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Longitudinal Associations Among Youths' Depressive Symptoms, Peer Victimization, and Low Peer Acceptance: An Interpersonal Process Perspective

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Abstract

A longitudinal investigation was conducted to explicate the network of associations between depressive symptoms and peer difficulties among 486 fourth through sixth graders ($M = 9.93$ years). Parent and teacher reports of depressive symptoms, peer, self, and teacher reports of victimization, and peer reports of peer acceptance were obtained. A systematic examination of nested structural equation models provided support for a symptoms-driven model whereby depressive symptoms contributed to peer difficulties; no evidence was found for interpersonal risk or transactional models. Analyses further revealed that victimization mediated the association between prior depressive symptoms and subsequent peer acceptance. Results extend knowledge about the temporal ordering of depressive symptoms and peer difficulties and elucidate one process through which depressive symptoms disrupt peer relationships.

In recent decades, evidence indicating that youths' peer relations, such as peer victimization and peer acceptance, correlate with their psychological adjustment motivated researchers to examine more closely the predictive associations among these variables (see Ladd, 2005). Most of this work was guided by the premise that peer relational difficulties are precipitants, rather than consequences, of various forms of psychological maladaptation (e.g., depression; Khatri, Kupersmidt, & Patterson, 2000; Kiesner, 2002; Lansford et al., 2007; Panak & Garber, 1992; Parker & Asher, 1987; Prinstein, Borelli, Cheah, Simon, & Aikins, 2005; Vernberg, 1990). Recently, however, an alternate premise—that poor peer relations and depressive symptoms transact over time—has garnered attention (Chen & Li, 2000; Nolan, Flynn, & Garber, 2003; Schwartz, Gorman, Nakamoto, & Toblin, 2005; Sweeting, Young, West, & Der, 2006).

Because evidence for these premises is inconsistent, we aimed to stipulate and test three plausible models of the predictive associations between depressive symptoms and poor peer relations. Specifically, it was of interest to empirically evaluate (a) an *interpersonal risk* model in which poor peer relations precipitate depressive symptoms, (b) a *symptoms-driven* model in which depressive symptoms antecede poor peer relations, and (c) a *transactional* model in which poor peer relations and depressive symptoms are reciprocally associated across time. Models were examined as youth progressed from late preadolescence to early

adolescence, a stage during which the maturation of peer relationships is particularly critical for adaptive development (Rubin, Bukowski, & Parker, 2006).

Interpersonal Risk Model

The assumption underlying this model is that poor peer relations constitute a significant stressor—one that contributes to problematic outcomes, such as depressive symptoms (Patterson & Capaldi, 1990). It was proposed, for example, that low-status positions in peer groups cause youth to feel a diminished sense of belonging or relatedness to others (i.e., thwarts basic human needs; see Baumeister & Leary, 1995), which engenders feelings of depression.

Findings from several studies support the proposition that poor peer relations—including low peer acceptance (i.e., the degree to which youth are disliked, as opposed to liked, relative to their classmates; Ladd, 2005) and peer victimization (i.e., physical, verbal, or relational aggression inflicted with the intent to harm; Juvonen & Graham, 2001)—antecedent the development of depressive symptoms (e.g., Kiesner, 2002; Panak & Garber, 1992; Schwartz et al., 2005; Vernberg, 1990). For example, Vernberg (1990) found that self-reported rejection among 7th and 8th graders forecasted elevated self-reported depressive symptoms six months later. Likewise, Panak and Garber (1992) reported that increases in 3rd through 5th graders' peer rejection over a period of one year predicted self-reported depressive symptoms, after controlling for prior depressive symptoms. In this case, however, it was change in rejection—not initial rejection—that forecasted later depressive symptoms. In a study of Italian middle school students, a series of regression analyses revealed that initial low peer status predicted subsequent self-reported depressive symptoms, after controlling for prior depressive symptoms (Kiesner, 2002). Research also provides some support for the role of peer victimization in the prediction of depressive symptoms: Schwartz and colleagues (2005) reported that peer victimization (indicated by peer- and teacher-report items) predicted 3rd and 4th graders' depressive symptoms (indicated by self-report items) one year later; support was not obtained for a pathway leading from depression to peer victimization.

Some research, however, does not support the premise that poor peer relations precipitate the development of depressive symptoms. For example, Prinstein et al. (2005) found that low social preference failed to predict 6th through 8th graders' self-reported depressive symptoms 11 months later, after controlling for prior depressive symptoms. In another study, Khatri and colleagues (2000) reported that, for a sample of 4th through 6th graders, initial peer victimization did not contribute to subsequent self-reported depressive symptoms. Interpretation of seemingly contradictory findings across studies is complicated by the fact that some investigators obtained evidence consistent with the view that the across-time linkages between depressive symptoms and peer difficulties vary according to sample characteristics, such as age and ethnicity. For example, Lansford et al. (2007) conducted a study with Italian and American youth and found that the social preference scores of Italian 6th and 7th graders predicted peer-reported (but not teacher-, parent-, or self-reported) depressive symptoms in 8th grade, after controlling for prior depressive symptoms and prior and concurrent aggression. With younger American youth, however, Lansford et al. discovered that social preference in 1st through 3rd grade generally did not predict depressive symptoms in 4th through 12th grade, after prior depressive symptoms and prior and concurrent aggression had been controlled. The one exception to this pattern of findings was that early social preference predicted teacher-reported depressive symptoms in 7th grade.

Symptoms-Driven Model

Symptoms-driven models focus attention on a relatively untested hypothesis—that is, the possibility that depressive symptoms antecede the development of poor peer relations. According to “scar” theories of depression, depressive symptoms interfere with youths’ development of adaptive social skills and promote relationship difficulties (e.g., Nolen-Hoeksema, Girgus, & Seligman, 1992; Rohde, Lewinsohn, & Seeley, 1990; Rudolph, 2009). Depression might contribute to peer difficulties because (1) depressed youth exhibit social deficits (Rudolph, Flynn, & Abaied, 2008), which have the potential to elicit disliking or aggressive responses from their peers, (2) depressed youth self-select into maladaptive relationships (Rudolph, 2009), which elevate depressed youths’ risk for interpersonal conflict (e.g., peer victimization), and/or (3) depression-linked behavioral styles, such as withdrawal, passivity, and fearfulness (Harrington, 1993; Kennedy, Spence, & Hensley, 1989) cause depressed youth to be viewed unfavorably by peers or signal vulnerability, which invites victimization (Olweus, 1978; Schwartz, Dodge, & Coie, 1993; Veenstra et al., 2007).

