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Peer and family support as moderators of the relationship between stress and symptoms in low-income urban youth

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PEER AND FAMILY SUPPORT AS MODERATORS OF THE RELATIONSHIP BETWEEN STRESS AND SYMPTOMS IN LOW-INCOME URBAN YOUTH

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Rationale

In summary, the research has established that stress leads to symptoms and adolescence is a time of increased stress. Thus, adolescence is a time of increased risk for psychopathology. Further, low-income urban youth are at particular risk due to additional stressors associated with poverty (such as exposure to violence). Due to this increase in risk, it is essential to examine possible protective factors that may buffer low-income urban you from the effects of stress.

Research has indicated that social support may produce particularly consistent buffering effects in populations faced with high levels of exposure to violence. Further, when examining peer support and family support separately, interesting differential patterns emerge with family support much more likely to show protective effects. This study will examine peer and family support as potential moderators of the relation between specific types of stressors and internalizing problems and externalizing problems, in a sample of predominantly low-income urban youth.

Hypotheses

Hypothesis I. Stress at time one will be significantly associated with self-reported internalizing problems at time two, controlling for self-reported internalizing problems at time one.

Hypothesis II. Stress at time one will be significantly associated with parent-reported externalizing problems at time two, controlling for parent-reported externalizing problems at time one.

Hypothesis III. Family support will moderate the relationship between stress and self-reported internalizing problems, such that the relation between stress and symptoms will be attenuated for youth reporting more family support.

Hypothesis IV. Family support will moderate the relationship between stress and parent-reported externalizing problems, such that the relation between stress and symptoms will be attenuated for youth reporting more family support.

Research Questions

Research Question I. Does peer support moderate the relationship between stress and self-reported internalizing symptoms in low-income urban youth? And if so, what is the nature of that moderating effect?

Research Question II. Does peer support moderate the relationship between stress and parent-reported externalizing symptoms in low-income urban youth? And if so, what is the nature of that moderating effect?

CHAPTER II

METHODS

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

Participants included in the present analyses completed measures at two points in time (1 year apart). This sample included 389 adolescents (mean age = 13.06; 64% female). Twenty-five percent of the students were enrolled in the sixth grade, 22% were enrolled in the seventh grade, and 24% were enrolled in the eighth grade, 26% were enrolled in the ninth grade, and 1% were enrolled in the tenth grade. Approximately 42% of participants self-identified as Black/African American, 30% as Latino, 6.6% as Asian/Asian American, 12% as White/Caucasian, 4.8% as Bi/Multi-Racial, 1% as American Indian, and 1.8% as "Other."

Procedures. The schools that agreed to participate in the present study were recruited by a standard procedure. Introductory phone calls were made to school principals, followed by letters describing the goals and procedures of the study. Once schools agreed to participate in the study, meetings were held with students and classroom teachers to describe the project, coordinate dates for the data collection, explain confidentiality, answer questions, and distribute parent

consent forms. Consent forms also were mailed directly to some parents (at recommendation of school administrators); participation rates did not vary across the two distribution methods. Parent consent forms described the larger project, the voluntary nature of participation, and the confidentiality of the data collected. Parents were invited to contact the first author and/or school administrators if they had questions and/or wished to see copies of the measures. Participants were given $25 in gift card incentives for completing the measures.

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

Surveys were administered in school classrooms during regular class time at the convenience of participating teachers. Surveys were administered by clinical psychology graduate students, and efforts were made to ensure that at least one research assistant assigned to each classroom identified as a member of

the predominant racial/ ethnic group represented in that classroom. Questionnaires were read aloud by research assistants to ensure that students with varying reading levels kept pace with the administration, and students were given assistance if they had difficulty understanding any of the questions. Students recorded answers on their own copies of the survey, which we then collected at the end of the data collection session.

Measures

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

Daily Hassles and Major Life Events. Stressful life experiences were assessed using the Urban Adolescent Life Experiences Scale (UALES; Allison, et al., 1999). The UALES items were generated by low-income urban, predominantly African-American, youth (Allison et al., 1999). Respondents are asked to rate the frequency with which they have been exposed to each of the stressful experiences on a scale ranging from 1 through 5, with higher numbers indicating greater frequency of exposure. The UALES assesses total stress, as well as life-time chronic and episodic stress in four content areas: (a) school, (b) family/community, (c) peer, (d) personal and measures both major life events and

daily hassles. The total score on the UALES was used in the current analyses. Sample major life event items include "A friend has died", "I broke up with a boyfriend or girlfriend", and "A friend goes to jail". Sample daily hassle items include "I have poor school supplies" and "I have transportation problems". The original measure includes positive and negative events. In the present study, the measure was shortened to the 111 negative events, as positive events have not been shown to predict psychological problems (Siegel & Brown, 1988). The modified version of the UALES used in the present study demonstrated good internal consistency ($\alpha = .80$).

Exposure to violence. Lifetime exposure to violence was assessed using the Exposure to Violence Survey--Screening Version (Richters & Martinez, 1990), a 51-item true or false questionnaire developed on fifth and sixth grade low-income urban African American youth. The measure asks respondents to report whether they have witnessed or experienced 27 types of violence/ crime including gang violence, drug trafficking, burglary, police arrests, assaults, physical threats, sexual assaults, weapon carrying, firearm use, and intentional injuries such as stabbings, gunshots, suicides, and murders. Richters and Martinez (1990) report good test-retest reliability for the measure ($r = .90$) and, in the present sample, internal consistency reliability was good ($\alpha = .89$).

Economic stressors. Economic stressors were assessed using a modified version of Conger's (1992) Family Economic Pressure Index. Sample items include: "My family has enough money to afford the kind of home we would like to have", "We have enough money for the kind of clothing most people have",

"We have enough money to pay our bills." Respondents indicated how true each of these statements is, with responses coded as 1 = not true, 2 = somewhat true, 3 = very true. A second subscale includes 15 items and assesses specific stressors associated with poverty. Sample items include: "During the past year, have your lights, heat, gas, or telephone been turned off?", "During the past year, has your family been homeless or evicted from your apartment?" , "Do you have a telephone in your apartment or home?" Respondents indicate their response to each of these questions with a "yes" or "no." A "no" response was coded as "1", and a "yes" response was coded as "3" to make the response format consistent across the two subscales. Responses for all 24 items were summed, with higher numbers indicating greater exposure to economic stressors. Internal consistency reliability was moderate ($\alpha = .76$).

Psychological symptoms. Based on empirical and theoretical work suggesting that adolescent internalizing symptoms may be more validly assessed via self-report and externalizing symptoms more validly assessed using parent-report (Achenbach & Rescorla, 2001), separate versions of the Child Behavior Checklist were used to assess internalizing and externalizing symptoms. Adolescent internalizing symptoms were assessed with the internalizing subscale of the adolescent self-report version of the Child Behavior Checklist (Youth Self-Report; YSR; Achenbach, 1991). The YSR includes 119 behavior items that adolescents rated on a three-point scale as "not true", "somewhat or sometimes true", or "very true or often true" of themselves during the past six months. Thirty-three of these items make up the internalizing subscale. Sample

internalizing items include “I feel nervous or tense", “I feel worthless or inferior”, and “I cry a lot.” Adolescent externalizing symptoms were assessed using the externalizing subscale of the Child Behavior Checklist – Parent Version (CBCL; Achenbach, 1991). The CBCL includes 113 behavior items which parents rate on a 3-point scale analogous to the YSR. Thirty-three of these items make up the externalizing subscale. Sample externalizing items include “My child gets in many fights”, “My child argues a lot”, “My child destroys his/her own things.” Normative data for the Child Behavior Checklist – Parent and Youth versions are based on a nationally representative sample of non-referred children and adolescents. In the present sample, internal consistency for the YSR internalizing scale was adequate ($\alpha = .79$), and internal consistency for the CBCL externalizing scale was good ($\alpha = .91$).

Internalizing symptoms were also examined using the Children’s Depression Inventory (CDI; Kovacs, 1992). The CDI is the most commonly cited and thoroughly examined measure of childhood and adolescent depressive symptoms (Fitzpatrick, 1993; Kazdin & Petti, 1982; Kovacs 1992). It is a 27-item self-report measure designed for use with school-aged children and adolescents (age seven and older). Each item represents a depressive symptom, and children/ adolescents are asked to choose which level best describes how they have been feeling over the past two weeks. A total score of 20 represents the clinical cut-point for the CDI for both boys and girls; corresponding to the 90th percentile in the standardization sample. Kovacs (1992) found that adolescents tend to score

higher than younger children on the CDI and Fundudis et al. (1991) found that girls ages 8 to 16 tend to score higher than boys in the same age range.

Protective Factor Measure. Open-ended interview questions assessing protective factors were developed for the present study. An introductory statement was read to the participants and interviewers were instructed to take as much time as needed to ensure that the participant understood the concept of protective factors. Once the adolescent demonstrated understanding, a series of questions were asked. Questions move from general to specific, with initial questions asking adolescents to generate protective factors across domains, and follow-up questions focusing responses on individual, family, school, and neighborhood factors. The questions are as follows:

> Now I want you to tell me all the things you can think of
> that might protect people your age from stress.

