Simoes, N. A., & Henin, A. (2008). High risk studies and developmental antecedents of anxiety disorders. *American Journal Of Medical Genetics. Part C, Seminars In Medical Genetics, 148C(2)*, 99-117.
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus. *Structural Equation Modeling, 6(1)*, 1.
- Ingoldsby, E. M., Kohl, G. O., McMahon, R. J., & Lengua, L. (2006). Conduct Problems, Depressive Symptomatology and Their Co-Occurring Presentation in Childhood as Predictors of Adjustment in Early Adolescence. *Journal of Abnormal Child Psychology, 34(5)*, 602-620.
- Jacobs, R. H., Becker-Weidman, E. G., Reinecke, M. A., Jordan, N., Silva, S. G., Rohde, P., & March, J. S. (2010). Treating Depression and Oppositional Behavior in Adolescents. *Journal of Clinical Child & Adolescent Psychology, 39(4)*, 559-567. doi: 10.1080/15374416.2010.486318
- Jagers, R., Morgan-Lopez, A., Howard, T., Browne, D., & Flay, B. (2007). Mediators of the Development and Prevention of Violent Behavior. *Prevention Science, 8(3)*, 171-179.
- Kaplan, B., Crawford, S., Cantell, M., Kooistra, L., & Dewey, D. (2006). Comorbidity, co-occurrence, continuum: what's in a name? *Child: Care, Health & Development, 32(6)*, 723-731. doi: 10.1111/j.1365-2214.2006.00689.x
- Keiley, M. K., Lofthouse, N., Bates, J. E., Dodge, K. A., & Pettit, G. S. (2003). Differential Risks of Covarying and Pure Components in Mother and Teacher Reports of Externalizing and Internalizing Behavior Across Ages 5 to 14. *Journal of Abnormal Child Psychology, 31(3)*, 267.

- Kendall, P. C., Brady, E. U., & Verduin, T. L. (2001). Comorbidity in Childhood Anxiety Disorders and Treatment Outcome. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(7), 787.
- Kiesner, J. (2002). Depressive Symptoms in Early Adolescence: Their Relations with Classroom Problem Behavior and Peer Status. *Journal of Research on Adolescence (Blackwell Publishing Limited), 12*(4), 463-478.
- Kim, H. K., Capaldi, D. M., & Stoolmiller, M. (2003). Depressive symptoms across adolescence and young adulthood in men: Predictions from parental and contextual risk factors. *Development and Psychopathology, 15*(2), 469-495. doi: 10.1017/s0954579403000257
- Kofler, M. J., Ruggiero, K. J., McCart, M. R., Zajac, K., Saunders, B. E., & Kilpatrick, D. G. (2011). Depression and Delinquency Covariation in an Accelerated Longitudinal Sample of Adolescents. *Journal of Consulting & Clinical Psychology, 79*(4), 458-469. doi: 10.1037/a0024108
- Kovacs, M., & Devlin, B. (1998). Internalizing disorders in childhood. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 39*(1), 47.
- Kraatz Keiley, M., Bates, J. E., Dodge, K. A., & Pettit, G. S. (2000). A cross-domain growth analysis: Externalizing and internalizing symptoms during 8 years of childhood. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology, 28*(2), 161-179. doi: 10.1023/a:1005122814723
- Kusche, C. A., & Greenberg, M. T. (1988). *Seattle Personality Questionnaire for Young School Aged Children (Unpublished personality questionnaire)*. Seattle: University of Washington Department of Psychology.

- Ladd, G. W. (2006). Peer Rejection, Aggressive or Withdrawn Behavior, and Psychological Maladjustment from Ages 5 to 12: An Examination of Four Predictive Models. *Child Development, 77*(4), 822-846. doi: 10.1111/j.1467-8624.2006.00905.x
- Ladd, G. W., & Troop-Gordon, W. (2003). The Role of Chronic Peer Difficulties in the Development of Children's Psychological Adjustment Problems. *Child Development, 74*(5), 1344-1367. doi: 10.1111/1467-8624.00611
- Lansford, J. E., Malone, P. S., Stevens, K. I., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2006). Developmental trajectories of externalizing and internalizing symptoms: factors underlying resilience in physically abused children. *Development And Psychopathology, 18*(1), 35-55.
- Lerner, R. M. (1998). Theories of human development: Contemporary perspectives. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Volume 1: Theoretical models of human development (5th ed.)*. (pp. 1-24). Hoboken, NJ US: John Wiley & Sons Inc.
- Levy, K., Hunt, C., & Heriot, S. (2007). Treating Comorbid Anxiety and Aggression in Children. *Journal of the American Academy of Child & Adolescent Psychiatry, 46*(9), 1111-1118. doi: 10.1097/chi.0b013e318074eb32
- Liber, J. M., van Widenfelt, B. M., van der Leeden, A. J. M., Goedhart, A. W., Utens, E. M. W. J., & Treffers, P. D. A. (2010). The Relation of Severity and Comorbidity to Treatment Outcome with Cognitive Behavioral Therapy for Childhood Anxiety Disorders. *Journal of Abnormal Child Psychology, 38*(5), 683-694. doi: 10.1007/s10802-010-9394-1

- Lilienfeld, S. O. (2003). Comorbidity Between and Within Childhood Externalizing and Internalizing Disorders: Reflections and Directions. *Journal of Abnormal Child Psychology*, 31(3), 285.
- Lilienfeld, S. O., Waldman, I. D., & Israel, A. C. (1994). A critical examination of the use of the term and concept of comorbidity in psychopathology research. *Clinical Psychology: Science and Practice*, 1(1), 71-83.
- Loeber, R., & Keenan, K. (1994). Interaction between conduct disorder and its comorbid conditions: Effects of age and gender. *Clinical Psychology Review*, 14(6), 497-523. doi: 10.1016/0272-7358(94)90015-9
- Luby, J. L., Heffelfinger, A. K., Mrakotsky, C., Brown, K. M., Hessler, M. J., Wallis, J. M., & Spitznagel, E. L. (2003). The Clinical Picture of Depression in Preschool Children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(3), 340.
- MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods*, 7(1), 19-40.
- MacKinnon, D. P., & Fairchild, A. J. (2009). Current Directions in Mediation Analysis. *Current Directions in Psychological Science (Wiley-Blackwell)*, 18(1), 16-20. doi: 10.1111/j.1467-8721.2009.01598.x
- Markon, K. E., Chmielewski, M., & Miller, C. J. (2011). The reliability and validity of discrete and continuous measures of psychopathology: A quantitative review. *Psychological Bulletin*. doi: 10.1037/a0023678
- Marmorstein, N. R., & Iacono, W. G. (2003). Major Depression and Conduct Disorder in a Twin Sample: Gender, Functioning, and Risk for Future Psychopathology. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(2), 225.

- Marmorstein, N. R., & Iacono, W. G. (2004). Major depression and conduct disorder in youth: associations with parental psychopathology and parent–child conflict. *Journal of Child Psychology & Psychiatry, 45*(2), 377-386. doi: 10.1111/j.1469-7610.2004.00228.x
- Masten, A. S., & Cicchetti, D. (2010). Developmental cascades. *Development And Psychopathology, 22*(3), 491-495.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., . . . Tellegen, A. (2005). Developmental Cascades: Linking Academic Achievement and Externalizing and Internalizing Symptoms Over 20 Years. *Developmental Psychology, 41*(5), 733-746. doi: 10.1037/0012-1649.41.5.733
- Mazza, J. J., Fleming, C. B., Abbott, R. D., Haggerty, K. P., & Catalano, R. F. (2010). Identifying Trajectories of Adolescents' Depressive Phenomena: An Examination of Early Risk Factors. *Journal of Youth & Adolescence, 39*(6), 579-593. doi: 10.1007/s10964-009-9406-z
- McCarty, C. A., Mason, W. A., Kosterman, R., Hawkins, J. D., Lengua, L. J., & McCauley, E. (2008). Adolescent school failure predicts later depression among girls. *The Journal Of Adolescent Health: Official Publication Of The Society For Adolescent Medicine, 43*(2), 180-187.
- McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review, 27*(2), 155-172. doi: 10.1016/j.cpr.2006.09.002
- McMahon, R. J., & Forehand, R. L. (2003). *Helping the noncompliant child: Family-based treatment for oppositional behavior (2nd ed.)*. New York, NY US: Guilford Press.

