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Preference-for-Solitude and Adjustment Difficulties in Early and Late Adolescence

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Social withdrawal has been associated with adjustment difficulties across development. Although much is known about shyness, little is known about preference-for-solitude; even less is known about its relations with adjustment across different periods of adolescence. We examined whether preference-for-solitude might be differentially associated with adjustment difficulties in early and late adolescence. Self- and parent-reports of withdrawal motivations and adjustment were collected from 234 eighth graders (113 boys; *M* age = 13.43) and 204 twelfth graders (91 boys; *M* age = 17.25). Results from structural equation modeling demonstrated that above and beyond the effects of shyness, preference-for-solitude was more strongly associated with adjustment difficulties in 8th grade than in 12th grade. Preference-for-solitude was associated with greater anxiety/depression, emotion dysregulation, and lower self-esteem in 8th grade; these relations were not found in 12th grade. Although preference-for-solitude was associated with lower social competence in both 8th and 12th grades, this relation was significantly stronger in 8th grade than in 12th grade. Findings suggest preference-for-solitude has closer ties to maladjustment in early adolescence than in late adolescence. Interventions targeting preferred-solitary youth in early adolescence may be particularly fruitful.

A significant number of adolescents struggle with psycho emotional difficulties; these difficulties come with considerable personal and societal costs (Wolfe & Mash, 2008). Social withdrawal, the behavior of consistently withdrawing oneself from the peer group (Rubin & Coplan, 2004), has been linked with such internalizing difficulties as anxiety and depression in childhood and adolescence (see Rubin & Coplan, 2010, for a review). Despite these findings, the risks associated with withdrawal may depend on the underlying motivations; different outcomes have been found for youth with differing combinations of social approach and social avoidance motivations (Bowker, Markovic, Cogswell, & Raja, 2012; Bowker & Raja, 2011; Thijs, Koomen, de Jong, van der Leij, & van Leeuwen, 2004). *Shyness* consists of high approach and high

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avoidance motivations (Asendorpf, 1990, 1993); shy youth are interested in interacting with others but withdraw because they are socially anxious. *Unsociability* consists of low approach and low-to-average avoidance motivations; though they do not actively avoid interacting with others, unsociable youth withdraw due to a preference for solitary activities. *Avoidance* consists of low approach and high avoidance motivations; in addition to a preference for solitary activities, avoidant youth also actively avoid others. Thus, in regards to approach motivation, both unsociability and avoidance are marked by low approach motivation or a preference for solitary activities. From this view, unsociability and avoidance fall under the broader construct of preference-for-solitude (see Figure 1).

Although shyness has been associated with maladjustment across development (Rubin & Coplan, 2010), little is known about the implications of preference-for-solitude for adjustment, particularly during adolescence. Of the limited research conducted, preference-for-solitude appears to be maladaptive in early adolescence. Marcoen and Goossens (1989) found that an affinity for aloneness was associated with loneliness and fewer intimate friends in early adolescence. Coplan et al. (2012) found that low approach motivation was associated with socially withdrawn behaviors in young adolescents, which in turn predicted peer difficulties. Bowker and colleagues (Bowker et al., 2011; Bowker & Raja, 2012) found that both unsociability and avoidance were associated with peer rejection in young adolescents. Because researchers have yet to examine preference-for-solitude beyond early adolescence, however, it is not known whether preference-for-solitude is maladaptive *across* adolescence. Given there are considerable developmental differences between early and late adolescence (Laursen & Collins, 2009), preference-for-solitude may be differentially associated with adjustment at these different time points.

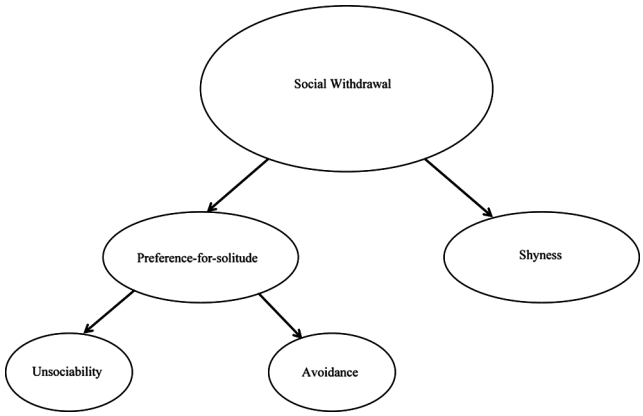

FIGURE 1 Conceptual model of preference-for-solitude.

Younger and older adolescents differ in the importance they place on solitude. In particular, solitude is viewed negatively in early adolescence— young adolescents find time alone aversive and hold negative views toward solitude and withdrawn behaviors (Larson, 1990; Rubin & Coplan, 2010). In contrast, solitude becomes more acceptable in late adolescence (Coplan & Weeks, 2010)—older adolescents not only spend more time alone compared with younger adolescents but also report such solitude as more positive and more important (Goossens & Marcoen, 1999; Larson, 1990).

These developmental differences may affect how preference-for-solitude relates to adjustment between early and late adolescence. Given the negative views of solitude in early adolescence, preferred-solitary youth may feel less self-assured when comparing themselves with their more sociable peers. Indeed, although little is known about the self-perceptions of preferred-solitary youth, shy youth have been found to report lower self-perceptions than non-shy youth during early adolescence (Rubin, Bowker, & Gazelle, 2010). As well, given the negative perceptions of solitude in early adolescence, young adolescents who prefer solitude may also be at risk for peer maltreatment and subsequent maladjustment (Rubin et al., 2009). Indeed, preference-for-solitude has been associated with peer difficulties in early adolescence (Bowker & Raja, 2011; Coplan et al., 2012).

In contrast, because solitude becomes more salient and normative in late adolescence (Coplan & Weeks, 2010), preference-for-solitude may be less associated with peer maltreatment and subsequent maladjustment during this period. Indeed, Freeman, Csikszentmihalyi, and Larson (1986) asked adolescents to rate changes in their affective states over the previous years. They found that older adolescents not only reported an increased need and desire to be alone but also reported solitude as less socially stigmatizing and less alienating than they had before. Similar results have been found in other studies (Goossens & Marcoen, 1999; Larson, 1990). Although these developmental possibilities provide important insights for understanding adolescent psychopathology, they remain to be empirically substantiated.

Given the aforementioned gaps in research, the overall goal of this study was to examine the unique relations between preference-for-solitude and psychoemotional adjustment in early and late adolescence. Specifically, because shyness has been strongly associated with internalizing difficulties across development (Rubin & Coplan, 2010), we examined the unique contribution of preference-for-solitude to internalizing difficulties (anxiety/depression, emotion dysregulation, social competence, and self-esteem) across adolescence. We hypothesized that (a) preference-for-solitude would

emerge as a distinct construct from shyness across adolescence and (b) preference-for-solitude would be more strongly associated with internalizing difficulties above and beyond the effects of shyness for younger adolescents (8th graders) than for older adolescents (12th graders). Given it is currently unknown whether all youth who prefer solitude across adolescence might benefit from or even require intervention, our results would provide much-needed knowledge on the heterogeneity of withdrawal.

METHOD

Participants

The sample consisted of 234 eighth graders (113 boys; *M* age = 13.43) and 204 twelfth graders (91 boys; *M* age = 17.25) from public middle and high schools in the greater Washington, DC, area. The sample was ethnically diverse, with 53.9% of the adolescents self-identifying as European American, 15.9% as African American, 13.3% as Asian, 11.4% as Latino/a, and 5.5% as bi- or multiracial.

Available demographic information classified the majority of the sample as middle to upper-middle class. Statistical comparisons (analysis of variance) did not reveal significant grade differences in socioeconomic status or gender.

Procedure

Across 8th and 12th grades, data were collected during the spring (April–June) of the school year. Participants were first contacted by telephone; if both parents and adolescents expressed interest, an informational letter, parental consent form, and adolescent assent form were mailed to the home (consent rate = 84%).

Depending on participant preference, packets of questionnaires were mailed home (87% of the sample) or a link to a secure website was sent via e-mail (13% of the sample). Statistical comparisons (analysis of variance) did not reveal significant demographic differences or differences in any of the study variables among participants who completed the questionnaires in these different contexts.

Measures

Preference-for-solitude and shyness. Preference-for-solitude and shyness were measured using items on the Social Withdrawal Scale (SWS; Terrell-Deutsch, 1999) and the Youth Self Report (YSR; Achenbach & Rescorla, 2001). The SWS is a self-report of withdrawal on a scale that ranges from 0 (*not at all true*) to 5 (*always true*). The YSR is a self-report of youth adjustment on a scale that ranges from 0 (*not true*) to 2 (*very often true*). Items were standardized and subjected to exploratory factor analyses separately in the 8th and 12th grades (see the Results section).

Preference-for-solitude consisted of 4 item indicators (three SWS items and one YSR item; "I like spending time alone more than being with other kids," "I would rather be with other kids than be alone" [reversed], "I spend time alone because I want to be alone more than I want to be with other kids," and "I would rather be alone than with others"). Internal reliability was acceptable ($\alpha = 0.72$, 8th grade; $\alpha = 0.79$, 12th grade).

Shyness consisted of a scale indicator (two SWS items and one YSR item; "I am shy," "I spend time alone because I want to be with other kids but I don't because I'm too shy or afraid," and "I am too timid or shy"). Internal reliability was acceptable ($\alpha = 0.76$, 8th grade; $\alpha = 0.75$, 12th grade).

Anxiety/depression. Anxiety/depression was measured using established subscales from the YSR (Achenbach & Rescorla, 2001) and the Child Behavioral Checklist (CBCL; Achenbach & Rescorla, 2001). The CBCL is a parent-report measure, similar to the YSR, that assesses youth adjustment on a scale that ranges from 0 (*not true*) to 2 (*very often true*).

The anxiety/depression consisted of a self-report scale indicator (12 YSR items: e.g., "I cry a lot," "I feel worthless or inferior," "I am nervous or tense," "I worry a lot") with good internal reliability ($\alpha = 0.82$, 8th grade; $\alpha = 0.84$, 12th grade) and a parent-report scale indicator (12 CBCL items: e.g., "My child cries a lot," "My child feels worthless or inferior," "My child is nervous, high strung, or tense," "My child worries") with good internal reliability ($\alpha = 0.80$, 8th grade; $\alpha = 0.78$, 12th grade).

Emotion dysregulation. Emotion dysregulation consisted of three CBCL item indicators ("My child tends to be emotional," "My child reacts intensely when upset," and "My child gets upset easily"). Internal reliability was acceptable ($\alpha = 0.72$, 8th grade; $\alpha = 0.86$, 12th grade).

Social competence and self-esteem. Social competence and self-esteem were measured using the Self-Perception Profile for Adolescents (SPPA; Harter, 1988) in 8th grade and the Self Perception Profile for College Students (SPPCS; Neemann & Harter, 1986) in 12th grade. The SPPA and the SPPCS assess youth' self-perceptions self-esteem; only similarly worded items

between SPPA and SPPC were used to ensure measurement invariance across grades.

Social competence consisted of two item indicators drawn from the Social Competence subscales of the SPPA and the SPPCS (''Able to make friends easily'' and ''Feel socially accepted by many''). Internal reliability was acceptable ($\alpha = 0.70$, 8th grade; $\alpha = 0.67$, 12th grade) for measures consisting of two items (Burisch, 1997).

Self-esteem consisted of five item indicators drawn from the Global Self-Worth subscales of the SPPA and the SPPCS (''Like the kind of person they are,'' ''Like the way they are leading their lives,'' ''Pleased with themselves,'' ''Happy being the way they are,'' and ''Usually satisfied with themselves''). Internal reliability was acceptable ($\alpha = 0.85$, 8th grade; $\alpha = 0.84$, 12th grade).

Plan of Analysis

To assess whether there were gender or ethnic group differences in the relations between preference-for-solitude and outcomes, several multigroup structural equation modeling analyses were conducted within Mplus 7 (Muthén & Muthén, 1998–2010). Results did not differ as a function of gender or ethnicity, so each was omitted from the final model. There were no statistically significant grade differences in variance across all latent constructs.

To address our research question of whether preference-for-solitude would be more strongly associated with outcomes in early than late adolescence, a measurement model of indicators to latent factors was first tested, followed by a structural model testing the relations of interest (with shyness as a control variable). This two-phase approach represents an optimal way to ensure data-model fit (Anderson & Gerbing, 1988; Hancock & Mueller, 2006). Comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square (SRMR) were used for model-fit assessments. Model-fit comparisons were conducted using a chi-square difference test.

On average, 0.0 to 7.1% of the data were missing across all variables; Little's MCAR test (Little & Rubin, 1987) revealed that these data were missing completely at random. Full information maximum likelihood was used to address missingness; this procedure is a robust and accurate estimator of results in small samples (Hancock & Mueller, 2006).

RESULTS

Preliminary Factor Analyses

Descriptives are presented in Table 1. To examine whether preference-for-solitude could be distinguished from shyness in early and late adolescence, scores on the SWS and YSR items were first standardized and subjected to exploratory factor analyses using principal-axis factoring with oblique rotation (due to the anticipation of factor intercorrelations; Preacher & MacCallum, 2003) separately in the 8th and 12th grades. Table 2 shows that a two-factor solution was the most appropriate in both grades, providing evidence that shyness and preference-for-solitude were related but unique constructs.

Next, to examine the structural validity of this two-factor model, we conducted separate confirmatory factor analyses comparing the two-factor model with the one-factor model within each grade. The one-factor model exhibited significantly poorer fit compared with the two-factor model in both the 8th grade, $\Delta\chi^2(1) = 74.32$, $p < .001$, and 12th grade, $\Delta\chi^2(1) = 90.53$, $p < .001$, providing further evidence of shyness and preference-for-solitude as unique dimensions of withdrawal.

TABLE 1
Estimated Means, Variance, and Correlations for All Latent Constructs

	M	*Variance*	*Preference-for-Solitude*	*Shyness*	*Anxiety/Depression*	*Emotion Dysregulation*	*Social Competence*
Preference-for-Solitude	.12 (8th)	.24 (8th)					
	.28 (12th)	.53 (12th)					
Shyness	.18 (8th)	.36 (8th)	.52 (8th)				
	.41 (12th)	.57 (12th)	.47 (12th)				
Anxiety/Depression	.85 (8th)	.35 (8th)	.76 (8th)	.59 (8th)			
	.88 (12th)	.41 (12th)	.14 (12th)	.37 (12th)			
Emotion Dysregulation	.03 (8th)	.14 (8th)	.35 (8th)	.21 (8th)	.61 (8th)		
	.27 (12th)	.30 (12th)	.14 (12th)	.11 (12th)	.56 (12th)		
Social Competence	−.46 (8th)	.32 (8th)	−.63 (8th)	−.62 (8th)	−.43 (8th)	−.34 (8th)	
	−.59 (12th)	.29 (12th)	−.46 (12th)	−.53 (12th)	−.21 (12th)	−.17 (12th)	
Self-Esteem	−.36 (8th)	.33 (8th)	−.43 (8th)	−.41 (8th)	−.46 (8th)	−.32 (8th)	.66 (8th)
	−.40 (12th)	.25 (12th)	−.24 (12th)	−.25 (12th)	−.16 (12th)	−.21 (12th)	.64 (12th)

Note: $N = 234$ 8th graders, 204 12th graders. All correlations were significant at $p < .05$.