After the participant provided a list of potential protective factors, each protective factor mentioned was probed, using the following probes:

> PROBE 1: What is it about this that you think would
> protect people your age from the effects of stress?
> PROBE 2: Is this something that has helped you deal
> with stress? Why or why not?

Although a series of standard questions were asked, interviewers were instructed to follow up as needed with additional questions to ensure that the adolescent provided as full an answer as possible. Adolescent responses to the open-ended protective factor questions were transcribed verbatim for qualitative

analysis. Following the interview, a team of coders from the DePaul University Stress and Coping project conducted qualitative analysis. The analyses produced the variables used in the current analysis.

Qualitative Analysis of Protective Factors. Doctoral student Russell Carlton developed an organizational system to allow the various protective factor themes to be described along the dimensions of "who", "what/why", "where", and "when". A trained team coded each reported protective strategy across these four dimensions. Each item that made up the four dimensions represented a separate "protective factor". Coders coded interviews individually and then came together in pairs to produce one consensus-coding sheet per protective strategy endorsed. Twenty-five percent of the interviews were double coded to assess inter-rater reliability. Inter-rater reliability reached an acceptable level of 80%. The proposed study uses two of the "who" variables to measure support from "family" or "friends

CHAPTER III

RESULTS

Results of analyses are reported in several stages. First, results of analysis of descriptive statistics for the current sample's variables of interest are summarized (Table 1). Second, results of paired-sample t-tests, which tested for differences in both internalizing and externalizing problems between Time 1 (T1) and Time 2 (T2; Table 2), are reported. Third, results of attrition analysis using a 2x2 chi-square are reported (Table 3). Fourth, results of independent-sample t-tests that tested for mean differences between moderator groups are summarized.

In stage five, results of analyses that tested the normality of the distribution of all observed variables are presented. SEM variables were tested for normality by examining the skewness and kurtosis statistics for each variable, with values greater than 1 suggest non-normality (Cohen, Cohen, West, & Aiken, 2003; Kline, 2005). As recommended by Kline (2005), non-normal variables were transformed to achieve adequate normality needed for parametric analyses such as SEM. Using the transformed variables, the sixth stage of analysis established a measurement model, which tested how well each latent construct was measured by its indicators. The measurement model was tested by examining both overall model fit and the contribution of each indicator to its respective latent construct. This process is summarized and the results are reported below.

In stage seven, the hypothesized structural model was tested, to determine if the expected linear relationships between the current study's latent constructs of interest existed. To test the structural model, both overall model fit

and the contribution of individual pathways to the overall model were tested. As individual pathways were tested, model trimming was performed. Model trimming created a more parsimonious model for moderator analysis, by eliminating any non-contributing pathways from the structural model. Procedures of model trimming dictate that non-significant pathways that were also found to not contribute to overall model fit were systematically eliminated. Individual path contribution was tested by systematically constraining each non-significant pathway to zero, and comparing the constrained model fit to the unconstrained model. If no significant chi-square difference is observed between the unconstrained model and any of the constrained models, that respective pathway may be trimmed. During model trimming, only one pathway was considered for trimming at a time, with all pathways tested iteratively. Importantly, any pathway deemed critical for testing the central hypotheses of the current research (e.g. stress to psychological outcomes) was retained, regardless of model contribution. These procedures are further described in the "structural model" section and subsequent results are reported. After model trimming was complete, the structural model was established, which is subsequently referred to as the "reduced model".

In stage nine, results of moderation analyses are reported. During this analysis, the reduced model was reexamined with participant's moderator group membership specified (Peer Support [PS] group vs. Non-Peer Support [NPS] group, Family Support [FS] group vs. Non-Family Support [NFS] group). To test for potential moderating effects, multi-group analysis was used to test for

potential differences in structural pathways between the two moderator groups. Additionally, the multi-group analysis also compared moderator groups by: measurement weights, measurement intercepts, and structural covariances. Examining differences in these additional parameters provided a clearer understanding of the nature of any potential moderating effects. Moderation was indicated by a significant change in model fit, when the structural coefficients were constrained to be equal between groups.

Stage ten reports results of post-hoc analysis, which probed all significant moderators to determine the nature of their moderating effects (protective or exacerbating). A protective effect was indicated by a weaker structural coefficient between T1 stress and T2 psychological problems for the group that reported the presence of the potential protective factor (PS or FS), than for the group that did not (NPS or NFS). In contrast, an exacerbating effect was indicated by a stronger structural coefficient between T1 stress and T2 psychological problems for the group that reported the presence of the potential protective factor (PS or FS), than for the group that did not (NPS or NFS). The significance of between-group differences for each pathway was tested and is reported in the "post-hoc analysis" section.

Following the initial ten stages of analysis, an additional supplementary analysis was performed to explore potential differences in variables of interest between T1 and T2. The primary purpose of this supplementary analysis was to test for potential measurement effects in the current study's self-report data. This involved constructing a new measurement model that replaced the parent report of

externalizing problems with a youth self-report, in order to determine whether unexpected findings could be attributed to informant effects.

Descriptive Statistics and Analysis of Attrition

Descriptive statistics of all variables used in the current analysis are presented in Table 1, including: means, medians, standard deviations, skewness, and kurtosis. Additionally, skewness and kurtosis statistics are presented for each variable as they were observed both before and after natural log transformation, to demonstrate the effect of transformation on the distribution of each variable (Table 1). Notably, some mean differences were observed between T1 and T2 internalizing variables and externalizing variables. Specifically, both types of outcome variables generally tended to be higher at T1 than at T2. Consequently, paired-sample t-tests were performed to test the significance of these differences.

Results of paired-sample t-tests revealed that differences between T1 and T2 self-reported internalizing problems for all indicator variables, and most self-reported stress variables, were statistically significant ($p < .05$; Table 2), such that respondents reported higher rates at T1, compared to T2. Differences between T1 and T2 parent-reported delinquency and aggression were much smaller and not statistically significant (Table 2).

After comparing all variables of interest between T1 and T2, an analysis that tested the randomness of attrition in the current sample was conducted, to test whether lower internalizing and stress scores at T2, compared to T1, may be due to attrition. If those that were highest on stress and/or depression at T1 were less likely to return at T2, the current longitudinal estimates may be biased. To test

attrition, a 2x2 chi-square analysis was conducted, as recommended by Brownstone (1997). First, all T1 participants were coded for their retention from T1 to T2 (0 = retained, 1 = attrited). Next, all indicator variables were split by the median, with all participants coded as either above or below each variable's median (0 = below the median [low], 1 = above the median [high]). Finally, a 2x2 chi-square analysis was performed separately for each indicator variable, testing the null hypothesis that there were no differences in likelihood of attrition between the high and low groups. Results of chi-square analyses of attrition are presented in Table 3. Results indicate that individuals from the high and low groups were equally likely to be lost (attrited) from T1 to T2, resulting in non-significant chi-square statistics for all variables, except daily hassles. Respondents that reported scores above the median for daily hassles were somewhat more likely to be attrited from T1 to T2 ($\chi 2 = 8.400$, $p < .05$). With all other stress and outcome variables showing random attrition, the variables examined in the current SEM analysis were generally accepted as missing at random (MAR).

Mean Comparisons by Moderator Group

Following analysis of attrition, independent-sample t-tests were used to compare the PS to the NPS group and the FS to the NFS group on all variables. Of the four T1 stress indicators tested (Exposure to Violence, Daily Hassles, Major Life Events, and Total Stress Score), none demonstrated significantly different mean scores between the PS and the NPS groups. With respect to family support, Daily Hassles ($t[375] = 2.208$, $p < .05$) differed as a function of participant endorsed FS, such that participants in the FS group reported

significantly lower mean scores (Mean = 143.42) than the NFS group (Mean = 148.39).

With respect to internalizing outcome indicators, the only significant difference between groups emerged for the CDI Total Depression Score at T2. In contrast to the pattern found for the stress indicators, the FS group (Mean = 7.16) demonstrated significantly higher T2 CDI Depression scores than the NFS group (Mean = 5.78; $t[279] = -2.080$, $P < .05$).

In terms of externalizing problems, no differences were found between the PS and NPS groups for Externalizing indicators (CBCL Aggression and CBCL Delinquency) at either T1 or T2. However, differences were found between the FS group and the NFS group for T1 CBCL Aggression ($t[248] = 2.390$, $p < 05$), such that the FS group reported significantly lower aggression scores (T1 CBCL Aggression = 4.72) than did the NFS group (T1 CBCL Aggression = 6.49).