- Measelle, J. R., Hogansen, J. M., & Stice, E. (2006). Developmental Trajectories of Co-Occurring Depressive, Eating, Antisocial, and Substance Abuse Problems in Female Adolescents. *Journal of Abnormal Psychology, 115*(3), 524-538. doi: 10.1037/0021-843x.115.3.524
- Miller-Johnson, S., Lochman, J. E., Coie, J. D., Terry, R., & Hyman, C. (1998). Comorbidity of conduct and depressive problems at sixth grade: Substance use outcomes across. *Journal of Abnormal Child Psychology, 26*(3), 221.
- Moffitt, T. E. (1993). Adolescence-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy. *Psychological Review, 100*(4), 674-701.
- Moilanen, K. L., Shaw, D. S., & Maxwell, K. L. (2010). Developmental cascades: Externalizing, internalizing, and academic competence from middle childhood to early adolescence. *Development & Psychopathology, 22*(3), 635-653. doi: 10.1017/s0954579410000337
- Muthén, L. K., & Muthén, B. O. (1998-2011). *Mplus User's Guide (6th ed.)*. Los Angeles: Muthén & Muthén.
- Mychailyszyn, M. P., Mendez, J. L., & Kendall, P. C. (2010). School Functioning in Youth With and Without Anxiety Disorders: Comparisons by Diagnosis and Comorbidity. *School Psychology Review, 39*(1), 106-121.
- Oggers, C. L., Moffitt, T. E., Broadbent, J. M., Dickson, N., Hancox, R. J., Harrington, H., . . . Caspi, A. (2008). Female and male antisocial trajectories: From childhood origins to adult outcomes. *Development and Psychopathology, 20*(2), 673-716. doi: 10.1017/s0954579408000333

- Oland, A. A., & Shaw, D. S. (2005). Pure versus co-occurring externalizing and internalizing symptoms in children: the potential role of socio-developmental milestones. *Clinical Child And Family Psychology Review*, 8(4), 247-270.
- Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *The American Psychologist*, 44(2), 329-335.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1998). Antisocial Boys. In J. M. Jenkins, K. Oatley & N. L. Stein (Eds.), *Human emotions: A reader*. (pp. 330-336). Malden: Blackwell Publishing.
- Patterson, G. R., & Stoolmiller, M. (1991). Replications of a Dual Failure Model for Boys' Depressed Mood. *Journal of Consulting and Clinical Psychology*, 59(4), 491-498.
- Prenoveau, J. M., Zinbarg, R. E., Craske, M. G., Mineka, S., Griffith, J. W., & Epstein, A. M. (2010). Testing a hierarchical model of anxiety and depression in adolescents: A tri-level model. *Journal of Anxiety Disorders*, 24(3), 334-344. doi: 10.1016/j.janxdis.2010.01.006
- Renouf, A. G., & Kovacs, M. (1997). Relationship of depressive, conduct, and comorbid disorders and social functioning in childhood. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(7), 998.
- Rockhill, C. M., Vander Stoep, A., McCauley, E., & Katon, W. J. (2009). Social competence and social support as mediators between comorbid depressive and conduct problems and functional outcomes in middle school children. *Journal Of Adolescence*, 32(3), 535-553.
- Roesch, S. C., Norman, G. J., Adams, M. A., Kerr, J., Sallis, J. F., Ryan, S., . . . Patrick, K. (2009). Latent Growth Curve Modeling of Adolescent Physical Activity: Testing Parallel Process and Mediation Models. *Journal of Health Psychology*, 14(2), 313-325. doi: 10.1177/1359105308100216

- Rohde, P., Clarke, G. N., Mace, D. E., Jorgensen, J. S., & Seeley, J. R. (2004). An Efficacy/Effectiveness Study of Cognitive-Behavioral Treatment for Adolescents With Comorbid Major Depression and Conduct Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(6), 660-668. doi: 10.1097/01.chi.0000121067.29744.41
- Sack, W. H., Beiser, M., Phillips, N., & Baker-Brown, G. (1992). Co-morbid symptoms of depression and conduct disorder in First Nations children: some findings from the Flower of Two Soils Project. *Culture, Medicine And Psychiatry, 16*(4), 471-486.
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*(4), 507-514. doi: 10.1007/bf02296192
- Schwartz, O., Dudgeon, P., Sheeber, L., Yap, M., Simmons, J., & Allen, N. (2012). Parental Behaviors During Family Interactions Predict Changes in Depression and Anxiety Symptoms During Adolescence. *Journal of Abnormal Child Psychology, 40*(1), 59-71. doi: 10.1007/s10802-011-9542-2
- Serba, S. K., Prinstein, M. J., & Cox, M. J. (2007). Trajectories of internalizing problems across childhood: Heterogeneity, external validity, and gender differences. *Development & Psychopathology, 19*(2), 345-366.
- Severson, H. H., Walker, H. M., Hope-Doolittle, J., Kratochwill, T. R., & Gresham, F. M. (2007). Proactive, early screening to detect behaviorally at-risk students: Issues, approaches, emerging innovations, and professional practices. *Journal of School Psychology, 45*(2), 193-223. doi: 10.1016/j.jsp.2006.11.003
- Sheeber, L., & Hops, H. (1997). Family support and conflict: Prospective relations to adolescent depression. *Journal of Abnormal Child Psychology, 25*(4), 333.

- Shirk, S., Talmi, A., & Olds, D. (2000). A developmental psychopathology perspective on child and adolescent treatment policy. *Development And Psychopathology*, *12*(4), 835-855.
- Singh, A. L., & Waidman, I. D. (2010). The Etiology of Associations Between Negative Emotionality and Childhood Externalizing Disorders. *Journal of Abnormal Psychology*, *119*(2), 376-388. doi: 10.1037/a0019342
- Slough, N. M., & McMahon, R. J. (2008). Preventing serious conduct problems in school-age youth: The fast track program. *Cognitive and Behavioral Practice*, *15*(1), 3-17. doi: 10.1016/j.cbpra.2007.04.002
- Spitzer, R. L. (1994). Psychiatric 'co-occurrence'? I'll stick with 'comorbidity.'. *Clinical Psychology: Science and Practice*, *1*(1), 88-92.
- Stice, E., Ragan, J., & Randall, P. (2004). Prospective Relations Between Social Support and Depression: Differential Direction of Effects for Parent and Peer Support? *Journal of Abnormal Psychology*, *113*(1), 155-159.
- Stipek, D., & Miles, S. (2008). Effects of Aggression on Achievement: Does Conflict With the Teacher Make It Worse? *Child Development*, *79*(6), 1721-1735. doi: 10.1111/j.1467-8624.2008.01221.x
- Stoolmiller, M., Kim, H. K., & Capaldi, D. M. (2005). The Course of Depressive Symptoms in Men From Early Adolescence to Young Adulthood: Identifying Latent Trajectories and Early Predictors. *Journal of Abnormal Psychology*, *114*(3), 331-345. doi: 10.1037/0021-843x.114.3.331
- Thorpe, J., Kamphaus, R. W., & Reynolds, C. R. (2003). The Behavior Assessment System for Children. In C. R. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and*

- educational assessment of children: Personality, behavior, and context (2nd ed.)*. (pp. 387-405). New York, NY US: Guilford Press.
- Tofighi, D., & MacKinnon, D. P. (2011). RMediation: an R package for mediation analysis confidence intervals. *Behavior Research Methods*, *43*(3), 692-700.
- Troop-Gordon, W., & Ladd, G. W. (2005). Trajectories of Peer Victimization and Perceptions of the Self and Schoolmates: Precursors to Internalizing and Externalizing Problems. *Child Development*, *76*(5), 1072-1091. doi: 10.1111/j.1467-8624.2005.00898.x
- Van Lier, P. A. C., & Koot, H. M. (2010). Developmental cascades of peer relations and symptoms of externalizing and internalizing problems from kindergarten to fourth-grade elementary school. *Development & Psychopathology*, *22*(3), 569-582. doi: 10.1017/s0954579410000283
- Van Lier, P. A. C., Vitaro, F., Barker, E. D., Brendgen, M., Tremblay, R. E., & Boivin, M. (2012). Peer Victimization, Poor Academic Achievement, and the Link Between Childhood Externalizing and Internalizing Problems. *Child Development*, *83*(5), 1775-1788. doi: 10.1111/j.1467-8624.2012.01802.x
- Vander Stoep, A., Adrian, M. C., Rhew, I. C., McCauley, E., Herting, J. R., & Kraemer, H. C. (2012). Identifying comorbid depression and disruptive behavior disorders: Comparison of two approaches used in adolescent studies. *Journal of Psychiatric Research*, *46*(7), 873-881. doi: 10.1016/j.jpsychires.2012.03.022
- Vander Stoep, A., Herting, J. R., McCauley, E., & Rhew, I. C. (in press). Stability of co-occurring depression and conduct problems in early adolescence *Journal of Psychiatric Research*.

- Walton, K. E., Ormel, J., & Krueger, R. F. (2011). The Dimensional Nature of Externalizing Behaviors in Adolescence: Evidence from a Direct Comparison of Categorical, Dimensional, and Hybrid Models. *Journal of Abnormal Child Psychology*, 39(4), 553-561. doi: 10.1007/s10802-010-9478-y
- Watson, D. (2005). Rethinking the Mood and Anxiety Disorders: A Quantitative Hierarchical Model for DSM -- V. *Journal of Abnormal Psychology*, 114(4), 522-536. doi: 10.1037/0021-843x.114.4.522
- Webster-Stratton, C., & Herman, K. C. (2008). The Impact of Parent Behavior-Management Training on Child Depressive Symptoms. *Journal of Counseling Psychology*, 55(4), 473-484.
- Webster-Stratton, C., Reid, M. J., & Hammond, M. (2004). Treating Children With Early-Onset Conduct Problems: Intervention Outcomes for Parent, Child, and Teacher Training. *Journal of Clinical Child & Adolescent Psychology*, 33(1), 105-124.
- Weiss, B., Harris, V., Catron, T., & Han, S. S. (2003). Efficacy of the RECAP Intervention Program for Children With Concurrent Internalizing and Externalizing Problems. *Journal of Consulting & Clinical Psychology*, 71(2), 364.
- Weiss, B., Susser, K., & Catron, T. (1998). Common and specific features of childhood psychopathology. *Journal of Abnormal Psychology*, 107(1), 118.
- Werthamer-Larsson, L., Kellam, S., & Wheeler, L. (1991). Effect of first-grade classroom environment on shy behavior, aggressive behavior, and concentration problems. *American Journal Of Community Psychology*, 19(4), 585-602.