TABLE 2
Results of Principal Axis Factor Analysis of the Preference-for-Solitude and Shyness Items in 8th grade ($N = 234$) and 12th grade ($N = 204$)

	Factor			
Items	*PFS (8th)*	*Shy (8th)*	*PFS (12th)*	*Shy (12th)*
Want to be alone more than with other kids	.67*	−.13	.79*	−.03
Like spending time alone more with other kids	.82*	−.09	.82*	−.11
Would rather be with other kids than alone (R)	.83*	.24	.77*	−.05
Would rather be alone than with others	.62*	−.20	.80*	−.04
Want to be with other kids but too shy/afraid	.20	−.72*	−.05	−.79*
I am very shy	−.08	−.89*	.01	−.89*
I am too shy or timid	.01	−.84*	.07	−.79*

Note: Factor analysis was calculated using principal axis factor analysis with promax/oblique rotation. PFS = preference-for-solitude; Shy = shyness; R = reverse scored.
*Primary loadings.

Finally, to examine the structural validity of the outcome model, we conducted separate confirmatory factor analyses comparing a one-factor model, in which items describing anxiety/depression, emotion dysregulation, self-esteem, and social competence all loaded onto one factor, with a four-factor model, in which items for each variable loaded onto separate factors. The one-factor model exhibited significantly poorer fit compared with the four-factor model in both the 8th grade, $\Delta\chi^2(8) = 160.61$, $p < .001$, and 12th grade, $\Delta\chi^2(8) = 495.31$, $p < .001$, providing support for the distinctiveness of these internalizing indices.

Measurement Models

To evaluate measurement equivalency between 8th and 12th grades, multiple-group confirmatory factor analyses were conducted. Freely estimated and constrained confirmatory factor analyses were compared using the chi-square difference criterion. The constrained measurement model exhibited adequate fit, $\chi^2(226) = 400.03$, RMSEA =.06, CFI =.95; all loadings were significant and exhibited the same pattern across both groups, demonstrating evidence of measurement equivalence across the two grades.

Construct reliability was assessed with Hancock's H (Hancock & Mueller, 2001), an index of latent construct reliability that is psychometrically stronger than traditional reliability indices (Hancock & Mueller, 2006). All latent constructs were reliable in both grades ($H > 0.75$).

Structural Equation Models of Preference-for-solitude to Psychoemotional Adjustment across Adolescence

Structural equation models tested whether preference-for-solitude would be more strongly associated with adjustment difficulties in 8th grade than in 12th grade. In all models, shyness was included as a control variable, with direct paths to preference-for-solitude and to all outcomes. In both grades, shyness was significantly associated with preference-for-solitude ($r = .52$, 8th grade; $r = .47$, 12th grade), anxiety/depression ($\beta = .59$, 8th grade; $\beta = .37$, 12th grade), emotion dysregulation ($\beta = .21$, 8th grade; $\beta = .11$, 12th grade), social competence ($\beta = -.62$, 8th grade; $\beta = -.53$, 12th grade), and self-esteem ($\beta = -.41$, 8th grade; $\beta = -.25$, 12th grade) at $p < .05$. There were no statistically significant grade differences in the magnitude of relations from shyness to any of the outcomes. Because the focus of this study was on the unique associations between preference-for-solitude and adjustment, over and above associations with shyness, shyness was included in all models as a control variable.

First, to examine the effects of preference-for-solitude, direct paths from preference-for-solitude to all outcomes were specified within each grade; this initial structural model exhibited adequate fit (Table 3).

Second, to test whether the relations between preference-for-solitude and outcomes differed between younger and older adolescents, all direct paths from preference-for-solitude to outcomes were constrained to be equal across grades. This constrained model exhibited significantly poorer fit compared with the initial unconstrained model, $\Delta\chi^2(5) = 17.21$, $p < .01$, suggesting preference-for-solitude was differentially associated with adjustment in 8th and 12th grades.

Third, to identify path differences between the two grades, path constraints from preference-for-solitude to outcomes were released sequentially based on information from the modification indices. First, the preference-for-solitude to self-esteem constraint was released; this resulted in a statistically significant model improvement $\Delta\chi^2(1) = 5.24$, $p < .05$, suggesting that preference-for-solitude was differentially associated with

TABLE 3
Summary of Data Model Fit Statistics

Model	χ^2	*df*	*CFI*	*RMSEA*	*SRMR*
Measurement Model	400.03	226	.95	.056	.073
Initial Structural Model	405.71	230	.95	.056	.073
First Structural Model (With All Paths Constrained)	422.92	234	.94	.058	.088
Second Structural Model (with PFS-Self-Esteem Constraint Released)	417.68	233	.94	.058	.085
Third Structural Model (with PFS-Social Competence Constraint Released)	413.54	232	.95	.057	.081
Fourth Structural Model (with PFS-Anxiety/Depression Constraint Released)	409.57	231	.95	.057	.078
Final Structural Model (With PFS- Emotion Dysregulation Constraint Released)	405.71	230	.95	.056	.073

Note: $N = 234$ 8th graders, 204 12th graders. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square; PFS = preference-for-solitude.

self-esteem for younger versus older adolescents. Second, the preference-for-solitude to social competence constraint was released; this resulted in a statistically significant model improvement, $\Delta\chi^2(1) = 4.14$, $p < .05$, suggesting that preference-for-solitude was differentially associated with social competence for younger versus older adolescents. Third, the preference-for-solitude to anxiety/depression constraint was released; this resulted in a significant model improvement, $\Delta\chi^2 = 3.97$, $p < .05$, suggesting that preference-for-solitude was differentially associated with anxiety/depression for younger versus older adolescents. Finally, the preference-for-solitude to emotion dysregulation constraint was released; this resulted in a significant model improvement, $\Delta\chi^2 = 3.86$, $p \leq .05$, suggesting preference-for-solitude was differentially associated with emotion dysregulation for younger versus older adolescents.

To explore the possibility of peer rejection as a confounder, we controlled for peer rejection (as measured via peer nominations; see Wojslawowicz, Rubin, Burgess, Rose-Krasnor, & Booth-LaForce, 2006) in the 8th-grade model. These additional analyses yielded results very similar to the original results for 8th graders: preference-for-solitude was still associated with all indices of maladjustment even after controlling for peer rejection. Given peer rejection was not the main research focus, and because we did not have peer rejection data in 12th grade, these analyses were not included.

Summary of Results

The final structural model exhibited adequate fit (Table 3). Figure 2 demonstrates that, above and beyond the effects of shyness, preference-for-solitude was more strongly associated with adjustment difficulties for younger adolescents than for older adolescents. Whereas preference-for-solitude was significantly associated with greater anxiety/depression and emotion dysregulation and lower self-esteem in 8th grade, it was not associated with these outcomes in 12th grade. In addition, although preference-for-solitude was significantly associated with lower social competence in both 8th and 12th grades, this relation was significantly stronger in 8th grade compared with 12th grade.

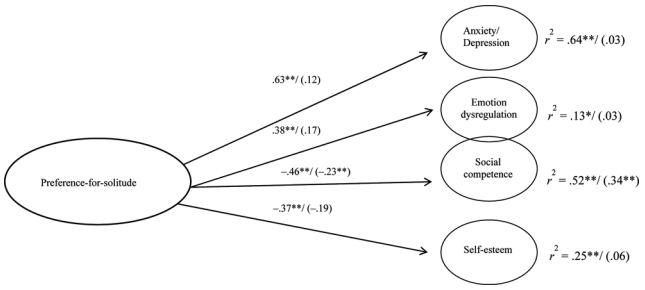

FIGURE 2 Unique associations between preference-for-solitude and adjustment in 8th grade ($N = 234$) and 12th grade ($N = 204$). *Note:* Paths between shyness and preference-for-solitude and from shyness to anxiety/depression, emotion dysregulation, social competence, and self-esteem were included in the model but were omitted from the figure to improve clarity. $^*p < .05$. $^{**}p < .01$.

DISCUSSION

Using a racially diverse sample, we examined whether preference-for-solitude would be differentially associated with psychoemotional adjustment above and beyond the effects of shyness in early and late adolescence. Several findings stand out. First, as hypothesized and consistent with previous research (Bowker & Raja, 2011; Coplan et al., 2012; Nelson, 2012), preference-for-solitude and shyness emerged as related but unique dimensions of withdrawal. These findings further demonstrate that there are several "faces" to withdrawal across development (Rubin & Mills, 1988)—whereas some youth spend time alone because they are conflicted

about approaching others, others spend time alone because they desire to be alone.

Second, as hypothesized, we found that preference-for-solitude was more strongly associated with maladjustment for younger adolescents than for older adolescents, even after controlling for shyness. Specifically, although preference-for-solitude was associated with greater anxiety/depression and emotion dysregulation as well as lower self-esteem in 8th grade, it was not associated with these difficulties in 12th grade. Preference-for-solitude was also more strongly associated with lower social competence in 8th grade than in 12th grade. Indeed, the magnitude of relations between preference-for-solitude and all adjustment outcomes were significantly stronger in 8th grade relative to 12th grade, suggesting preference-for-solitude may be particularly maladaptive in early adolescence.

Several explanations exist for why the strength of associations between preference-for-solitude and adjustment difficulties might decrease with age. Because withdrawal is viewed negatively in early adolescence (Marcoen & Goossens, 1989; Rubin et al., 2009), preferred-solitary young adolescents may internalize peers' negative views of withdrawal and come to feel negatively about themselves, particularly if they are also victimized. Indeed, shy youth who are frequently victimized experience adjustment difficulties across development (Rubin & Coplan, 2010). In addition, as cliques and crowds become prominent sources of influence in early adolescence (Veenstra & Dijkstra, 2011), the need to belong begins to take increased importance during this period. Given withdrawn youth are often not members of peer groups (Rubin & Coplan, 2010), preferred-solitary youth may feel particularly alienated in early adolescence. Indeed, withdrawn young adolescents report greater loneliness and lower self-perceptions compared with their nonwithdrawn peers (Bowker & Raja, 2011; Marcoen & Goossens, 1989; Rubin & Coplan, 2010).

In contrast, given the need for solitude increases across adolescence (Larson, 1990), preference-for-solitude may be less associated with peer maltreatment and subsequent maladjustment in late adolescence. Indeed, youth view solitude as less socially stigmatizing and less aversive as they approach late adolescence (Freeman et al., 1986; Goossens & Marcoen, 1999). In addition, given that older adolescents are generally granted more independence and behavioral autonomy than younger adolescents (Laursen & Collins, 2009), preferred-solitary older adolescents may have more freedom to enjoy solitude (e.g., go to places alone without company), possibly contributing to greater well-being. Because this is the first study on preference-for-solitude in late adolescence, further studies are needed to explore these possibilities.

Despite these different age-related findings, preference-for-solitude was associated with lower perceived social competence in both 8th and 12th grades. This suggests that, regardless of age, preferred-solitary youth may feel negatively about their social competence across adolescence. By consistently withdrawing from social interactions, preferred-solitary adolescents may miss out on important opportunities to learn social skills. Indeed, scholars have long posited the significance of peer interaction for social skills development (Hartup & Laursen, 1999; Rubin et al., 2009). Future longitudinal research is needed to better understand the relations between preference-for-solitude, social skills, and adjustment across development. Although we found that preference-for-solitude was less maladaptive in late adolescence than early adolescence, the relation between preference-for-solitude and adjustment may be nonlinear over time. For instance, given the new social demands of adulthood (e.g., adjusting to college; establishing romantic relationships), preference-for-solitude may become increasingly maladaptive as adolescents enter adulthood. From this view, preference-for-solitude may be maladaptive in early adolescence, decreasingly maladaptive in late adolescence, and increasingly maladaptive once again in adulthood. These possibilities remain to be explored.

Several limitations are worth noting. Due to the cross-sectional nature of our data and because our analyses tested only for associative (e.g., predictive) relations among constructs, results should be viewed as temporally descriptive rather than causal. Individual trajectories of social withdrawal have been documented (Booth-LaForce & Oxford, 2008; Oh et al., 2008); it remains to be seen if similar patterns will emerge for preference-for-solitude. In addition, given the central focus of this study was on the broader construct of preference-for-solitude rather than the different motivations behind such preference (e.g., social avoidance motivations), unsociability and avoidance could not be differentiated. Indeed, some of our preference-for-solitude items overlap with some of the avoidance items in previous studies (Bowker & Raja, 2011). Future research is needed to distinguish between these different dimensions of preference-for-solitude across development. Unsociability has been shown to be less associated with maladjustment than has avoidance in early adolescence and adulthood (Bowker & Raja, 2011; Coplan et al., 2012; Nelson, 2012). Whether such relations also hold true in late adolescence and whether such relations differ between distinct development periods remain to be examined.

Moreover, given psychoemotional adjustment (e.g., internalizing difficulties) was the only type of adjustment examined in this study, it is not known how preference-for-solitude might have contributed to other types of adjustment across adolescence. Indeed, although we speculated preference-for-solitude may be differentially associated with peer difficulties in early

and late adolescence, future research is needed to confirm these speculations. It remains to be seen whether preference-for-solitude is indeed less associated with peer difficulties in late adolescence compared with early adolescence, and whether such differences might moderate or mediate the relations between preference-for-solitude and adjustment. As well, given peer difficulties contribute to withdrawal (Rubin & Coplan, 2010), it also remains to be seen whether prior negative peer experiences might lead to later preference-for-solitude. Indeed, peer rejection and victimization may cause youth to voluntarily choose solitude. Similarly, although additional exploratory analyses in this study demonstrated that preference-for-solitude was still associated with all indices of maladjustment above and beyond the effects of peer rejection for eighth graders, future research that controls for such negative peer experiences in a longitudinal framework would provide more clarity to the conceptualization of preference-for-solitude and its implications across development.

Limitations notwithstanding, this study provides several insights for youth intervention and prevention efforts. In light of our findings that preference-for-solitude was more maladaptive in early adolescence than in late adolescence, interpersonal and cognitive-behavioral interventions that focus on social skills and behavioral training (Kaslow, McClure, & Connell, 2002) may prove particularly helpful for preferred-solitary youth in early adolescence. Because decreased peer influence is thought to lessen the negative consequences of preference-for-solitude in late adolescence, techniques that address the level of regard youth place on peers may also prove fruitful. Indeed, Wang, McDonald, Rubin, and Laursen (2012) found that peer rejection was most associated with maladjustment for young adolescents who highly valued social acceptance. As well, because the increased salience of solitude is thought to lessen the negative consequences of preference-for-solitude in late adolescence, interventions that alter youths' attitudes about solitude and those that foster "solitude skills" (see Galanaki, 2005, for a review) may also prove fruitful for young adolescents who prefer solitude.