Structural Equation Modeling

Moderator analysis was conducted using Structural Equation Modeling (SEM), as recommended by Holmbeck (1997). While moderator effects are commonly tested using OLS regression and interaction terms, using SEM to examine moderator effects minimizes the impact of compounded measurement error, occurring when the independent variable and moderator are multiplied to create an interaction term (Holmbeck, 1997; Jaccard &Wan, 1996; Peyrot, 1996, Ping, 1996). Further, SEM offers the benefit of using Maximum Likelihood Estimation (MLE), which maximizes statistical power of a sample because it does not require list-wise deletion when variables can be assumed to be generally MAR

(Kline, 2005). Finally, SEM analysis has the capacity to examine constructs using multiple indicators, further reducing the effect of measurement error (Kline, 2005; Holmbeck, 1997).

SEM: Measurement Model

Prior to testing for potential moderating effects for Peer Support (PS) and Family Support (FS) using multi-group analysis, the measurement model was constructed and estimated. To construct the measurement model, all indicator variables were specified to predict the latent construct they were intended to measure and all latent constructs were specified to correlate with one another (Kline, 2005). To test the model, both the overall model fit and the contribution of each indicator to the measurement of its respective construct were examined (Kline, 2005). A chi-square statistic close to zero, CFI above .90, and RMSEA below .08 indicated adequate fit in the measurement model (Kline, 2005). A measurement weight (coefficient from an indicator variable to its construct) of .30 or above indicated that a variable adequately contributed to the construct it was intended to measure (Kline, 2005). Indicators that demonstrated (standardized) weights below .30 were further tested, before exclusion, using a nested model that constrained the variable in question to be zero. Using this method, if constraining the variable's weight to zero resulted in a significant increase in chi-square fit (indicating worse fit), the variable should be retained as an indicator of the latent construct (Kline, 2005).

Results indicated that the hypothesized measurement model (See Figure 1) was a strong fit overall ($\chi 2$ [109] = 298.588 [p = < .001], CFI = .932, RMSEA =

.067), and all indicators adequately contributed to their latent constructs. One indicator variable (economic stress at T1), had a measurement weight slightly below the ideal cut-off ($\beta = 0.27$), but constraining the weight to zero resulted in a significant increase in chi-square ($\chi 2$ diff [1] = 27.321, $p < .001$), so the indicator was retained.

SEM: Structural Model

With the measurement model established, the structural model was constructed, which served as the framework for subsequent moderator testing, using multi-group analysis. To construct the structural model, the longitudinal pathways that were hypothesized to be directional were changed from non-directional correlations (represented by two-headed arrows in a structural diagram; see Figure 1) to regression weights (represented by single-headed arrows in a structural diagram; see Figure 2), which assert directionality into the model by specifying which construct is the dependent variable (T2 internalizing problems and T2 externalizing problems, in this case), and which constructs are the predictors (T1 stress, T1 internalizing problems, and T1 externalizing problems).

Results of analysis of the initial structural model in the current research produced adequate fit ($\chi 2$ [109] = 308.981 [p = < .001], CFI = .929, RMSEA = .068), but evidence that model trimming was appropriate (presence of non-significant path coefficients that were not essential for testing for hypothesized moderator effects; Kline, 2005). Execution of the previously described procedures for model trimming, resulted in the elimination of two pathways from the initial

model: T1 internalizing problems to T2 externalizing problems and T1 externalizing problems to T2 internalizing problems. With the two "non-contributing" pathways eliminated, the reduced model (Figure 2) was established ($\chi 2$ [112] = 310.379 [p = < .001], CFI = .929, RMSEA = .067) and was used for all subsequent multi-group tests of moderation.

Testing for Moderation: Multi-group Analysis

Using the reduced model as a framework, multi-group analysis was used to test for model differences between moderator groups (PS vs. NPS; FS vs. NFS). To execute this test, all model parameters were systematically constrained to be equal between moderator groups (PS vs. NPS; FS vs. NFS), with each constraint being applied in an additive manner. More specifically, the first model constrained only measurement weights, the second constrained measurement weights and measurement intercepts, the third measurement weights, intercepts, and structural weights, the fourth constrained measurement weights, intercepts, structural weights, and structural covariances, and the final iteration added measurement residuals to the constrained parameters (Kline, 2005).

At each stage, any constraint that failed to result in a significant chi-square change was retained in subsequent comparisons, to improve parsimony, while narrowing the source of variability between groups and freeing degrees of freedom in the model (Cole & Maxwell, 2003; Kline, 2005). Moderation was indicated when constraining the structural weights in the model to be equal between the two moderator groups precipitated a significant increase in chi-square

(indicating worse fit). Differences in structural covariances and intercepts are also presented, as they may aide in interpretation of potential moderator effects.

Peer Support as a Moderator

Results of multi-group analysis indicated that the two groups (PS and NPS) did not differ on the previously described parameters tested in multi-group analysis (Figure 3). In particular, multi-group analysis constrained the PS and NPS groups to be equal by: measurement weights, measurement intercepts, structural weights, and structural covariances, none revealing differences between the PS and NPS groups (Figure 3). Models that demonstrate such equality across groups can be said to be invariant (Cole & Maxwell, 2003; Kline, 2005) and are considered to be generally structurally equal. Model fit remained adequate across all constrained models. Since no differences between the PS and NPS groups were found on any of the tested parameters, post-hoc testing was not conducted for this moderator.

Family Support as a Moderator

Results of multi-group analysis between the FS and NFS groups (Figure 4) indicated that the two groups were significantly different based on structural weights ($\chi 2$ diff [21] = 41.928, $p < .05$) and structural covariances ($\chi 2$ diff [27] = 51.547, $p < .05$), while no differences were found for measurement weights or measurement intercepts. Since the two groups were invariant by both measurement weights and intercepts, these parameters were constrained to be equal, in order to conserve degrees of freedom and narrow the source of observed variability. The condition in which both measurement weights and measurement

intercepts are invariant is often called measurement invariance (Kline, 2005). Since measurement invariance was observed in the family moderator model, measurement weights and intercepts were also constrained to be equal during post-hoc testing of FS effects.

Post-hoc Analysis: Family Support vs. Non-Family Support

Post-hoc procedures involved examination of the path diagram produced by AMOS 17.0 (see Figure 4 for FS and NFS group diagrams) and testing for equality of structural weights and structural covariance pathways between the FS and NFS groups. Testing differences between moderator groups separately for each pathway demonstrated which were driving the omnibus differences between groups. Post-hoc testing of individual pathways was conducted using procedures similar to those used to test for omnibus effects, except pathways were constrained individually, instead of constraining all pathways simultaneously.

As previously outlined, all individual pathways were tested using the reduced model, with both measurement weights and intercepts constrained to be equal between the FS and NFS groups. In all, seven pathways were tested during post-hoc testing (four structural weights and three covariance pathways). Of the seven tested pathways, only T1 stress to T2 internalizing problems showed evidence of "pathway-specific" moderator effects, as the difference between groups approached significance ($\chi 2$ diff [1] = 2.928, p = .087). With respect to this pathway, the NFS group had a stronger structural weight (β = -.336, $p < .05$), than the FS group (β = -.061, ns). However, the structural weight for the NFS group was unexpectedly negative. Potential explanations for this inverse

relationship are explored in supplementary analysis, reported below.

With respect to differences in intercept, respondents from the FS group generally reported more internalizing problems at both T1 and T2 than respondents from the NFS group. Specifically, the FS group reported more T1 and T2 problems for YSR Anxiety-Depression score (T1 YSR Anxiety/Depression = 1.672, T2 YSR Anxiety/Depression = 1.197) than the NFS group (T1 YSR Anxiety/Depression = 1.528, T2 YSR Anxiety/Depression = 1.084). Participants from the FS group also reported higher scores at intercept for T2 CDI Total Depression score (T2 = 1.782) than the NFS group (T2 = 1.597).

By contrast, participants in the NFS group generally displayed higher scores at intercept for externalizing problems, compared to the FS group. Specifically, participants from the NFS group had higher scores at intercept on T1 and T2 CBCL Aggression (T1 = 1.657, T2 = 1.273) than the FS group (T1 = 1.337, T2 = 1.119). The NFS group also demonstrated somewhat higher scores at intercept for T1 and T2 CBCL Delinquency (T1 = 1.064, T2 = .883) than the FS group (T1 = .901, T2 = .831).

The consistent nature of the between-group differences found across variables, relative to latent constructs (i.e. the FS group was higher on most internalizing indicators and NFS higher on all externalizing indicators), allowed for the significance of these between group differences of intercepts to be tested through a mean structure analysis of the latent constructs. This was performed during the supplemental analyses and is reported below. As previously reported, results of multi-group analysis also showed evidence of differences in covariance

pathways between the FS and NFS groups, but post-hoc tests of each of the three individual covariance pathways failed to produce significant differences. All standardized pathways, both significant and non-significant, can be examined and compared between groups (FS and NFS) in Figure 4.