- Wiesner, M. (2003). A Longitudinal Latent Variable Analysis of Reciprocal Relations Between Depressive Symptoms and Delinquency During Adolescence. *Journal of Abnormal Psychology, 112*(4), 633-645. doi: 10.1037/0021-843x.112.4.633
- Wiesner, M., & Kim, H. K. (2006). Co-Occurring Delinquency and Depressive Symptoms of Adolescent Boys and Girls: A Dual Trajectory Modeling Approach. *Developmental Psychology, 42*(6), 1220-1235. doi: 10.1037/0012.1649.42.6.1220
- Wolff, J. C., & Ollendick, T. H. (2006). The comorbidity of conduct problems and depression in childhood and adolescence. *Clinical Child And Family Psychology Review, 9*(3-4), 201-220.
- Xie, H., Drabick, D. A. G., & Chen, D. (2011). Developmental trajectories of aggression from late childhood through adolescence: similarities and differences across gender. *Aggressive Behavior, 37*(5), 387-404. doi: 10.1002/ab.20404
- Youngstrom, E. A., Findling, R. L., & Calabrese, J. R. (2003). Who Are the Comorbid Adolescents? Agreement Between Psychiatric Diagnosis, Youth, Parent, and Teacher Report. *Journal of Abnormal Child Psychology, 31*(3), 231.
- Zahn-Waxler, C., Crick, N. R., Shirtcliff, E. A., & Woods, K. E. (2006). The origins and development of psychopathology in females and males. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology, Vol 1: Theory and method (2nd ed.)*. (pp. 76-138). Hoboken, NJ US: John Wiley & Sons Inc.
- Zhao, X., Lynch, J. G., Jr., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197-206.
- Zoccolillo, M. (1993). Gender and the development of conduct disorder. *Development and Psychopathology, 5*(1-2), 65-78. doi: 10.1017/s0954579400004260

Table 1.

Scales and items with Cronbach's Alpha

Scale	Alpha	Items
Externalizing	.89 to .91 for boys, .87 to .90 for girls	*Is cruel or mean to others *Argues a lot Talks back to adults, is disrespectful *Fights Harms/damages property on purpose *Lies Stubborn Takes other's property *Threatens people Yells at others *Can't sit still Completes assignments Stays on task
Internalizing	.79 to .81 for boys, .82 to .87 for girls	Do you feel afraid a lot of the time? Are you afraid to try new things? Do you worry that a lot of other kids might not like you? Do you worry about being teased? Do you have trouble falling asleep or staying asleep? *Do you feel like crying a lot of the time? Do you feel tired a lot of the time? Do you feel upset about things a lot? Do/did you feel that you do/did things wrong a lot at school? Do you want to be by yourself a lot?
Peer rejection	.78 to .87 for boys, .74 to .81 for girls	It's hard to get kids in school to like me.

I'm lonely at school.
 I have nobody to talk to in class.

Parent-child conflict	.69 to .74 for boys, .64 to .71 for girls	Do you and your mom or dad get into arguments/disagreements about getting ready for school in the morning? Do you and your mom or dad get into arguments/disagreements about helping around the house? Do you and your mom or dad get into arguments/disagreements about doing homework?
Academic competence	.92 to .96 for boys, .94 to .97 for girls	Academically, how would you rate this student in terms of language arts ... Academically, how would you rate this student in terms of math ... Academically, how would you rate this student in terms of reading ...

Note. * items similar to those in the Youth Self-Report and Teacher Rating Form of the ASEBA though the exact wording may differ

Table 2.

Descriptive statistics for measures in dual growth and predictive models

	Boys				Girls			
	<i>N</i>	<i>M (SD)</i>	Skewness (<i>SE</i>)	Kurtosis (<i>SE</i>)	<i>N</i>	<i>M (SD)</i>	Skewness (<i>SE</i>)	Kurtosis (<i>SE</i>)
Externalizing g. 4	517	1.40 (.40)	1.10 (.11)	.64 (.21)	447	1.23 (.32)	1.90 (.12)	3.62 (.23)
Externalizing g. 5	505	1.40 (.41)	1.43 (.11)	1.75 (.22)	433	1.24 (.33)	2.08 (.12)	5.14 (.23)
Externalizing g. 6	496	1.41 (.39)	1.06 (.11)	.67 (.22)	415	1.23 (.31)	1.73 (.12)	2.79 (.24)
Externalizing g. 7	492	1.36 (.37)	1.49 (.11)	2.41 (.22)	421	1.20 (.28)	2.56 (.12)	8.16 (.24)
Externalizing g. 8	490	1.34 (.38)	1.76 (.11)	3.23 (.22)	425	1.20 (.28)	2.10 (.12)	5.10 (.24)
Internalizing g. 4	530	1.99 (.61)	.54 (.11)	-.33 (.21)	458	2.04 (.68)	.48 (.11)	-.29 (.23)
Internalizing g. 5	521	1.99 (.59)	.46 (.11)	-.28 (.21)	441	2.08 (.69)	.41 (.12)	-.66 (.23)
Internalizing g. 6	507	1.92 (.54)	.57 (.11)	-.15 (.22)	436	1.96 (.60)	.54 (.12)	-.12 (.23)
Internalizing g. 7	511	1.92 (.53)	.80 (.11)	1.22 (.22)	440	1.98 (.61)	.58 (.12)	-.27 (.23)
Internalizing g. 8	503	1.85 (.47)	.77 (.11)	1.32 (.22)	437	1.97 (.54)	.35 (.12)	-.20 (.23)
Household income	496	4.03 (1.90)	.33 (.11)	-.58 (.22)	444	4.06 (1.93)	.33 (.12)	-.59 (.23)

Note. g. = grade

Table 3.

Correlation matrix for measures in boys' dual growth and predictive models

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Externalizing g. 4	--										
2. Externalizing g. 5	.59**	--									
3. Externalizing g. 6	.55**	.60**	--								
4. Externalizing g. 7	.51**	.48**	.53**	--							
5. Externalizing g. 8	.49**	.50**	.48**	.51**	--						
6. Internalizing g. 4	.18**	.13**	.15**	.17**	.08	--					
7. Internalizing g. 5	.23**	.15**	.12**	.14**	.10*	.63**	--				
8. Internalizing g. 6	.16**	.13**	.11*	.15**	.14**	.54**	.61**	--			
9. Internalizing g. 7	.16**	.13**	.12**	.18**	.11*	.43**	.46**	.58**	--		
10. Internalizing g. 8	.04	-.01	.04	.05	.02	.34**	.38**	.45**	.57**	--	
11. Household income	-.20**	-.16**	-.12*	-.12**	-.04	.01	-.03	.02	.01	.07	--

Note. g. = grade, * $p < .05$, ** $p < .01$

Table 4.

Correlation matrix for measures in girls' dual growth and predictive models

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Externalizing g. 4	--										
2. Externalizing g. 5	.62**	--									
3. Externalizing g. 6	.60**	.60**	--								
4. Externalizing g. 7	.47**	.43**	.50**	--							
5. Externalizing g. 8	.51**	.46**	.47**	.44**	--						
6. Internalizing g. 4	.26**	.24**	.18**	.14**	.20**	--					
7. Internalizing g. 5	.28**	.28**	.19**	.17**	.21**	.66**	--				
8. Internalizing g. 6	.15**	.23**	.16**	.17**	.18**	.53**	.67**	--			
9. Internalizing g. 7	.11*	.20**	.15**	.17**	.11*	.42**	.54**	.66**	--		
10. Internalizing g. 8	.15**	.16**	.14**	.15**	.16**	.40**	.50**	.60**	.71**	--	
11. Household income	-.18**	-.16**	-.18**	-.20**	-.12*	-.15**	-.15**	-.14**	-.10	-.08	--

Note. g. = grade, * $p < .05$, ** $p < .01$

Table 5.

Unconditional multiple-group externalizing growth model

Paths	Boys (<i>N</i> = 534)		Girls (<i>N</i> = 469)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
$I_{EX} \leftrightarrow S_{EX}$	-.01** (.00)	-.51	-.01** (.00)	-.72
Means				
I_{EX}	1.41** (.01)	4.43	1.25** (.01)	4.74
S_{EX}	-.01** (.00)	-.26	-.01** (.00)	-.30
Variances				
I_{EX}	.10** (.01)	1.00	.07** (.01)	1.00
S_{EX}	.00* (.00)	1.00	.00* (.00)	1.00
Fit				
Model χ^2 (df)	30.67 (22)			
CFI	.99			
RMSEA	.03			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing, * $p < .05$, ** $p < .01$

Table 6.

