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# Developmental Trajectories of Chinese Adolescents' Relational Aggression: Associations With Changes in Social-Psychological Adjustment

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This study investigated the development of relational aggression (RA) in a sample of Chinese youth ($N$ = 2,274, 52% boys) from fourth ($M_{age}$ = 10.27 years) to ninth grade. Using latent class growth analysis, four trajectories were identified for both peer- and teacher-rated RA: a no aggression trajectory, a low-increasing trajectory, a moderate-decreasing trajectory, and a chronically high trajectory. Chronically high RA showed a chronicity effect on adolescent peer acceptance, rejection, and rule-breaking behaviors. Adolescents showed worse adjustment as RA increased, but they did not necessarily evidence significant improvement in adjustment even if their RA decreased. Findings reveal the maladaptive nature of RA and highlight the importance of considering cultural context in understanding RA.

For decades, researchers have shown increasing interest in examining individual differences in the development of aggression. Despite much that has been learned regarding the developmental patterns of *physical* aggression (PA), significantly less is known about the development of other forms of aggression, such as harming others by social manipulation, group exclusion, or malicious gossip. Three different terms have been proposed to describe such behaviors, including indirect aggression, social aggression, and relational aggression (RA). Precisely, each term refers to slightly different behaviors (Archer & Coyne, 2005). However, they also converge around the common theme of behaviors that attack a victim's actual or perceived social relationships with others, often (though not always) in a way that avoids direct confrontation (Card, Stucky, Sawalani, & Little, 2008). Although we draw on prior evidence from studies using all three terms, in this study we have focused on RA to help understand the features of aggressive behaviors in Chinese culture in which interpersonal relationships are highly valued and emphasized.

Despite of the large number of studies on RA in the past 2 decades, there are few longitudinal investigations, and fewer still examining youth in non-Western cultural contexts (Kawabata, Tseng, Murray-Close, & Crick, 2012). The broad goal of this study was to investigate the development of RA from late childhood to middle adolescence and its association with youth psychosocial adjustment in the context of Chinese culture using a person-oriented approach. The three specific aims were to (a) identify various classes of developmental trajectories of RA in Chinese youth from late childhood to middle adolescence; (b) test whether and how the different trajectory group memberships predicted changes over time in psychosocial adjustment—specifically, adolescent peer acceptance, peer rejection, and rule-breaking behavior; and (c) examine potential gender differences in RA and its associations with adolescent adjustment.

### *Developmental Trajectories of RA*

Due to a general lack of longitudinal research, only limited information is available on the stability and change in RA. With regard to typical or average growth, cross-sectional studies have indicated that RA increases over childhood and then peaks in late childhood or early adolescence (11–12 years of age; see Björkqvist, Lagerspetz, & Kaukiainen,

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1992). Longitudinal studies have shown a similar pattern, with an increase across middle childhood (Kawabata et al., 2012; Murray-Close, Ostrov, & Crick, 2007) into and through early adolescence, and a decrease following early adolescence (Karriker-Jaffe, Foshee, Ennett, & Suchindran, 2008).

Not all children follow the same developmental trajectory of RA. Several studies have offered important preliminary evidence for the heterogeneity of developmental trajectories. Mothers' reports of indirect aggression in the Canadian National Longitudinal Survey of Children and Youth (NLSCY) revealed two classes of trajectories from age 4 to 10 years: a low stable trajectory and a low increasing trajectory (Vaillancourt, Miller, Fagbemi, Côté, & Tremblay, 2007). Analysis of adolescent self-reports from the NLSCY revealed three classes of trajectories in early adolescence: a low declining trajectory, a moderate declining trajectory, and a stable high trajectory (Cleverley, Szatmari, Vaillancourt, Boyle, & Lipman, 2012). In a US sample, three trajectories of teacher-rated social aggression were identified between 9 and 18 years of age: a low trajectory, a medium-desisting trajectory, and a high-desisting trajectory (Ehrenreich, Beron, Brinkley, & Underwood, 2014). In another US sample, a similar three-class trajectory model of self-rated RA was identified (Orpinas, McNicholas, & Nahapetyan, 2015). In addition, Ettekal and Ladd (2015) identified a four-class and a three-class model separately for girls' and boys' RA using peer nominations, in which the trajectories were distinct from each other mainly on the intercepts. By and large, three types of trajectories were consistently identified in existing studies—a low stable one, a moderate-decreasing one, and a high one with stable or decreasing trend.

Despite the innovative contributions of the studies mentioned above, there are some limitations. First, the validity of the trajectory classes in literature may be threatened and weakened given their relatively small sample sizes (Ehrenreich et al., 2014; Ettekal & Ladd, 2015) or long measurement intervals (Cleverley et al., 2012; Vaillancourt et al., 2007). In this aspect, long-term and large-scale longitudinal studies are extremely valuable and desperately needed. Second, RA has typically been measured based on mother report (Vaillancourt et al., 2007), teacher report (Ehrenreich et al., 2014), or self-report (Cleverley et al., 2012; Orpinas et al., 2015). A lack of information from peer informants is a major gap in the literature with the exception of Ettekal and Ladd (2015), given that peers may be more aware of these forms of aggression, which are typically more covert in nature and hidden from adults. These methodological limitations may mask other possible developmental pathways of RA.