Supplementary Analysis: Mean Structure Analysis of Latent Constructs

Mean structure analysis (MSA) of latent constructs refers to the comparison of estimated means of latent constructs between groups. This procedure was performed on the measurement model and entailed three main stages of analysis: 1) all measurement weights and intercepts were constrained to be equal between groups (in this case FS and NFS), 2) all of one group's latent construct mean-estimates were constrained to be equal to zero (this group is used as the reference group), while giving each mean estimate in the other group a unique and non-numeric label (this left that group's latent construct means freely estimated), 3) the model was run and the "non-reference group" (which was freely estimated) was compared to the reference group (which had pathways that were constrained to be equal to zero). Output for this analysis is labeled only "means" in AMOS 17.0, and is found in the non-reference group's text output.

With respect to interpretation, positive values for the mean indicate that the non-reference group has a higher mean score for that latent construct than the reference group. Negative values indicate the opposite, that the reference group was higher for that latent construct. AMOS 17.0 also produces p-values to allow for simple estimation of significant differences. Results of MSA of latent constructs in the current sample indicated that the NFS group was significantly

higher on mean latent T1 stress scores (Estimate = -.277, $p < .05$), as well as T1 externalizing problems (Estimate = -.034, $p < .05$). In both cases, the NFS group was the reference. Significant mean differences were not found for latent T2 externalizing problems, T1 internalizing problems, or T2 internalizing problems. It is important to note that this analysis assumes invariance of measurement weights, which was present in the current sample.

Supplementary Analysis: Differences between T1 and T2 Outcome Scores

To test whether significant differences between T1 and T2 scores may be an artifact of reporter bias, self-report externalizing scores were included in supplementary analysis to compare their effects with that of self-reported internalizing problems and parent-reported externalizing problems. For the purposes of this analysis, we hypothesized that if self-reported externalizing problems were more related to self-reported internalizing problems than parent-reported externalizing problems, that differences in scores may be more strongly predicted by who is reporting them, than by differences in measured the type of symptom. To test this hypothesis, new measurement and structural models were constructed, using self-report externalizing indicators, to compare to the original model (see Figure 1 and Figure 2 for original models).

Results of supplementary measurement and structural models provide evidence that differences in outcome scores between T1 and T2 may be related to who is reporting the outcome. Results of the analyses examining supplementary measurement model (Figure 5) show that all correlational relationships between latent constructs are positive in nature. However, examining Figure 6

demonstrates that partialing out the variability of T2 outcomes that is explained by their T1 counterparts changes the sign for the association between T1 stress and both T2 externalizing and T2 internalizing problems.

Finally, comparing Figures 5 and 6 to Figures 1 and 2 shows that this change in sign when controlling for T1 outcomes appears to be specific to self-report measures, as similar changes in sign were not observed for parent-reported externalizing problems.

Independent-sample t-tests and the previously described median-split indicator variables were also used to test whether self-reported internalizing scores decreased from T1 to T2 more for respondents that were above the median for T1 internalizing problems, compared to respondents that reported scores below the T1 median. Each internalizing indicator's T2 score was subtracted from each internalizing indicator's T1 score, to create change score for each indicator to use in this t-test. If respondents that were highest at T1 for internalizing problems decreased significantly more from T1 to T2 than respondents that were below the median, this suggests regression to the mean and/or the impact of a basement effect, relative to normative functioning, may also be contributing to the lower scores at T2. The conceptual basis for these hypotheses are discussed further, following analyses.

Results of t-tests provide evidence that those respondents that were above the median for internalizing problems at T1 decreased significant more than respondents that were below the median at T1 (see Table 4, Table, 5, Table 6, and

Table 7 for t-test statistics). This was true for all indicators of internalizing problems.

Since our measurement models demonstrated that internalizing problems at T1 and stress at T1 were significantly correlated (Figure 1), we also expected that those that were above the median for T1 stress would decrease more from T1 to T2 on internalizing problems, compared to respondents below the median for T1 stress. To test this hypothesis, a median split was conducted on the stress indicators, forming dichotomous stress indicator variables that represented individuals above and below each median score for stress. Respondents above and below the median on each stress variable were then compared to each other using independent-sample t-tests, to determine if individuals above the median at T1 decreased significantly more than respondents below the median. Change scores described in the previous t-test's description were used as dependent variables.

Results of t-tests provide evidence that those respondents that were above the median for T1 stress scores decreased more from T1 to T2 on their report of internalizing problems, compared to respondents below the median (see Table 8, Table 9, Table 10, Table 11, and Table 12). Thus, by including T1 internalizing problems in the structural model (common practice for longitudinal models), which partialed the proportion of variance explained by T1 internalizing out of the model, we were left with a regression coefficient that was a rough estimate of the association of T1 stress with differences between T1 and T2 internalizing problems, which was negative.

In sum, results of the supplementary t-tests indicate that the negative association between T1 stress and T2 self-reported internalizing problems, controlling for T1 internalizing problems, may be an artifact of limitations of our structural model, such as the exclusion of T2 stress. Potential statistical, methodological, and conceptual explanations for decreases in scores of both stress and internalizing problems, as well our unexpected negative coefficients are provided below.

CHAPTER IV

DISCUSSION

Results of analysis of descriptive statistics demonstrated unexpected differences between T1 and T2 in reports of both internalizing problems and stress, such that respondents reported significantly higher scores on both constructs at T1, compared to T2. Paired-sample t-tests determined that these decreases were statistically significant (Table 2). These unexpected findings were isolated to self-reported internalizing outcomes and stress, as parent-reported externalizing problem indicators generally remained stable over time. Supplementary analyses were conducted to test whether informant bias may be impacting our sample and/or explaining this unexpected decrease in scores over time.

Previous literature suggests that use of self-report survey measures sometimes results in decreases in scores over time. Informant bias was tested by examining self-reported externalizing problems at T1 and T2, replacing parent-report externalizing problems in the SEM model. Results indicated informant bias was determined to be likely impacting our sample, as self-reported externalizing problems decreased from T1 to T2, similarly to self-reported internalizing problems and contrary to parent-reported externalizing problems, which remained stable over time.

These results suggest that differences in effects between internalizing and externalizing problems may vary as much or more by informant, than by stress or other predicting factors, and should be interpreted with caution. Prior literature

offers several examples of decreases in scores that are related to the use of repeated self-report survey (Nolen-Hoeksema & Girgus, 1994 1992; Nolen-Hoeksema, Girgus, Buchanan, & Seligman, 1995 1992; Nolen-Hoeksema, Girgus, & Seligman, 1986 1992; 1991 1992; 1992 1992; Nolen-Hoeksema, Morrow, & Fredrickson, 1993 1992; Twenge & Nolen-Hoeksema, 2002 1992). Results of a meta-analysis conducted by Twenge and Nolen-Hoeksema (2002) reported that a downward trend exists in self-report measures of depression for adolescence and children. Additionally, the meta-analysis determined that the decrease in scores did not occur as a function of age, by examining potential differences in age groups in cross-sectional samples (Twenge & Nolen-Hoeksema, 2002).

Hatzenbueier and colleagues (Hatzenbueier) reported that such a decrease was increasingly likely when scores were high at T1, which was consistent with our supplementary analyses. Further, Sharpe and Gilbert (date) found that such a decrease tends to sustain across multiple time points, but the largest drop in score was "almost invariably" found between T1 and T2, which is again supported by the substantial drop from T1 to T2, observed in the current sample. While previous literature shows that the unexpected decrease in stress and internalizing problems from T1 to T2 is not completely unprecedented, the literature is less clear about why this may occur specifically with self-report measures. Both a statistical explanation and a conceptual explanation from extant literature are discussed below.

Results of our supplementary analyses indicate that statistical causes, such as a basement effect might have driven the decreases in stress and internalizing

problems. A basement effect refers to the lower limit of potential score responses on a scale that restricts the "downward" variability of scores as a function of the number of items in the scale or by a minimum level of functioning that is represented by a common lower limit of scores. For example, if adolescents that are experiencing little or no depressive symptoms report an average score of 8 (on a scale from 1 to 27, such as in the CDI total depression score), then it is unlikely that individuals that are experiencing a decrease in symptoms will fall significantly below that score that represents a normative level of functioning.

In the context of an entire sample, respondents with decreasing depressive symptoms over time will likely be limited on their lower range of scores by the average minimum scores of normative "non-depressed" experience, giving respondents with a higher score at T1 a greater potential for decrease from T1 to T2. In our sample, supplementary analyses provided evidence that this may be occurring, as youth that were above the median for internalizing problems at T1 had a significantly higher mean change score for internalizing problems from T1 to T2. The inequity of decreases in scores across levels of T1 internalizing problems is particularly problematic because of its strong association with T1 overall stress. The downward trend in internalizing problems, combined with the T1 association between overall stress and internalizing problems, indicates that individuals with the highest levels of T1 overall stress most likely decreased most on internalizing problems from T1 to T2, which manifests as a negative coefficient when estimated in either a SEM or OLS regression model. In fact, supplementary analyses provided further support for this assumption, as youth

that were above the median for T1 stress tended to decrease significantly more from T1 to T2 on internalizing problems, than youth below the median for T1 stress. The consequences of this effect are discussed further in the context of our structural model.