In light of our findings that preference-for-solitude was associated with lower social competence across adolescence, social skills interventions may prove fruitful for both younger and older adolescents who prefer solitude. Such interventions may be particularly warranted given social competence is significantly associated with a variety of adjustment outcomes across development (Rubin et al., 2009).

Taken together, our study suggests that a balance of solitude and social interactions might prove fruitful for adaptive development during adolescence. Caregivers and educators should encourage adolescents to balance both time alone and time spent with others so that youth do not place too much emphasis on one at the expense of the other. Given that the need for connectedness and the need for autonomy underlie what it means to be human, the sooner youth learn to balance such needs, the more likely they will be able to flourish across development.

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Psychometric Properties of the Network Relationship Inventory-Social Provision Version in Chinese Youth

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ORIGINAL ARTICLE

Psychometric Properties of the Network Relationship Inventory-Social Provision Version in Chinese Youth

Jennifer M. Wang

Abstract Given the lack of psychometric research on friendship measures in non-Western countries, this study examined the psychometric properties of the Chinese version of the network relationship inventory-social provision version (NRI-SPV-C) in a sample of 200 young adolescents living in China (91 boys; *M* age = 13.21 years). Results from confirmatory factor analysis demonstrated that a hierarchical structure model with two second-order factors (Social Support, Negative Interactions) and nine first-order factors (Companionship, Intimacy, Instrumental Aid, Nurturance, Affection, Admiration, Reliable Alliance, Conflict, and Antagonism) was the best-fitting model. High internal consistency and high construct reliability were found for all factors. Girls reported higher levels of Social Support compared with boys, though no gender differences emerged for Negative Interactions. Social Support was positively associated with youth's friendship satisfaction (Satisfaction), whereas Negative Interactions was negatively associated with Satisfaction. Findings suggest the NRI-SPV-C may be a fruitful measure for assessing youth's friendship quality in China.

Keywords Adolescents · Friendship quality · Chinese adolescents · Psychometric · Factor structure · Network relationship inventory

Introduction

The significance of friendship is well acknowledged in developmental literature [1]; friendship plays a significant role in the lives of youth across development. *Friendship quality*, the combination of positive and negative features in a friendship [2], is particularly relevant to youth's adjustment. Research has shown that high-quality friendship protects youth from the consequences of negative family and peer experiences [1, 2]. Perceptions of high-quality friendship are also associated with indices of well-being like higher self-esteem and lower anxiety and depression [1–3].

Whereas high-quality friendships are characterized by socially supportive features like validation and intimacy, low-quality friendships are characterized by relationship-straining features like conflict and antagonism [1, 2]. Consistent with these views, researchers typically measure friendship quality during development by asking youth about the prevalence of positive and negative features in their friendships [1, 4, 5].

The network relationships inventory-social provision version (NRI-SPV) [5]—one of the most utilized measures of relationship quality across development and cultures [6]—asks youth to rate the extent to which their relationships with different social network members (e.g., parents, best friends) are characterized by positive, socially supportive features (Affection, Reliable Alliance, Enhancement of Worth, Intimacy, Instrumental Help, Companionship, and Nurturance) and negative, relationship-straining features (Conflict and Antagonism). Evidence of reliability and validity for the NRI-SPV has been demonstrated in Western countries. Using a sample of North American youth, Furman and Buhrmester [5] found that all nine features of friendship (Affection, Reliable Alliance, Enhancement of Worth, Intimacy, Instrumental Help, Companionship, Nurturance, Conflict, and Antagonism) were internally consistent and reliable (average $\alpha = .80$), and that these factors further loaded onto two distinct higher-order or second-order

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factors: (a) Social Support, which comprises Affection, Reliable Alliance, Enhancement of Worth, Intimacy, Instrumental Help, Companionship, and Nurturance, and (b) Negative Interactions, which comprises Conflict and Antagonism. Other studies with North American youth have found similar support for this hierarchical structure model [6–8].

Although the NRI-SPV appears adequate for assessing friendship quality in North American youth, little is known about its psychometric properties in youth living in non-Western countries. Indeed, the only published psychometric research on the NRI-SPV to date was conducted with North American adolescents over a decade ago [6]. Accordingly, despite being used by over 900 developmental researchers from across the world [4, 9], little is known about whether the NRI-SPV is indeed suitable for assessing youth's friendship quality in non-Western countries. Given the majority of the world's youth do not live in Westernized countries and because friendship plays a significant role in youth's socioemotional and psychological adjustment across cultures [1–3], this lack of research remains to be addressed.

To address this gap in research, this study examined the psychometric properties of the NRI-SPV in young adolescents living in China. More specifically, this study examined: (a) the factor structure, (b) internal consistency and reliability, and (c) variable intercorrelations of the Chinese version of the NRI-SPV (NRI-SPV-C). Additionally, this study examined how the NRI-SPV-C factors of Social Support and Negative Interactions relate to Chinese youth's satisfaction with their friendships (Satisfaction).

Given that social relationships are conceptualized and regulated by the norms and values of culture [10], examining the NRI-SPV in China provides an ideal opportunity to examine how cultural differences in norms and values might influence the mechanisms of friendship in youth. In particular, whereas Western cultures like the U.S. are biased toward individualistic values like self-expression and independence, Eastern cultures like China are more characterized by collectivistic values like group-harmony and interdependence [10]. Indeed, China appears to be one of the most collectivistic and least individualistic countries [11]. These differences in cultural norms and values may affect the manifestation of friendships as well as how certain phenomena (e.g., intimacy) are expected and displayed within these relationships across different cultures. Understanding the mechanisms of friendship in China, then, may help elucidate critically important distinctions between culture-specific and culture-general forms of social relationships and help contribute to a more global understanding of friendship and its implications for youth's adjustment across development.

Method

Participants

200 Chinese young adolescents (91 boys; *M* age = 13.21 years; *SD* = .72) attending a public middle school in Beijing, China, participated in this study (consent rate = 100 %). 100 % of the participants were Han Chinese, the predominant ethnic group in China. All participants were developmentally normal and attended regular classrooms. The percentage of youth from two-parent families was 85 %. Available demographic information classified the majority of the participants as middle to upper-middle class.

Procedure

Data were collected during the Spring school semester (April–June). Participants were first contacted by telephone; if both parents and adolescents expressed interest, IRB-approved parental consent and adolescent assent forms were mailed to the home with pre-addressed and stamped return envelopes, along with NRI-SPV-C.

Chinese Version of the NRI-SPV (NRI-SPV-C)

The original NRI-SPV [5] assesses the quality of youth's relationship with their mothers, fathers, and friends. Youth's friendship quality was of interest in this study. Participants rated their relationships with their best friends based on 27 items, using a scale ranging from 1 ("none/not at all") to 5 ("very much/almost always"). The items form nine conceptually distinct first-order factors that further load onto two higher-order or second-order factors: (a) Social Support (Affection, Reliable Alliance, Enhancement of Worth, Intimacy, Instrumental Help, Companionship, and Nurturance) and (b) Negative Interactions (Conflict and Antagonism).

In addition to assessing youth's friendship quality, the NRI-SPV [5] also assesses youth's satisfaction with these relationships (Satisfaction). Participants rated their satisfaction with their best friends based on three items (e.g., "How satisfied are you with your relationship with this person?"), using a scale ranging from 1 ("none/not at all") to 5 ("very much/almost always").

Several members of the research team who were fluent in both English and Mandarin translated the original NRI-SPV using the standard forward and backward methods [12]. A variety of formal and informal strategies (e.g., interviews with youth, psychometric analysis) were also used to maximize the reliability and validity of the NRI-SPV-C.

Results

Preliminary Analyses and Descriptive Information

Table 1 contains the means and standard deviations of the NRI-SPV-C scale scores. Skewness and kurtosis values were within the acceptable range of univariate normality (e.g., skewness <2; kurtosis <7) for all scales [13]. Results from independent samples t tests demonstrated several gender differences between the scales. Compared to boys, girls scored significantly higher on Intimacy, Affection, Nurturance, and Social Support. No other gender differences were found. These results are consistent with past research with North American youth that demonstrated higher friendship quality among girls relative to boys [1–3, 6].

Internal Consistency and Reliability

To examine the internal consistency of the NRI-SPV-C, Cronbach's alpha coefficients were calculated for all factors. Table 2 demonstrates strong internal consistency for the two second-order factors (Social Support: $\alpha = .90$, Negative Interactions: $\alpha = .85$), and acceptable internal consistency for all nine first-order factors ($\alpha = .70$–$.85$). These results are similar to those obtained from past studies with North American youth [5, 6, 9].

To further examine the construct reliability of the NRI-SPV-C, coefficient H [14], a reliability index for latent factors, was calculated across all factors. Table 2 shows high H coefficients ($H = .73$–$.97$) across all factors.

Factor Structure

To examine the factor structure of the NRI-SPV-C, several confirmatory factor analysis (CFA) models were constructed within Mplus 7 [15] based on established guidelines [13].

First, a hierarchical structure model was examined with the entire sample (Fig. 1). In this hierarchical structure model, the NRI-SPV-C scale items loaded onto nine first-order factors (Affection, Admiration, Intimacy, Companionship, Reliable Alliance, Instrumental Aid, Nurturance, Conflict, and Antagonism), and these nine first-order factors further loaded onto two second-order factors (Social Support, Negative Interactions). Results demonstrated good model-fit for this model ($\chi^2 = 463.09$, $df = 314$; RMSEA = .05; SRMR = .06; CFI = .94). Table 3 demonstrates that all items loaded highly (average = .65–.77) onto their appropriate first-order factors, and that all first-order factors loaded highly (.80–.97) onto their appropriate second-order factors. Goodness of model-fit for this hierarchical structure model was also verified by the absence of large modification indices and standardized residuals, indicating no focal areas of ill fit in the solution [13].

Next, to further test the structural validity of the hierarchical structure model, this model was compared with several other competing models: (a) a model in which there were no first-order factors, and items loaded directly onto the two second-order factors (Second-order only model;

Table 1 Means and standard deviations for the NRI-SPV-C by sex

	Mean		SD	
	Boys	Girls	Boys	Girls
First-order factors				
Affection	3.47*	3.91*	.88	.78
Admiration	3.54	3.61	.86	.78
Intimacy	3.51*	3.83*	.93	.88
Companionship	3.80	4.03	.87	.70
Reliable alliance	4.00	4.20	.88	.79
Instrumental aid	3.57	3.61	.84	.70
Nurturance	3.47*	3.78*	.81	.67
Conflict	2.31	2.09	.86	.76
Antagonism	2.13	2.07	.86	.79
Second-order factors				
Social support	3.62*	3.85*	.72	.58
Negative interactions	2.22	2.08	.79	.73
Satisfaction	4.15	4.32	.77	.66

Note. $N = 91$ boys, 109 girls

NRI-SPV-C Chinese version of the network relationship inventory-social provision version

* Denotes significant gender differences at $p < .05$

Table 2 Internal consistency and reliability of the NRI-SPV-C

	Cronbach's α	*H*
First-order factors		
Affection	.81	.82
Admiration	.74	.75
Intimacy	.80	.81
Companionship	.73	.78
Reliable alliance	.80	.81
Instrumental aid	.71	.76
Nurturance	.70	.73
Conflict	.85	.96
Antagonism	.71	.74
Second-order factors		
Social support	.90	.97
Negative interactions	.85	.96
Satisfaction	.83	.86

Note: $N = 91$ boys, 109 girls

NRI-SPV-C Chinese version of the network relationship inventory-social provision version

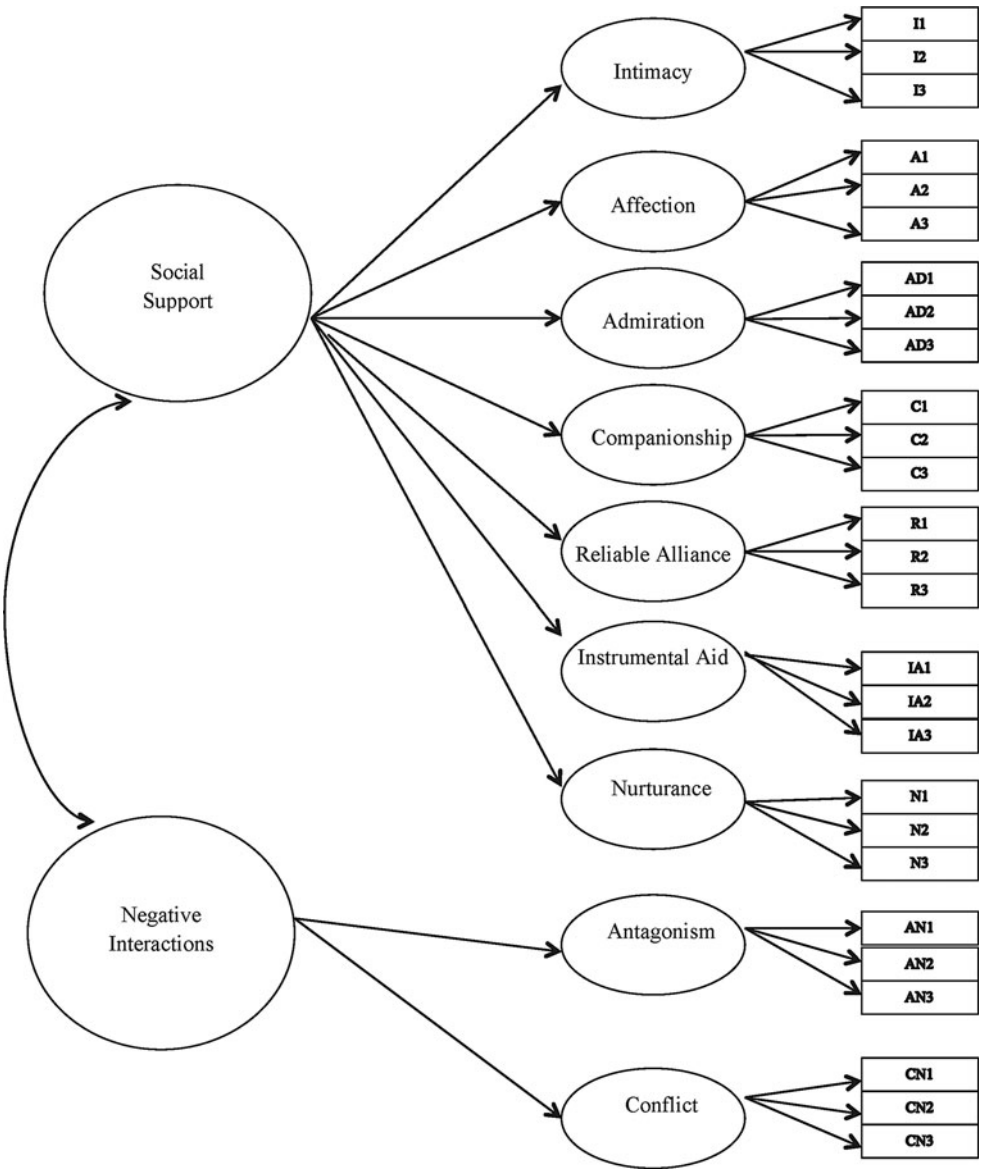

Fig. 1 Hierarchical structure model. $N = 91$ boys, 109 girls. Item indicators for first-order factors: Intimacy (I1–I3). Affection (A1–A3), Admiration (AD1–AD3); Companionship (C1–C3); Reliable Alliance (R1–R3); Instrumental aid (IA1–IA3); Nuturance (N1–N3); Antagonism (AN1–AN3); and Conflict (CN1–CN3)

Fig. 2), and (b) a model in which there were no second-order factors and items loaded directly onto the nine first-order factors (First-order only model; Fig. 3). Compared with the hierarchical structure model, results demonstrated a significant decrease in model-fit in both the Second-order only model ($\Delta\chi^2(9) = 156.76$, $p < .01$) and the First-order only model ($\Delta\chi^2(10) = 928.89$, $p < .0001$). These model comparisons (Table 4) provided further evidence that the hierarchical structure model was the best-fitting model for the NRI-SPV-C.

