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UNIVERSITY OF CALIFORNIA, MERCED

Resilience against Depression over Time in Diverse Youth: A Multigroup Growth Curve Modeling Approach

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy

in

Psychological Sciences

by

Sarah Melissa Scott

Committee in charge:

       Professor Jan Wallander, Chair
       Professor Sarah Depaoli
       Professor Linda Cameron

The Dissertation of Sarah Melissa Scott is approved, and it is acceptable

in quality and form for publication on microfilm and electronically.

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Linda Cameron

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Sarah Depaoli

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Jan Wallander, Chair

University of California, Merced

2015

This dissertation is dedicated to my little Oliver. I will always treasure how you have been with me from the beginning stages through to the final submission of this dissertation. I love you more than you know!

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Acknowledgements

I have many people to thank for the successful completion of my Ph.D. Most notably I would like to thank by primary advisor, Jan Wallander, for his continued support and understanding. I truly appreciate his mentorship style of providing guidance and criticism in such a way that I always felt like I could find a solution and ultimately excel. I am also extremely grateful that he allowed me the flexibility I needed upon the birth of my son, Oliver, to complete the final stages of my dissertation. Thank you, Jan!

I would also like to thank my co-advisor, Sarah Depaoli, for providing me with the opportunity to broaden my statistical skills. Moreover, I would like to thank my committee member, Linda Cameron, for her guidance and enthusiasm regarding this topic.

To my friends and labmates, thank you for listening to my work and pregnancy-related complaints, especially during my final year. Thank you for sharing in my excitement as my little fella morphed from a grape to watermelon!

To my family, thank you for always being ready to help and for encouraging me to push myself. To my mother in particular, danke für Deine enorme Unterstützung bei allem was ich tat. Danke das Du all meinen Sorgen die ganzen Jahre aufmerksam zugehört hast. Ich kann mir nicht vorstellen das ich ohne Deine Liebe, Empathie und Geduld jemals so weit gekommen wäre. To my husband, Corey, thank you for always encouraging me to confront further challenges and to keep trying to improve. Also, thanks for always rubbing my back when I've been hunched over my laptop for too long! I look forward to sharing my life with you for many years to come.

Finally, I would like to thank UC Merced's Graduate Fellowships which funded much of research, as well as the Center of Excellence on Health Disparities for relieving me of my TA duties for a year.

Curriculum Vita

SARAH M. SCOTT

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Education:

University of California, Merced
Health Psychology Doctoral Program, GPA: 3.93

University of Virginia, Charlottesville, VA, May 2008
High Honors Psychology (BA), GPA: 3.77, Major GPA: 3.85

York High School, Yorktown, VA, June 2005
International Baccalaureate Programme Diploma

Relevant Coursework:
Public Health
Research and Design Methodology in Psychology
Health Behavior and Decision Making
Longitudinal Data Analysis with Bayesian Extensions
Advanced Psychological Statistics I and II
Structural Equation Modeling

Publications:

Depaoli, S. & Scott, S. M. (under review). Frequentist and Bayesian estimation of
CFA measurement models with mixed item response types: A Monte
Carlo investigation.

Scott, S. M., Depaoli, S., & Wallander, J. L. (in prep). How does physical activity
impact depression trajectories? A growth mixture modeling approach.

Scott, S. M., Wallander, J. L., & Cameron, L. (under review). Resilience against
depression among racial/ethnic minority youth.

Scott, S. M., Wallander, J. L., & Depaoli, S., Elliott, M.N., Grunbaum, J.A.,
Tortolero, S.R., Cuccaro, P.M., & Schuster, M.A. (in press). Gender role
orientation is associated with health-related quality of life differently
among African American, Hispanic, and White youth. *Quality of Life
Research.*

Scott, S. M., Wallander, J. L., Elliott, M.N., Grunbaum, J.A., Tortolero, S.R.,
Cuccaro, P.M., & Schuster, M.A. (in press). Do social resources protect
against lower quality of life among diverse young adolescents?

Wallander, J.L., Fradkin, C., & Scott, S.M. (2013). Issues in adolescent adherence
and health behavior change. In L.R. Martin & M.R. DiMatteo (Eds.),
*Oxford Handbook of Health Communication, Behavior Change, and
Treatment Adherence*. New York: Oxford University Press.

Wallander, J.L., Fradkin, C., & Scott, S.M. (in prep). Racial/ethnic disparities in the quality of life among diverse youth.

Conference Presentations:

Scott. S. & Depaoli, S. (2014, April). *Frequentist and Bayesian estimation of CFA measurement models with mixed item response types: A Monte Carlo investigation.* Poster presented at the 76th Annual Meeting of the National Council on Measurement in Education, Philadelphia, PA.

Scott. S., Depaoli, S., & Wallander, J. L. (2014, April). *Do physical activity levels impact depressed mood across adolescence?* Poster presented at the 94th Annual Meeting of the Western Psychological Association, Portland, OR.

Scott, S., Wallander, J. L., & Depaoli, S. (2013, March). Gender Role Orientation Is Associated with Health-related Quality of Life Differently among White, African American, and Hispanic Youth. Poster presented at the 34th Annual Meeting & Scientific Sessions of the Society of Behavioral Medicine San Francisco, CA.

Scott, S. & Wallander, J. L. (2012, April). *Positive personal, family, and social characteristics protect low SES children from reduced quality of life.* Poster presented at the 33rd Annual Meeting & Scientific Sessions of the Society of Behavioral Medicine, New Orleans, LA.

Scott, S. & Wallander, J. L. (2012, April). *Low SES and protective factors on children's quality of life.* Poster presented at the Western Psychological Association 92nd Annual Convention, San Francisco, CA.

Awards and Honors:

2015	Graduate Dean's Dissertation Year Fellowship
2011 – 2014	Graduate Research Committee Summer Funding
2011 – 2012	Center of Excellence on Health Disparities Fellow
2008	High Distinction B.A. in Psychology (based on GPA and undergraduate honors thesis), University of Virginia.
2007 – 2008	*Honors Thesis (Distinguished Majors Program) Candidate,* Child Study Center, Judy DeLoache, University of Virginia.
	My project sought to determine the level of interest very young children (18 to 32 month olds) have in animate versus inanimate objects and also natural versus artificial landscapes, as well as whether any gender differences exist. Presented at L. Sterling Reid Undergraduate Research Conference (Charlottesville, VA, 2008)
2005	International Baccalaureate Diploma Programme York County Scholarship, based on academics, athletic involvement, and community service.