Those who study peer relations have tended to emphasize the opposing direction of effect (i.e., poor peer relations predict depressive symptoms); nonetheless, it is conceivable that youths’ psychological difficulties predate problems in their peer relations (Ladd, 2005; Parker & Asher, 1987). Results from at least two studies lend support for this latter hypothesis. In a study of Chinese junior high school students, Chen and Li (2000) found that self-reports of depressive symptoms negatively predicted social preference two years later when controlling for baseline social preference. Consistent with these findings, Brendgen, Vitaro, Turgeon, and Poulin (2002) reported that, among a sample of 4th through 6th graders, membership in a depressive subgroup predicted lower self-perceived social acceptance six months later.

Transactional Model

Interpersonal theories of depression suggest the possibility that poor peer relations and depressive symptoms are reciprocally related across time. These theories imply that (a) depressed individuals exhibit social-behavioral deficits that disrupt interpersonal relationships (i.e., elicit negative responses, generate conflict), and (b) such interpersonal difficulties perpetuate depressive symptoms (Coyne, 1976; Rudolph et al., 2008). To our knowledge, four teams of researchers have empirically tested bidirectional or transactional associations between poor peer relations and depression.

First, in Chen and Li’s (2000) study of Chinese junior high school students, the observed predictive associations were consistent with only one direction of effect (i.e., earlier depressive symptoms negatively predicted subsequent social preference but earlier social preference did not predict subsequent depressive symptoms); thus, these findings do not support a transactional perspective. Findings from a second study also cast doubt on a transactional perspective: Nolan et al. (2003) tested a series of autoregressive models to examine the premise that rejection and depressive symptoms are reciprocally related; they reported that, across two, one-year lags, social rejection by peers *and* parents (indicated by self-, mother-, and teacher-reports) predicted heightened depressive symptoms (indicated by self-, mother-, and clinician-reports) but not vice versa.

In a third study, Sweeting et al. (2006) also tested a series of competing autoregressive models to test for reciprocal associations between depressive symptoms and victimization among a sample of 11 to 15 year old British youth across two, two-year lags. The best fitting model was a bidirectional model—one in which victimization predicted depressive symptoms and vice versa at age 11; this model was better fitting than the alternatives (e.g.,

stability model, lagged victimization to depression, lagged depression to victimization, lagged bidirectional, simultaneous victimization to depression, simultaneous depression to victimization), though the lagged bidirectional model was an adequate fit to the data with significant paths leading from age 11 depression to age 13 victimization, from age 11 victimization to age 13 depression, and from age 13 depression to age 15 victimization. Findings reported by Sweeting et al. (2006), therefore, provide limited support for transactional associations between depressive symptoms and poor peer relations. Results from a fourth study (Schwartz et al., 2005) do not, however, provide support for bidirectional links; rather, findings from this study suggest that peer victimization (indicated by peer- and teacher-report items) predicted depressive symptoms (indicated by self-report items) but not vice versa over a one-year period.

The State of the Science

At present, the overall body of evidence on the temporal sequence between poor peer relations and depressive symptoms has yielded somewhat inconsistent findings. Whereas some research corroborates the view that poor peer relations contribute to the development of depressive symptoms (Kiesner, 2002; Nolan et al., 2003; Panak & Garber, 1992; Schwartz et al., 2005; Vernberg, 1990), other research does not (Chen & Li, 2000; Khatri et al., 2000; Prinstein et al., 2005); moreover, data from a few investigations provide support for reciprocal associations between poor peer relations and depressive symptoms (Sweeting et al., 2006) or for models in which depressive symptoms antecede the development of poor peer relations (Brendgen et al., 2002; Chen & Li, 2000). Current research, therefore, does not provide a clear picture of how poor peer relations and depressive symptoms are associated across time, perhaps because delimitations in past investigative strategies make it difficult to draw conclusions about the temporal ordering of variables. Specifically, prior researchers have not, to our knowledge, investigated competing predictive hypotheses within a single longitudinal model that includes multiple peer relations criteria (i.e., peer victimization *and* low peer acceptance) and depressive symptoms. Importantly, however, investigations into the temporal ordering of depressive symptoms and multiple peer relational criteria have the potential to elucidate (1) the relative plausibility of competing directions of association, (2) the longitudinal linkages between partially distinct (i.e., somewhat overlapping) aspects of youths' peer relations, and (3) the differential across-time associations between depressive symptoms and peer victimization versus low peer acceptance. Accordingly, we used a design and method that enabled us to test competing hypotheses about the causal priority of peer relations versus depressive symptoms in the context of multiple, longitudinal models.

First, we utilized a three-wave longitudinal design to determine whether one of three competing models best fit the data. This design permits the examination of competing directions of effect simultaneously; moreover, the examination of predictive pathways across two lags has the potential to expose reliable data patterns. Second, constructs within this investigation were measured with latent variables based on multi-informant reports to reduce bias and to capture more of the phenomena of interest (Rushton, Brainerd, & Pressley, 1983). Third, we conducted mediation analyses to evaluate potential process perspectives—ones that may best represent prospective links between poor peer relations and depressive symptoms or vice versa. Specifically, we examined whether either peer relations variable (i.e., peer victimization or low peer acceptance) was a mediator in the developmental sequence from depressive symptoms to the other peer relations variable or vice versa.

To elucidate these possible mediational pathways, it was important to determine the direction of association between peer victimization and low peer acceptance. Investigators who have examined the concurrent associations between peer victimization and low peer

acceptance (or similar constructs; e.g., peer rejection, social preference) typically reported moderate correlations (e.g., Bukowski & Sippola, 2001; Perry, Kusel, & Perry, 1988); it is less clear, however, how peer victimization and low peer acceptance are prospectively linked. On the one hand, low peer acceptance might provoke peer victimization because (a) rejected youth are devalued by the peer group and, thus, viewed as suitable targets for victimization, or (b) low-status positions within peer groups render rejected youth easy marks for victimization (i.e., rejected youth lack social protection from bullies' attacks; see Hodges & Perry, 1999). Extant evidence provides some support for these tenets (Hodges & Perry, 1999; Salmivalli & Isaacs, 2005).