Finally, to test whether the hierarchical structure model was invariant across gender, several multiple-group CFA's were conducted following established guidelines on group comparisons [16]. First, the hierarchical structure model was tested separately within each gender. Results showed good model-fit in both girls (RMSEA = .05, SRMR = .05; CFI = .95) and boys (RMSEA = .06; SRMR = .07; CFI = .93), demonstrating evidence of configural invariance between the two genders. Next, a freely estimated model in which all paths were allowed to vary between girls and boys was compared to a model in which all paths were constrained to be equal between the two sexes. Results demonstrated no significant differences in model-fit between the free and the constrained models ($\Delta\chi^2(18) = 16.33$, $p > .05$); all loadings also exhibited the same pattern across both groups. These results provided evidence of metric invariance between the two genders. Then, a model in which all intercepts were allowed to vary between boys and girls was compared to a model in which all intercepts were constrained to be equal between the two sexes. Results showed no significant differences in model-fit between the free and the constrained models ($\Delta\chi^2(18) = 7.27$, $p > .05$), demonstrating evidence of scalar invariance between the two

Table 3 Factor loadings of the NRI-SPV-C

	Item loadings on scale		Factors	
	Mean	Range	Social support	Negative interactions
Affection	.77	.76–.78	.91	–
Admiration	.70	.66–.74	.87	–
Intimacy	.76	.68–.82	.82	–
Companionship	.70	.60–.81	.87	–
Reliable alliance	.76	.72–.81	.90	–
Instrumental aid	.69	.55–.81	.80	–
Nurturance	.65	.59–.78	.96	
Conflict	.76	.69–.81	–	.94
Antagonism	.68	.60–.77	–	.97

Note: $N = 91$ boys, 109 girls

NRI-SPV-C Chinese version of the network relationship inventory-social provision version

genders. Taken together, these findings provided evidence that the hierarchical structure model was invariant across gender.

Intercorrelations Among First-order factors

Given its hierarchical structure, the degree of intercorrelation between the nine NRI-SPV-C first-order factors should be higher *within* than across their respective second-order factors. Results supported this assumption. As seen in Table 5, the seven first-order factors that make up Social Support (Affection, Admiration, Intimacy, Companionship, Reliable Alliance, Instrumental Aid, Nurturance; $r = .43$–$.78$) were highly correlated with each other, as were the two first-order factors that make up Negative Interactions (Conflict, Antagonism; $r = .74$). By contrast, the degree of intercorrelation between the nine first-order factors was much lower ($r = -.02$ to $-.15$) among different second-order factors (Table 5). These results demonstrated that the intercorrelations between the first-order factors were much higher *within* than across their second-order factors.

Associations with Friendship Satisfaction

Past research of North American youth has demonstrated significant associations between features of friendship quality and perceptions of friendship satisfaction [1–3, 6]. To test whether similar relations also exist for youth in China, path analyses were conducted to examine the associations between Social Support, Negative Interaction, and Satisfaction. Results demonstrated that, consistent with past research [1–3, 6], Social Support was positively associated with Satisfaction ($\beta = .72$, $p < .001$), whereas Negative Interaction was negatively associated with Satisfaction ($\beta = -.31$, $p < .001$); these results were comparable across gender. Thus, whereas higher Social Support was significantly associated with higher Satisfaction, higher Negative Interaction was significantly associated with lower Satisfaction.

Discussion

The goal of this study was to examine the psychometric properties of the network relationship inventory-social provision version (NRI-SPV) in Chinese youth. The original version of the NRI-SPV [5] for friendship was translated into Chinese (NRI-SPV-C) and administered to young adolescents in China. Findings from this study suggest the NRI-SPV-C may be suitable for assessing youth's friendship quality in China, and that the manifestations and functions of friendship quality may be similar to those found in Western cultures [1, 6].

Adequate coefficient alphas and *H* indices were found across all factors, including the nine first-order factors (Affection, Admiration, Intimacy, Companionship, Reliable Alliance, Instrumental Aid, Nurturance, Conflict, and Antagonism) as well as the two second-order factors (Social Support and Negative Interactions). As hypothesized, and similar to prior research in Western cultures [6, 9], a hierarchical structure model emerged as the most appropriate model in this study.

The intercorrelations between the nine first-order factors were much higher *within* than across their respective second-order factors: Affection, Admiration, Intimacy, Companionship, Reliable Alliance, Instrumental Aid, and Nurturance were more strongly correlated with one another than with Conflict or Antagonism, and Conflict and Antagonism were more strongly correlated with each other than with any of the other first-order factors of Social Support. These results provided evidence that the NRI-SPV-C is internally consistent and reliable among Chinese young adolescents.

Several gender differences as well as similarities were found. Compared with boys, girls reported higher scores on Intimacy, Affection, and Nurturance; they also scored higher on Social Support. By contrast, no gender differences in Negative Interactions were found—girls and boys reported similar levels of Negative Interactions in their friendships. In other words, whereas girls reported their friendships to be more socially supportive than boys, the two genders did not differ in their reports of negativity in these friendships. These results are consistent with past research with North American youth [1–3]. Indeed, although girls typically report higher levels of support in their friendships (e.g., greater affection, closeness, intimacy, and enhancement of self-worth), they do not tend to differ from boys in perceptions of negativity in these friendships. Results from this study further add to these

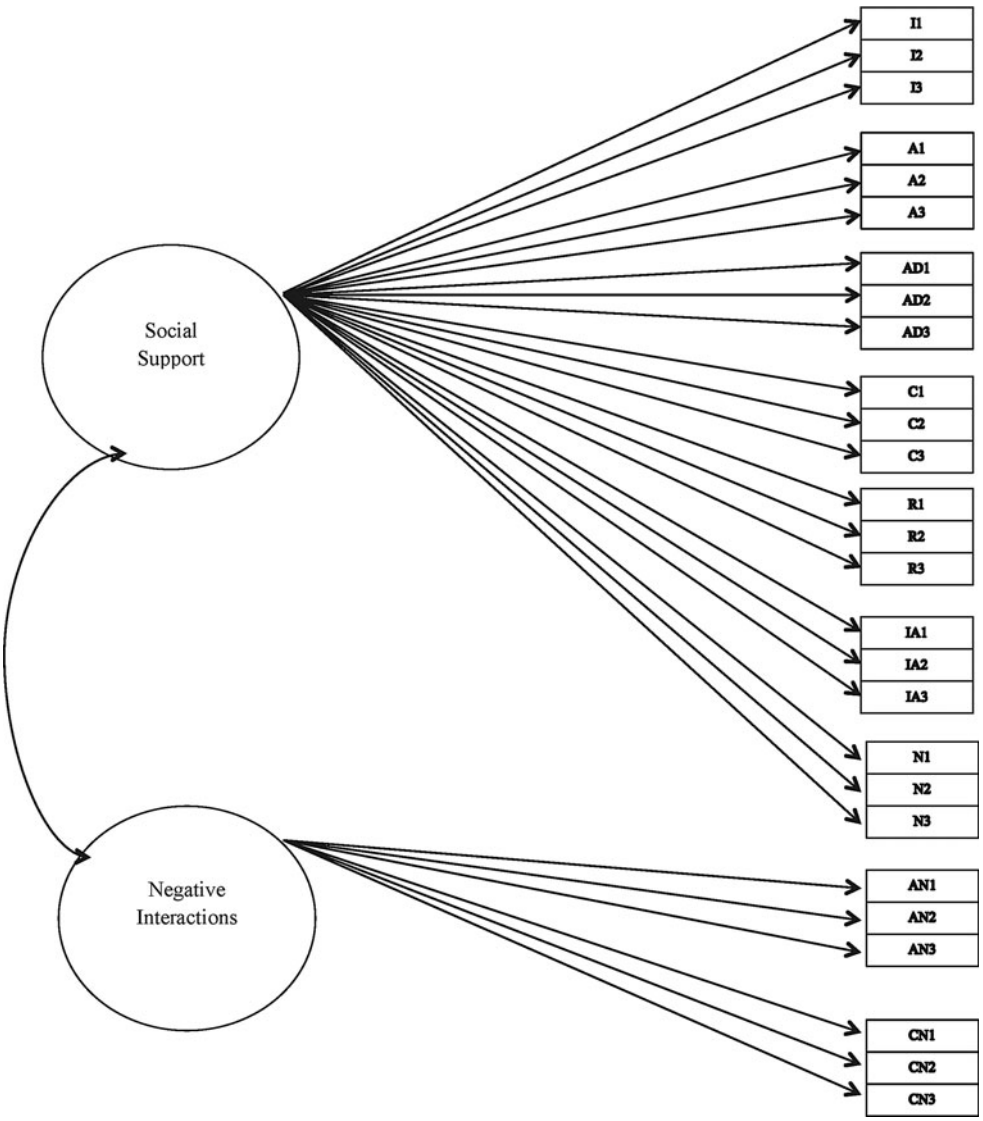

Fig. 2 Second-order only model. Note. $N = 91$ boys, 109 girls. Item indicators for second-order facotrs: Social Support (I1–I3, A1–A3, AD1–AD3, C1–C3, R1–R3, IA1–IA3, N1–N3) and Negatove interactions (AN1–AN3, CN1–CN3)

extant findings, suggesting that gender differences in friendship quality during early adolescence may be comparable across different cultures.

Also consistent with past research in Western cultures [1–3, 6], findings from this study demonstrated that whereas Social Support was associated with greater Satisfaction, Negative Interactions was associated with lower Satisfaction. Given the importance of friendship across development [1–4], these findings are not surprising. Whereas highly supportive friendships contribute to youth's sense of self-worth and emotional security, highly negative friendships put youth at risk for psychopathology and emotional distress [1, 2]. Because peers become particularly salient and influential during early adolescence [2], these implications may be particularly true for young adolescents. Regardless of cultural differences, youth's satisfaction with their friendships may be contingent on their perceptions of social support and negativity in these relationships.

Taken together, findings from this study highlight the universal importance of friendship in youth's development across different cultures. Although China has been found to be more collectivistic and less individualistic compared with Western cultures like the U.S. [10, 11], results from this study suggest that the underlying mechanisms of friendship quality may be comparable to those found in North American and European countries. Despite the potential differences in cultural norms and values, findings suggest youth in different cultures may ascribe similar meanings to the concept of friendship. Consistent with empirical findings that suggest peer relationships may contribute similarly to youth's adjustment across different cultures [17], findings from this study provide further evidence that friendship is a universal phenomenon during development.

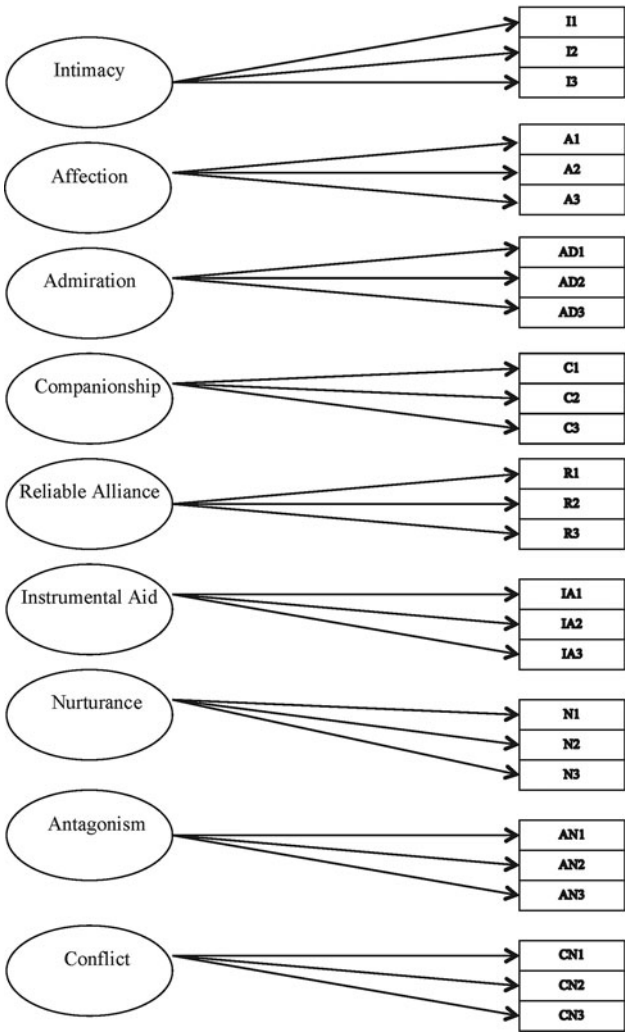

Fig. 3 First order only model. Note. N = 91 boys, 109 girls. Item indicators for first-order factors: Intimacy (I1–I3). Affection (A1–A3), Admiration (AD1–AD3); Companisionship (C1–C3); Reliable Alliance (R1–R3); Instrumental aid (IA1–IA3); Nuturance (N1–N3); Antagonism (AN1–AN3); and Conflict (CN1–CN3)

Table 4 Summary of model comparisons

Model	χ^2	*df*	CFI	RMSEA	SRMR
Hierarchical structure model	463.09	314	.95	.05	.06
Second-order only model	619.85	323	.88	.08	.07
First-order only model	1,391.98	324	.56	.13	.30

Note: $N = 91$ boys, 109 girls

CFI comparative fit index, *RMSEA* root-mean-square error of approximation, *SRMR* standardized-root-mean-square

Although this study helps address the lack of psychometric research on friendship measures and helps contribute to a more global understanding of youth's friendship quality, several limitations are worth noting. In particular, due to the cross-sectional nature of this study, future cross-cultural research on the NRI-SPV should employ longitudinal designs to examine its test–retest reliability. Additionally, because this study only examined the *friendship* dimension of the NRI-SPV, future research would do well to examine whether other dimensions, such as parent or romantic dimensions [8], also appear valid for assessing the quality of these relationships across different cultures. Furthermore, although the NRI-SPV-C was significantly associated with youth's friendship satisfaction in this study, future research on the NRI-SPV warrants the inclusion of other socioemotional outcomes (e.g., peer status, social competence), particularly from different informants (e.g., peers, teachers).