Memberships and Activities:

2014 – 2015	National Council on Measurement in Education Student Affiliate and Student Reviewer
2014	Undergraduate Learning Outcomes Assessment: Pedagogy and Program Planning Student Participant
2013 – 2014	WPA Steering Committee Graduate Representative
2013	Graduate student representative for health psychology faculty search committee
2012 – 2015	Co-manager of UCM Psychology Website
2012 – 2013	Toastmaster's International Vice President of Education (Communication and Leadership)
2012 – 2015	Western Psychological Association Student Affiliate
2012 – 2013	Society of Behavioral Medicine Student Affiliate
2011 – 2012	Society of Pediatric Psychology Student Affiliate
2009 – 2010	Psi Chi Secretary for the University of Virginia's Chapter
2007 – 2010	American Psychological Association Student Affiliate

Research and Employment Experience:

2010 – 2015	*Graduate Student.* Jan Wallander and Sarah Depaoli, University of California, Merced. Researched adolescent risk and resilience and the moderating role of protective factors; conducting simulation research.
2014 – 2015	*Teaching Assistant.* Psy 01 Introduction to Psychology, Ross Avilla, University of California, Merced. Distributing assessments, grading exams, and holding weekly office hours.
2013	*Teaching Assistant.* Psy 15 Research Methods, Alexander Khislavsky, University of California, Merced. Distributed assessments, graded exams, and held weekly office hours.
2012	*Teaching Assistant.* Psy 15 Research Methods, Ross Avilla, University of California, Merced. Distributed assessments, graded exams, and held weekly office hours.
2010 – 2011	*Teaching Assistant.* Psy 143 Abnormal Child Psychology, Jan Wallander, University of California, Merced. Distributed assessments, graded homework and exams, held weekly office hours, and taught as a guest lecturer.
2009 – 2010	*Lead Assessment Examiner*. Early Steps Project, Melvin Wilson, Principle Investigator, University of Virginia. Performed in-home, research-based assessments with families participating in the Early Steps Project: a multi-site, longitudinal, multi-method, multi-reporter, prevention/early intervention treatment trial for very high-risk young children with behavior problems. Lead a small team of researchers in building rapport, administering questionnaires, filmed family interaction tasks, administered standardized academic assessments, coded surroundings. Office-based duties included maintaining databases of participants' consents and payments, assisting with training other examiners, and supporting office management as requested.

2008 – 2009	*Research Assistant.* Affective Neuroscience Lab, James Coan, University of Virginia. Investigated how age-related changes in prefrontal cortex functioning correspond with the maintenance and perception of social support. Operating EEG and other psychophysiological measures such as skin conductance and heart rate.
2009	*Research Assistant*. Cultural Psychology Lab, Paul Rozin, University of Pennsylvania. Assisted in designing a study of retrospective re-evaluation and life satisfaction during a self-directed summer internship.
2009	*Research Assistant.* Positive Psychology Lab, Jane Gillham, University of Pennsylvania. Worked with data and conducted literature reviews on the positive psychology interventions and the Penn Resiliency Project, a cognitive-behavioral and social problem-solving group intervention for adolescents during a self-directed summer internship.
2007 – 2009	*Research Assistant.* Morality and Positive Psychology Lab, Jonathan Haidt, University of Virginia. Researched stimuli to elicit and distinguish moral from non-moral disgust; awe-inspiring and elevating stimuli; and the effect of construal levels on self-control, persistence, and well-being. I also worked with undergraduate participants.
2008	*Research Assistant.* Behavioral Medicine Center, Daniel Cox, University of Virginia. Hospital. Reviewed the literature on ADHD, diabetes, and driving research and revised and prepared manuscripts for submission during a summer research opportunity.
2008	*Research Assistant.* Cognitive Aging Lab, Timothy Salthouse, University of Virginia. Worked with participants between 25-99 years of age and administered 2-hour long memory and reasoning tasks (e.g. NAART, WAIS, STAI, PANAS, and MMSE), scheduled participants, scored tests, and entered data during a summer research employment opportunity.
2007 – 2008	*Honors Thesis (Distinguished Majors Program) Researcher.* Child Study Center, Judy DeLoache, University of Virginia. In investigated the level of interest very young children (18 to 32 month olds) have in animate versus inanimate objects and also natural versus artificial landscapes, as well as whether any gender differences exist. I designed and conducted an experiment, coded videos, inputted and analyzed the data using Excel and SPSS, prepared a manuscript and presented at the 2008 L. Sterling Reid Undergraduate Research Conference.
2007	*Research Assistant.* Clinical Psychology Lab, Neill Watson, the College of William and Mary. Working on a project involving self-discrepancies and with anxiety/depression as psychotherapy outcome measures; entered data on a self-directed summer internship.
2007	*Research Assistant and Directed Readings student.* Clinical Child Psychology Lab, Janice Zeman, the College of William and Mary. Conducted literature

searches, wrote article summaries, and entered data on Child Behavior Checklists and several other programs. The work focused on emotional regulation in children and adolescents, especially African American and other minority children.

Volunteer Experience:

2007 – 2008   Crisis hotline anonymous volunteer with weekly training on handling calls ranging from suicide, drug use, sexual abuse, etc., located near Charlottesville, VA

2006 – 2007   Volunteering with International Students and Scholars (VISAS) to improve the effectiveness of International Teaching Assistants in the classroom and bridge the gap between American and international students.

2005 – 2008   Student Organizations: ESL Program, Best Buddies Program interacting with developmentally delayed children, Circle K, Active Minds

2002 – 2005   York Hall Historical Museum, Yorktown, VA.

Conserved and cleaned artifacts for the Chiskiack Watch Archaeological Dig.

2004   Drug Demand Reduction Center, American Red Cross, Langley Air Force Base, Langley VA.

Headed the sign-in desk, completed clerical duties, and organized files.

2004   York Convalescent and Rehabilitation Center, Yorktown, VA

Assisted with events and trips and socialized with the residents.

2003 – 2004   Special Olympics Coach for the Basketball Season, York County, VA

Technical Skills:

Microsoft Office (Word, Excel, Access, Powerpoint)

STATA, SPSS, R, Mplus

SAS, G*Power, HLM (learner)

Fluent German speaker

Abstract of the Dissertation

We examined whether parental nurturance moderates the effects peer problems have in the development of depression among youth across racial/ethnic groups. Data were from Healthy Passages, a longitudinal study of fifth-graders (mean [SD] age, 11.1 [0.5] years) recruited through public schools in and around Birmingham, Alabama; Houston, Texas; and Los Angeles County, California, from 2004-2006. Youth reported about their depression using the Children's Depression Inventory (DISC Predictive Scales: Lucas et al., 2001) and their parental nurturance and peer problem (peer isolation and victimization) levels. Among African American and Hispanic girls, high levels of parental nurturance buffered against elevated initial depression levels, but only when peer problem levels were low. Parental nurturance did not buffer against peer problems at any level among boys across race/ethnicity nor White girls. Further research should examine other protective mechanisms and seek to inform targeted prevention efforts.