On the other hand, the hypothesis that peer victimization precipitates low peer acceptance (i.e., victimization makes youth less acceptable members of their peer group) is consistent with the view that youth sometimes espouse attitudes merely because they perceive them to be consistent with their peers' attitudes (i.e., social norms perspective; Trafimov & Finlay, 1996); thus, knowledge that a child is victimized may cause peers to assume that the child is not likeable (Coie, 2004). Consistent with this premise, some research suggests that victimization predicts low peer acceptance during preadolescence through early adolescence (Hodges & Perry, 1999; Kochel, McConnell, & Ladd, 2007; Ladd & Troop-Gordon, 2003). In view of mixed findings concerning the longitudinal associations between peer victimization and low peer acceptance, we sought to shed light on the across-time linkages between peer victimization and low peer acceptance by (1) evaluating competing predictive pathways between peer victimization and low peer acceptance across two, one-year lags, and (2) examining the possibility that one peer relations variable (i.e., either peer victimization or low peer acceptance) functions as a mediator in the developmental sequence from depressive symptoms to the other peer relations variable or vice versa.

The Present Study

The purpose of this research was to expand and refine knowledge about the prospective linkages among depressive symptoms, peer victimization, and low peer acceptance among youth in preadolescence through early adolescence. The specific aims of this study were two-fold. The first aim was to examine whether, among this study's community sample of youth, poor peer relations antecede the development of depressive symptoms, depressive symptoms antecede the development of poor peer relations, or poor peer relations and depressive symptoms are transactionally associated across time. The second aim was to stipulate and test one or more plausible three-wave mediation models in which one peer relations variable is examined as an intervening process in the association between depressive symptoms and the second peer relations variable. Given past research showing that peer victimization and low peer acceptance are closely related, it is possible that either peer victimization or low peer acceptance will function as a mediator of the association between depressive symptoms and the other peer relations variable. Tests of mediation have the potential to contribute to what is known about the relative strength of indirect (i.e., mediated) versus direct predictive associations and, in turn, elucidate one process that underlies linkages between depressive symptoms and one aspect of youths' peer relations.

Method

Participants

Data for this study came from a longitudinal investigation of 486 youth (242 girls, 244 boys; M_{age} in spring of 4th grade = 9.93; $SD = .40$) across grades four (G4), five (G5), and six (G6). There were 380 youth participating in the study in G4; in G5, 106 additional participants were recruited. This subsample ($M_{\text{age}} = 10.73$, 50 females) was identified via peer and teacher assessments (e.g., youth scoring $\geq 1 SD$ on standardized average aggression

nominations from classmates) and included to increase the representation of youth who were prone to act moderately aggressively among peers during preadolescence. Consent was obtained from school districts before recruitment began, and written informed parental consent and youth assent was obtained from all participants at the time of recruitment. The sample included European Americans (80.2%), African Americans (15.6%), and youth from Hispanic, mixed race, or other (4.2%) backgrounds. Participants came from diverse socioeconomic backgrounds: 30.3% were lower-to lower-middle income (\$0–\$30,000), 24.8% were middle income (\$30,001–\$50,000), and 54.9% were upper-middle to high-income (above \$50,001).

Throughout the course of the investigation, participants became dispersed across classrooms and schools ($N = 68$), and, as a result, not all participants transitioned from elementary to secondary (i.e., middle school or junior high) at the same point in time. Sixty-one percent of participants made the transition to middle school in 6th grade, 30% of participants transitioned to junior high in 7th grade, and 9% of participants transitioned in other grades (e.g., 8th grade) or did not transition at all (e.g., attended a school in which the configuration was kindergarten through 12th grade). For participating classrooms that were housed in elementary schools, sociometric procedures were administered in self-contained classrooms. Otherwise, permission was obtained to review participants' class schedules, and classmates who shared a minimum of one class with the target participant were identified. From the pool of identified classmates who had permission to participate, 25 to 44 raters/nominators were selected at random.

The number of participating classrooms was 153 (G4), 167 (G5), and 154 (G6); mean classroom consent rates were 78% (G4), 83% (G5), and 78% (G6). The mean number of participating youth per classroom (i.e., target youth and their classmates) was 16 (G4), 18 (G5), and 22 (G6); the mean number of participating targets per classroom was 2.27 (G4), 2.51 (G5), and 2.90 (G6). The number of teachers and parents who participated per assessment was 128 (G4), 135 (G5), and 138 (G6), and 371 (G4), 450 (G5), and 456 (G6), respectively.

Procedure

Data were gathered in the spring of G4, G5, and G6. Sociometric measures (i.e., peer victimization and acceptance measures) were administered to youth and their classmates. Youth underwent training on how to use each response format, after which they completed the measures individually. Participants also completed measures assessing their own peer victimization experiences. Participants' teachers were mailed measures of youths' depressive symptoms and peer victimization and parents were mailed measures of youths' depressive symptoms; teachers and parents were instructed to return their completed forms by mail. All measures were completed at each of the three waves of data collection. Youth and their classmates, teachers, and parents were compensated for their participation.

Measures

Depressive symptoms—Depressive symptoms were assessed using parent and teacher reports. Parents completed the Child Behavior Checklist (CBCL; Achenbach, 1991a), which includes 118 items rated on a 3-point scale (0 = *Not True* or *Never True*, 2 = *Very True* or *Often True*) to indicate how often their child displayed each symptom. When more than one parent was available, the one with the most knowledge about the child's development was asked to complete this measure. Typical scoring of the CBCL yields an anxiety/depression subscale, but research suggests that it is possible to utilize CBCL items to form a valid subscale that focuses more specifically on depressive symptoms (Connor-Smith & Compas, 2003; Lengua, Sadowski, Friedrich, & Fisher, 2001). Because depression was the construct

of interest in the current study, the depressive symptom subscale developed by Lengua and colleagues (2001) was used. This subscale was based on a reorganization of the CBCL items to more closely coincide with clinical diagnoses as reflected in the Diagnostic and Statistical Manual (DSM-IV-TR; American Psychiatric Association, 2000). Confirmatory factor analyses and coefficient alphas demonstrated adequate construct validity and reliability, respectively, based on findings from one nonclinical sample and two clinical samples (CFIs = .90, .91, and .89, respectively; α s = .67, .81, and .81, respectively). The IRB did not permit administration of two of the CBCL items that are included in the Lengua et al. depressive symptom scale (items 18 and 91). Our depressive symptom subscale, therefore, consisted of the remaining 10 items (items 12, 14, 33, 35, 54, 76, 77, 100, 102, 103 on the CBCL; Achenbach, 1991a). Depressive symptom scores were created by averaging the 10 items (α s = .71–.75).