Table 5 Estimated intercorrelations among the NRI-SPV-C first-order factors

	1	2	3	4	5	6	7	8	9
1. Affection		.65	.64	.59	.64	.51	.64	−.10	−.08
2. Admiration			.48	.53	.59	.53	.61	−.25	−.20
3. Intimacy				.71	.54	.43	.58	−.10	−.07
4. Companionship					.78	.48	.60	−.02	−.03
5. Reliable Alliance						.72	.61	−.20	−.15
6. Instrumental Aid							.77	−.12	−.06
7. Nurturance								−.14	−.12
8. Conflict									.74
9. Antagonism									

Note: $N = 91$ boys, 109 girls

NRI-SPV-C Chinese version of the network relationship inventory-social provision version

Summary

As the first study to examine the psychometric properties of the NRI-SPV in a non-Western country, findings demonstrated that NRI-SPV-C was a reliable measure for assessing youth's friendship quality in China. Similar to past studies with North American youth [6–9], the best-fitting model was a hierarchical structure model with two second-order factors (Social Support, Negative Interactions) and nine first-order factors (Companionship, Intimacy, Instrumental Aid, Nurturance, Affection, Admiration, Reliable Alliance, Conflict, and Antagonism); all factors were reliable and internally consistent. Consistent with past findings of gender differences in friendships [1–3], girls reported higher levels of Social Support compared with boys, though no gender differences emerged for Negative Interactions. Also consistent with past research [1–3], Social Support was positively associated with Satisfaction, whereas Negative Interactions was negatively associated with Satisfaction.

Taken together, findings from this study suggest that the NRI-SPV-C may be a fruitful measure for assessing youth's friendship quality in China, and highlight friendship as a universal phenomenon during development. Given psychometric research is critical for the advancement of psychological research and theories, findings from this study help contribute to a more global understanding of friendship and its significance for youth's development across different cultures.

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Interpersonal and Personal Antecedents and Consequences of Peer Victimization Across Middle Childhood in Hong Kong

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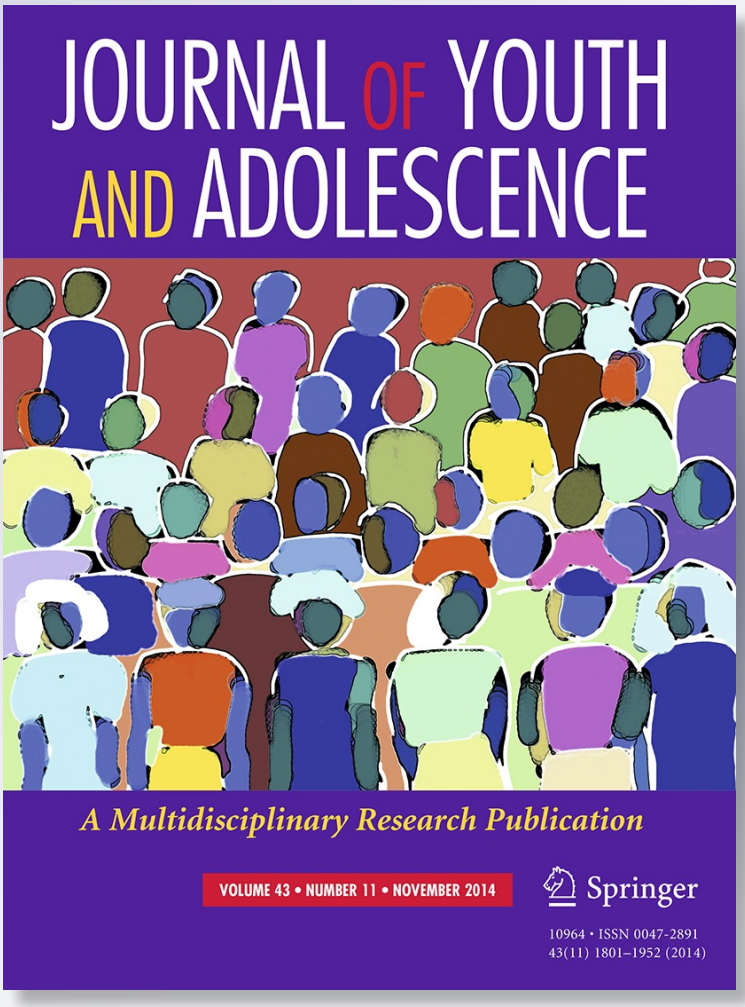

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EMPIRICAL RESEARCH

Interpersonal and Personal Antecedents and Consequences of Peer Victimization Across Middle Childhood in Hong Kong

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Abstract Although much is known about peer victimization, the majority of the longitudinal research in this area has been restricted to Western settings. The main objective of this study was to examine the interpersonal (rejection) and personal (withdrawal, aggression) antecedents and consequences of victimization for Chinese children living in Hong Kong. A sample of 1,058 children (501 boys; M age = 9.5 years) in Hong Kong was followed longitudinally from the 3rd and 4th grades to the 7th and 8th grades. Consistent with a transactional framework, rejection and withdrawal contributed to, as well as resulted from, victimization. Although victimization predicted later aggression, aggression was unrelated to later victimization. These findings closely replicate past research conducted in North America and European settings, and suggest considerable correspondence in the links between maladaptive child characteristics and victimization across Western and Hong Kong schools.

Keywords Peer victimization · Rejection · Withdrawal · Aggression · Hong Kong · Longitudinal · Path analysis

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Introduction

Research has sought to identify different characteristics that might increase children's risk for peer abuse (Cook et al. 2010; Espelage and De La Rue 2012). Rejection or peer dislike has emerged as a core interpersonal or group-level risk factor for peer maltreatment (Ladd and Troop-Gordon 2003). Aggression and withdrawal have been found to be as some of the strongest personal or individual correlates of victimization (Reijntjes et al. 2010; Salmivalli 2001). While such problematic characteristics may put children at risk for victimization, being victimized may also influence children's social status and behavior over time. Indeed, longitudinal research has demonstrated that peer victimization is both a consequence of and an antecedent of maladaptive child characteristics like rejection and withdrawal (e.g., Boivin et al. 2010). Most of these studies, however, have been restricted to North American and European contexts.

Because the pathways to positive social outcomes may be influenced by values and social conventions inherent in a particular culture (Chen and French 2008), it is not clear if findings from Western settings will replicate in other contexts. Moreover, as previous researchers have noted, an exclusive concern with Western contexts could obscure critically important distinctions between culture-specific and culture-general forms of child maladjustment (see López and Guarnaccia 2012). Research conducted in other cultural contexts could also help demonstrate the relevance of existing findings for cultural subgroups within North

America and Europe (Chen and French 2008). In line with these views, we examined the interpersonal (rejection) and personal (aggression, withdrawal) correlates of victimization across middle childhood in Hong Kong.

Hong Kong is a unique setting for peer relations research given its complex history. While under British jurisdiction, Hong Kong had extensive contact with other Asian cultures, as well as Western cultures (Cheung-Blunden and Juang 2008). Despite the population's exposure to outside cultures, traditional Chinese values continue to serve as a predominant socializing factor for many of Hong Kong's children. Hong Kong's value system emphasizes the maintenance of group well-being over individual interests (Yau and Smetana 2003), and children are expected to obey adult caregivers and cooperate with others (Berndt et al. 1993). Indeed, Hong Kong has appeared as one of the most collectivistic and least individualistic countries in meta-analytic reviews of individualism- collectivism (see Oyserman et al. 2002, for a comprehensive review). By replicating existing reciprocal models of maladaptive child characteristics and peer maltreatment in this under-investigated context, findings from this study will contribute to a richer understanding of the mechanisms underlying peer victimization.

Research on the antecedents and consequences of peer group victimization has highlighted a number of specific mechanisms. In terms of interpersonal risk, disliking by peer is one critical factor to consider. Due to factors such as negative reputations (Bierman 2004) and a lack of social resources (e.g., friends; Hodges and Perry 1999), rejected children are often frequent targets of peer abuse (Perry et al. 1988). In particular, peers perceive and describe rejected children more negatively than non-rejected children (Waas and Honer 1990). Not only do peers treat rejected children more aversively than they treat their non-rejected peers, they also justify the abuse and mistreatment of these rejected children (Berndt et al. 1993). Because rejection also prevents important opportunities to interact with others, rejected children often lack social skills and social support (Rubin et al. 2009). These factors combine to create the perfect invitation for peer abuse and victimization.

In addition to the broader risks associated with rejection by peers, more targeted behavioral deficits can increase children's vulnerability to peer victimization. Notably, aggression and withdrawal have emerged as salient personal factors. Aggressive and withdrawn behaviors deviate from social norms, and children often find these behaviors odd and irritating (Bierman 2004). Indeed, aggressive children's disruptive behaviors often provoke anger and abuse from peers (e.g., Salmivalli 2001), while withdrawn children's submissive behaviors likely invite attacks from those who view them as "odd" and "easy" targets (e.g., Olweus 1993).

Even though these problematic characteristics can put youth at risk for victimization, victimization can also impact children's status and behavior in peer groups. In particular, transactional models of development (Caspi et al. 1989) suggest that children actively shape their own environments, which in turn has an impact on their development. Consistent with this view, victimization predicts increases in rejection and friendlessness across childhood (Hodges and Perry 1999; Salmivalli and Isaacs 2005). Victimization also predicts increases in both aggression (Ladd and Troop-Gordon 2003) and withdrawal (Siegel et al. 2009) over time. From these perspectives, children and their social environments reciprocally influence one another across development.

In line with these views, longitudinal research has provided evidence of bidirectional relations between negative child attributes and peer maltreatment across development. For instance, Hodges and Perry (1999) found that initial victimization predicted later peer rejection, and that peer rejection also contributed to increased victimization across middle childhood. Boivin et al. (2010) found that withdrawn behaviors predicted later victimization, and that victimization also predicted later withdrawn behaviors in young adolescents. Because these studies were conducted only in North America and Europe, however, it remains to be investigated whether similar relations are also evident in non-Western settings.

Although longitudinal research on peer relationships has been mostly limited to Western contexts, a small number of relevant cross-sectional studies have been conducted with Chinese children in Mainland China and the Special Administrative Region of Hong Kong (Duong et al. 2009; Eslea et al. 2004; Xu et al. 2003). These findings suggest some degree of consistency in the concurrent correlates of peer victimization across Chinese and Western settings. For instance, as in Western settings, Chinese children who emerge as persistent victims of peer abuse are often rejected and disliked (Abouezzeddine et al. 2007; Xu et al. 2003). These children also tend to be highly aggressive and disruptive (Eslea et al. 2004). Though the links between withdrawal and negative peer experiences in Chinese children have been mixed, with some researchers finding positive relations (e.g., Hart et al. 2000; Schwartz et al. 2001) and others finding zero associations (Chen et al. 1999), increasing evidence suggests that withdrawal is a risk factor for negative peer experiences among Chinese children (Chang 2003; Chen et al. 1995). Although these studies provide important first-steps toward a cross-cultural understanding of peer maltreatment, they are limited to cross-sectional designs. Because development is a dynamic process between child and environment, research that incorporates longitudinal frameworks is needed to better understand the

developmental mechanisms underlying children's negative peer experiences.

Current Study

Due to the lack of longitudinal research on peer victimization in Chinese settings, this study examined the personal and interpersonal correlates of peer victimization across middle childhood in Hong Kong. Specifically, we used autoregressive cross-lagged panel analyses (Bollen and Curran 2006) to examine the potential reciprocal relations between victimization, rejection, aggression, and withdrawal over four time periods. In contrast to simple main effects models, autoregressive cross-lagged analyses help control for stability effects and concurrent links among study variables (Selig and Little 2012), allowing for a more reliable examination of developmental processes.

Based on the view of development as a dynamic process and because available findings suggest some degree of consistency in the correlates of victimization across Chinese and Western settings, we hypothesized a bidirectional relationship between victimization and problematic child characteristics over time. In particular, based on prior research with North American and European youth that demonstrate reciprocal relations between maladaptive child characteristics and peer victimization (e.g., Hodges and Perry 1999; Reijntjes et al. 2010), we posited that interpersonal (rejection) and behavior (withdrawal, aggression) would be reciprocally related to peer group victimization in the Hong Kong cultural context. That is, we expected that rejection, aggression, and social withdraw would each predict increases in peer victimization over time. In turn, we hypothesized that peer victimization would be predictive of later rejection, aggression, and withdrawal.

Method

Participants

Participants were drawn from a 4-year, four-wave longitudinal project that followed Hong Kong children from primary to secondary schools. The final sample consisted of 1,058 children (501 boys, 557 girls). The participating schools served families from Hong Kong's lower-middle socioeconomic class. Almost all of the mothers (97.7 %) had a lower secondary school education (the equivalent of a high school degree in the United States) or below. All families lived in government-subsidized housing, which required that each family's annual income and fixed assets were below set ceilings.

Procedures

At Time 1 (T1), all children in 3rd and 4th grade classrooms at four Hong-Kong schools were invited to participate in the project. Letters explaining the study were sent home along with consent forms. Parents were reminded that their children's participation was purely voluntary and that they could decline involvement in the study without penalty. Children were asked to return the forms to their classroom teachers regardless of whether their parents consented or denied their participation in the project. Of all the children who were invited to participate, 95 % returned positive parental permission, agreed to participate in the project, and were present in school during the period of data collection. On the days of data collection, research staff provided written and oral descriptions of the study procedures and children whose parents had provided consent were asked to give their assent.

Trained research assistants group-administered questionnaires students' classes in testing sessions lasting approximately 45 min. Two researchers were assigned to each classroom. One researcher read the instructions and questionnaire items aloud, while the other walked around to answer questions and ensure that students' answers were kept private.

The first wave of data collection was conducted in late fall 2005, and children were followed every year for 4 years. Data were collected after students had been in school for at least 2 months, so that participating students had time to know each other and could reliably report on their classmate's behavior. At T2, 4th and 5th graders from two additional schools were recruited. Of the 1,058 students in the final sample, 818 children (77.3 %) participated at T1, 1,018 children (96 %) participated at T2, and 713 children (67 %) participated at T3. Because the larger project included a transition from primary to secondary school, only a subset of children ($N = 459$; 43 % of the final sample) participated at T4. Children with incomplete data did not differ significantly from those with complete data on any demographic variable or study variable (all p's $>.10$). Study variables also did not differ as a function of classrooms or any other school characteristics across all time points (all p's $>.10$).