Resilience against Depression over Time in Diverse Youth:
A Multigroup Growth Curve Modeling Approach
Introduction

Depression has high prevalence and costs to individuals, families, and societies (Kessler et al., 2003). In fact, the World Health Organization (WHO) ranks depression as a priority condition and the fourth leading contributor to the global burden of disease, affecting more than 350 million people. While relatively rare in childhood prior to puberty, the onset of Major Depressive Disorder (MDD) increases six fold in adolescence and early adulthood (Hankin et al., 1998). According to the *National Comorbidity Survey*, an estimated 20% of adolescents will have had a depressive disorder by the time they are 18 years old (Avenevoli & Merikangas, 2006). Complex interactions among social, psychological, and biological factors not only produce depression, but worsen symptoms (WHO, 2012). Moreover, studies have typically shown that non-White youth have higher rates of depression than White youth (Moon & Rao, 2010; Siegal et al., 1998; Van Voorhees et al., 2008). Understanding depression among racial/ethnic minorities, as well as economically disadvantaged youth, is especially important because they face additional stressors related to historical discrimination, subtle racism, economic strain, and demonstrate fewer developmental assets on average (Greene, Way, & Pahl, 2006; Romero & Roberts, 2003; Surko, Ciro, Blackwood, Nembhard, & Peake, 2005).

Risk

Many characteristics, ranging from health problems to the death of a parent, have been determined to be risk factors for depression (Costello et al., 2008; D'Imperio, Dubow, & Ippolito, 2000; Hull, Kilbourne, Reece, & Husaini, 2008). However, given the increasing importance of peer relationships during adolescence (La Greca & Harrison, 2005), for the current study we will focus on problems with peers, and how this risk factor may have differential effects across gender and race/ethnicity. As peer groups become the primary context for socialization (Rose & Rudolph, 2006), the risks for rejection and conflict increase, which can negatively influence adolescents' mental health (Graham & Bellmore, 2007; Monroe, Rohde, Seeley, & Lewinsohn, 1999). The increased risks are likely due to the impact of peer problems on adolescents' feelings of belongingness, a fundamental human goal with profound effects on well-being (Baumeister & Leary, 1995). Two ways in which feelings of belongingness are threatened include loneliness and negative experiences stemming from peer isolation and victimization. Indeed, both are important predictors of depression, especially among adolescents (Klomeck, Marracco, Kleinman, Schonfeld & Gould, 2008; Rotenberg et al., 2004).

Peer isolation, defined by a separation from peers, is often a painful emotional experience (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007; Matthews et al., 2015). Children from low SES families are especially likely to experience isolation, likely due to limited access to social activities and unstable family environments (Matthews et al., 2015). Successful socialization in the early years is important for navigating the increasingly complex peer relationships in adolescence (Hartup & Stevens, 1997). Moreover, peer isolation, as well as associated loneliness (occurring among 70% of adolescents), is predictive of depression, anxiety, and suicidal behavior (Danese et al., 2009; Harter, Marold, Whitesell, & Cobbs, 1996; Heinrich & Gullone, 2006; Rotenberg et al., 2004; Savikko et al., 2005).

Whereas women report higher rates of loneliness among adults (Borys & Perlman, 1985), findings are mixed for adolescents. In fact, boys often report higher rates of loneliness than girls (Koenig & Abrams, 1999), likely because they spend less time socializing compared to

adolescent girls. The deleterious effects of peer isolation and loneliness are especially relevant for racial/ethnic minority youth because they report higher social isolation than White youth, particularly in racially heterogeneous schools (Zirkel, 2004). Thus, peer isolation may be a particularly salient risk factor for African American and Hispanic youth.

Victimization by a peer group consists of aggressive actions intended to be hurtful and harmful (Taylor, Sullivan, & Kliewer, 2013).   Especially in the school context, peer victimization has been a major public health concern in the United States due to its high prevalence and severity (Srabstein & Piazza, 2008). In fact, approximately one third of high school students reported peer victimization during the previous academic year (National Center for Educational Statistics, 2013), especially girls.   Furthermore, approximately 40-80% of youth experience peer victimization at least once (Juvonen & Graham, 2001). Since peer victimization has been linked with depression, suicidal ideation, and risky behaviors, this problem requires further research (Glew, Fan, Katon, Rivara, & Kernic, 2005; Kim, 2005; Klomeck, et al., 2008; Reijntjes et al., 2011).

Studies examining victimization among racial/ethnic groups have mixed results as to which group experiences higher rates (Carbone-Lopez, Esbensen, & Brick, 2010; Eaton et al., 2012; Kaufman et al., 2001). Some of these discrepancies may relate to whether direct or indirect victimization is the focus.   African American youth report less peer victimization overall than White or Hispanic youth (Spriggs, Iannotti, Nansel, & Haynie, 2007), but a higher likelihood to experience direct victimization compared to White and Hispanic youth (Boel-Studt & Renner, 2014). Peer victimization is closely tied to feelings of peer isolation, as youth experiencing one are also more likely to report the other (Spriggs et al., 2007).

Resilience

Despite the generally unfavorable circumstances associated with being exposed to several of the risk factors for depression, including peer problems, many children are resilient and thus able to avoid exhibiting severe, if any depressive symptoms (Beardslee, Versage, & Gladstone, 1998). Resilience is defined as a dynamic process through which positive adaptation is achieved in spite of serious threats to adaptation or development (Masten, 2001; Luthar, Cicchetti, & Becker, 2000). This process is hypothesized to occur due to protective mechanisms, which are positive moderators of risk or adversity. Moreover, the term "protective" implies an interaction whereby a protective mechanism exerts an effect only under high levels of adversity (Garmezy, Masten, & Tellegen, 1984; Masten et al., 1988; Rutter, 1987). As supported by the stress-buffering hypothesis, protective mechanisms involving social resources are important components of the resilience process (Cassel, 1976; Cohen & Pressman, 2004; Lakey & Cohen, 2000).   Although the social sphere can contain a variety of resources for adolescents, parents continue to be present for the vast majority and may provide several protective mechanisms (Stice, Ragan, & Randall, 2004).

For one, parents can act as protective mechanisms by providing nurturance, defined by high levels of warmth, care, and attention which reflects child-centered, accepting, and responsive parenting (Baumrind, 1966, 1971). Moreover, parental nurturance encompasses two critical and universal dimensions of parenting, control (supervision and limit-setting) and warmth (Suchman, Rounsaville, DeCoste, & Luthar, 2007). The way in which parents control their children and provide emotional support is predictive of higher self-esteem, academic achievement, fewer interpersonal problems, greater overall psychological adjustment, and decreased engagement in risky behaviors, in addition to decreased depressive symptoms (Buri,

1989; Finkenauer et al., 2005; Huver et al., 2010; Locke & Prinz, 2002; Meester & Muris, 2004). Although most parental nurturance research has relied on White samples, high maternal nurturance has been associated with lower depressive symptoms also among African American and Hispanic adolescents (Chapman, 2012; Locke & Prinz, 2002; Meesters & Muris, 2004). Additionally, father-child connectedness has been associated with decreased risk of suicidal ideation in Latino youth (De Luca, Wyman, & Warren, 2012).