While some evidence existed in our sample that basement effects might be present, some recent research suggests that conceptual factors may also be contributing to the decrease in stress and internalizing problems over time, and they may not be solely an artifact of statistical limitations. Sharpe and Gilbert (1998) suggested that individuals may become more aware of their maladaptive functioning and psychological distress after an initial self-report survey data collection (possibly as a result of the measure acting as a queue) and employ more adaptive coping strategies in the future, resulting in a reduction in psychological problems (Sharpe & Gilbert, 1998).

Sharpe and Gilbert's assertion may explain why the existing literature consistently suggests that the largest drops in scores tend to be between T1 and T2, as a realization of one's current functioning may be most influential at first presentation, and subsequently decrease as coping strategies minimize the discrepancy between youth's current and desired functioning. While the large drop in internalizing problems from T1 to T2 may be characteristic of the effects described by Sharpe and Gilbert, further exploration of their hypothesis is beyond the scope of the current research. Further, our data lacks the cognitive and/or coping measures necessary to directly test this hypothesis. Future research should explore this potential explanation for the discrepancy further and the implications

it may have on the use of repeated self-report survey measures of psychological functioning with low-income urban youth.

Measurement and Structural Models

Analysis of the measurement model essentially tested the construct validity of each latent construct by examining whether each observed indicator adequately measured the construct it was intended to measure. Results of the analysis of the measurement model support the construct validity of our latent variables. Overall, results indicated that an adequate measurement model existed that could serve as a framework for subsequent structural analysis (Figure 1).

Using the measurement model as a framework, a structural model was constructed to more closely examined the hypothesized associations between the latent constructs (Figure 2). With parsimony in mind, the structural model was trimmed to produce the reduced model by eliminating two non-contributing pathways (T1 internalizing to T2 externalizing and T1 externalizing to T2 internalizing). The reduced model demonstrated adequate model fit, as well as evidence to support the hypothesized correlational relationship between T1 stress and both T1 internalizing problems and T1 externalizing symptoms, which is consistent with previous research (Grant, Behling, Gipson, & Ford, 2005 & Ford, 2005; Grant, et al., 2006).

Results also provide evidence for the predictive validity of both internalizing problems and externalizing problems, as both constructs significantly predicted themselves from T1 to T2. However, results of structural analysis did not provide support for the hypothesis that stress at T1 would

positively predict externalizing problems at T2, controlling for externalizing problems at T1. Importantly, this pathway was not trimmed during construction of the reduced model, because it was essential for testing the potential moderating effects of peer and/or family support. In fact, if moderating effects exist, variability between moderator groups on the link between stress and externalizing problems may even explain why the link is not evident in the overall sample (Kline, 2005).

Prior research has indicated that variability in the strength of an association between two variables that is related to a third (moderator) variable can sometimes obscure a main effect between the original two variables in the overall sample (Kline, 2005). In this case, a clear picture of how the two main effect variables are related to each other can only be gained by examining the main effects separately in each moderator group (Kline, 2005). With this in mind, the pathway was retained and tested in subsequent moderator analyses.

With respect to the longitudinal link between stress and internalizing problems, T1 stress was significantly associated with internalizing problems at T2, controlling for internalizing problems at T1, but the link was unexpectedly negative.

This result suggests that having more stress at T1 is predictive of having less internalizing problems at T2, relative to internalizing problems at T1, which was an unexpected finding. This finding appears to be driven, from a methodological perspective, by decreases in both stress and internalizing problems from T1 to T2. Specifically, a pronounced decrease in self-reported

psychological problems from T1 to T2 may have biased regression estimates, causing them to manifest as negative coefficients. This assertion is supported by the positive correlational coefficient found in the measurement model between stress at T1 and internalizing problems at T2, which was contrary to the negative regression coefficient that emerged when T1 internalizing problems was introduced as a control variable in the structural model (see pathways in Figure 1 and Figure 2).

Potential bias in regression estimates represents a limitation of the current research, as the availability of only two waves of data at the time of analysis prevented an ideal model for measuring change to be constructed. Future research on longitudinal effects of stress on psychological outcomes can guard against potential bias of estimates caused by changes in predictor and outcomes by utilizing three or more time points (R. M. Baron & D. A. Kenny, 1986; Reuben M. Baron & David A. Kenny, 1986; Cohen, Cohen, West, & Aiken, 2003).

Recent literature indicates that using three or more time points is highly preferable for examining longitudinal relationships (Cole & Maxwell, 2003; Kline, 2005; Singer & Willett, 2003), because it allows the researcher to examine change ideographically (Singer & Willett, 2003). An ideographic analysis first examines within-subject change over time and then examines the impact of between-subject effects on within-subject variability, both modeled with repeated-measures (Singer & Willett, 2003). This type of analysis models both predictors and outcome at every time point, guarding against potentially misleading outcomes that may be evident when two variables decrease (or increase) together

over time, with the magnitude of change is greater at higher values for both variables (as was the case in the current analysis). In this circumstance, results will produce a negative coefficient for the T1 predictor on the T2 outcome score, even though changes in the predictor are actually associated with similar changes in the outcome variable. Since the cost-effectiveness and practical benefits of self-report survey data collection make it unlikely to be readily replaced with alternative methods, such as clinical interview, it is critical that research examine methodological strategies that may guard against things like informant bias that may threaten validity and make interpretation of longitudinal effects difficult.

While some evidence exists in our sample that methodological/statistical limitations (possible informant bias, combined with having only two time-points available for modeling) may explain the unexpected negative longitudinal link between stress and internalizing problems, some evidence in extant literature also suggests that there may be conceptual explanations for such effects (Nolen-Hoeksema, et al., 1992 1992; Nolen-Hoeksema, et al., 1993 1993; Twenge & Nolen-Hoeksema, 2002). Recent literature has suggested that low-income urban youth may employ particularly unique coping strategies to deal with internalizing problems, such as aggression, delinquency, and other responses traditionally considered maladaptive (Grant, Lyons, et al., 2004; Koelch, et al., 2009; Twenge & Nolen-Hoeksema, 2002). This literature, along with our findings, suggests that the disproportionately higher levels of exposure to violence and intense environmental stressors may result in a different psychological response than previously found in research focusing on normative samples. More specifically,

youth facing the highest levels of stress, such as low-income urban youth, may perceive traditional expressions of internalizing problems as leaving them at greater risk for victimization, leading them to cope with stress through externalizing behaviors such as aggression and/or delinquent activities (K. Grant, et al., 2000; K. E. Grant, et al., 2000). For the purposes of discussion, we refer to this effect as the "depression-vulnerability hypothesis".

Cassidy and Stevenson (2005) discussed a similar effect, suggesting that exposure to community violence may lead to feelings of vulnerability, which may pose threats to self-esteem in low-income urban youth. In response and to combat these feels of vulnerability, and to protect themselves from victimization by others, may instead portray a strong facade, which may manifest as externalizing behaviors (Cassidy & Stevenson, 2005). Further, Cassidy and Stevenson concluded that internalizing problems are present in low-income urban contexts, but the environment is most conducive to the development of externalizing problems (Grant et al., 2009; Cassidy & Stevenson, 2005).

Previously described patterns of change in the current sample provide some prospective support for the depression-vulnerability hypothesis, as results of t-tests that examined differences in scores across time for externalizing problems did not parallel the decreases of internalizing problems, but instead remained stable. In fact, individuals that were highest on stress at T1 demonstrated the greatest decrease in Internalizing problems, while also manifesting modest increases in externalizing problems from T1 to T2. Additionally, the magnitude of the decrease in reported scores from T1 to T2 for internalizing problems may

indicate that the age of respondents at T1 (Mean Age = 13) represents a critical age at which this change is particularly likely to occur. With this in mind, future research should examine the possible development of aggressive coping strategies, specifically relative to early adolescence. Further, research using three or more time points should closely examine externalizing scores at 14, 15, and 16 years, to determine if a subsequent increase in externalizing scores parallels the decrease in internalizing problems.

Moderator Analysis

Prior to SEM analysis, mean differences between moderator groups were tested. With respect to peer support, MSA of latent constructs failed to demonstrate significant differences in latent constructs between the PS and NPS groups. Additionally, differences in individual indicators were also not found during independent-sample t-tests.

In contrast, differences in latent construct means were found between the FS and NFS groups. MSA of latent constructs revealed that the FS group reported significantly lowers scores than the NFS group for externalizing problems at both T1 and T2. Additionally, individual indicator differences were found for T1 exposure to violence, T1 major life events, T1 aggression, T2 aggression, T1 delinquency, and T2 delinquency, with the family support group reporting lower scores for all. Notably, the family support group also reported significant higher scores for T2 CDI depression scores, compared to the non-family support group. However, analysis of means for the latent constructs did not find differences between FS and NFS for internalizing problems, so the differences in the single

indicator should be interpreted with caution. Overall, MSA indicated that the only latent construct mean differences between moderator groups existed for externalizing problems, as the FS group was lower than the NFS group both at T1 and T2. This finding is consistent with existing literature that indicates that family support is generally associated with less externalizing problems (K. E. Grant, et al., 2000).