Measures

A sociometric (i.e., peer nomination) procedure was used to obtain measures of children's victimization, and personal and interpersonal characteristics. Peer nominations have been shown to produce estimates of children's peer status and social behaviors that are valid and highly reliable (Jiang and Cillssen 2005; also see Cillessen 2009, for a

review). Moreover, at least in Asian studies (e.g., Schwartz et al. 2001, 2002), overlap between peer nominations and estimates obtained via other informants (self-report and teachers) appears quite high. For instance, Schwartz et al. (2001) found high agreement between peer nominations, teacher-reports, and self-reports of victimization, aggression, and withdrawal in Chinese children.

Each participating child in the current study was given an alphabetized class roster and asked to nominate up to three peers who fit a series of behavioral descriptors. Students could nominate peers of either gender, and nominate the same peer for multiple items. They were told, however, that self-nominations were not allowed. A computer algorithm was used to remove any self-nominations before analysis. Because each item is completed by a large number of reporters (all participating students in the classroom), peer nomination procedures yield highly reliable and valid indices of peer reputations and social behavior even when a small number of assessment items are used (Coie and Dodge 1983). All items described below were derived from past research conducted in the Chinese cultural context (e.g., Schwartz et al. 2001). All measures were translated into Chinese.

Aggression

To assess aggression, students were given a class roster and asked to nominate three peers in their class who "fight with others," "push or hit others," "gossip or say mean things about other kids," and "try to leave other kids out of play to hurt their feelings." As in past research (e.g., Duong et al. 2009), we included items that tap both relational and overt aggression ($\alpha = .95$). The number of nominations a child received for each item was summed and standardized within class to account for varying numbers of nominators (as per Coie et al. 1982). The mean of these standardized scores constituted each child's aggression level, with higher scores reflecting more aggression.

Withdrawal

Withdrawal was also measured with four items on the peer nomination inventory. Students were asked to nominate the name of three peers who "are always alone," "are quiet," "are shy," and "like to be alone" ($\alpha = .85$). Similar to the procedure for calculating an aggression score, described above, we calculated a child's withdrawal score by summing the number of nominations he or she received for each item, standardizing this within class, and calculating a mean across the standardized scores. Research in Western settings has raised questions about the utility of peer nomination indices for identifying socially withdrawn youth. However, it should be noted that the evidence with regard to the validity of these assessment approaches in the Chinese cultural context has been stronger (Chang et al. 2005; Schwartz et al. 2001). For example, Schwartz et al. (2001) found that peer nominations for social withdrawal correlated with teacher reports and predicted rejection and peer group victimization.

Rejection

Children were asked to nominate three peers in their class whom they "like least." The number of nominations a child received for this item was standardized within class and constituted the child's rejection score.

Victimization

Five items on the peer nomination inventory assessed victimization by peers: "gets pushed around," "gets picked on or bullied," "gets bullied and can't protect themselves," "has mean things said about them by other kids," and "gets excluded from play when other kids are trying to hurt their feelings." As in past research (e.g., Duong et al. 2009), we included items that tap both relational and overt victimization ($\alpha = .90$). Again, the number of nominations a child received for each item was summed and standardized within class, and then a mean standardized score across all four items was used as the child's victimization score.

Plan of Analysis

We constructed several autoregressive cross-lagged path models (Bollen and Curran 2006) within Mplus 7 (Muthén and Muthén 1998–2012) to examine the longitudinal bivariate relations between victimization, rejection, withdrawal, and aggression from T1 to T4. In this framework, each study variable is regressed on all of the variables that precede it in time, allowing for the bivariate effects between different constructs to be examined while controlling for the temporal stability of these constructs over time. Comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and standardized-root-mean-square (SRMR) were used for all model-fit assessments.

We conducted Little's MCAR test (Little and Rubin 1987) to assess whether data were missing completely at random (MCAR; Rubin and Coplan 2010). Results revealed that all data were missing completely at random ($\chi^2 = 95.72$, $df = 122$, $p = .96$). Full information maximum likelihood (FIML) was used to address data missingness, as this approach is effective at handling data that are missing at random (Little 2013). ML is superior to traditional techniques for addressing missing data because it maximizes statistical power by borrowing information from the observed data (Enders 2010). More specifically, ML integrates over all possible values of

missing data and gives more weight to values that are more likely (Allison 2002; Little and Rubin 1989). Because ML does not require complete data for each participant, it is ideal for addressing missingness in longitudinal data as participants can be measured at different time points. Indeed, research has shown that ML is a robust and accurate estimator of results even among data with large proportions of missingness (Enders 2010; Hancock and Mueller 2006; Little 2013; Schafer and Graham 2002).

Results

Descriptives

Descriptive statistics are presented in Table 1. Consistent with past research, peer victimization was significantly correlated with withdrawal, aggression, and rejection.

To assess whether there were potential gender differences in the relations between aggression, withdrawal, rejection, and victimization, we constructed several multi-group path analyses and compared freely estimated and constrained models with the Chi square difference criterion (see Hancock and Mueller 2006). Results did not differ as a function of gender. Thus, gender was omitted from the final model to keep the models parsimonious (Hancock and Mueller 2006). There were no statistically significant grade differences in variance among constructs across all time points.

Reciprocal Longitudinal Relations Between Rejection and Victimization

To assess the reciprocal relations between rejection and victimization, we constructed an autoregressive cross-lagged model with paths between all measures of rejection and victimization from T1 to T4. Results demonstrated excellent model-fit ($\chi^2 = 107.44$, $df = 12$, CFI = 0.98, RMSEA = .06 (90 CIs .06–.09), SRMR = .05).

Path coefficients indicated stability for both rejection and victimization over time (Fig. 1). As evident in Fig. 1, the relations between rejection and victimization were generally reciprocal over time. T1, T2, and T3 victimization predicted T2, T3, and T4 rejection after controlling for prior rejection, and T1 and T2 rejection predicted T2 and T3 victimization after accounting for prior victimization. These findings suggest reciprocal paths between rejection and victimization among children in Hong Kong.

Reciprocal Longitudinal Relations Between Withdrawal and Victimization

To assess the reciprocal relations between withdrawal and victimization, we constructed an autoregressive cross-lagged model with paths between all measures of withdrawal and victimization from T1 to T4. Results demonstrated excellent model-fit ($\chi^2 = 177.71$, $df = 12$, CFI = 0.96, RMSEA = .06 (90 CIs .06–.09), SRMR = .05).

Path coefficients indicated stability for both withdrawal and victimization over time (Fig. 2). As evident in Fig. 2, the relations between withdrawal and victimization were generally reciprocal over time. T1, T2, and T3 victimization predicted T2, T3, and T4 withdrawal after controlling for prior withdrawal, and T1 and T2 withdrawal predicted T2 and T3 victimization after accounting for prior victimization. These findings suggest reciprocal paths between withdrawal and victimization among children in Hong Kong.

Reciprocal Longitudinal Relations Between Aggression and Victimization

Finally, to examine the reciprocal relations between aggression and victimization, we constructed an autoregressive cross-lagged model with paths between all measures of aggression and victimization from T1 to T4. Results demonstrated excellent model-fit ($\chi^2 = 150.53$, $df = 12$, CFI = .97, RMSEA = .07 (90 CIs .06–.09), SRMR = .05).

Path coefficients indicated stability for both aggression and victimization over time (Fig. 3). As evident in Fig. 3, the relations between aggression and victimization were not reciprocal over time. Whereas T2 and T3 victimization predicted T3 and T4 aggression after accounting for prior aggression, aggression did not predict later victimization at any of the time periods after controlling for prior victimization. These findings suggest unidirectional paths from victimization to later aggression among children in Hong Kong.

Discussion

Research conducted in Western settings has shown that problematic child characteristics and peer maltreatment are reciprocally linked across development—rejection, withdrawal, and aggression predict later victimization, and victimization also predicts increases in these problematic characteristics over time (Boivin et al. 2010; Hodges and Perry 1999). By examining the interpersonal (rejection) and personal (withdrawal, aggression) antecedents and consequences of victimization across middle childhood in Hong Kong, findings from this study help extend the extant peer relationships research and contribute to a more comprehensive understanding of children's negative peer experiences in Eastern cultures.

Our results mostly replicate existing peer relationships research in Western contexts. As in previous research

Table 1 Correlations among the main study variables

	M	*SD*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Withdraw	−.00	.82	.70**	.71**	.67**	−.04	−.08*	−.01	−.01	.24**	.17**	.27**	.26**	.54**	.46**	.52**	.50**
2. T2 Withdraw	−.00	.84		.79**	.64**	−.07	−.06	−.06	−.04	.16**	.18**	.23**	.19**	.43**	.57**	.57**	.44**
3. T3 Withdraw	−.01	.85			.82**	−.02	−.07	−.02	.03	.19**	.19**	.31**	.34**	.50**	.55**	.68**	.63**
4. T4 Withdraw	−.00	.89				.06	−.04	.06	.13*	.25**	.24**	.39**	.44**	.51**	.55**	.74**	.74**
5. T1 Aggress	−.00	.88					.78**	.75**	.67**	.61**	.56**	.51**	.47**	.47**	.36**	.30**	.28**
6. T2 Aggress	−.00	.90						.84**	.73**	.55**	.71**	.57**	.44**	.36**	.47**	.34**	.23**
7. T3 Aggress	−.01	.88							.79**	.57**	.61**	.62**	.50**	.37**	.43**	.42**	.30**
8. T4 Aggress	−.00	.90								.53**	.62**	.63**	.68**	.38**	.41**	.39**	.48**
9. T1 Reject	−.00	1.00									.67**	.65**	.60**	.63**	.52**	.48**	.47**
10. T2 Reject	−.00	1.00										.76**	.67**	.52**	.62**	.52**	.52**
11. T3 Reject	−.01	1.00											.76**	.56**	.59**	.64**	.65**
12. T4 Reject	−.00	1.00												.56**	.54**	.60**	.73**
13. T1 Victim	−.00	.80													.76**	.74**	.69**
14. T2 Victim	−.00	.81														.84**	.75**
15. T3 Victim	−.01	.83															.87**
16. T4 Victim	−.00	.88															

$N = 501$ boys, 557 girls. *Withdraw* withdrawal, *Aggress* aggression, *Reject* rejection, *Victim* victimization. * $p < .05$; ** $p < .001$

conducted in North America and Europe (Boulton and Smith 1994; Boulton and Underwood 1992; Ladd and Troop-Gordon 2003; Salmivalli and Isaacs 2005; Siegel et al. 2009), victimization, rejection, withdrawal, and aggression were highly stable over time: prior victimization significantly predicted later victimization, and prior rejection significantly predicted later rejection. Being a target of peer abuse and dislike may rob children of important opportunities to learn social skills and develop supportive peer relationships, thereby increasing their risks of further victimization and rejection (Bierman 2004). Similarly, we found significant continuity in withdrawal and aggression over time: prior withdrawal significantly predicted later withdrawal, and prior aggression significantly predicted later aggression. Given that aggression and withdrawal are considered dispositional characteristics (Rubin et al. 2009), such findings are not surprising. Indeed, previous research with North American and European youth have demonstrated moderate to high stability in children's levels of aggression and withdrawal across development (Ladd and Troop-Gordon 2003; Siegel et al. 2009). Taken together, our findings provide further evidence that children's social status and reputations are highly stable across development. Because negative peer experiences and maladaptive behavioral characteristics put children at significant risks for later psychopathology (Bierman 2004; Rubin et al. 2009), early interventions may be crucial for children who are experiencing peer difficulties.

One of the main contributions of this study was the longitudinal examination of bidirectional influences between peer victimization and child characteristics (rejection, withdrawal, aggression). Replicating previous research in Western settings (Hodges and Perry 1999), we found that rejection and withdrawal are reciprocally associated with victimization over time: rejection predicted later victimization, and victimization predicted later rejection; withdrawal predicted later victimization, and victimization also predicted later withdrawal. These reciprocal relations, however, were not found for aggression and victimization: whereas victimization predicted later aggression, aggression was unrelated to later victimization.

Consistent with our hypotheses, we found reciprocal associations between rejection and victimization over time. In line with research in North America and Europe (Ladd and Troop-Gordon 2003; Hodges and Perry 1999), these findings highlight the particular relevance of rejection as both a contributor to and a consequence of victimization in Hong Kong schools. Several explanations may account for these reciprocal relations. First, the low social status and lack of social resources experienced by rejected children may serve as risk factors for subsequent victimization. In particular, peer victimization is embedded in a larger social

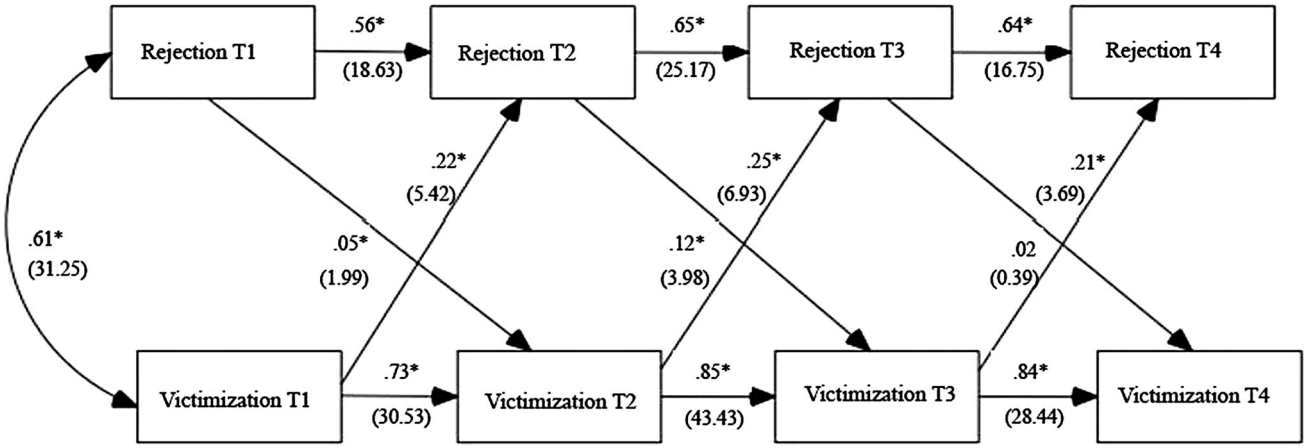

Fig. 1 Autoregressive cross-lagged model of rejection and victimization. *Note* Standardized coefficients and *z*-scores (in parentheses). $*p < .05$

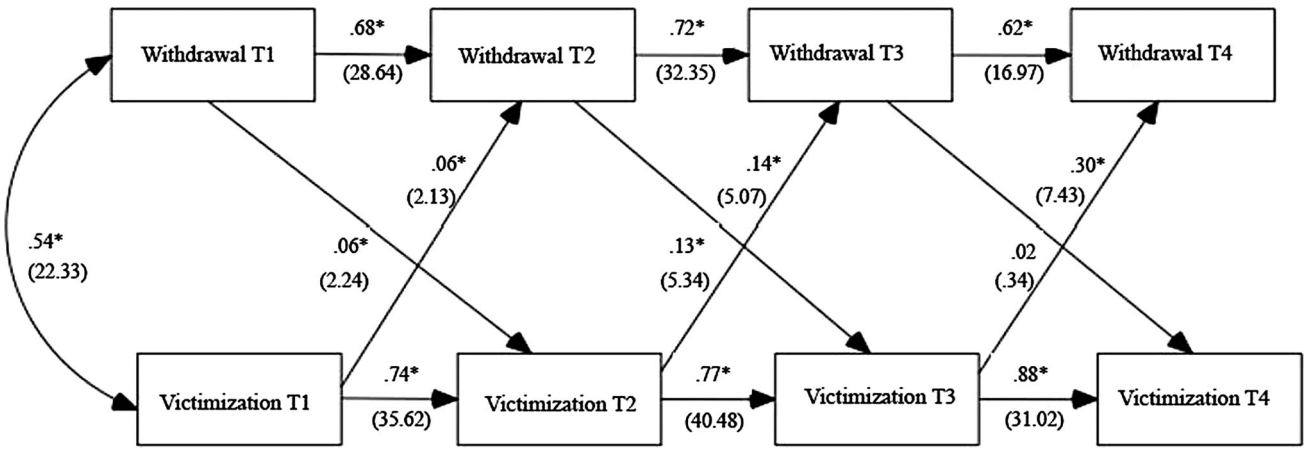

Fig. 2 Autoregressive cross-lagged model of withdrawal and victimization. *Note* Standardized coefficients and *z*-scores (in parentheses). $*p < .05$

system (Salmivalli 2001)—children who are not liked or defended by others may represent vulnerable targets for bullies (Hodges and Perry 1999). Indeed, research has shown that bullies often choose victims who are rejected by the larger peer group (Bukowski and Sippola 2001; Salmivalli and Peets 2009); even nonaggressive children are shown to view rejected children unfavorably (Dodge 1986). These unfavorable views may lead other children to dismiss or even encourage the peer abuse experienced by rejected children (Salmivalli and Peets 2009). Because peer rejection also robs children of important opportunities to develop appropriate social skills (Bierman 2004; Rubin et al. 2009), rejected children may become increasingly isolated over time; this isolation may further contribute to future victimization.