The extant literature has not examined the associations among peer problems, parental nurturance, and depression among diverse youth over time. In addition to the lack of research examining these components together, rarely have the transitions from elementary to middle and high school been captured during which important physical, social, and emotional changes occur. Resilience in these domains are important to analyze longitudinally because as peers rise in salience during these years, new social challenges arise that can pose significant threats to adolescent well-being, giving parents the opportunity to help mitigate this stress (Prior & Glaser, 2006). Although both parents can be important in this respect, a limitation within the parental nurturance research has been the focus solely on maternal support; rarely have both mothers' and fathers' roles been examined (e.g., B*á*maca-Colbert, Umaña-Taylor, & Gayles, 2012; Vaughan, Foshee, & Ennett, 2010). Finally, in addition to examining resilience via an interaction with a risk factor, the majority of studies lack the developmental perspective (e.g., Kam & B*ámaca-Colbert, 2013;* Trask-Tate, Cunningham, & Lang-DeGrange, 2010). Since resilience is a dynamic process, Luthar and colleagues (2000) argue that it requires a minimum of three measurement occasions to enable hypothesized protective mechanisms to exert their effects.

Research Objectives

By applying a resilience framework to examine protection against depression among diverse youth in the development from pre- to mid-adolescence, this study will be among the first to evaluate racial/ethnic differences in the moderation of parental nurturance in youth exposed to peer isolation and victimization. The specific aims are to determine: (1) whether parental nurturance moderates the relationship between peer problems and depression from pre- to mid-adolescence and (2) if so, whether racial/ethnic and gender differences exist in these processes.

In order to achieve these aims, we will be analyzing a multigroup (African American, Hispanic, and White youth) growth curve model with time-invariant covariates (SES, parental nurturance, and peer problems) and latent variable interactions (between parental nurturance and peer problems on depression) for each gender and across racial/ethnic groups (see Figure 1). More specifically, we seek to determine whether SES, parental nurturance, and peer problems assessed among African American, Hispanic, and White youth at the 5th grade predict depression levels at the 5th, 7th, and 10th grades. Maternal and paternal nurturance formed the latent parental nurturance variable, whereas peer isolation and victimization formed the latent peer problems variable. Finally, we are assessing resilience through the interactions between these two latent variables, potentially marking a protective mechanism, on depression intercepts and slopes.

Methods

Data for this study are from Healthy Passages,[TM] a longitudinal, multi-site community study of health and health behaviors and their correlates among youth initiated in 2004 (see Windle et al., 2004; Schuster et al., 2012, for an overview). Data were collected from the same cohort of youth while in 5th grade, two years later when they generally were in 7th grade, and three years later when they were generally in 10th grade. Institutional review boards at each research site approved the Healthy Passages[TM] study.

Participants

Participants were recruited from public schools located in three areas: (1) 10 contiguous public school districts in and around Birmingham, Alabama, (2) 25 contiguous public school districts in Los Angeles County, California, and (3) the largest public school district in Houston, Texas. Eligible schools had an enrollment of at least 25 fifth-graders, representing over 99% of students enrolled in regular classrooms in the three areas. A cluster probability sampling procedure was used to recruit students from each site. Public schools within the three study site communities were randomly selected with probabilities proportionate to a weighted measure of the scarcity of a school's students relative to race/ethnicity targets. To ensure adequate sample sizes of non-Hispanic African American, Hispanic, and non-Hispanic White students, we took a random sample of schools using probabilities that were a function of how closely a school's racial/ethnic mix corresponded to the site's racial/ethnic target. Information on the study was disseminated to the 5th grade youth in the 118 selected schools to bring to their parents (or caregivers), which was a potential pool of 11,532 students. Youth were excluded from participation if they were not attending a regular academic classroom or if they or their parents could not complete interviews in English or Spanish.

A total of 6,663 returned permission to be contacted of which 5,147 (77%) completed both a parent and a child interview. The IRB approved protocol did not allow for further contact with families that did not return the permission to contact form. To focus on the three major race/ethnic groups, the 6% who were not identified by their parents as being Hispanic, African American, or White (see details below) were eliminated from the current analysis. Of the 4,824 constituting the final sample, the unweighted (weighted) distribution was 36% (30%) African American, 38% (47%) Hispanic, and 26% (23%) White and child age $M = 11.1$ ($SD = 0.6$) at the 5th grade assessment. . Additional detailed demographic information appears elsewhere (Schuster et al., 2012). The retention at the 7th-grade assessment, at age $M = 13.06$ ($SD = .59$), was 93%, resulting in 4,491 participants, and at the 10th-grade assessment, at age $M = 16.1$ ($SD = .5$), it was 87%, resulting in 4,488, with an essentially identical distribution across race/ethnicity and gender as at 5th grade.

Procedures

Following standard procedures approved by the Institutional Review Boards at the three sites and the Centers for Disease Control and Prevention, two trained interviewers completed the full Healthy Passages[TM] assessment protocol with a child and one of his/her parents (mother, 88%; father 6%; other, 6%) at their home or a research facility. In each of the three waves, the parent provided signed informed consent and the child signed assent. Parents could choose whether all material would be presented to them in English or Spanish (prepared using standard back-translation). The interviews were conducted using both computer–assisted personal and self-interview procedures with the child and parent separated in private spaces (Windle et al., 2004).

Measures

     Outcome: Depression. *Depression* was measured with the Children's Depression Inventory (DISC Predictive Scales: Lucas et al., 2001), which uses five items to assess a lack of energy and interest (5th grade α = .62; 7th grade α = .72; 10th grade α = .68; combined α = .76). Administered at each of the three assessment, youth provided answers on binary scales (1 = *yes,* 2 = *no*), which were reverse scored as appropriate and summed such that higher scores indicate more depressive symptoms. Various studies have found support for the reliability and validity of this scale (Kazdin, Rodgers, & Colbus, 1986; Radloff, 1977; Spirito, Williams, Stark, & Hart, 1988; Thurber, Hollingsworth, & Miller, 1996).

     Risk: Peer Problems. *Peer Isolation* was measured with the Loneliness Scale (5 items, α = .81; Asher, Hymel, & Renshaw, 1984) administered in the 5th grade assessment, which adresses absence of and dissatisfaction with relationships with peers in the school setting. Examples of items include "You have lots of friends at school" and "You feel left out of things at school." Youth provided answers on five point scales (1 = *always true about you,* 5 = *not true at all about you*), which were summed to indicate increased isolation. Having been used in past studies to assess friendship adjustment and acceptance (Parker & Asher, 1993; Scott et al., in press), the Loneliness Scale has shown good internal consistency, a stable factor structure, and convergent validity with other measures of peer status (Asher & Wheeler, 1985; Bagner, Storch, & Roberti, 2004).