Unconditional multiple-group internalizing growth model

Paths	Boys (<i>N</i> = 532)		Girls (<i>N</i> = 464)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
$I_{IN} \leftrightarrow S_{IN}$	-.04** (.00)	-.70	-.04** (.00)	-.58
Means				
I_{IN}	2.00** (.02)	3.81	2.07** (.03)	3.58
S_{IN}	-.03** (.01)	-.26	-.03** (.01)	-.24
Variances				
I_{IN}	.27** (.01)	1.00	.34** (.02)	1.00
S_{IN}	.01** (.00)	1.00	.02** (.00)	1.00
Fit				
Model χ^2 (df)	87.63 (22)			
CFI	.96			
RMSEA	.08			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, IN = Internalizing, * $p < .05$, ** $p < .01$

Table 7.

Multiple-group dual growth model

Paths	Boys (<i>N</i> = 486)		Girls (<i>N</i> = 430)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
I _{EX} ↔S _{EX}	-.01** (.00)	-.49	-.01** (.00)	-.72
I _{IN} ↔S _{IN}	-.04** (.00)	-.71	-.04** (.00)	-.58
I _{EX} ↔I _{IN}	.05** (.01)	.32	.05** (.01)	.35
S _{EX} ↔S _{IN}	.00** (.00)	.27	.00** (.00)	.33
I _{EX} ↔S _{IN}	-.01** (.00)	-.22	-.01** (.00)	-.27
I _{IN} ↔S _{EX}	-.01** (.00)	-.25	-.01** (.00)	-.29
Intercepts				
I _{EX}	1.54** (.03)	4.81	1.38** (.03)	5.19
S _{EX}	-.03** (.01)	-.58	-.03** (.01)	-.71
I _{IN}	2.09** (.05)	3.92	2.18** (.05)	3.78
S _{IN}	-.05** (.01)	-.47	-.05** (.01)	-.42
Fit				
Model χ^2 (df)	180.79 (106)			
CFI	.97			
RMSEA	.04			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained

to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing,

IN = Internalizing, * $p < .05$, ** $p < .01$

Table 8.

Multiple-group predictive model

Paths	Boys (<i>N</i> = 486)		Girls (<i>N</i> = 430)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
I _{EX} →S _{IN}	.00 (.02)	.01	.00 (.02)	.01
S _{EX} →S _{IN}	.34 (.29)	.16	.34 (.29)	.08
I _{EX} →S _{EX}	-.08** (.01)	-.53	-.08** (.01)	-.68
I _{IN} →S _{IN}	-.14** (.01)	-.66	-.14** (.01)	-.59
I _{EX} ↔I _{IN}	.05** (.01)	.32	.05** (.01)	.36
Intercepts				
I _{EX}	1.56** (.03)	4.82	1.37** (.03)	5.31
S _{EX}	.09** (.02)	1.84	.09** (.02)	2.95
I _{IN}	2.10** (.05)	4.01	2.17** (.06)	3.72
S _{IN}	.24** (.04)	2.22	.24** (.04)	1.78
Fit				
Model χ^2 (df)	191.85 (107)			
CFI	.97			
RMSEA	.04			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing,

IN = Internalizing, * $p < .05$, ** $p < .01$

Table 9.

Descriptive statistics for peer rejection, parent-child conflict, and academic competence

	Boys				Girls			
	<i>N</i>	<i>M (SD)</i>	Skewness (<i>SE</i>)	Kurtosis (<i>SE</i>)	<i>N</i>	<i>M (SD)</i>	Skewness (<i>SE</i>)	Kurtosis (<i>SE</i>)
Peer rejection g. 4	261	1.72 (.82)	1.06 (.15)	.04 (.30)	241	1.64 (.73)	1.22 (.16)	0.92 (.31)
Peer rejection g. 5	520	1.60 (.69)	1.33 (.11)	1.29 (.21)	440	1.59 (.72)	1.30 (.12)	0.95 (.23)
Peer rejection g. 6	504	1.53 (.67)	1.50 (.11)	1.86 (.22)	429	1.50 (.64)	1.50 (.12)	1.92 (.24)
Peer rejection g. 7	505	1.56 (.63)	1.42 (.11)	2.21 (.22)	432	1.46 (.61)	1.47 (.12)	1.69 (.23)
Peer rejection g. 8	500	1.49 (.59)	1.43 (.11)	2.22 (.22)	431	1.42 (.53)	1.32 (.12)	1.39 (.24)
Parent-child conflict g. 4	259	1.64 (.74)	1.07 (.15)	0.47 (.30)	237	1.62 (.74)	1.26 (.16)	1.08 (.32)
Parent-child conflict g. 5	516	1.73 (.75)	1.02 (.11)	0.52 (.22)	516	1.73 (.76)	1.04 (.12)	0.60 (.23)
Parent-child conflict g. 6	504	1.84 (.76)	0.91 (.11)	0.38 (.22)	433	1.79 (.72)	0.88 (.12)	0.28 (.23)
Parent-child conflict g. 7	506	1.98 (.76)	0.47 (.11)	-0.31 (.22)	435	1.97 (.75)	0.70 (.12)	0.15 (.23)
Parent-child conflict g. 8	501	2.06 (.74)	0.25 (.11)	-0.49 (.22)	438	2.05 (.72)	0.35 (.12)	-0.37 (.23)
Academic competence g. 4	516	3.12 (1.25)	-0.07 (.11)	-1.04 (.22)	445	3.26 (1.25)	-0.22 (.12)	-0.99 (.23)
Academic competence g. 5	502	3.01 (1.25)	0.05 (.11)	-1.02 (.22)	432	3.18 (1.25)	-0.10 (.12)	-1.09 (.23)
Academic competence g. 6	490	3.03 (1.26)	-0.01 (.11)	-1.05 (.22)	410	3.28 (1.25)	-0.29 (.12)	-0.99 (.24)
Academic competence g. 7	486	2.83 (1.31)	0.11 (.11)	-1.09 (.22)	412	3.25 (1.23)	-1.56 (.12)	-0.93 (.24)
Academic competence g. 8	483	2.96 (1.36)	-0.03 (.11)	-1.22 (.22)	416	3.28 (1.31)	-0.28 (.12)	-1.03 (.24)

Note. gr. = grade, * $p < .05$, ** $p < .01$

Table 10.

Correlation matrix of peer rejection with other variables

	Boys					Girls				
	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.
1. Peer rejection g. 4	--					--				
2. Peer rejection g. 5	.50**	--				.50**	--			
3. Peer rejection g. 6	.41**	.49**	--			.27**	.50**	--		
4. Peer rejection g. 7	.39**	.42**	.48**	--		.27**	.33**	.51**	--	
5. Peer rejection g. 8	.22**	.29**	.36**	.51**	--	.10	.24**	.40**	.61**	--
Externalizing g. 4	.40**	.27**	.17**	.12**	.04	.17**	.24**	.15**	.12*	.12*
Externalizing g. 5	.22**	.16**	.07**	.08	.02	.17*	.23**	.25**	.21**	.17**
Externalizing g. 6	.23**	.14**	.09*	.04	.04	.09	.21**	.13**	.14**	.14**
Externalizing g. 7	.13**	.13**	.16**	.12*	.06	.07	.18**	.10*	.09	.13**
Externalizing g. 8	.15**	.09*	.08	.02	-.01	.14*	.20**	.10	.10*	.07
Internalizing g. 4	.58**	.44**	.40**	.34**	.28**	.55**	.50**	.35**	.32**	.19**
Internalizing g. 5	.43**	.56**	.43**	.35**	.25**	.39**	.67**	.49**	.35**	.28**
Internalizing g. 6	.45**	.38**	.58**	.42**	.32**	.24**	.47**	.62**	.47**	.40**
Internalizing g. 7	.37**	.37**	.39**	.57**	.47**	.22**	.33**	.46**	.67**	.52**
Internalizing g. 8	.23**	.30**	.30**	.40**	.59**	.24**	.30**	.37**	.47**	.56**
Household income	-.04	-.04	-.05	.00	.07	-.09	-.16**	-.09	-.16**	-.02

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

Table 11.

Correlation matrix of parent-child conflict with other variables

	Boys					Girls				
	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.
1. Parent-child conflict g. 4	--					--				
2. Parent-child conflict g. 5	.46**	--				.48**	--			
3. Parent-child conflict g. 6	.33**	.43**	--			.29**	.47**	--		
4. Parent-child conflict g. 7	.29**	.31**	.39**	--		.19**	.35**	.47**	--	
5. Parent-child conflict g. 8	.40**	.26**	.36**	.39**	--	.14**	.34**	.29**	.46**	--
Externalizing g. 4	.08	.16**	.18**	.11*	.09*	.24**	.23**	.15**	.15**	.20**
Externalizing g. 5	.06	.20**	.22**	.12**	.10*	.14**	.22**	.23**	.12*	.13**
Externalizing g. 6	.08	.13**	.14**	.14**	.10*	.15**	.17**	.13**	.12*	.15**
Externalizing g. 7	.11	.13**	.17**	.12**	.10*	.15**	.13**	.17**	.20**	.14**
Externalizing g. 8	.11	.12**	.16**	.10*	.11*	-.03	.19**	.15**	.16**	.22**
Internalizing g. 4	.23**	.24**	.19**	.19**	.11*	.44**	.31**	.23**	.17**	.12*
Internalizing g. 5	.26**	.28**	.23**	.21**	.11*	.37**	.35**	.27**	.20**	.17**
Internalizing g. 6	.21**	.21**	.27**	.22**	.22**	.20**	.28**	.45**	.25**	.17**
Internalizing g. 7	.17**	.17**	.17**	.33**	.19**	.25**	.19**	.29**	.37**	.26**
Internalizing g. 8	.15*	.13**	.21**	.25**	.28**	.23**	.26**	.29**	.32**	.33**
Household income	.11	.01	-.02	.00	-.00	-.11	-.08	.00	.02	-.08

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

Table 12.