The current research tested whether family support and/or peer support moderated the link between stress and psychological problems, in a sample of low-income urban youth. Additionally, the effects of family support and peer support are described, relative to one another, to determine if differential effects between them may help to explain inconsistent findings for potential protective effects of social support in the extant literature. Results are reported separately for each outcome type, beginning with externalizing problems and then internalizing problems. Implications of findings for both future research and clinical practice are discussed. Results of multi-group analysis indicated that peer support did not moderate the link between stress and externalizing problems. While the PS group demonstrated a weaker coefficient for the link between T1 stress and T2 externalizing problems, controlling for T1 externalizing problems, multi-group moderator analysis indicated that the differences between groups were not significant.

Like peer support, family support also failed to produce significant moderating effects on the link between stress and externalizing problems, despite the FS group reporting lower scores for externalizing problems overall, compared

to the NFS group. Although respondents that endorsed family support had a somewhat weaker link between T1 stress and T2 externalizing problems than individuals that did not endorse family support, the difference between groups was not statistically significant. Overall, results indicate that youth that receive family support are less likely to experience externalizing problems than their counterparts that do not receive family support (MSA results), but this support does not necessarily buffer youth from the increased risk associated with exposure to high levels of stress (Grant, et al., 2005; Grant, et al., 2006). Future research might examine what potential mechanisms might account for the lower reports of externalizing problems in the FS group. Interestingly, recent research by Roosa and colleagues (2005) suggests that a families' impact on youth's externalizing behaviors may be mediated by exposure to high risk-neighborhood factors, including externalizing peers.

With respect to internalizing problems, results indicate that peer support did not moderate the link between stress and internalizing problems, while family support was a significant moderator. Consistent with previous research, cross-sectional associations between T1 overall stress and T1 internalizing problems were weaker for the group reporting more family support (K. E. Grant, et al., 2000; Overstreet, Dempsey, Graham, & Moely, 1999 & Moely, 1999). Although correlational pathway specific differences were not found between FS and NFS, results of multi-group analysis indicated that correlational pathways in the model, as a whole, were significantly weaker for the FS group, with this trend evident for both internalizing and externalizing problems.

Results of longitudinal analysis were more difficult to interpret. Multi-group analyses indicated that family support did moderate the link between T1 stress and T2 internalizing problems, such that the link between T1 stress and T2 internalizing was weaker for the youth reporting more family support. While this typically constitutes a protective effect, interpretation is less clear in this instance, due to the path coefficient for the NFS being unexpectedly negative.

Taking these effects at face value, results indicated that higher levels of T1 stress were predictive of fewer internalizing problems over time, for respondents in the FS group. However, this finding is inconsistent with both extant literature and the cross-sectional effects found in the current study. As discussed in the context of the structural model, this negative coefficient may be explained by bias caused by a basement effect, combined with decreasing internalizing and stress scores overtime.

The previously described vulnerability-depression hypothesis offers an alternative explanation. This explanation would assert that respondents that do not have family support may be more likely to perceive their environment as threatening, leading them to avoid traditional expressions of internalizing problems, as they may view them causing them to look weak and leaving them more vulnerable to victimization (Grant, et al., 2000; Lyons, et al., 2006; Twenge & Nolen-Hoeksema, 2002). This hypothesis is somewhat further supported by the higher reports of externalizing problems in the NFS group, which previous research suggests might be youth's alternative method of symptom expression (Grant, et al., 2000; Lyons, et al., 2006; Twenge & Nolen-Hoeksema, 2002). This

hypothesized interpretation is consistent with differences in mean scores and cross-sectional results. Although specific correlational pathways were not statistically different between the FS and NFS groups, the model's pathways as a whole from T1 stress to T1 internalizing and externalizing problems were significantly different between groups, and tended to be weaker for the FS group. Additionally, lower mean scores for stress and externalizing problems, as well as lower mean latent construct scores for externalizing problems offer some evidence that family support may be related to better functioning among low-income urban youth, although clear evidence for longitudinal moderating effects were not found.

Differential Moderating Effects: Peer Support vs. Family Support

Overall, limited support was found for the hypothesis that differential effects between peer support and family support in low-income urban youth would explain inconsistent findings for social support in the extant literature. While family support was uniquely found to be associated with lower mean scores for the externalizing problems latent construct, and no differences were found between the PS group and NPS group, clear protective effects were not found for either potential moderator (family support or peer support). However, lower latent mean scores related to family support, along with generally lower stress indicators and a trend toward weaker cross-sectional links between stress and psychological problems, suggest that there may be differences between the protective function of peer support and family support. Further research is needed with longitudinal

samples of three or more time points with low-income urban youth, to better determine if differential effects may exist.

Our failure to find moderating effects for peer support may represent differential protective effects between peer and family support, but it may also indicate that the mechanisms should be examined to determine why an association did not occur where expected. Existing literature on testing moderator effects using SEM suggests that a failure to find an expected effect can be indicative of an interaction effect that has not been considered (Kline, 2005). Future analysis should examine potential three-way interactions between stress, peer support, and potential third predictors that may specify under what conditions moderating effects of peer support might occur (Kline, 2005). As effects for family support were also somewhat weak, an examination of a three-way interaction between stress, family support, and peer support may be a logical model to test. Under this hypothesis, the protective function of either peer or family support may vary as a function of whether the other type of support is present.

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Appendix A

Tables

Table 1

Descriptive Statistics: all variables

		Raw Data Statistics				LN Statistics[1]	
Variables	N	Mean	SD	Skew	Kurt.	Skew	Kurt.
Exposure to Violence (T1)	372	88.55	27.89	1.786	4.485	0.88	0.539
Daily Hassles (T1)	378	145.39	21.43	0.757	0.831	0.288	0.267
Major Life Events (T1)	376	86.51	14.92	0.51	0.55	-0.076	0.4
Economic Stress (T1)	377	54.33	7.57	1.373	2.686	0.298	-0.429
Total Stress Severity (T1)	348	27.76	6.98	0.408	-0.176	-0.201	-0.334
CDI Depression (T1)	379	8.67	6.77	1.299	2.351	-0.598	0.058
YSR Anxiety-Dep. (T1)	383	5.54	4.35	0.952	0.978	-0.591	-0.376
YSR Withdrawn-Dep. (T1)	382	4.65	3.08	0.636	0.089	-0.749	0.171
YSR Somatic (T1)	379	4.39	3.73	1.096	1.112	-0.366	-0.644
CBCL Aggression (T1)	251	5.31	5.59	1.753	4.238	-0.165	-0.502
CBCL Delinquency (T1)	251	2.54	3.11	2.452	8.908	0.202	-0.852
CDI Total Dep. (T2)	282	6.64	5.42	1.035	1.054	-0.517	-0.521
YSR Anxiety-Dep. (T2)	283	3.35	3.43	1.651	3.552	-0.025	-0.976
YSR Withdrawn-Dep. (T2)	283	3.67	2.76	0.721	0.393	-0.579	0.539
YSR Somatic (T2)	282	2.74	2.71	1.237	1.108	-0.012	0.267
CBCL Aggression (T2)	199	4.28	1.59	11.145	143.481	0.403	0.4
CBCL Delinquency (T2)	199	2.11	2.57	1.706	3.033	0.335	-0.429

[1] = Natural Logarithm Statistics (post-transformation)

Table 2

Testing change in means (paired-sample t-tests)

Outcome Pairs	Mean Diff.	T-Score	DF	Sig.
CDI total score (T1) CDI total score (T2)	1.987	5.607	272	.000
YSR Anxiety- Dep. (T1) YSR Anxiety- Dep. (T2)	2.342	1.351	276	.000
YSR Withdrawn- Dep. (T1) YSR Withdrawn- Dep. (T2)	1.125	5.687	275	.000
YSR Somatic Complaints (T1) YSR Somatic Complaints (T2)	1.832	9.265	273	.000
CBCL Aggression (T1) CBCL Aggression (T2)	.409	.423	138	.673
CBCL Delinquency (T1) CBCL Delinquency (T2)	.145	.563	139	.574
Daily Hassle Stress (T1) Daily Hassle Stress (T2)	.145	.563	139	.574
Major Life Event Stress (T1) Major Life Event Stress (T2)	.145	.563	139	.574
Exposure to Violence (T1) Exposure to Violence (T2)	.145	.563	139	.574
Economic Stress (T1) Economic Stress (T2)	.145	.563	139	.574
Sum of Severity Ratings (T1) Sum of Severity Ratings (T2)	.145	.563	139	.574

Table 3

Testing the Randomness of Attrition

SEM Variables	Chi-Square	df	Sig.
Total Exposure to Violence (T1)	.002	1	.967
Daily Hassles (T1)	8.400	1	.004
Major Life Events (T1)	3.389	1	.066
Economic Stress (T1)	.863	-	.353
Total Stress Severity Ratings (T1)*	-	-	-
CDI Total Dep. (T1)	.384	1	.536
YSR Anxiety-Dep. (T1)	.845	1	.358
YSR Withdrawn-Dep. (T1)	.266	1	.606
YSR Somatic Complaints (T1)	.064	1	.800
CBCL Aggression (T1)	.001	1	.976
CBCL Delinquency (T1)	.236	1	.627

* = Chi-square analysis not permissible, due to low cell counts in one or more cell

Table 4

Comparison of changes in internalizing problems between high and low CDI total depression.