     Peer Victimization was measured with a revised Peer Experiences Questionnaire (6 items, α = .71) (Prinstein, Boergers, & Vernberg, 2001; Vernberg, Jacobs, & Hershberger, 1999) administered in the 5th grade assessment. Examples of questions include "How often do kids kick or push you in a mean way?" and "How often do kids call you names?" Youth provided answers on five point scales (1 = *never,* 5 = *a few times a week*), which were summed to indicate increased peer victimization. This scale has demonstrated a stable factor structure, significant correlations with peer reports of the construct, and a test-retest reliability over six months between .48 and .52 (Prinstein et al., 2001)

     Protective Mechanism: Parental Nurturance. *Parental Nurturance* was measured at the 5th grade assessment using the Maternal (7 items, α = .74) and Paternal (7 items, α = .71) subscales derived from the Barnes Parental Nurturance Scale (Barnes & Windle, 1987). These scales assess the child's report of the quality and quantity of guidance and support from each parent. Examples of items include "How often do you rely on your mother for advice and guidance?" and "How often does your father give you a hug or kiss?" Youth provided answers on four point scales (1 = *almost never*, 4 = *almost always*), which were summed such that higher scores indicate more nurturing relationships. These scales have demonstrated good reliability and validity (Mrug et al., 2008; Mrug, Gaines, Su, & Windle, 2010).

     Covariates. *Child race/ethnicity* was based the parent's response when asked first whether the child belonged to any of several Hispanic groups, followed by which of seven races applied. The child was classified as Hispanic if so indicated regardless of race category. Children not categorized as Hispanic were classified as African American, White, or other (i.e., American Indian/Alaskan native, Asian or Pacific Islander, and multi-racial youth). The latter category was not included in the analysis sample. *Socioeconomic status (SES)* was represented by the educational level of the primary caregiver. Responses were provided from seven choices, which ranged from less than a 9th grade education to greater than a college (four-year) degree.

Statistical Analyses

All analyses were performed with design weights to account for differential probabilities of selection of students according to their school and a cluster variable to account for clustering of students within schools using M*plus* Version 7.11 (Muthén & Muthén, 1998 - 2012). More specifically, weighting accounted for non-participation (by school, race/ethnicity, gender, and combinations thereof) initially and then for dropout, producing unbiased estimates among respondents if the characteristics used in the weights account for all nonresponse bias.

Preliminary analyses were first conducted to determine to what extent each variable is correlated with depression and to investigate whether latent parental nurturance and peer problems variables were justified, and whether the latent variables were significant predictors of depression. Racial/ethnic differences on all variables were examined with Wald *F*-test. Next, the associations between depression and the hypothesized protective mechanism was addressed using multigroup growth curve models, to assess trajectories over time with latent indicators and interactions and how these may be replicable across race/ethnicity. These models were analyzed separately for males and females. The protective mechanism is a latent parental nurturance variable composed of paternal and maternal nurturance subscales. The risk factor, peer problems, is a latent variable composed of isolation and victimization scales. SES, indicated by parental education, was entered as a covariate.

Finally, measurement invariance for the full model was assessed across racial/ethnic groups; these analyses were conducted separately by gender (see Table 3). Changes in the *Akaike information criterion (AIC),* Bayesian Information Criterion (BIC; Schwarz, 1978), and the Sample Size Adjusted Bayesian Information Criterion (SSA-BIC; Schwarz, 1978) were used to compare models, since it is important to consider a variety of fit indices instead of relying too heavily on a single indicator. The model with the lowest comparative index is deemed the optimal model. In each analysis, model specification involved (a) invariant covariance matrices (the baseline model without a multigroup component), (b) configural invariance (the pattern of fixed and free factor loadings was held constant across groups, but the magnitudes of these loadings were not constrained to be equal), (c) metric invariance (the factor loadings were constrained to be equal), (d) scalar invariance (the intercepts were constrained to be equal) across racial/ethnic groups (e) invariant uniqueness (the residual variances were constrained to be equal), (f) invariant factor variances (the factor variances were constrained to be equal), (g) invariant factor covariances (constraining the factors to be equal across groups), and (h) equal factor means (the factor means were constrained to be equal) (Horn & McArdle, 1992; Vandenberg & Lance, 2000).

We addressed the main aim, whether parental nurturance, peer problems, and SES assessed among diverse youth at the 5th grade predict depression levels at the 5th, 7th, and 10th grades, by conducting a multigroup growth curve model with time-invariant covariates and latent variable interactions for each gender and across racial/ethnic groups. Parental nurturance and peer problems formed latent variables, whereas depression and the SES covariate were represented by observed variables. In order to assess resilience we determined whether significant interactions exist between parental nurturance and peer problems on the intercept and slope of depression across the three timepoints. In contrast to the preliminary analyses assessing individual model components, these analyses with the full model (including the measurement invariance testing) were conducted on each gender separately.

Conventional fit indices (i.e., the Comparative Fit Index, Tucker-Lewis Index, root mean square error of estimation, and standardized root mean square residual) were unavailable for

these growth curve model analyses. Although this has disadvantages for judging the appropriateness of a given model, it requires reliance upon theoretical justifications for model design and prevents unnecessary or erroneous changes to the model for the sole purpose of improving model fit (Barrett, 2007). Moreover, a good-fitting model does not necessarily indicate that the model is valid because the parameters could still be zero and the proposed associations could still be incorrectly specified (Hayduk, Cummings, Boadu, Pazderka-Robinson, & Boulianne, 2007).

Full Information Maximum Likelihood (FIML) was used to estimate missing values that were missing at random.   Missing variables comprised ≤2.2% for the predictor variables and <13.3% for depression outcome variables.

Results

Descriptive Statistics and Correlations

As shown in Table 1, the observed variables of paternal and maternal nurturance are significantly negatively correlated with depression at each grade, with the exception of maternal nurturance for depression at grades 7 and 10 (see Table 1). Moreover, the observed variables of peer isolation and victimization are significantly positively correlated with depression at each grade. Aside from SES, for which White youth exhibited the highest levels, there were no significant racial/ethnic differences in any of the substantive variables.

Preliminary Model Analyses

Next, we analyzed a growth curve model, in which the latent parental nurturance variable, comprised of paternal and maternal nurturance, and the latent peer problems variable, comprised of peer isolation and victimization, were both significant predictors of depression intercepts and slopes across racial/ethnic groups (see Table 2). We also examined the latent parental nurturance and peer problems variables, separately, to determine whether the observed variables corresponded with each respective factor. For example, we assessed whether peer isolation and peer victimization are sufficiently associated with one another such that a latent variable combining the two serves as an appropriate representation. Indeed, we found that the observed variables loaded significantly onto the two latent variables ($\beta = 0.65 - 0.84$) indicating that the latent variables is justified.