Correlation matrix of academic competence with other variables

	Boys					Girls				
	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.
1. Academic competence g. 4	--					--				
2. Academic competence g. 5	.71**	--				.74**	--			
3. Academic competence g. 6	.65**	.69**	--			.70**	.72**	--		
4. Academic competence g. 7	.63**	.60**	.63**	--		.66**	.65**	.70**	--	
5. Academic competence g. 8	.52**	.55**	.59**	.60**	--	.61**	.58**	.65**	.69**	--
Externalizing g. 4	-.32**	-.29**	-.26**	-.32**	-.28**	-.38**	-.37**	-.38**	-.37**	-.38**
Externalizing g. 5	-.25**	-.35**	-.30**	-.27**	-.25**	-.36**	-.42**	-.42**	-.32**	-.37**
Externalizing g. 6	-.29**	-.24**	-.34**	-.28**	-.29**	-.29**	-.31**	-.45**	-.32**	-.39**
Externalizing g. 7	-.25**	-.24**	-.24**	-.37**	-.29**	-.28**	-.30**	-.37**	-.39**	-.39**
Externalizing g. 8	-.23**	-.22**	-.24**	-.27**	-.40**	-.25**	-.26**	-.28**	-.31**	-.48**
Internalizing g. 4	-.11*	-.09*	-.10*	-.07	-.07	-.21**	-.18**	-.18**	-.17**	-.14**
Internalizing g. 5	-.04	-.13**	-.11*	-.07	-.06	-.22**	-.22**	-.21**	-.22**	-.21**
Internalizing g. 6	-.12**	-.10*	-.16**	-.11*	-.10*	-.14**	-.15**	-.16**	-.15**	-.18**
Internalizing g. 7	-.08	-.09	-.04	-.05	-.03	-.04	-.00	-.08	-.08	-.07
Internalizing g. 8	.06	.08	.10*	.10*	.06	-.06	-.03	-.07	-.10	-.12*
Household income	.28**	.28**	.29**	.28**	.30**	.25**	.21**	.23**	.21**	.20**

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

Table 13.

Multiple-group model with peer rejection as mediating factors

Paths	Boys (<i>N</i> = 486)		Girls (<i>N</i> = 430)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
I _{EX} →S _{PR}	.00 (.02)	.00	.01 (.02)	.00
S _{EX} →S _{PR}	.01 (.23)	.01	.01 (.23)	.00
S _{PR} →S _{IN}	.69** (.06)	.87	.69** (.06)	.79
I _{EX} ↔I _{PR}	.06** (.01)	.31	.06** (.01)	.41
I _{EX} ↔I _{IN}	.05** (.01)	.32	.05** (.01)	.36
I _{PR} ↔I _{IN}	.26** (.02)	.89	.26** (.02)	.86
Means				
I _{EX}	1.55** (.03)	4.77	1.37** (.03)	5.21
S _{EX}	.11** (.02)	2.07	.10** (.02)	3.04
I _{PR}	1.79** (.06)	3.12	1.78** (.07)	3.29
S _{PR}	.22** (.04)	1.58	.20** (.04)	1.43
I _{IN}	2.11** (.05)	4.00	2.16** (.06)	3.78
S _{IN}	.07* (.03)	0.60	.10** (.03)	.75
Fit				
Model χ^2 (df)	385.59*(225)			
CFI	.97			
RMSEA	.04			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing, PR = Peer rejection, IN = Internalizing, * $p < .05$, ** $p < .01$

Table 14.

Multiple-group model with parent-child conflict as mediating factors

Paths	Boys (N = 486)		Girls (N = 430)	
	Coeff. (SE)	Standardized coeff.	Coeff. (SE)	Standardized coeff.
I _{EX} →S _{PC}	.11** (.04)	.26	.11** (.04)	.20
S _{EX} →S _{PC}	.68 (.39)	.27	.68 (.39)	.16
S _{PC} →S _{IN}	.36** (.06)	.42	.36** (.06)	.37
I _{EX} ↔I _{PC}	.05** (.01)	.25	.05** (.01)	.33
I _{EX} ↔I _{IN}	.05** (.01)	.29	.05** (.01)	.34
I _{PC} ↔I _{IN}	.15** (.02)	.50	.15** (.02)	.50
Intercepts				
I _{EX}	1.55** (.03)	4.74	1.37** (.03)	5.25
S _{EX}	.11** (.02)	2.12	.10** (.02)	2.91
I _{PC}	1.62** (.06)	2.86	1.62** (.06)	3.04
S _{PC}	.20** (.05)	1.51	.21** (.05)	1.46
I _{IN}	2.10** (.05)	3.95	2.16** (.06)	3.78
S _{IN}	.16** (.03)	1.40	.20** (.03)	1.32
Fit				
Model χ^2 (df)	284.98** (222)			
CFI	.98			
RMSEA	.03			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing, PC = Parent-child conflict, IN = Internalizing, * $p < .05$, ** $p < .01$

Table 15.

Multiple-group model with academic competence as mediating factors

Paths	Boys (<i>N</i> = 486)		Girls (<i>N</i> = 430)	
	Coeff. (<i>SE</i>)	Standardized coeff.	Coeff. (<i>SE</i>)	Standardized coeff.
I _{EX} →S _{AC}	-.31** (.09)	-.97	-.31** (.09)	-.78
S _{EX} →S _{AC}	-2.63** (.99)	-1.16	-2.63** (.99)	-.89
S _{AC} →S _{IN}	-.15 (.09)	-.14	-.15 (.09)	-.11
I _{EX} ↔I _{AC}	-.13** (.01)	-.40	-.13** (.01)	-.48
I _{EX} ↔I _{IN}	.05** (.01)	.29	.05** (.01)	.34
I _{AC} ↔I _{IN}	-.11** (.02)	-.20	-.11** (.02)	-.17
Intercepts				
I _{EX}	1.55** (.03)	4.73	1.38** (.04)	5.32
S _{EX}	.10** (.02)	2.20	.09** (.02)	2.67
I _{AC}	2.37** (.10)	2.25	2.51** (.10)	2.28
S _{AC}	.46** (.13)	4.34	.49** (.12)	4.74
I _{IN}	2.10** (.05)	3.99	2.16** (.06)	3.71
S _{IN}	.23** (.02)	2.13	.27** (.02)	1.96
Fit				
Model χ^2 (df)	484.46** (227)			
CFI	.95			
RMSEA	.05			

Note. Similar parameter estimates for both boys and girls indicate that the path was constrained to equality; Coeff. = coefficient, I = intercept factor, S = slope factor, EX = Externalizing, AC = Academic competence, IN = Internalizing, * $p < .05$, ** $p < .01$

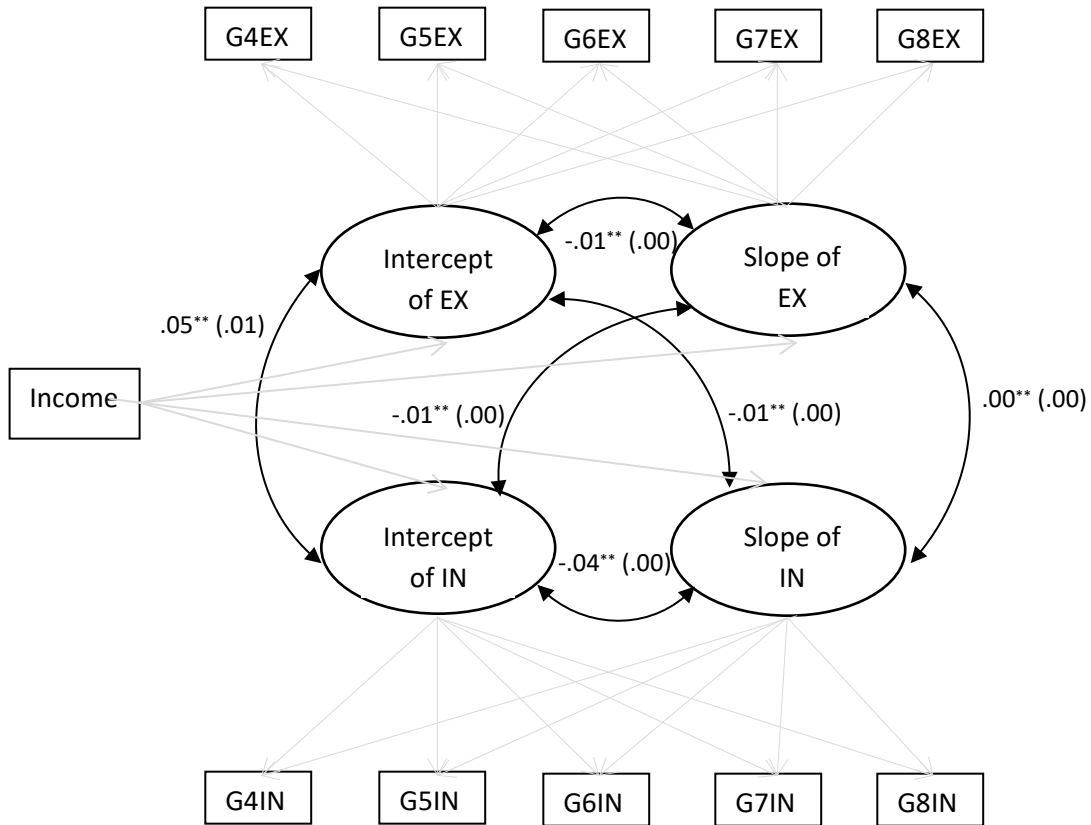


Figure 1. Multiple-group dual growth model. EX = externalizing, IN = internalizing, Income = household income. Numbers on significant paths are unstandardized estimates with standard errors in brackets. Fit statistics are $\chi^2(106, N = 916) = 180.79, p < .01$, CFI = .97, RMSEA = .04. * $p < .05$, ** $p < .01$