At the same time, peer victimization may also increase children's risks for later rejection. Because social acceptance and approval are partly based on one's status and position in the hierarchy, children are likely to dissociate themselves from those whom they view as frequent targets of ridicule and abuse. Indeed, children may distance themselves from their victimized classmates in order to appear more like the bully, as doing so may increase their own social standing (Juvonen and Galván 2008). Children may also be unwilling to side with victims due to fears of becoming the next victims themselves. Because peer acceptance becomes increasingly important to youth across middle childhood (Rubin et al. 2009), children at this stage of development may be particularly unwilling to associate with their victimized classmates. Accordingly, victimized children may become even more rejected as victimization continues, as evident in this study.

The reciprocal links between rejection and victimization may be particularly strong in collectivistic societies like Hong Kong, where interpersonal relationships and group harmony are heavily valued. Indeed, being disliked is strongly associated with peer victimization across development in Chinese cultures (Chen et al. 1999; Xu et al.

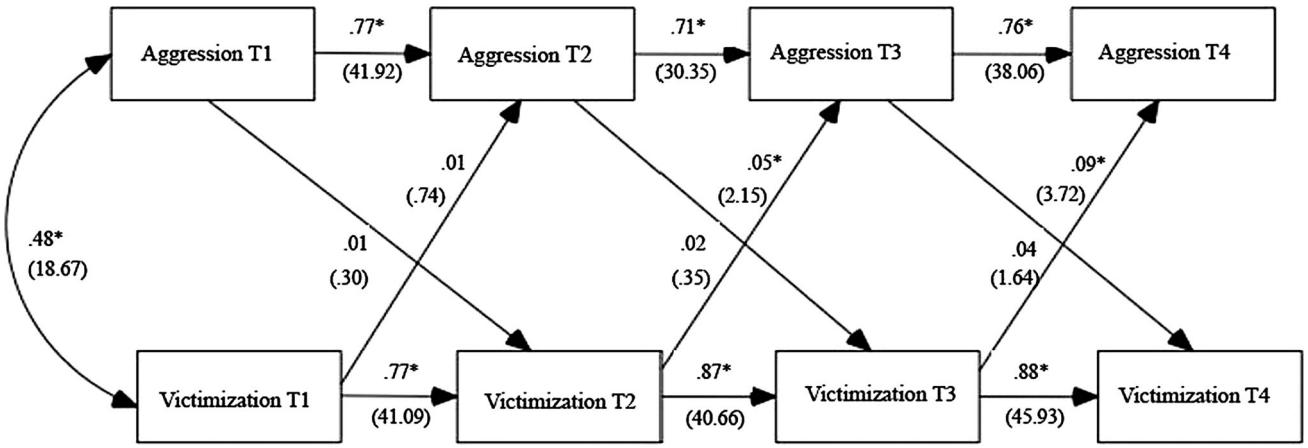

Fig. 3 Autoregressive cross-lagged model of aggression and victimization. *Note* Standardized coefficients and *z*-scores (in parentheses). $^{*}p < .05$

2003). As one of the first studies to examine the longitudinal relations between rejection and victimization beyond the North American and European contexts, our findings suggest there is considerable correspondence in the links between rejection and victimization across Western and Hong Kong schools.

Also consistent with our hypothesis, we found reciprocal associations between withdrawal and victimization over time. In particular, as in research in North America and Europe (Reijntjes et al. 2010; Siegel et al. 2009), withdrawal predicted later victimization, and victimization reciprocally influenced later withdrawal over time. These findings highlight the particular relevance of withdrawal as both a contributor and a consequence of victimization among children in Hong Kong.

Why might withdrawal and victimization reciprocally influence each other over time in Hong Kong schools? First, withdrawal may signal weakness and thus attract aggressors. Indeed, peers often view withdrawn children as easy targets for abuse (Gazelle and Ladd 2003; Olweus 1993). Although some researchers have argued that withdrawn behaviors are conducive to China's collectivistic values on group harmony (Chen et al. 1995), recent research increasingly suggests that withdrawal has negative implications for Chinese children's adjustment, particularly in urban settings (see Chen 2010, for a review). For instance, Schwartz et al. (2001) found that peer victimization was positively associated with withdrawal in 5th and 6th graders living in China. Chang et al. (2005) found that social withdrawal was negatively predictive of peer acceptance during adolescence in Hong Kong. Others have also found similar relations across development in different urban regions of China (e.g., Chen et al. 2005; Xu et al. 2003).

While withdrawal may increase children's risks for victimization, victimization may also increase children's risks for withdrawal. In particular, chronic maltreatment by peers may lead to increased fear of classmates and further withdrawal from peer interaction and school activities (Hoglund and Leadbeater 2007). Consistent with this view, research has shown that peer maltreatment exacerbates withdrawal across development (Gazelle and Ladd 2003; Gazelle and Rudolph 2004). As evident in this study, withdrawn children often become even more withdrawn as victimization continues. By examining the reciprocal relations between withdrawal and victimization beyond the North American and European settings, our findings suggest there is considerable correspondence in the links between withdrawal and victimization across Western and Hong Kong schools.

In contrast to our findings with rejection and withdrawal, we did not find reciprocal associations between aggression and victimization among children in Hong Kong. Rather, the relations between aggression and victimization appeared to be unidirectional. Whereas aggression did not predict later victimization at any of the time points, victimization generally predicted later aggression over time. Although these results are inconsistent with our hypothesis, they appear consistent with some previous research in Western contexts. For instance, Hodges and Perry (1999) found that children's aggressive and externalizing behaviors were unrelated to victimization 1 year later. Boivin et al. (2010) found that aggression became decreasingly associated with victimization from the 3rd grade through the 6th grade. Other studies have also found similar associations between aggression and peer maltreatment across development (see Little et al. 2013, for a review).

Several explanations may account for why aggression was not a significant predictor of later victimization in this study. First, although aggression is strongly sanctioned against in Chinese cultures (Chen and French 2008), children in these settings may be unwilling to directly confront aggressive

classmates. Indeed, Chinese cultures are generally low on direct confrontational behaviors (Oyserman et al. 2002). Moreover, unlike their withdrawn counterparts, who often appear weak and powerless (Coplan and Rubin 2010), aggressive children are known to retaliate when attacked by peers (Crick and Dodge 1994). Over time, these children also increasingly associate with one another, forming networks characterized by high levels of aggression and deviancy (Vitaro et al. 2007). From this view, because the costs of bullying aggressive children may be greater than the costs of bullying "weaker" children (i.e., withdrawn children), aggressive children may be more avoided or feared than confronted in Hong Kong schools.

Aggression has also been associated with *increased* popularity across development. Indeed, recent research in Western settings has demonstrated that aggression is increasingly associated with perceived popularity and social prominence from middle childhood to early adolescence (Cillessen and Mayeux 2004; Little et al. 2013). As peers play an increasingly more central role in children's lives across development (Rubin et al. 2009), aggression becomes an effective means for some children to gain high social status and prominence. Although the Western construct of popularity appears inconsistent with China's collectivistic values, it is likely that popularity does not require a child to engage in behaviors that are positively evaluated or consistent with the larger societal norms, or even that a child is liked. Rather, popular children are likely to be those who are controversial (liked by some while disliked by others) and who are highly skilled at balancing both prosocial and aggressive behaviors within their peer groups (Cillessen and Mayeux 2004; Little et al. 2013).

Despite limited research, there is some evidence to support these views. For instance, using the same sample as this study, Schwartz et al. (2009) found that popularity was associated with high levels of aggression among 3rd and 4th grade children in Hong Kong. These researchers suggest that popularity in Hong Kong peer groups might reflect a context characterized by vertical collectivism. In vertical collectivism (Triandis 1995), individuals see themselves as unique actors contributing to the functioning of the group. From this view, because popular children in Hong Kong may be those who serve a central organizing role in the peer group hierarchy, their aggression may be more accepted by their peers, even if they are not necessarily well-liked. Future research that examines the impact of societal and cultural changes on youth aggression may shed additional insights.

Whereas evidence is mixed on the predictive role of aggression for later victimization, theoretical and empirical evidence suggest victimization is a significant predictor of aggression (Eslea et al. 2004; Schwartz 2000). According to social-cognitive models (e.g., Anderson and Bushman 2002; Crick and Dodge 1994), negative social experiences can cause one to misinterpret social cues and become overly sensitive to rejection cues; this hypervigilance likely increases one's tendency for aggressive behaviors. Indeed, research has demonstrated that victimization alters youth's social schemas about relationships and, in turn, increases their tendency to defensively expect and overreact to rejection (Wang et al. 2012). Consistent with these perspectives, our finding further emphasizes the relevance of maladaptive peer experiences for youth aggression across development.

The results of this longitudinal study provide insight into the processes underlying peer victimization in an underexplored cultural context. Nonetheless, several limitations are worth noting. As is common in longitudinal research (Little 2013), our attrition rate was not low. Because this study followed children across a school transition, complete data across all four time points were not available for the full sample. Although we addressed data missingness with FIML, the small sample size may have decreased the power of our findings. Future longitudinal research with larger samples is therefore needed before firm conclusions can be made regarding our findings.

Although sociometric methods like peer nominations provide important information about children's peer experiences, they are not without limitations. In particular, biases in children's interpretation of social behavior may yield unreliable results (Bierman 2004). Children also differ in abilities to recall descriptions of various characteristics and behaviors (Cillessen 2009). Future longitudinal research would do well to incorporate different methodologies (e.g., self-reports, parent-reports) in addition to peer nominations in examining children's peer experiences.

Limitations notwithstanding, this study provides several insights for Chinese youth intervention and prevention programs. In light of our findings that victimization was both influenced by and contributed to rejection and withdrawal over time, interventions for rejected and withdrawn Chinese children may prove fruitful if they include programs that explicitly teach children how to deal with negative peer experiences. Indeed, although interventions for rejected children incorporate social competence training, they often do not directly address issues of peer victimization. As a consequence, a rejected child in China may know what to do to increase his or her acceptance in the general peer group, yet still struggle in coping with direct attacks from specific classmates. Similarly, although interventions for withdrawn children incorporate social skills and assertiveness training, they often do not directly address issues of peer abuse.

At the same time, interventions for victimized Chinese children might consider including components that deal specifically with increasing children's peer group acceptance, such as adaptive behavioral training (e.g., increasing

cooperative behaviors; Bierman 2004). Increasing victimized Chinese children's prosocial behaviors might help facilitate adaptive affiliations and thus decrease the likelihood of future victimization. Programs for victimized Chinese children might also benefit from incorporating specific components from withdrawal interventions. For instance, assertiveness training (e.g., Albano and DiBartolo 2007) may help victimized Chinese children behave in ways that help promote positive relationships with others.

In light of our finding that victimization contributed to later aggression, identifying and helping Chinese children who are victimized might be particularly relevant for interventions that aim to decrease aggression in Chinese schools. In particular, victimization may serve as a marker for aggression, and interventions that increase self-regulation skills may help reduce aggression in victimized Chinese children. Indeed, research has highlighted the importance of self-regulation for maladaptive social behaviors like aggression (Gross 2007). Such interventions may be important given that aggressive behaviors, particularly those in reaction to negative social interactions (i.e., reactive aggression), are significantly associated with a variety of adjustment difficulties (Rubin et al. 2009), especially in Chinese cultures (Chen and French 2008).

Conclusion

This study adds to the extant peer relationships literature by replicating existing reciprocal models of maladaptive child characteristics and victimization in Hong Kong schools. Consistent with research in Western settings, the findings suggest that rejection and withdrawal are both determinants and consequences of victimization, while victimization appears to be a risk factor for later aggression. Further replications of this study in different cultures will shed additional insights on the mechanisms underlying peer maltreatment across development.

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Author contributions J.M.W. participated in the conceptualization of the study, performed data analyses, interpreted the findings, and drafted the manuscript; M.D. participated in the conceptualization of the study, data analysis, interpretation of data, and drafting of the manuscript; D.S. participated in the conceptualization of the study, interpretation of the data, and drafting of the manuscript. L.C. participated in the design of the study and the collection of data. T.L. participated in the conceptualization of the study and drafting of the manuscript. All authors read and approved the final manuscript.

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Short Communication

Peer rejection as a social antecedent to rejection sensitivity in youth: The role of relational valuation

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ABSTRACT

Although much is known about the consequences of rejection sensitivity (RS), less is known about its social antecedents, particularly during development. Despite research demonstrating the role of peer rejection in the development and maintenance of problematic social schema like RS, little is known about why some youth are more susceptible to these negative consequences than others. We examined how relational valuation might moderate the effects of peer rejection on RS in a sample of 294 youth (138 boys) who made the transition from middle to high school. Results from path analysis revealed that 8th grade peer rejection was most highly associated with 9th grade RS for youth who held high regard for social relationships. Findings demonstrate the importance of examining cognitive moderators in the links between negative social experiences and problematic social schema, and highlight the need to move beyond simple main effects models for understanding the heterogeneity of rejection.