Finally at this stage, analyses were conducted to assess invariance of measurement items across racial/ethnic groups, separately for each gender. For both genders, the observed depression variables evidenced invariance over time with equal intercepts, equal variances, and correlated intercepts and slopes across racial/ethnic groups (as evidenced by minimal changes in AIC, BIC, and SSA-BIC). We also assessed the measurement invariance of the full multigroup model, tested separately for each gender, and found evidence for invariant covariance matrices, configural invariance, metric invariances, scalar invariances, and invariant uniqueness for both girls and boys. These results supported the use of the same measurement model across racial/ethnic groups and genders.

Multigroup SEM Analysis

Females. Figure 2 depicts the results from the multigroup SEM analysis for females, which assessed depression changes over time and whether racial/ethnic differences exist in the interactions between parental nurturance and peer problems. Peer problems were significantly associated with increased initial depressive symptoms for African American, Hispanic, and White youth ($\beta = 0.391$, SE $= .037$; $\beta = 0.473$, SE $= 0.044$; $\beta = .438$, SE $= 0.041$, respectively) at $p < .001$. However, peer problems were associated with decreasing depressive symptoms over time among African American, Hispanic, and White youth ($\beta = -0.061$, SE $= 0.010$, $\beta = -0.067$, SE $= .014$, $\beta = -0.035$, SE $= .013$), $p < .01$. There were significant interactions between peer problems and parental nurturance on initial depression levels among African American and Hispanic youth, ($\beta = 0.029$, SE $= 0.013$; $\beta = 0.035$, SE $= 0.015$), at $p < .05$, but not White youth. There was also a significant interaction between peer problems and parental nurturance on changes in depression, but only for African American youth ($\beta = -0.009$, SE $= 0.004$), $p < .05$. Further investigation of the interactions among African American and Hispanic youth indicated that at low levels of peer problems, high parental nurturance buffered against elevated initial depression levels, whereas at high levels of peer problems, parental nurturance did not buffer against elevated initial depression levels. Moreover, among African American youth, regardless

of parental nurturance levels, low levels of peer problems were associated with increased depression levels over time and high levels of peer problems were associated with decreased depression levels over time. High parental nurturance was associated with slightly lower depressive symptoms when peer problems were high.

Males. Figure 3 depicts the results from the multigroup SEM analysis for males, where peer problems were also significantly associated with increased initial levels of depressive symptoms for African American, Hispanic, and White youth ($\beta = 0.268$, SE = 0.32; $\beta = 0.277$, SE = 0.038; $\beta = 0.309$, SE = 0.044, respectively), $p < .001$. Again, peer problems were associated with decreasing depressive symptoms over time among African American, Hispanic, and White youth ($\beta = -0.044$, SE = 0.010; $\beta = -0.022$, SE = .009; $\beta = -0.038$, SE = 0.011, respectively), $p < .05$. Parental nurturance was associated with increased depressive symptoms over time among Hispanic youth ($\beta = 0.013$, SE = 0.006), $p < .05$. However, interactions between peer problems and parental nurturance were not significant.

Discussion

Across racial/ethnic groups and genders, peer problems were associated with increased initial depression levels, but over time depression levels decreased. Parental nurturance was associated with lower initial depression levels only for Hispanic girls, and increased depression across time only for Hispanic boys. Additionally, although our preliminary analyses indicated no significant racial/ethnic differences in protective or risk variable levels, differences emerged in the interactions evident between them. Among African American and Hispanic girls, high levels of parental nurturance buffered against elevated initial depression levels, but only when peer problems were low. Parental nurturance did not appear to buffer against peer problems at any level for boys of any race/ethnicity nor for White girls.

The finding that parental nurturance serves as a protective mechanism only among African American and Hispanic girls may indicate stronger ties between parents and youth or better communication and support regarding peer problems in these groups. Although parental nurturance was associated with increased depression levels over time among Hispanic boys, this relationship was weak ($\beta = 0.013$) and may merely be an artifact of the study's large sample size ($n \geq 4,488$). Nevertheless, since maternal and paternal nurturance levels were comparable across groups, there may be an important difference in the way in which nurturance is received with respect to peer problems for White girls. Once youth experience depression, it may be difficult for parents to provide appropriate nurturance because they are unsure how to interpret their children's behaviors or suffer from depression themselves (Sander & McCarty, 2005). There may also be a reciprocal relationship to some extent: higher initial levels of depressive symptoms predicted lower levels of subsequent perceived parental and peer warmth for White adolescents (Chung et al., 2009). Moreover, because parental nurturance is reported by the youth, this may reflect a perception that parental nurturance is interfering instead of caring when youth are emotionally compromised. Boys of any racial/ethnic group are less likely than girls to discuss their problems (Rose & Rudolph, 2006) and may therefore be unable to benefit from parental nurturance to the same extent as girls.

There was a significant interaction between parental nurturance and peer problems on changes in depression over time among African American youth, such that peer problems in 5th grade were associated with decreased depression regardless of parental nurturance. However, despite being significant in this large sample, this association was essentially zero (-0.009). Likewise, even though peer problems and changes in depression were negatively associated across all groups, these associations were also near zero (0.02-0.07). The correlations in the preliminary analyses and depression levels in the growth curve models revealed that across groups, peer problems and depression are positively correlated, so this weak negative correlation only exists between peer problems and the depression *slope*. Perhaps three or four-way interactions exist that we did not assess. For example, as youth experience depression they may become withdrawn and apathetic to the extent that they are less sensitive to increases in negative peer experiences, or as bullying increases the guidance they receive from other sources also increases which leads to an overall decrease in depression. However, it is more likely that these results are significant due to the large sample size.

As this is the first study to our knowledge that examined parental nurturance as a protective mechanism against depression in different racial/ethnic groups, further research is needed to build this knowledge base so that it can inform interventions. Yet, this study may provide potentially information about the resilience process among African American, Hispanic,

and White youth in respect to parental and peer processes. Despite comparable levels of parental nurturance, peer problems, and depression across racial/ethnic groups, differences emerged in the interactions among these variables such that parental nurturance only acted as a buffer for African American and Hispanic girls and only at low levels of peer problems. These findings indicate that effects of peer isolation and victimization are substantial and complex, likely making them difficult to alleviate even when parents offer high degrees of nurturance.

Limitations of this study include foremost that these results are correlational. Despite the longitudinal design therefore, it is impossible to infer causal direction among parental nurturance, peer problems, and depression. These findings are best seen as generating hypotheses that can be tested in experimental designs. Moreover, the associations, particularly for the interactions, were modest due in part to the complexity of the models being examined. Additionally, this study was conducted in three metropolitan areas in the U.S., and may not generalize to the national population. Whereas the three largest racial/ethnic groups in the U.S. were examined in this study, encompassing 90% of all children in the U.S., other racial/ethnic groups could not be included.   Furthermore, the Hispanic participants resided primarily in the Houston and Los Angeles areas and predominately represent a heritage from Mexico and Central America. Non-response bias may be an issue because we did not have permission to contact all parents. However, the sampling weights account for differential non-response by gender, race/ethnicity, and school, ensuring the representativeness of the weighted sample for the defined population and reducing potential non-response bias. Another limitation is the inherent biases of self-report data. For example, youth who are more likely to report positive parental and peer experiences are also more likely to report less depression.   Nevertheless, we expect that the differential findings across groups partially mitigate this concern. Finally, the study sample consisted of youth mainly on the low to middle end of the SES spectrum with few from high SES families.