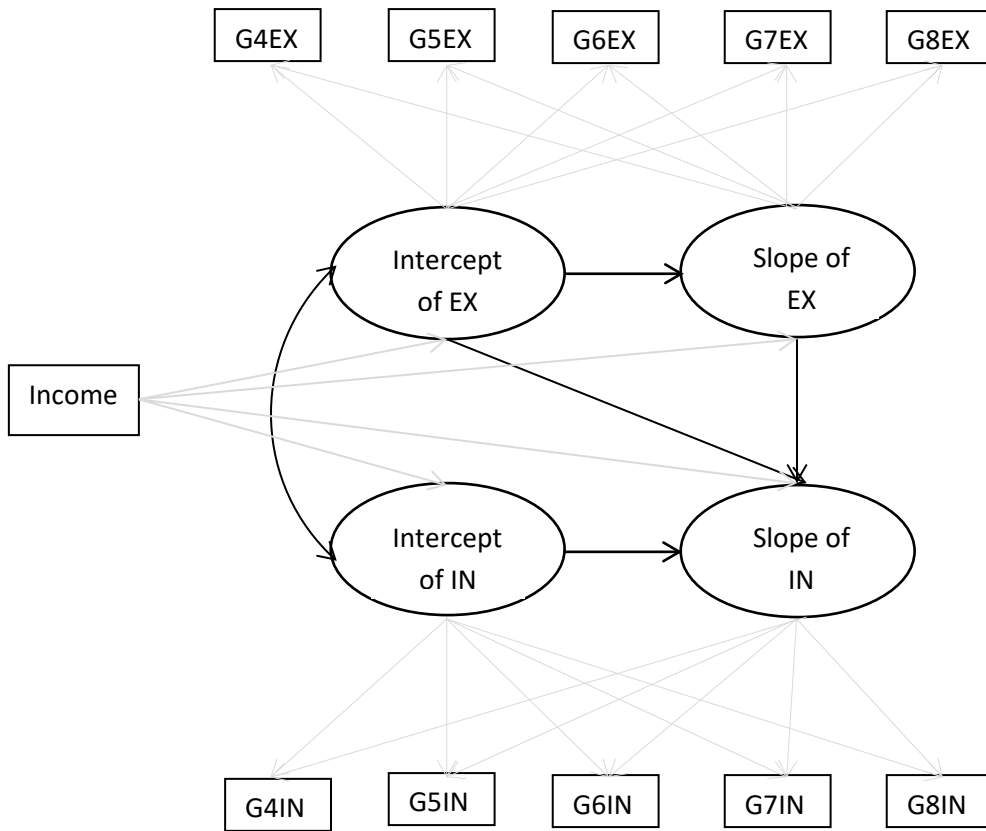


Figure 2. Specifications for the predictive model. EX = externalizing, IN = internalizing, Income = household income.

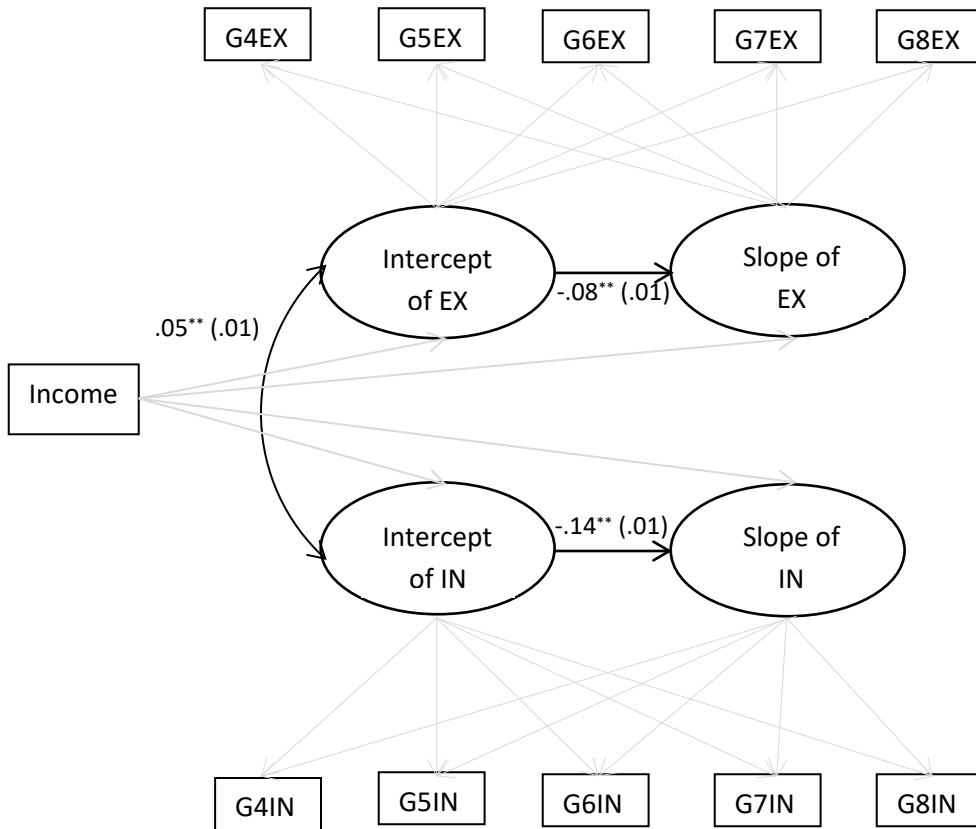


Figure 3. Multiple-group predictive model. EX = externalizing, IN = internalizing, Income = household income. Numbers on significant paths are unstandardized estimates with standard errors in brackets. Fit statistics are $\chi^2(107, N = 916) = 191.85$, $p < .00$, CFI = .97, RMSEA = .04. * $p < .05$, ** $p < .01$