1. Introduction

Rejection sensitivity has been defined as the dispositional tendency to defensively expect, perceive, and overreact to rejection (*RS*; Downey & Feldman, 1996; Harb, Heimberg, Fresco, Schneier, & Leibowitz, 2002). Ironically, RS can lead to a self-fulfilling prophecy in which individuals' expectations of rejection lead them to engage in defensive actions (e.g., aggressing against or withdrawing from others; Downey, Lebolt, Rincon, & Freitas, 1998), which in turn increases the likelihood of actual rejection. Indeed, RS has been linked with psychosocial problems such as rejection, depression, and loneliness across development (e.g., Downey & Feldman, 1996; McDonald, Bowker, Rubin, Laursen, & Duchene, 2010; Sandstrom, Cillessen, & Eisenhower, 2003).

Although extensive research has examined the consequences of RS, much less is known about its antecedents. Whereas a genetic predisposition for RS has received empirical attention (Gillespie, Johnstone, Boyce, Heath, & Martin, 2001), little is known about its *social* predispositions during development. Because RS is theorized to originate from early rejection experiences (Feldman & Downey, 1994), peer rejection may play a role in its development and maintenance. Extant developmental research suggests chronic peer rejection may cause one to misinterpret social cues and become overly sensitive to rejection cues, contributing to interpersonal difficulties and leading to a vicious cycle of rejection (see Rubin, Bukowski, & Laursen, 2009). For instance, peer rejection alters youths' social schemas about relationships and, in turn, increases their tendency to defensively expect and overreact to rejection (London, Downey, Bonica, & Paltin, 2007). Understanding the links between peer rejection and RS, then, may provide important insights to breaking the cycle of rejection.

In the only developmental study to our knowledge that has been conducted, peer rejection in the beginning of 6th grade was associated with increases in RS by the end of 6th grade for boys (London et al., 2007). Research on adults using retrospective methods has also linked negative peer experiences during childhood with RS in adulthood (e.g., Butler, Doherty, & Potter, 2007).

Although these studies help address the paucity of research on the antecedents of RS, they are not without limitations. The ethnically homogeneous sample of London et al. (2007) study may have limited the generalizability of its findings, and the retrospective nature of Butler et al. (2007) study may have resulted in measurement biases like selection bias. Furthermore, none of these studies (or any research to our knowledge) has considered that the relations between peer rejection and RS may not hold across all individuals. In particular, because people vary considerably in how much they value social relationships (Leary, 2001), any explanation of people's reactions to rejection must consider the degree to

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which they value their relations with others. Indeed, cognitive dissonance (Festinger, 1957) and self-discrepancy (Higgins, 1987) theories suggest that failing in a domain deemed personally important would produce dissonance and lead to negative affect. In comparison, failing in a domain deemed personally insignificant would not. In this view, peer rejection may lead to RS particularly for youth who hold high regard for social relationships. Few researchers, however, have considered this possibility.

Despite limited research, there is some evidence for this moderation hypothesis. Research suggests people experience loneliness only when they perceive a discrepancy between their desired and existing social relationships (Heinrich & Gullone, 2006). Brown and Lohr (1987) found that adolescents who were unaffiliated with a peer crowd and who attributed little importance to crowd membership had higher self-esteem than unaffiliated adolescents who attributed high importance to crowd affiliation. Research also suggests that people who place a greater value on friendship and love are more likely to experience negative emotions when rejected than those who do not value social relationships as highly (Morrison, Wheeler, & Smeesters, 2007). Finally, Prinstein and Aikins (2004) found that peer rejection was predictive of increased depression only among adolescent girls who highly valued social acceptance.

Due to the paucity of developmental research on the social antecedents of RS and with the hypothesis that an individual's regard for relationships may impact their interpretations of social situations, we examined whether youths' relational valuation would moderate the link between peer rejection and RS. More specifically, we examined whether peer rejection would put youths at risk for RS, and whether certain youths—namely those who hold high (vs. low) regard for social relationships—would be more vulnerable to this negative outcome. Due to the importance of peers during early adolescence and because peer rejection becomes an increasingly prominent concern for youths during school transitions (Rubin et al., 2009), we felt that the 8th-to-9th grade school transition would provide an excellent opportunity to examine whether preexisting individual factors and environmental experiences contribute to problematic social schema.

We hypothesized that 8th grade relational valuation would moderate the link between 8th grade peer rejection and 9th grade RS. That is, we hypothesized that peer rejection would be most predictive of RS for youth who hold high regard for social relationships.

2. Method

2.1. Participants

Drawing from a larger longitudinal study, this study included 294 youths (138 boys) who made the transition from 8th (M_{age} = 13.61 years) to 9th grade (M_{age} = 14.05 years). The sample was ethnically diverse, with participants self-identifying as European–American (56.3%), Asian–American (18.9%), Latino/Hispanic (9.8%), African–American (8%), or bi-/multi-racial (6.9%).

2.2. Procedure

During 8th grade, participants completed the Peer Rejection and Relational Valuation measures (see below), either during lab visits (80.3%) or at home (19.7%). During the 9th grade, participants completed the RS measure (see below), either at home on paper (93.8%) or on the internet (6.2%). Statistical comparisons revealed no significant differences among participants who completed the questionnaires in these different contexts.

2.3. Measures

2.3.1. Peer rejection

8th Grade Peer Rejection was assessed using the *Extended Class Play* (*ECP*; Wojslawowicz, Rubin, Burgess, Rose-Krasnor, & Booth-LaForce, 2006). The ECP asks respondents to nominate up to three boys and three girls in their grade who best fit each description of Rejection ("Someone who has mean things said to them," "Someone who gets picked on", "Someone who gets hit or kicked by other persons", "Someone who has trouble making friends", "Someone who can't get others to listen", and "Someone who is often left out"). Only same-sex nominations for participants were considered to eliminate possible gender stereotyping. All item scores were standardized within sex and school to adjust for the number of nominations received and also the number of nominators. The standardized item scores for nominations were summed to create a Peer Rejection score for each participant (α = .90). A detailed description of the *ECP* has been reported elsewhere (Wojslawowicz et al., 2006).

2.3.2. Relational valuation

8th Grade Relational Valuation was assessed using *Harter's Self-Perception Profile for Adolescents* (SPPA; Harter, 1988). The SPPA asks respondents to report their perceptions of competence in several domains and the importance they attribute to each of these domains on a scale from 1 (low) to 4 (high). Only items assessing youths' regard for social relationships ("Think that having a lot of friends is important" and "Think it's important to be popular") were examined; these items were averaged to create a score of Relational Valuation (α = .65). This alpha reliability is acceptable for measures consisting of three or fewer items (see Burisch, 1997).

2.3.3. Rejection sensitivity (RS)

9th Grade RS was assessed using a modified version of the *Children's Rejection-Sensitivity Questionnaire* (*CRSQ*; Downey et al., 1998). The CRSQ asks respondents to read six separate hypothetical vignettes describing potential rejection situations involving *peers* (e.g., "...you hear some kids whispering... You wonder if they are talking about YOU"). After reading each vignette, respondents rate how nervous and how mad they would feel ("How NERVOUS would you feel?"; "How MAD would you feel?") in that situation on a scale from 1 (not nervous/mad) to 6 (very, very nervous/mad), and how much they would expect to be rejected in that situation (e.g., "Do you think they were saying bad things about you?") on a scale from 1 (no) to 6 (yes). The total RS score (α = .85) was created by multiplying the rating for each negative affect (anxiety, anger) by the rejection expectation for each vignette and then summing the products. Scores ranged from 16 to 262.

3. Results and discussion

On average, 7.14% (range = 0.0–10.0%) of each variable's data were missing across all variables. The full information maximum likelihood (FIML) method was used to address data missingness. Preliminary analyses demonstrated that missingness was unrelated to any of the variables.

Preliminary analyses with gender and ethnicity as moderators demonstrated that none of the interactions with gender or ethnicity were statistically significant. Because scores on 8th grade Peer Rejection were positively skewed, natural log transformations were applied. Analyses were performed with the untransformed and transformed data, and because the results were very similar, results with untransformed data are presented herein.

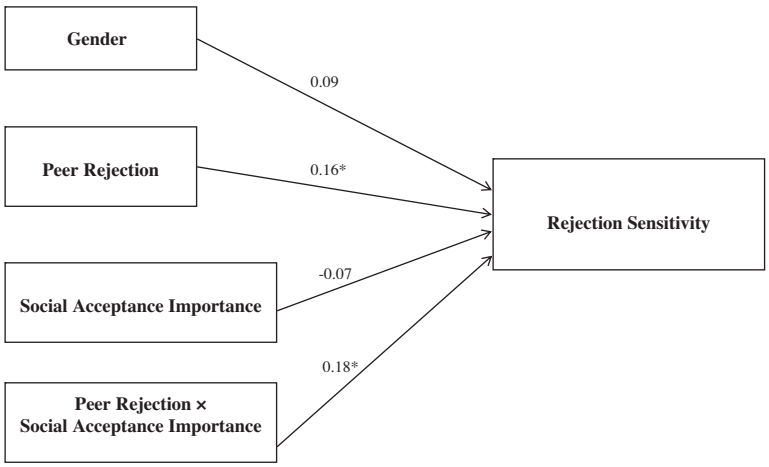

Fig. 1. Path diagram in standardized form $^{*}p < .05$.

3.1. Descriptives

8th Grade Peer Rejection ($M = .00$; $SD = .77$) was negatively correlated with 9th grade Relational Valuation ($M = 2.86$; $SD = .74$), $r(294) = -.09$, $p < .01$. Further, 9th grade RS ($M = 79.63$; $SD = 46.94$) was unrelated to 8th grade Peer Rejection, $r(294) = .11$, *ns*, and 8th grade Relational Valuation, $r(294) = -.05$, *ns*.

3.2. Does relational valuation moderate the effects of peer rejection on RS?

In order to test the moderating effect of Relational Valuation on the link between 8th grade Peer Rejection and 9th grade RS, a path analysis was conducted using FIML within LISREL (Jöreskog & Sörbom, 2005). This approach not only allows the testing of theory-driven models, it also allows the usage of all available data information (see Hancock & Mueller, 2006). With gender as a control variable, our final path model consisted of Peer Rejection, Relational Valuation, and the interaction between Peer Rejection and Relational Valuation.

The final model accounted for 9.5% of the total variance in RS. Fig. 1 shows that, consistent with previous research (Butler et al., 2007; London et al., 2007), Peer Rejection was significantly associated with RS ($Z = 1.99$, $SE = 5.47$, $p < 0.05$). In addition, consistent with our hypothesis, the interaction between Peer Rejection and Relational Valuation was significant ($Z = 2.19$, $SE = 5.35$, $p < 0.05$). In order to probe this interaction, we conducted simple slopes analyses (Aiken & West, 1991) using values for Relational Valuation that corresponded to 1 *SD* above (high) and 1 *SD* below the mean (low). Fig. 2 shows that whereas Peer Rejection was positively associated with RS for youth who scored high on Relational

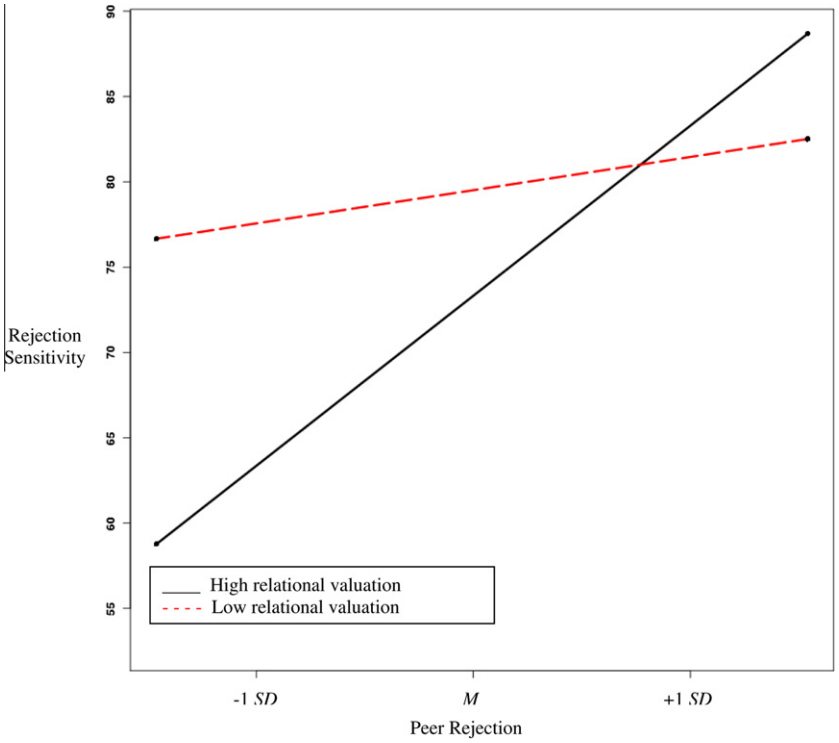

Fig. 2. Interaction between Peer Rejection and Relational Valuation in the prediction of RS.

Valuation (β = 19.94, t = 2.51, p < 0.01), this relation was not significant for those who scored low on Relational Valuation (β = 3.90, t = 0.74, *ns*). Thus, consistent with our hypothesis, peer rejection was most associated with RS for youth who held high regard for social relationships.

It is important to note that because RS was only measured in 9th grade, results should be viewed as temporally descriptive and not as causal, though RS does appear to be moderately stable (Downey & Feldman, 1996; London et al., 2007). Although we examined Peer Rejection as an antecedent to RS, it is possible that RS may also lead to Peer Rejection. This view would be consistent with the "cumulative deficit" hypothesis forwarded by peer relationship researchers (Bierman, 2004; Rubin et al., 2009), in which prior negative social experiences lead to maladaptive schema and behaviors, which in turn lead to further rejection. Future research using a longitudinal design may shed additional insights.

4. Conclusion

By addressing the gap in research on the social antecedents of RS, we demonstrated that peer rejection was most associated with RS for adolescents who held high regard for social relationships. Consistent with cognitive dissonance (Festinger, 1957) and self-discrepancy (Higgins, 1987) theories, findings suggest youths may be most susceptible to adjustment difficulties like RS when encountering a stressor that is personally important. In addition to contributing to the literature on RS, findings demonstrate the importance of considering cognitive moderators for understanding the links between negative experiences and adjustment, and highlight the need to move beyond simple main effects models for understanding the heterogeneity of rejection.

In addition to cognitive interventions addressing the attribution and interpretation of social encounters, therapeutic techniques addressing the level of regard youths place on social relationships may successfully help rejected youths cope with negative social experiences. Such techniques may be particularly important given the difficulty of changing youths' overall reputations among peers (Bierman, 2004). Future research is needed to further elucidate the individual cognitive and motivational processes (e.g., need for belongingness) through which social dynamics are linked with adjustment across development.

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