Further research should investigate the role of acculturation, especially among Hispanic youth. Although the parental nurturance has been associated with lower internalizing behaviors and victimization across Hispanic, African American, and White adolescents (Windle et al., 2010), there may be important cross-cultural differences in how nurturance is defined and its effects on depression. The protective relationship parents have with African American and Hispanic youth should also be examined further, particularly among girls, because this was the only group for which parental nurturance appeared to buffer the effects of peer problems. Further investigation of other family members is also warranted, especially considering the importance of the extended family for African American and Hispanic youth (Miller & Taylor, 2012).

Thus, parental nurturance can serve as a protective mechanism when youth encounter peer problems, at least among and African American and Hispanic girls. Despite the increasing importance of peers across adolescence, parents are influential in the development, maintenance, and mitigation, of depression (Stice et al., 2004). Interventions targeting both peer problems and depression may work more effectively when engaging the parents together with the adolescents (Smokowski & Kopasz, 2005).   By providing comfort, encouraging youth to express their feelings, and working with the school to take further action regarding peer problems, if present, parents play key roles in helping their children cope with interpersonal problems (APA, 2015). These findings can help inform family-focused interventions to counter the deleterious effects of peer victimization and isolation on adolescent mental health.

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Table 1. Zero-order correlations and descriptive statistics for study variables.

	SES	Paternal Nurturance	Maternal Nurturance	Peer Isolation	Peer Victimiza-tion	Depression 5th Grade	Depression 7th Grade	Depression 10th Grade	*M*	*SD*	Wald *F*[a]
Gender (1 = Male)	.01	.04**	-.17**	.02	.10**	.04**	-.03*	-.04**	--	--	--
SES	1	.13**	.11**	-.11**	-.07**	-.06**	-.02	.06***	4.11	1.96	39.32**[b]
Paternal Nurturance		1	.56**	-.17**	-.10**	-.14**	-.05**	-.04**	19.70	4.87	.06
Maternal Nurturance			1	-.17**	-.06**	-.13**	-.02	.01	21.75	4.06	.09
Peer isolation				1	.42**	.30**	.16**	.10**	7.93	3.74	.29
Peer Victimization					1	.39**	.18**	.12**	10.38	4.89	.87
Depression 5th Grade						1	.29**	.23**	1.89	1.52	1.24
Depression 7th Grade							1	.31**	1.69	1.59	1.57
Depression 10th Grade								1	2.04	1.59	.59

Note. All measures are from 5th grade assessment unless otherwise indicated.
[a]Wald F tested for racial/ethnic differences after adjustment for SES and Bonferroni corrections setting $p < 0.017$; > indicates higher levels reported; W = white (non-Hispanic); AA = African-American (non-Hispanic); H = Hispanic.
[b] W > AA > H
**$p < .01$, *$p < .05$

Table 2.   Beta coefficients in preliminary multigroup latent growth curve models examining only the paths between parental nurturance and peer problems, respectively, with depression across racial/ethnic groups.

	Depression	African Americans	Hispanics	Whites
Parental Nurturance	Intercept	-0.081**	-0.074**	-0.068**
	Slope	0.012**	0.018**	0.016**
Peer Problems	Intercept	0.345**	0.345**	0.445**
	Slope	-0.049**	-0.053**	-0.064**

**$p < .01$.

Table 3. Tests of Female/Male Measurement Invariance Across Racial/Ethnic Groups

Model		Females			Males		
		AIC (Δ AIC)	*BIC* (Δ BIC)	*SABIC* (Δ *SABIC*)	*AIC* (Δ AIC)	*BIC* (Δ BIC)	*SABIC* (Δ *SABIC*)
0.	Invariant covariance matrices	65868.24 (N/A)	65868.24 (N/A)	65938.69 (N/A)	Error	Error	Error
1.	Configural invariance (1 vs. 2)	Error	Error	Error	67714.13 (N/A)	68031.88 (N/A)	67905.51 (N/A)
2.	Metric invariance (2 vs. 3)	70046.98 (0)	70046.98 (0)	70175.74 (0)	67778.44 (0)	68073.89 (0)	67905.51 (0)
3.	Scalar invariance (3 vs. 4)	70046.98 (0)	70046.98 (0)	70175.74 (0)	67778.44 (0)	68073.89 (0)	67905.51 (0)
4.	Invariant uniqueness (4 vs. 5)	70046.98 (-291.25)	70344.12 (-280.03)	70175.74 (-286.38)	67778.44 (0)	68073.89 (0)	67905.51 (0)
5.	Invariant factor variances (5 vs. 6)	70338.23 (24.08)	70624.15 (12.87)	70462.12 (19.22)	68161.23 (-2.25)	68445.53 (-13.40)	68283.51 (-7.05)
6.	Invariant factor covariances (6 vs. 7)	70314.15 (N/A)	70611.29 (N/A)	70442.90 (N/A)	68163.49 (N/A)	68458.94 (N/A)	68290.56 (N/A)
7.	Invariant factor means	Error	Error	Error	Error	Error	Error