Teachers completed a comparable depressive symptoms subscale drawing from the relevant items on the Teacher Report Form (TRF; Achenbach, 1991b). When a participant had multiple teachers, project staff selected a teacher who (1) professed to be knowledgeable about the child's development, and (2) demonstrated a willingness to complete the questionnaire battery. Depressive symptom scores were created by averaging seven items (12, 14, 33, 35, 54, 102, and 103; α s = .73 – .76) on the TRF (Achenbach, 1991b). The original CBCL (parent report) includes three more items than the TRF (teacher report) because information about three sleep-related symptoms on the CBCL typically is not accessible to teachers. We chose not to eliminate these three items from the parent report measure because they contribute to the overall syndrome on the CBCL.

Peer victimization—Victimization was assessed using peer, self, and teacher reports. Peers completed four nomination items to assess the extent to which each youth was victimized at school. Each item represents a specific form of victimization: (a) physical (“gets hit, pushed or kicked”), (b) verbal (“gets called bad names”), (c) relational (“kids say bad things about him/her to other kids”), and (d) general (“gets picked on”). For each item, youth were asked to nominate up to three classmates fitting the descriptor and to indicate the frequency with which classmates were victimized (0 = *Not nominated*, 1 = *Victimized sometimes* or *Victimized a lot*). Scores on each item were separately averaged and standardized within classrooms, and a total peer victimization score was computed by averaging the standardized scores for physical, verbal, relational, and general victimization (α s = .91 – .94).

Youth completed a 4-item victimization scale (Kochenderfer & Ladd, 1996) to assess the frequency with which they had experienced four forms of victimization (physical, verbal, relational, and general). Participants were trained to use a 5-point scale (1 = *no, never or rarely*; 3 = *sometimes*; 5 = *a lot of the time*) to respond to the following questions: Does anyone in your class ever: (1) “...hit you at school?” (2) “...say mean things to you at school?” (3) “...say bad things about you to other kids at school?” and (4) “...pick on you at school?” Peer victimization scores were calculated by averaging across the four items at each grade level (α s = .72 – .80).

Teachers completed a 6-item victimization scale to assess how often each youth experienced physical, verbal, relational, and general victimization at school. Teachers used a 3-point scale (1 = *does not apply*; 2 = *applies sometimes*; 3 = *certainly applies*) to rate the following items: (1) “is picked on by other children,” (2) “is called names by peers,” (3) “is pushed around by other children,” (4) “is teased or made fun of by peers,” (5) “is someone who peers say negative things about to others,” and (6) “is hit or kicked by other children.” Peer victimization scores were calculated by averaging across the six items at each grade level (α s = .88 – .91).

Low peer acceptance—Three indicators of low peer acceptance were included: (1) ratings youth received from peers as liked or disliked play partners (standardized average peer ratings), (2) the average number of nominations youth received as liked playmates (standardized average positive nominations), and (3) the average number of nominations youth received as disliked playmates (standardized average negative nominations). Past research has shown that positive *and* negative sociometric criteria (i.e., ratings/nominations that capture peers' sentiments of liking and disliking) are needed to distinguish between peer acceptance and rejection (see Coie, Dodge, & Coppotelli, 1982), and that average ratings are among the most reliable of the measures used to estimate peer acceptance across members of a peer group (see Ladd, 2005).

Ratings were obtained with a roster-and-rating instrument (Asher, Singleton, Tinsley, & Hymel, 1979) that presented youth with a list of their classmates' names, and instructed them to indicate how much they like to play with each classmate by circling a number on a scale that ranged from 1 to 5 (1 = *I don't like to*; 5 = *I like to a lot*). The second and third measures of peer group acceptance were obtained via a peer nomination procedure in which youth were presented with a class roster and asked to circle the names of up to three classmates who fit the following descriptions: (1) Someone who you don't like to play with at school (i.e., negative nominations), and (2) Someone who you like to play with at school (i.e., positive nominations). Prior to administering these measures, youth were shown class rosters, tested until they could identify all classmates, and trained to make nominations contingent on practice criteria. It has been established that these rating and nomination measures yield reliable and valid data (see Asher et al., 1979; Cillessen & Bukowski, 2000). Scores for each measure were separately averaged and standardized within classrooms with higher scores reflecting lower peer acceptance.

Results

Data Analytic Strategy and Results of Preliminary Analyses

Standardized mean scores, standard deviations, and correlations among variables are presented in Table 1. Raw mean scores and standard deviations for positive nominations, negative nominations, peer ratings, and victimization nominations in G4 were: 2.88 (1.85), 2.82 (2.74), 2.66 (.63), and 8.70 (10.26), respectively. Raw mean scores and standard deviations for positive nominations, negative nominations, peer ratings, and victimization nominations in G5 were: 2.54 (1.81), 3.04 (3.03), 2.56 (.64), and 9.82 (12.94), respectively. Raw mean scores and standard deviations for positive nominations, negative nominations, peer ratings, and victimization nominations in G6 were: 2.56 (1.92), 3.00 (2.99), 2.37 (.64), and 8.63 (11.96), respectively.

Complete data were not obtained for all youth participating in the study. The total percentage of missing data across all study variables was 15% because G4 data were missing for 106 participants recruited in G5 (approximately 21% of the study sample). The total percentage of missingness across G5 and G6 variables was less than 10%. In the current sample ($N = 486$), bivariate correlations among key variables (i.e., correlations between G4 depressive symptom indicators and G5 peer victimization indicators; correlations between G5 peer victimization indicators and G6 low peer acceptance indicators) were analogous to those obtained when the 106 participants recruited in G5 were excluded ($N = 380$). Specifically, the mean of the deviation between corresponding correlations across samples was .02, the mode was .01, and the range was .00 to .07.