	Median CDI	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	139	-.5833	-8.346	.000
	1.00	134	4.7591		
YSR Anxiety Diff.	.00	139	1.2693	-5.349	.000
	1.00	133	3.6227		
YSR Withdrawn Diff.	.00	139	.4013	-3.651	.000
	1.00	132	1.8367		
YSR Somatic Diff.	.00	139	1.1284	-3.831	.000
	1.00	130	2.6450		

Table 5

Comparison of changes in internalizing problems between high and low YSR anxious-depression.

	Median Anx-Dep	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	144	.6070	-4.460	.000
	1.00	128	3.7073		
YSR Anxiety Diff.	.00	147	.4593	-10.529	.000
	1.00	131	4.5128		
YSR Withdrawn Diff.	.00	147	.5285	-3.224	.001
	1.00	130	1.7813		
YSR Somatic Diff.	.00	147	.9561	-5.093	.000
	1.00	128	2.9091		

Table 6

Comparison of changes in internalizing problems between high and low YSR withdraw-depression.

	Median With-Dep	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	124	-.0756	-6.405	.000
	1.00	114	4.4403		
YSR Anxiety Diff.	.00	124	1.1072	-6.100	.000
	1.00	119	3.9016		
YSR Withdrawn Diff.	.00	124	-.6887	-10.356	.000
	1.00	119	3.0220		
YSR Somatic Diff.	.00	123	.7760	-5.903	.000
	1.00	118	3.1604		

Table 7

Comparison of changes in internalizing problems between high and low YSR somatic complaints.

	Median Somatic	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	123	1.0271	-2.696	.007
	1.00	147	2.9523		
YSR Anxiety Diff.	.00	128	1.5325	-3.539	.000
	1.00	148	3.1106		
YSR Withdrawn Diff.	.00	128	.8427	-1.345	.180
	1.00	148	1.3750		
YSR Somatic Diff.	.00	127	-.0543	-10.535	.000
	1.00	148	3.5122		

Table 8

Comparison of changes in internalizing problems between high and low exposure to violence.

	Median Exposto	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	135	1.2008	-2.431	.016
	1.00	133	2.9456		
YSR Anxiety Diff.	.00	137	1.9851	-1.806	.072
	1.00	131	2.8165		
YSR Withdrawn Diff.	.00	137	.9755	-.825	.410
	1.00	131	1.3090		
YSR Somatic Diff.	.00	135	1.6172	-1.386	.167
	1.00	131	2.1773		

Table 9

Comparison of changes in internalizing problems between high and low daily hassles.

	Median Dailyha	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	140	.5927	-4.311	.000
	1.00	131	3.5994		
YSR Anxiety Diff.	.00	140	1.6480	-3.559	.000
	1.00	131	3.2623		
YSR Withdrawn Diff.	.00	139	.5792	-2.894	.004
	1.00	131	1.7303		
YSR Somatic Diff.	.00	137	1.1853	-3.463	.001
	1.00	131	2.5596		

Table 10

Comparison of changes in internalizing problems between high and low major life events.

	Median Major	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	143	.8958	-3.546	.000
	1.00	125	3.3682		
YSR Anxiety Diff.	.00	142	1.9632	-2.100	.037
	1.00	126	2.9298		
YSR Withdrawn Diff.	.00	141	.5989	-2.852	.005
	1.00	126	1.7351		
YSR Somatic Diff.	.00	139	1.3952	-2.469	.014
	1.00	126	2.3918		

Table 11

Comparison of changes in internalizing problems between high and low KLZ economic stress.

	Median klzpov	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	129	1.6457	-.816	.415
	1.00	131	2.2454		
YSR Anxiety Diff.	.00	129	1.7084	-2.825	.005
	1.00	133	3.0074		
YSR Withdrawn Diff.	.00	129	.9841	-.746	.456
	1.00	133	1.2902		
YSR Somatic Diff.	.00	128	1.6942	-.887	.376
	1.00	132	2.0568		

Table 12

Comparison of changes in internalizing problems between high and low stress severity rating.

	Median Severity	N	Mean	T-Score	Diff. P-value
CDI Dep. Diff.	.00	115	.9713	-2.139	.034
	1.00	119	2.6142		
YSR Anxiety Diff.	.00	120	2.1449	-1.061	.290
	1.00	119	2.6665		
YSR Withdrawn Diff.	.00	119	.7543	-1.323	.187
	1.00	119	1.3286		
YSR Somatic Diff.	.00	117	1.6877	-.441	.660
	1.00	119	1.8755		

Appendix B

Figures

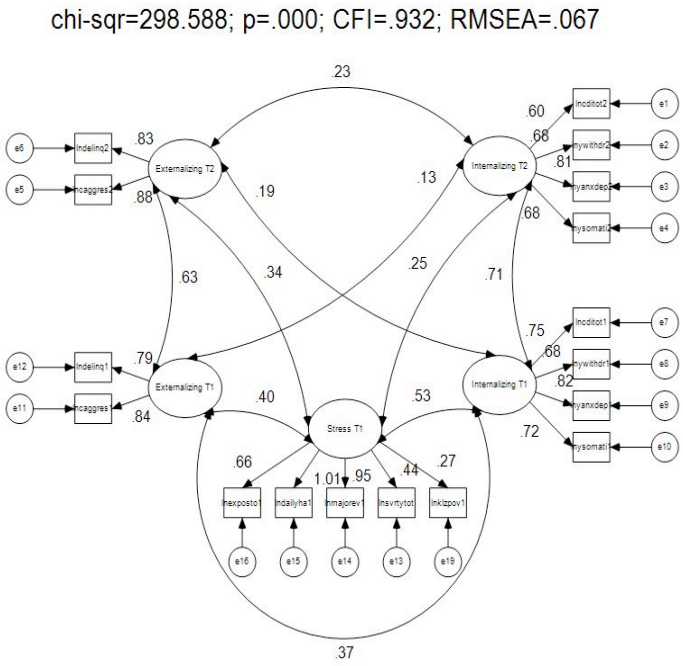

Figure 1. Measurement model

Note: All pathways are standardized in the above model.

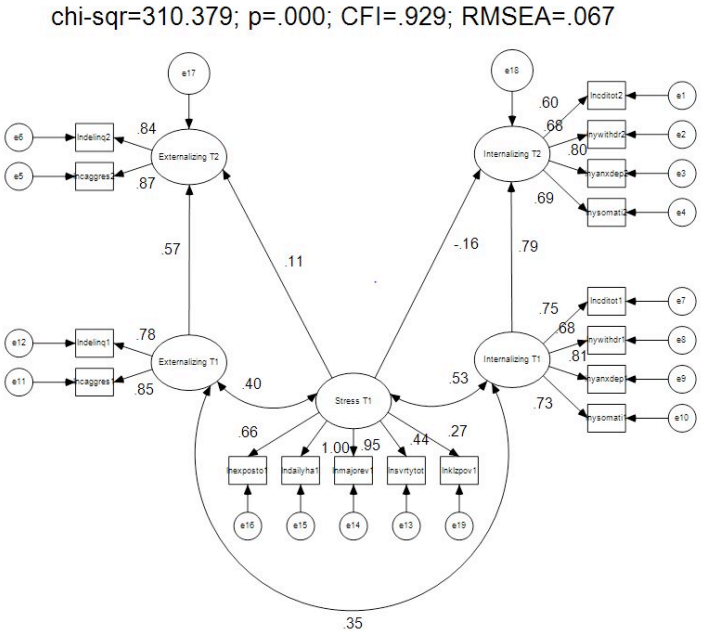

*Figure 2***.** Structural Model
Note: All pathways are standardized in the above model.