Note: AIC = Akaike Information Criterion; BIC = Bayesian Information Criteria; SABIC = Sample Size Adjusted Bayesian Information Criteria; Δ = change.
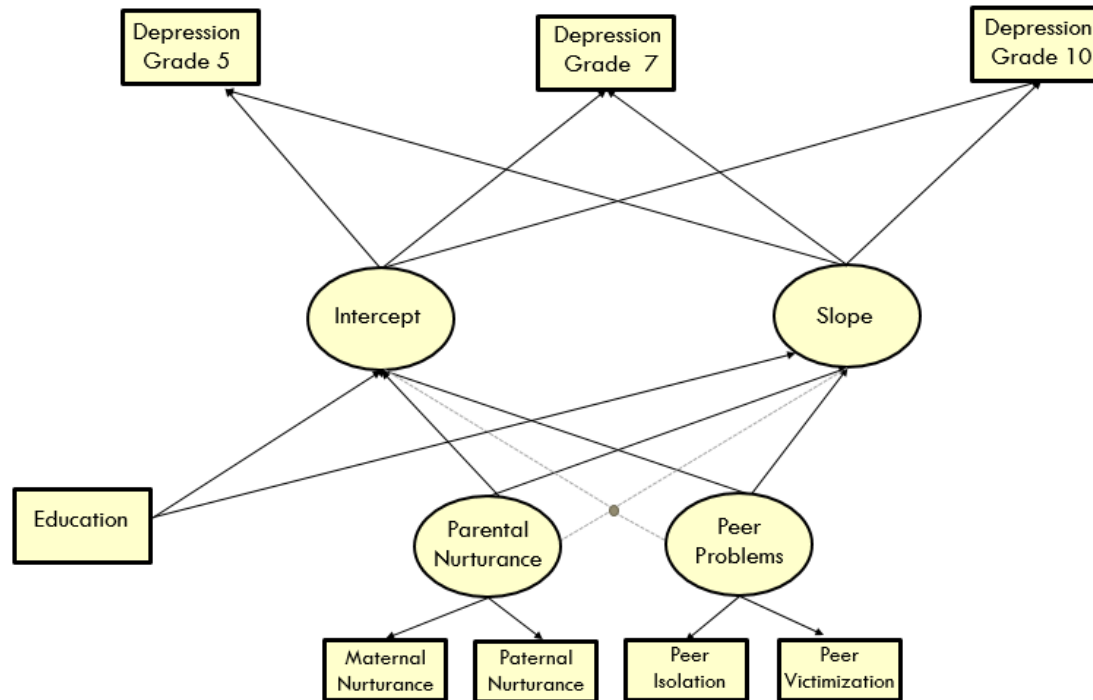
Figure 1. *Conceptual diagram for the multigroup growth curve model with time-invariant covariates and latent variable interactions (marked with dashed lines connecting parental nurturance and peer problems).*
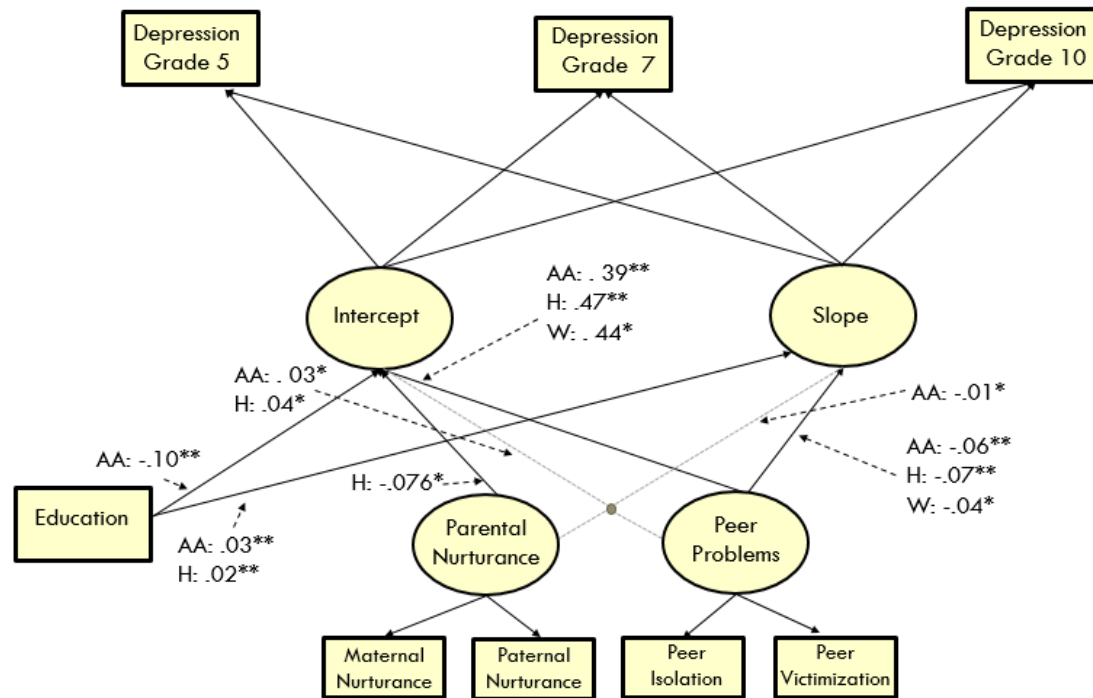
Figure 2. *Multigroup growth curve model for females with time-invariant covariates and latent variable interactions (marked with dashed lines connecting parental nurturance and peer problems). Note: Only significant paths are shown. *p< .05. **p < .01.*
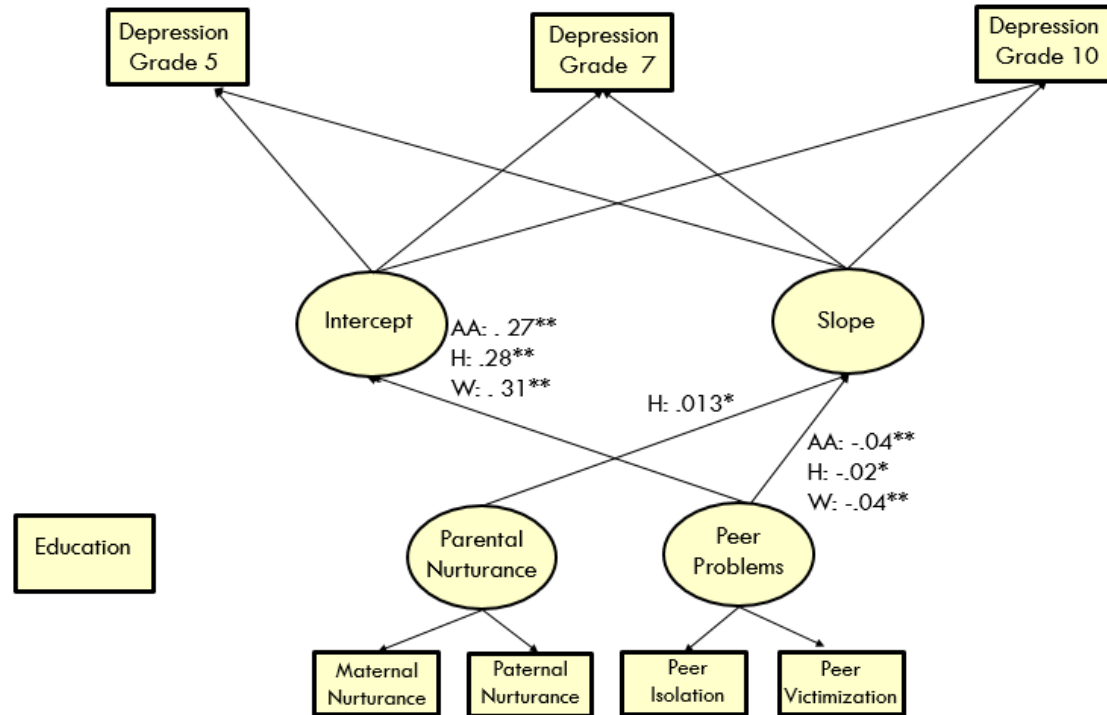
Figure 3. *Multigroup growth curve model for males with time-invariant covariates. Note: Only significant paths are shown. *p< .05. **p < .01.*