Before estimating measurement and structural equation models, variables were screened for normality. Given the presence of some non-normal variables (i.e., variables that exceeded the cutoff values of two for skewness and seven for kurtosis; West, Finch, & Curran, 1995),

structural equation analyses were performed using the maximum likelihood robust estimator (MLR), which provides standard errors and chi-square statistics for data with non-normal distributions (see Muthén & Muthén, 1998–2006) and treats for missing data.

Measurement models were estimated via Mplus Version 5 (Muthén & Muthén, 1998–2006) to examine whether construct indicators loaded on the corresponding latent factors and to evaluate factorial invariance over time. Structural equation models were then estimated in Mplus to evaluate fit between the data and the hypothesized models. For measurement and structural equation models, three criteria were employed to evaluate model fit: the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). According to Hu and Bentler (1999), the CFI value should typically equal or exceed .95 to ensure satisfactory model fit, the RMSEA estimate should fall below .06, and SRMR values should not exceed .08, with lower values indicating better model fit. Relative fit of models was tested with a scaled chi-square difference test for nested models (Crawford & Henry, 2003; Satorra & Bentler, 2001).

Formation of Latent Variables and Factorial Invariance

Prior to testing this study's aims, confirmatory factor analyses (CFAs) were conducted to determine whether the observed variables were indicators of their respective latent factors and to obtain evidence of temporal invariance among the latent factors. First, we estimated a *constrained* measurement model in which indicators of each latent factor were constrained to be equal to corresponding indicators across time. The model was a reasonable fit to the data, $\chi^2(df = 201; N = 486) = 463.59, p = .00, CFI = .93; RMSEA = .05, SRMR = .06$, and results provided evidence of weak factorial invariance.

Once evidence of weak factorial invariance was obtained, we sought to evaluate strong factorial invariance. The relative fit of the *constrained* model and a *fully unconstrained* model, $\chi^2(df = 191; N = 486) = 455.34, p = .00, CFI = .93; RMSEA = .05, SRMR = .06$, was examined via a scaled chi-square difference test (see Satorra & Bentler, 2001). Results from the scaled chi-square test, $\Delta\chi^2(10) = 13.03, p = .22$, indicated no significant difference in fit between the constrained and unconstrained models, which provides evidence for strong factorial invariance across time (see Meredith, 1993; Widaman & Reise, 1997).

Estimation of Cross-Lagged Models

A series of nested SEMs was examined to investigate the direction of associations between depressive symptoms (DEP), peer victimization (VIC), and low peer acceptance (LOW ACC) in the 4th through 6th grades. All models included within-time correlations of constructs (e.g., intercorrelations between G4 DEP, G4 LOW ACC, and G4 VIC were freely estimated).

Model 1, the baseline model, included stability paths for each construct (e.g., G4 DEP → G5 DEP → G6 DEP). Model 2 included all one-lag paths. Model 3 included all one-lag paths and two intercorrelations (i.e., within-time correlation between positive nominations and peer ratings in G6, within-time correlation between negative nominations and victimization nominations in G5). The specified intercorrelations were included on the basis of empirical as well as conceptual considerations. Specifically, intercorrelations were included if (1) they were specified in modification indices, *and* (2) their inclusion was conceptually warranted (e.g., in the case of same-informant measures; see MacKinnon, 2008).

The baseline stability model (Model 1) had marginal fit; the estimation of additional parameters in Model 2 and Model 3 resulted in incrementally better fit (see Table 2 for fit statistics and nested model comparisons). The global fit of Model 3 was adequate; stability paths were significant at $p < .05$ as were one-lag paths from G5 VIC → G6 LOW ACC (.

30), G4 DEP → G5 LOW ACC (.74), G5 DEP → G6 VIC (.28), and G4 DEP → G5 VIC (.48). Model 3 included the following nonsignificant paths (i.e., G4 LOW ACC → G5 DEP, .19; G5 LOW ACC → G6 DEP, .10; G4 LOW ACC → G5 VIC, .19; G4 VIC → G5 DEP, .12; G5 VIC → G6 DEP, .09; G5 LOW ACC → G6 VIC, .13; G4 VIC → G5 LOW ACC, .21; G5 DEP → G6 LOW ACC, .22). Model 3 was selected as the most plausible model of associations among those tested thus far in the present study.

Mediation Model

Following the establishment of Model 3 as the most plausible model, we sought to examine mediation. According to MacKinnon (2008), the principal conditions for mediation are that the *a* coefficient, which represents the path from the independent variable to the hypothesized mediator, and the *b* coefficient, which represents the path from the hypothesized mediator to the dependent variable, are significant. A nonsignificant association between the independent variable and the dependent variable after adjustment for the mediator (i.e., the direct effect), and a significant association between the independent variable and the dependent variable (i.e., the total effect) are not, according to MacKinnon (2008), conditions of mediation but are often of primary interest in evaluating mediation; thus, we examined G5 VIC as a mediator of the association between G4 DEP and G6 LOW ACC. We also evaluated the direct effect (*c'*) from G4 DEP → G6 LOW ACC adjusting for G5 VIC, and the total effect (*c*), G4 DEP → G6 LOW ACC.

A scaled chi-square difference test (see Table 2; Satorra & Bentler, 2001) revealed that, compared with Model 3, the resulting mediated model (Model 4) was a better fit to the data; moreover, standardized *a* (.63), *c* (.55), and *c'* (.55) coefficients were significant, but *b* was not (.23, $p = .10$). A final mediated model (Model 5) was estimated in which two additional intercorrelations were specified (i.e., within-time correlations between positive nominations and peer ratings in G4 and G5). There was a significant difference in fit between Models 4 and 5 (see Table 2); thus, the Mediated Model (Model 5) was retained as the final model (see Figure 1). Standardized *a* (.61), *b* (.25), and *c* (.78) coefficients were significant, and *c'* was marginally significant (.46, $p = .07$).

The significance of the mediated effect was tested using a confidence interval (CI) method that relies on the distribution of the product of two normally distributed variables (i.e., the product of *a* and *b*; MacKinnon, Lockwood, & Williams, 2004). Compared to other methods for establishing mediation, the distribution of the product method demonstrates better Type I error rates, statistical power, and accuracy of confidence limits (MacKinnon et al., 2004). If the 95% CI does not include zero, the indirect effect is significant. Results showed that G5 VIC mediated the effect of G4 DEP on G6 LOW ACC, Upper Confidence Limit (UCL) for the mediated effect = .394, Lower Confidence Limit (LCL) = .008, $p < .05$.