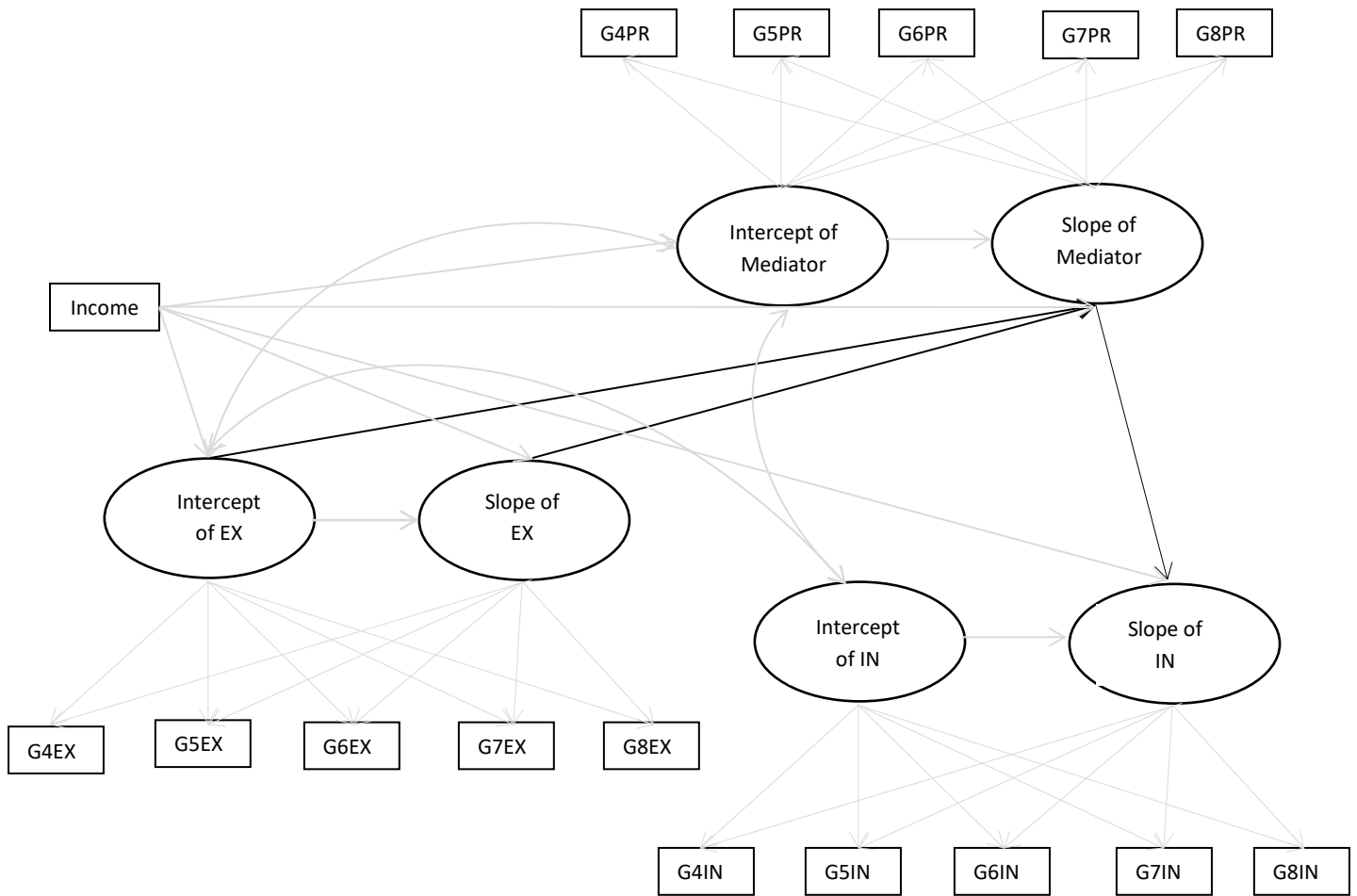


Figure 4. Specifications for the mediation models. EX = externalizing, IN = internalizing, Income = household income.

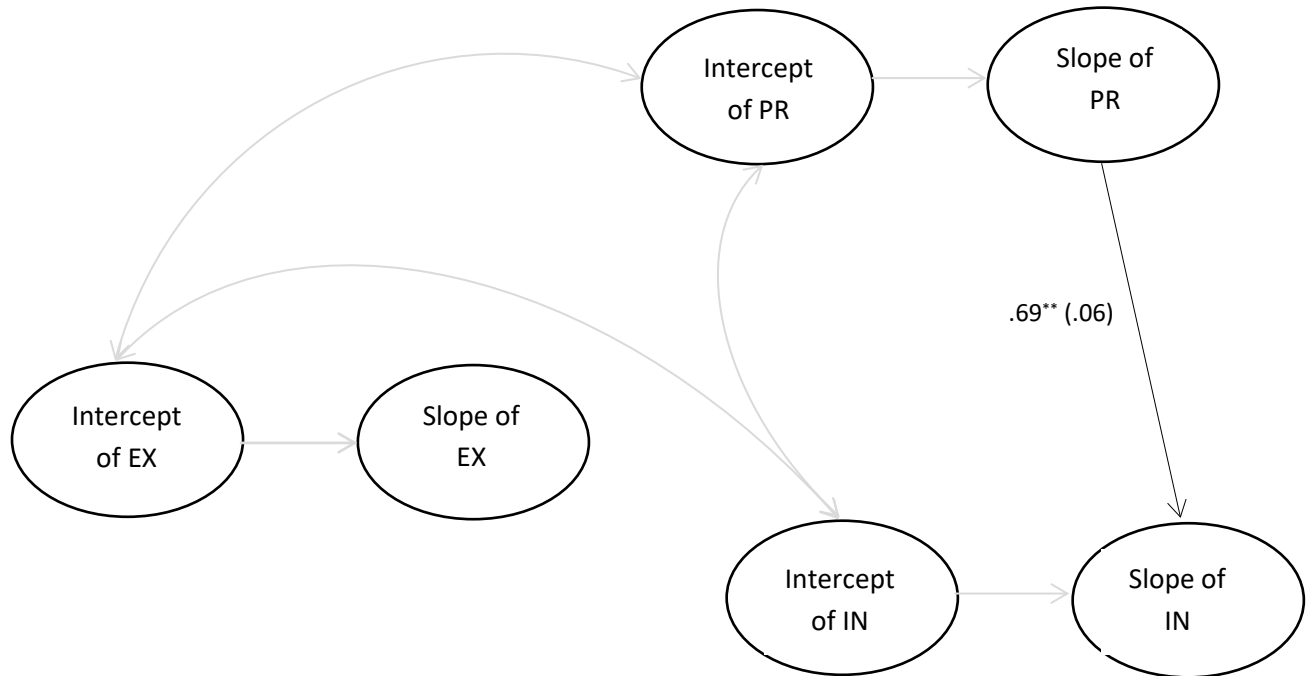


Figure 5. Multiple-group model with peer rejection as mediating factors. EX = externalizing, IN = internalizing, Income = household income, PR = peer rejection. All paths illustrated are significant but only the path being tested is labeled with its coefficient. Numbers are unstandardized estimates with standard errors in brackets. Fit statistics are $\chi^2(225, N = 916) = 385.59$, $p < .01$, CFI = .97, RMSEA = .04. * $p < .05$, ** $p < .01$

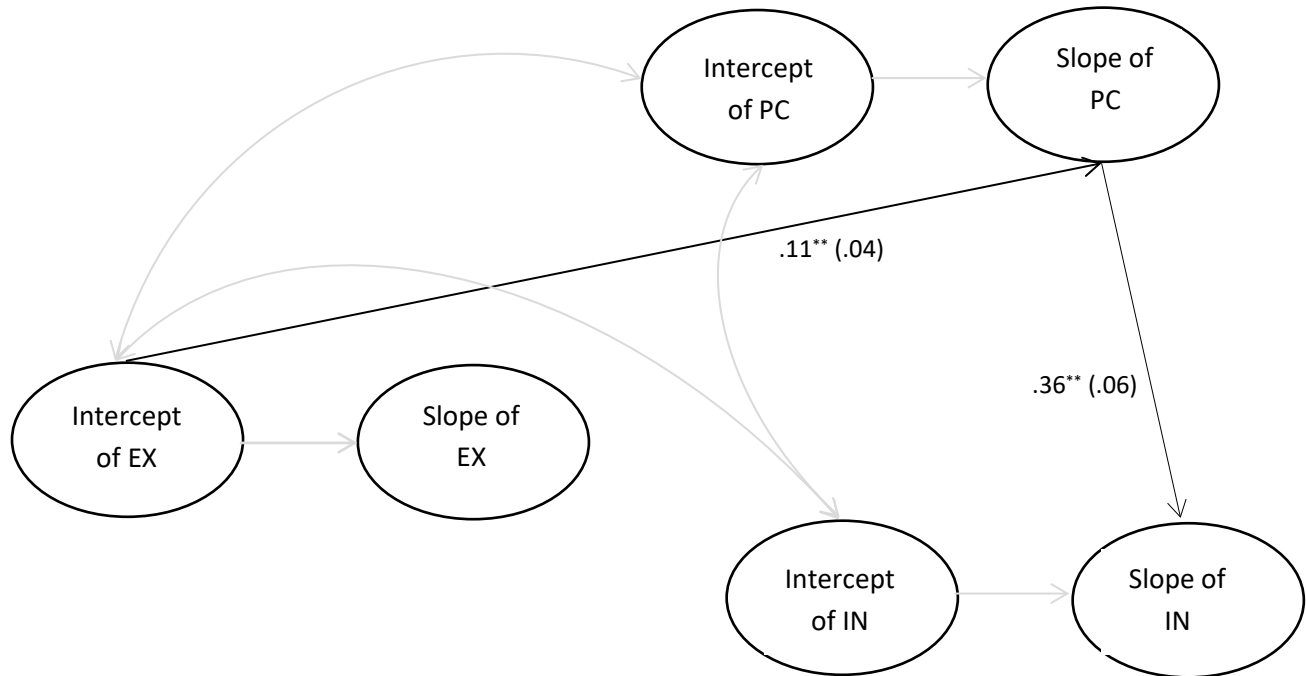


Figure 6. Multiple-group model with parent-child conflict as mediating factors. EX = externalizing, IN = internalizing, Income = household income, PC = parent-child conflict. All paths illustrated are significant but only the paths being tested are labeled with their coefficients. Numbers are unstandardized estimates with standard errors in brackets. Fit statistics are $\chi^2(222, N = 916) = 284.98$, $p < .01$, CFI = .98, RMSEA = .03. * $p < .05$, ** $p < .01$