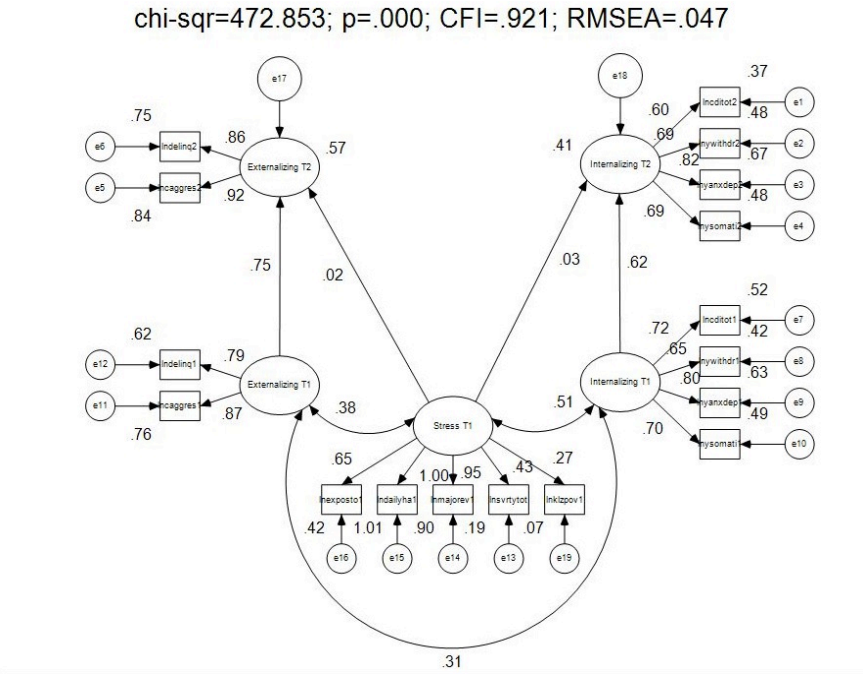

*Figure 3a***.** Peer Support (PS) Structural Model

Note: All pathways are standardized in the above model.

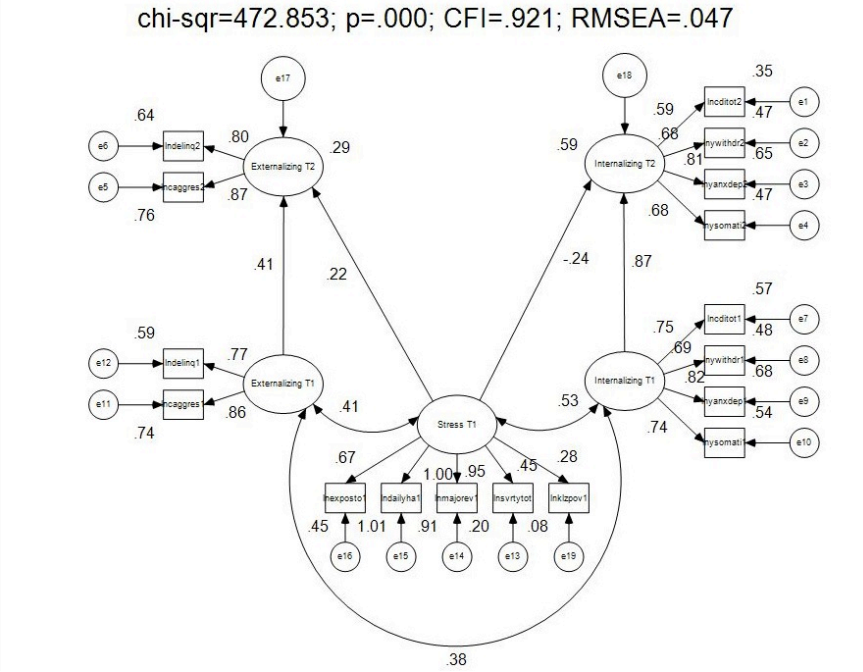

Figure 3b. Non-Peer Support (NPS) Structural Model

Note: All pathways are standardized in the above model.

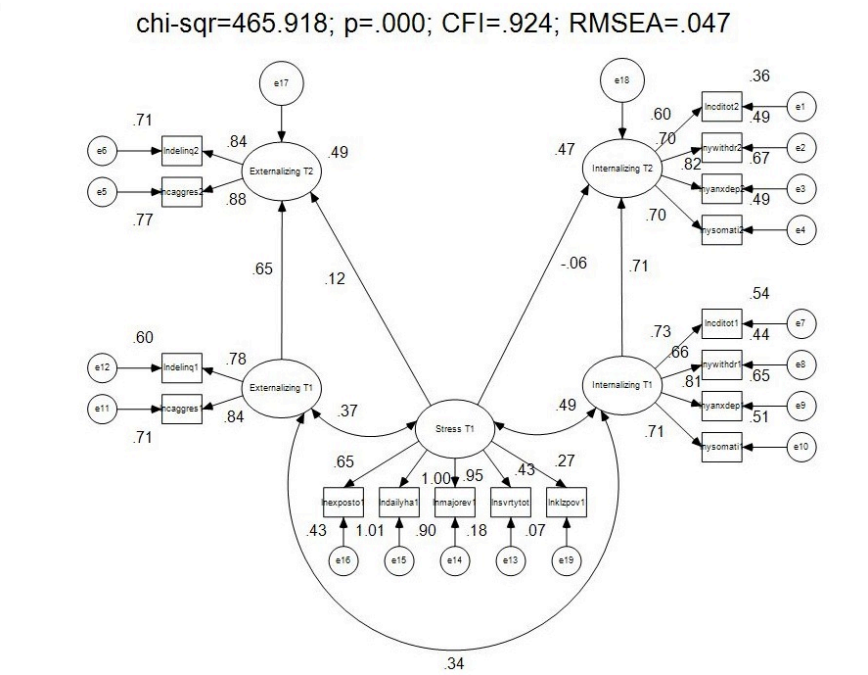

*Figure 4a***.** Family Support (FS) Structural Model

Note: All pathways are standardized in the above model.

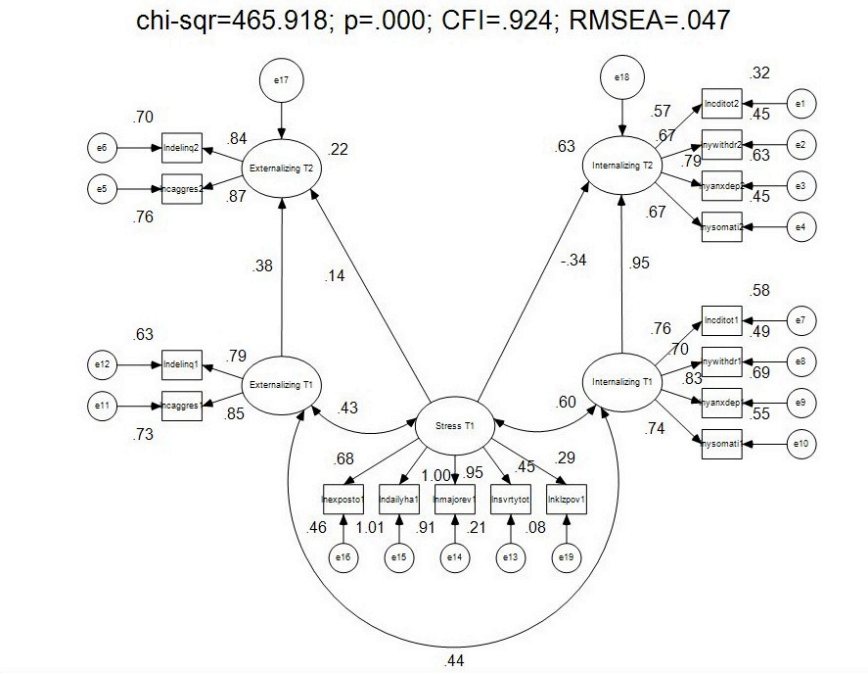

Figure 4b. Non-Family Support (NFS) Structural Model

Note: All pathways are standardized in the above model.

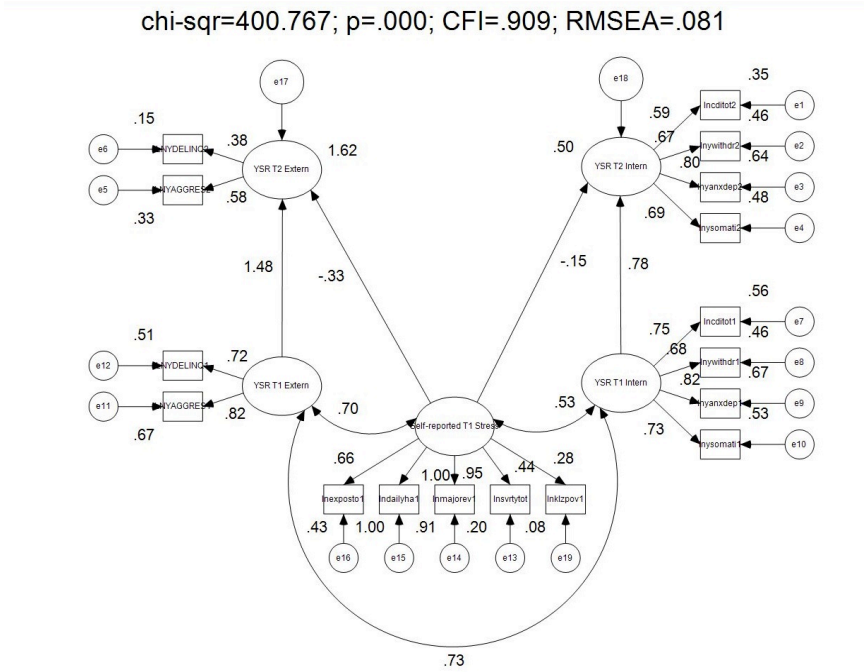

Figure 5. Supplementary Structural Model

Note: All pathways are standardized in the above model.