A standardized *a* coefficient, which represents change in the mediating variable for one standard deviation change in the independent variable, and a standardized *b* coefficient, which represents change in the dependent variable for a one standard deviation change in the mediating variable, can be interpreted as effect size measures for individual paths in the mediated effect (MacKinnon, 2008); moreover, the product of *a* and *b* is an effect size measure for the entire mediated effect. In the present investigation, a standardized *a* coefficient of .61, a standardized *b* coefficient of .25, and a product of the coefficients equal to .15, indicate a medium, small, and small effect, respectively (Cohen, 1992).

Sex differences—We originally aimed to examine sex differences in the final mediated model via two methods: (1) a multiple group analysis, and (2) models estimated separately on boys and girls. For both methods, analyses failed to converge, which is perhaps due to inadequate sample size and/or model complexity; thus, we opted to eliminate this aim.

Discussion

This investigation provides insight into the associations between youths' depressive symptoms and peer relational difficulties in preadolescence through early adolescence. Support was obtained for a symptoms-driven model, in which youths' depressive symptoms predicted subsequent peer difficulties; moreover, mediation analyses suggested that 4th grade depressive symptoms predicted 5th grade peer victimization, which, in turn, predicted 6th grade low peer acceptance. No support was found for an interpersonal risk model (i.e., the hypothesis that peer difficulties contribute to the development of depressive symptoms) or a transactional model (i.e., the hypothesis that depressive symptoms and peer difficulties are reciprocally related across time). Importantly, our findings support and extend “scar” models of depression (Nolen-Hoeksema et al., 1992; Rohde et al., 1990; Rudolph, 2009), which suggest that depressive symptoms not only exert proximal adverse effects on youths' interpersonal relationships but also interfere with the developmental maturation of relationships in ways that create longer-term social difficulties.

A Symptoms-Driven Perspective

The temporal patterning of associations found here shows that, among youth in preadolescence through early adolescence, depressive symptoms predated peer relational difficulties rather than vice versa. This network of predictive links is conceivable, first, because research indicates that the stability of depressive symptoms in early adolescence is, in general, very high (see Tram & Cole, 2006); thus, it is possible that, as youth approach adolescence, depression represents a more stable form of maladjustment than peer relational difficulties. If this trajectory is common, then depressive symptoms may function as the cause of peer problems for preadolescents and early adolescents because it is likely that more mature (i.e., stable) forms of dysfunction (e.g., depressive symptoms) drive less stable forms of difficulties (e.g., poor peer relations), rather than vice versa. Indeed, the data patterns obtained in this study are consistent with this logic.

Second, interpersonal theories of depression lend credence to the proposition that the interplay of specific environmental factors (e.g., exposure to family or peer adversity) and youth characteristics (e.g., social-behavioral deficits, maladaptive relationship appraisals) are influential in the onset of adolescent depression (see Rudolph, 2009; Rudolph, Hammen, & Daley, 2006). For example, Rudolph and colleagues argued that serious family disturbances (e.g., insecure parent-child attachment, child maltreatment, parental death or divorce, maladaptive parent socialization) set the stage for the intergenerational transmission of susceptibility to depression by fostering maladaptive relationship appraisals (e.g., negative expectations of self and others within relationships) and social-behavioral deficits (i.e., maladaptive responses to stressful social situations, such as excessive reassurance seeking, emotion dysregulation, heightened aggression or social withdrawal, a negative behavioral self-focus). Consistent with this perspective, results from several investigations provide support for the contribution of family adversity (e.g., parent-adolescent relationships low in overall quality, less supportive and more conflictual family environments; Allen et al., 2006; Eberhart & Hammen, 2006; Sheeber et al., 1997) to the development of depressive tendencies. It is conceivable, therefore, that some family-linked causes of depression antecede youths' participation in preadolescent and early adolescent peer relations, which suggests that pre-existing depressive symptoms have the potential to drive youths' peer relationship difficulties.

Interpersonal theories of depression also acknowledge the possibility that family adversity and associated maladaptive relationship appraisals and social-behavior deficits disrupt peer relationships, which then create a proximal risk factor for depression. Indeed, researchers have found that aspects of youths' peer relations (e.g., low quality best friendships, peer

rejection, peer victimization; Eberhart & Hammen, 2006; Kiesner, 2002; Panak & Garber, 1992; Schwartz et al., 2005; Vernberg, 1990) play a role in the etiology of youths' depression. Results from this study do not reinforce these findings, which implies that further research is needed to clarify what aspects of youths' peer relations contribute to depression and the reasons for inconsistencies in findings across studies.

An Interpersonal Process Perspective

Evidence obtained in this study implies that youths' depressive symptoms are a precursor of peers' collective sentiments toward them and that this association is at least partially mediated by exposure to peer victimization. To be specific, our findings lend support for the following tenets: (a) youths' depressive symptoms contribute to their risk for peer victimization (see Snyder et al., 2003; Sweeting et al., 2006), and (b) peer victimization negatively skews group members' judgments of the victims' likeability (see Coie, 2004; Hymel, Wagner, & Butler, 1990). These tenets suggest that there is a sequence of social consequences for youth who experience depressive symptoms: Youth who exhibit depressive symptoms are more likely to develop interaction patterns in which they are abused by one or more peers (i.e., become the targets of peer victimization); in turn, as these abusive interactions occur and/or proliferate, victims lose social status within the wider peer group.