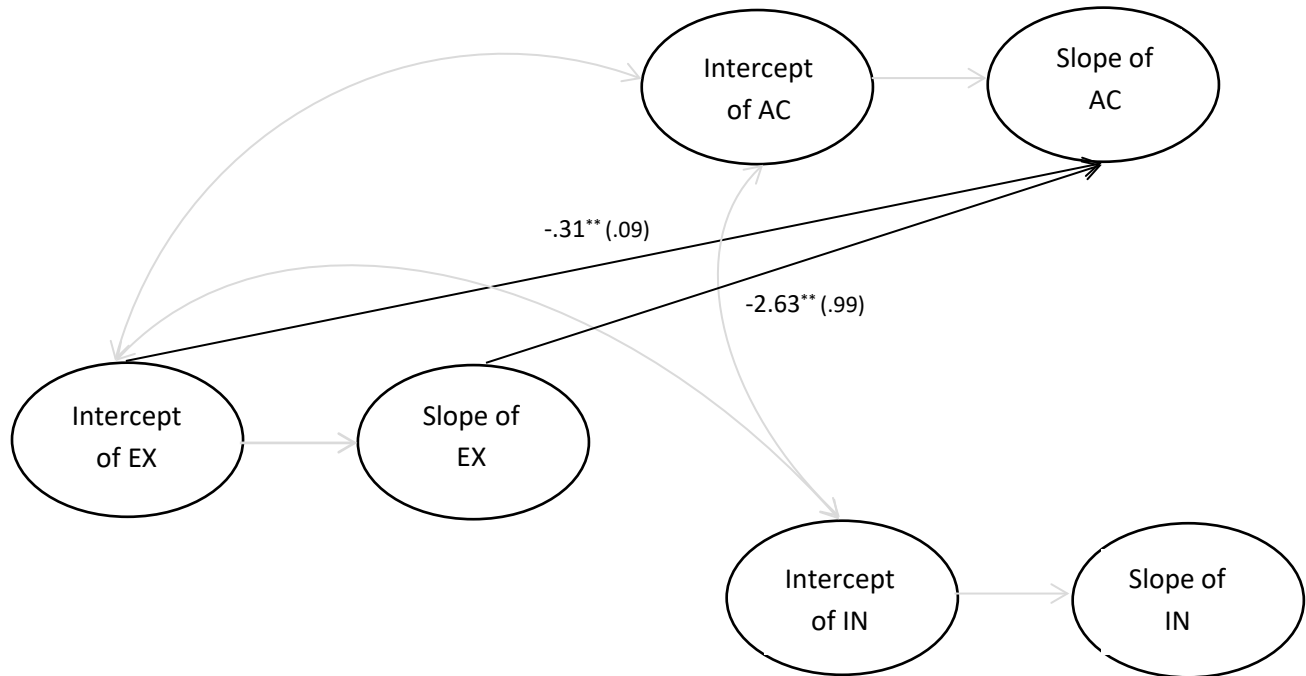


Figure 7. Multiple-group model with academic competence as mediating factors. EX = externalizing, IN = internalizing, Income = household income, AC = academic competence. All paths illustrated are significant but only the paths being tested are labeled with their coefficients. Numbers are unstandardized estimates with standard errors in brackets. Fit statistics are $\chi^2(227, N = 916) = 484.46, p < .00, CFI = .95, RMSEA = .05$. * $p < .05$, ** $p < .01$

Appendix A

TITLE: Externalizing growth model

DATA:

FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3
q4 q5 r1 r2 r3 r4 r5;

GROUPING IS c (0=Girls 1=Boys);

USEVARIABLES ARE x1 x2 x3 x4 x5;

MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;

ESTIMATOR IS MLR;

ITERATIONS = 1000;

CONVERGENCE = 0.00005;

COVERAGE = 0.10;

MODEL:

I1 s1 | x1@0 x2@1 x3@2 x4@3 x5@4;

I1 WITH s1 (1);

[i1];

[s1] (2);

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;

TITLE: Internalizing growth model

DATA:

FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3
q4 q5 r1 r2 r3 r4 r5;

GROUPING IS c (0=Girls 1=Boys);

USEVARIABLES ARE y1 y2 y3 y4 y5;

MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;

ESTIMATOR IS MLR;

ITERATIONS = 1000;

CONVERGENCE = 0.00005;

COVERAGE = 0.10;

MODEL:

i2 s2 | y1@0 y2@1 y3@2 y4@3 y5@4;

i2 WITH s2 (1);

[i2];

[s2] (2);

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;

TITLE: Dual growth model

DATA: FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3
q4 q5 r1 r2 r3 r4 r5;
GROUPING IS c (0=Girls 1=Boys);
USEVARIABLES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a;
MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;
ESTIMATOR IS MLR;
ITERATIONS = 1000;
CONVERGENCE = 0.00005;
COVERAGE = 0.10;

MODEL:

i1 s1 | x1@0 x2@1 x3@2 x4@3 x5@4;
i2 s2 | y1@0 y2@1 y3@2 y4@3 y5@4;

i1 s1 i2 s2 ON a;

i1 WITH s1 (1);
i2 WITH s2 (2);
i1 WITH i2 (3);
s1 WITH s2 (4);
i1 WITH s2 (5);
i2 WITH s1 (6);

[i1];
[s1] (7);
[i2];
[s2] (8);

OUTPUT: SAMPSTAT MODINDICES (ALL 5) STDYX;

TITLE: Predictive model

DATA: FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3

q4 q5 r1 r2 r3 r4 r5;

GROUPING IS c (0=Girls 1=Boys);

USEVARIABLES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a;

MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;

ESTIMATOR IS MLR;

ITERATIONS = 1000;

CONVERGENCE = 0.00005;

COVERAGE = 0.10;

MODEL:

i1 s1 | x1@0 x2@1 x3@2 x4@3 x5@4;

i2 s2 | y1@0 y2@1 y3@2 y4@3 y5@4;

i1 s1 i2 s2 ON a (8-11);

i1 WITH i2 (1);

s1 ON i1 (2);

s2 ON i1 s1 i2 (3-5);

[s1] (6);

[s2] (7);

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;

TITLE: Peer rejection mediation model

DATA: FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3
q4 q5 r1 r2 r3 r4 r5;
GROUPING IS c (0=Girls 1=Boys);
USEVARIABLES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a;
MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;
ESTIMATOR IS MLR;
ITERATIONS = 1000;
CONVERGENCE = 0.00005;
COVERAGE = 0.10;

MODEL:

iEX sEX | x1@0 x2@1 x3@2 x4@3 x5@4;
sEX ON iEX (1);
iPR sPR | p1@0 p2@1 p3@2 p4@3 p5@4;
sPR ON iPR (2);
iIN sIN | y1@0 y2@1 y3@2 y4@3 y5@4;
sIN ON iIN (3);

p1 WITH y1 (16);
p2 WITH y2 (17);
p3 WITH y3 (18);
p4 WITH y4 (19);
p5 WITH y5 (20);

sPR ON iEX sEX (4-5);
sIN ON sPR (6);

iEX sEX iPR sPR iIN sIN ON a (7-12);

iEX WITH iPR (13);
iPR WITH iIN (14);
iEX WITH iIN (15);

MODEL Girls:

p1 WITH p3;

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;

TITLE: Parent-child conflict mediation model

DATA: FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3

q4 q5 r1 r2 r3 r4 r5;

GROUPING IS c (0=Girls 1=Boys);

USEVARIABLES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a;

MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;

ESTIMATOR IS MLR;

ITERATIONS = 1000;

CONVERGENCE = 0.00005;

COVERAGE = 0.10;

MODEL:

iEX sEX | x1@0 x2@1 x3@2 x4@3 x5@4;

sEX ON iEX (1);

iPC sPC | q1@0 q2@1 q3@2 q4@3 q5@4;

sPC ON iPC (2);

iIN sIN | y1@0 y2@1 y3@2 y4@3 y5@4;

sIN ON iIN (3);

q1 WITH y1 (4);

q2 WITH y2 (5);

q3 WITH y3 (6);

q4 WITH y4 (7);

q5 WITH y5 (8);

sPC ON iEX sEX(9-10);

sIN ON sPC (11);

iEX sEX iPC sPC iIN sIN ON a (12-17);

y3 WITH y4 (18);

y2 WITH y3 (19);

iEX WITH iPC (20);

iPC WITH iIN (21);

iEX WITH iIN (22);

sIN WITH iPC (23);

MODEL Girls:

q3 WITH q5;

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;

TITLE: Academic competence mediation model
DATA: FILE IS "C:\Users\mlyong\Desktop\3_20 LGMM b.dat";

VARIABLE:

NAMES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a b c p1 p2 p3 p4 p5 q1 q2 q3
q4 q5 r1 r2 r3 r4 r5;
GROUPING IS c (0=Girls 1=Boys);
USEVARIABLES ARE x1 x2 x3 x4 x5 y1 y2 y3 y4 y5 a;
MISSING ARE ALL (999.00);

ANALYSIS:

TYPE IS MISSING;
ESTIMATOR IS MLR;
ITERATIONS = 1000;
CONVERGENCE = 0.00005;
COVERAGE = 0.10;

MODEL:

iEX sEX | x1@0 x2@1 x3@2 x4@3 x5@4;
sEX ON iEX (1);
iAC sAC | r1@0 r2@1 r3@2 r4@3 r5@4;
sAC ON iAC (2);
iIN sIN | y1@0 y2@1 y3@2 y4@3 y5@4;
sIN ON iIN (3);

sAC ON iEX (4);
sAC ON sEX (5);
sIN ON sAC (6);

iEX sEX iAC sAC iIN sIN ON a (7-12);

iEX WITH iAC (13);
iAC WITH iIN (14);
iEX WITH iIN (15);

x1 WITH r1 (16);
x2 WITH r2 (17);
x3 WITH r3 (18);
x4 WITH r4 (19);
x5 WITH r5 (20);

MODEL boys:
sAC@0 (21);

OUTPUT: SAMPSTAT MODINDICES(ALL 5) STDYX;