Evidence for the first pathway delineated in our mediation model (G4 depressive symptoms → G5 peer victimization) lends support to theoretical perspectives in which it has been argued that depressed youth (1) exhibit social-behavioral deficits that elicit negative responses from peers (Rudolph et al., 2008, Rudolph, 2009), (2) self-select into maladaptive relationships (Rudolph, 2009), and (3) exhibit depressive-linked behavioral styles (Harrington, 1993; Kennedy et al., 1989) that render them easy marks for victimization (see Olweus, 1978; Schwartz et al., 1993 Veenstra et al., 2007). The second link for which we obtained support (G5 peer victimization → G6 low peer acceptance) is likewise consistent with extant theory. Specifically, it is possible that victimization causes the peer group to take notice of youth who possess aversive characteristics and to view these youth as unlikable. As Coie (2004) suggested, it is likely that victimizing interactions are viewed by peers as evidence that the victim does not possess high status in the peer group and is not likeable; moreover, beginning in preadolescence—a period during which forging intimate friendships (Berndt, 1982) and establishing one's reputation within the peer group (Parker & Gottman, 1989) escalate in importance (Brown, Dolcini, & Leventhal, 1997)—youth might fail to accept their victimized peers because they are concerned with preserving their own social standing. For example, youth may report disliking their victimized peers as a way of deflecting bullies' attention and/or potential aggressive advances, establishing social ties with like-minded peers, and so on. Given that 4th grade peer victimization did not significantly predict 5th grade low peer acceptance but 5th grade peer victimization significantly predicted 6th grade low peer acceptance, findings from this study further suggest that youth in late preadolescence (4th through 5th grade) are only beginning to consider the potential social costs of interacting with victimized peers but, by early adolescence (5th through 6th grade), youth commonly regard victimized peers as risky persons with whom to affiliate (Coie, 2004).

Findings from this investigation imply that the association between depressive symptoms and subsequent peer acceptance is at least partially mediated by peer victimization, but alternate mediated pathways also may be operative. The significant pathway from 4th grade depressive symptoms to 5th grade low peer acceptance is consistent with the perspective that the contribution of depressive symptoms to low peer acceptance is not exclusively through the intervening role of victimization; rather, it is likely that depressive symptoms sometimes exert an influence on peer acceptance through other variables not assessed within the present

study. For example, future research is needed to investigate whether social-behavioral deficits (e.g., poor self-regulation, social disengagement, a negative self-focus; Rudolph, 2009) and depression-linked behaviors (e.g., withdrawal, fearfulness, passivity; Harrington, 1993; Kennedy et al., 1989) underlie the prospective associations between depressive symptoms and peer difficulties. Evidentiary support for such mechanisms would then enable researchers to explore whether differences in contextual factors (e.g., classroom-level variables) or the various types of depressive symptoms, social-behavioral deficits, or depression-linked behaviors exhibited by depressed youth tend to elicit specific types of peer reactions (e.g., low peer acceptance versus peer victimization). For example, youth might view withdrawal and passivity as innocuous relative to poor self-regulation and excessive self-focus, in which case the latter behaviors would seem more likely to precipitate peer victimization, an arguably more severe form of peer adversity. Studies should be undertaken to empirically examine these possibilities.

Limitations

The merits of this investigation are accompanied by certain limitations. First, future studies may benefit from complementing parent and/or teacher reports with self reports of depressive symptoms, particularly because certain depressive symptoms (e.g., feelings of worthlessness) are difficult to assess via adult informants. It may be the case, however, that behavioral symptoms that can be observed by peers, such as some of those studied here (e.g., cries a lot, lacks energy, overtired, complains of loneliness), or behaviors (e.g., withdrawal, excessive self-focus) that are driven by depressive symptoms, are more likely to undermine peer relationships than cognitive symptoms (e.g., feelings of worthlessness, inappropriate guilt) or affective symptoms (e.g., feeling sad), which may be less salient to peers.

Second, inferences with respect to the mediated model are limited to preadolescence through early adolescence; additional research is needed to examine whether similar processes apply in childhood and later adolescence. For example, it is possible that peer adversities would more strongly predict subsequent depressive symptoms during mid- to late- adolescence, as peer relationships take on heightened importance (Rudolph, 2009); thus, transactional associations among depressive symptoms, peer victimization, and peer acceptance may evolve over time. Third, the magnitude of the *a* path (from 4th grade depressive symptoms to 5th grade peer victimization) was .61 (a medium effect), which provides convincing support for the perspective that depressive symptoms forecasts peer relational difficulties; however, the modest effect sizes obtained for the final model's *b* path (from 5th grade peer victimization to 6th grade low peer acceptance) and the mediated effect suggest that evidence of mediation should be considered preliminary.

Conclusion

In sum, results from this investigation contribute to our understanding of the potential long-term consequences of youths' psychological dysfunction. More specifically, this study's findings imply that depression does not reflect a transient experience; rather, depressive symptoms leave a lasting scar that undermines the normative maturation of developmental skills and the achievement of key milestones (e.g., establishing healthy peer relationships). This process may fuel a self-perpetuating cycle of psychological dysfunction and peer adversity that forecasts increasing dysfunction across the life course.

These results also have important implications for prevention and early intervention efforts with depressed youth. In particular, they suggest that even subclinical levels of depressive symptoms can undermine the development of peer relationships and that intervention efforts

should be aimed at minimizing the adverse influence of depressive symptoms and associated deficits on these relationships.

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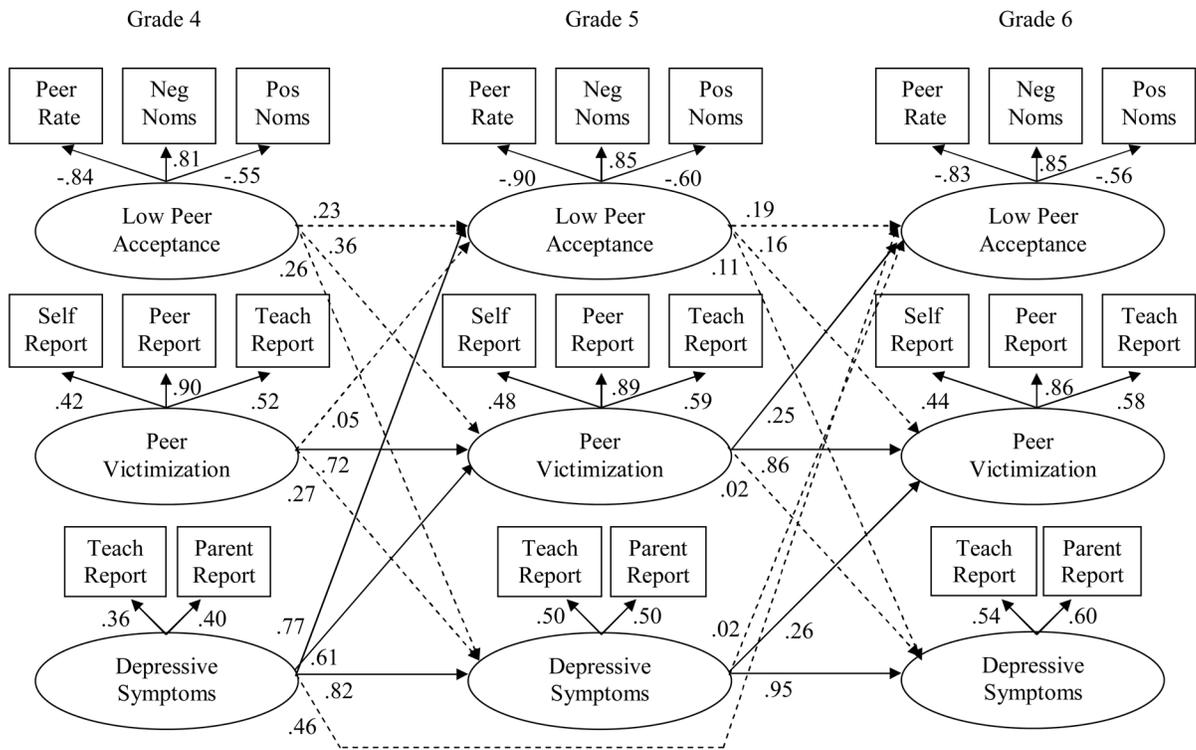


Figure 1. Standardized path coefficients for the final Mediation Model (Model 5). Dashed lines represent nonsignificant paths; all other paths are statistically significant at $p < .05$. Peer Rate = peer ratings. Neg Noms = negative nominations. Pos Noms = positive nominations. Teach Report = teacher report.

Table 1

Means, Standard Deviations, and Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	SD
1. G4 P-rat	--																							.01	.90
2. G5 P-rat	.57	--																						.07	.99
3. G6 P-rat	.53	.68	--																					.11	1.01
4. G4 P-nom	.62	.48	.42	--																				.05	.94
5. G5 P-nom	.36	.66	.51	.39	--																			-.06	.97
6. G6 P-nom	.35	.48	.69	.33	.48	--																		-.06	1.01
7. G4 N-nom	-.66	-.45	-.42	-.46	-.29	-.21	--																	.01	.96
8. G5 N-nom	-.52	-.74	-.56	-.38	-.40	-.33	.46	--																.13	1.06
9. G6 N-nom	-.46	-.58	-.68	-.31	-.37	-.41	.48	.62	--															.15	1.04
10. G4 S-vic	-.31	-.26	-.27	-.27	-.22	-.23	.32	.31	.33	--														1.95	.91
11. G5 S-vic	-.28	-.37	-.28	-.29	-.28	-.18	.26	.35	.34	.53	--													1.97	.88
12. G6 S-vic	-.16	-.17	-.21	-.12	-.15	-.18	.15	.17	.24	.33	.36	--												2.05	.87
13. G4 P-vic	-.57	-.42	-.42	-.39	-.27	-.26	.63	.48	.55	.48	.37	.17	--											.00	.98
14. G5 P-vic	-.49	-.66	-.55	-.37	-.42	-.35	.41	.71	.63	.36	.46	.23	.60	--										.18	1.15
15. G6 P-vic	-.45	-.53	-.60	-.30	-.34	-.36	.43	.49	.72	.35	.34	.25	.64	.71	--									.19	1.17
16. G4 T-vic	-.33	-.30	-.29	-.26	-.23	-.16	.33	.36	.29	.30	.25	.03	.44	.38	.36	--								1.18	.37
17. G5 T-vic	-.28	-.36	-.35	-.20	-.26	-.25	.29	.42	.41	.34	.38	.15	.35	.50	.47	.43	--							1.19	.37
18. G6 T-vic	-.36	-.34	-.40	-.22	-.21	-.30	.37	.33	.35	.24	.30	.21	.45	.42	.47	.41	.45	--						1.20	.35
19. G4 P-dep	-.17	-.22	-.23	-.15	-.14	-.15	.14	.22	.27	.19	.23	.06	.16	.16	.22	.15	.25	.21	--					1.16	.22
20. G5 P-dep	-.20	-.19	-.23	-.15	-.11	-.17	.12	.22	.27	.24	.27	.16	.22	.20	.32	.15	.16	.29	.51	--				1.17	.23
21. G6 P-dep	-.20	-.18	-.23	-.13	-.11	-.15	.14	.14	.29	.17	.15	.14	.24	.17	.34	.18	.17	.27	.45	.57	--			1.16	.22
22. G4 T-dep	-.28	-.26	-.31	-.18	-.24	-.26	.23	.17	.28	.20	.16	.09	.28	.17	.22	.48	.25	.32	.18	.13	.11	--		1.14	.26
23. G5 T-dep	-.25	-.26	-.27	-.22	-.21	-.20	.12	.24	.27	.22	.31	.16	.23	.27	.26	.22	.45	.26	.20	.30	.24	.26	--	1.14	.24
24. G6 T-dep	-.28	-.21	-.31	-.13	-.21	-.25	.20	.17	.23	.23	.23	.22	.26	.16	.27	.32	.30	.53	.24	.31	.33	.46	.32	1.16	.27

Note. G4 = 4th Grade, G5 = 5th Grade, G6 = 6th Grade, P-rat = peer ratings, P-nom = positive nominations, N-nom = negative nominations, S-vic = self report victimization, P-vic = peer report victimization, T-vic = teacher report victimization, P-dep = parent report depressive symptoms, T-dep = teacher report depressive symptoms. All correlations, except those in italics, are significant at $p < .05$. Coefficients in bold represent stabilities. Standardized mean scores and standard deviations are displayed in columns 24 and 25, respectively.

Table 2

Fit Statistics and Model Comparisons for Nested Structural Equation Models

Model	df	χ^2 ^a	CFI	RMSEA	SRMR	$\Delta\chi^2$ ^b	Δdf
1	226	543.43	.92	.05	.07	--	--
2	214	520.70	.92	.05	.06	26.45	12
3	212	430.63	.94	.05	.06	70.23	2
4	211	423.76	.95	.05	.06	3.96	1
5	209	393.91	.95	.04	.06	22.30	2

Notes. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. All difference tests were significant at $p < .05$.

^aSatorra-Bentler chi-square values.

^bCorrection factors were used to compute scaled chi-square difference tests (Crawford & Henry, 2003; Satorra & Bentler, 2001).

^cThe Satorra-Bentler chi-square test generated a negative scaled difference statistic; thus, standard chi square values were used to conduct a difference test.