There are both theoretical and empirical reasons to expect that developmental pathways with an increasing trend for RA during early adolescence exist. When children are entering puberty, they also shift from elementary to middle schools, with new and increasingly large groups of peers. These changes lead to some reorganization of social dominance hierarchies that may alter patterns of RA. According to social dominance theory (Pellegrini, 2008), it is during such transitions that aggression is used to establish status with peers in the form of dominance relationships. Indeed, studies on Western samples have reported that greater RA was associated with more perceived popularity later (Cillessen & Mayeux, 2004). Also, with the development of verbal ability and social perspective taking skills, adolescents become more capable of using subtle and covert forms of aggression. Accordingly, RA may increase in early adolescence as a means to attain social status in new and usually larger groups. Empirical research also indicated that the average level of RA increased from late childhood until middle adolescence (Karriker-Jaffe et al., 2008). Our first goal in this study was to identify different RA developmental trajectory classes and to explore the existence of such an increasing RA trajectory during early adolescence.

### *Adjustment Outcomes Associated With RA*

Studies have revealed that PA is associated with myriad adjustment problems (Card et al., 2008). In contrast, research has depicted a more complex picture of RA in predicting adjustment outcomes, motivating researchers to examine whether RA is adaptive or maladaptive in nature (Ettekal & Ladd, 2015; Kawabata, Tseng, & Crick, 2014; Leadbeater, Boone, Sangster, & Mathieson, 2006).

In most cases, RA is viewed as a maladaptive behavior that is accompanied by a host of negative consequences, particularly externalizing problems (Card et al., 2008; Ehrenreich, Beron, & Underwood, 2016). Relational aggressors may be rejected by mainstream peers and then affiliate with other deviant peers; in turn, they are further socialized to engage in more externalizing behaviors (Murray-Close, Nelson, Ostrov, Casas, & Crick, 2016). Furthermore, RA may share a similar underlying pathology with other subtypes of externalizing behaviors, including PA and rule-breaking behaviors (Murray-Close et al., 2016). Together, these

findings highlight the basic maladaptive nature of RA.

To understand the psychopathology of RA, it is important to evaluate the extent to which RA covaries with other subtypes of externalizing symptoms, including rule-breaking behaviors, which consist mainly of covert behaviors such as stealing and truancy (Burt, 2012). From a developmental perspective, rule-breaking behaviors dramatically increase from childhood through adolescence (Burt, 2012); as reviewed above, RA also increases with age, suggesting that they may develop jointly. Preliminary study has suggested that youth with elevated trajectories of RA from childhood to adolescence show more rule-breaking behaviors at age 15 years for both boys and girls (Ehrenreich et al., 2016). However, little is known about how rule-breaking behaviors change with the development of aggression longitudinally across the transition into adolescence.

Turning to interpersonal outcomes, the findings become mixed and more complex. On the one hand, RA is associated with negative peer experiences including high peer rejection and victimization (Card et al., 2008; Casper, Card, Bauman, & Toomey, 2017; Leadbeater et al., 2006). That finding is in line with the *social-cognitive deficit* model (Crick, Grotpeter, & Bigbee, 2002), according to which children who engage in aggressive behavior exhibit a range of social information and emotion processing deficits, including hostile attribution biases, revenge goals, and emotion dysregulation. On the other hand, according to *social dominance* and *resource control* theories (Hawley, Little, & Rodkin, 2007; Pellegrini, 2008), aggression (including RA) can be used as a set of strategies and tactics to assert dominance and attain greater access to materials and social resources within the peer group. Accordingly, RA may have some benefits for children's interpersonal development. Consistent with this view, several studies have shown RA to be associated with later positive interpersonal outcomes including peer-reported popularity (Cillessen & Mayeux, 2004) and liking (i.e., peer acceptance; Casper et al., 2017; Kawabata et al., 2014).

These mixed and perhaps paradoxical findings are mainly from variable-oriented studies that mask potential heterogeneities in the developmental course of aggressive behavior. As already noted, there is noteworthy heterogeneity in level, duration, and developmental timing of children's aggression —components of development that together reflect the complexity of how aggression is manifested. Using a person-oriented approach, Ettekal and Ladd (2015) found that children with high levels of both PA and RA were more likely to exhibit social-cognitive and emotion deficits, and thus experienced the most problematic outcomes. Children who used aggression more sparingly (i.e., moderate to high RA but low PA) appeared to have more positive relational development, because they appeared to use aggression more strategically and effectively. The second goal in this study was to examine how adolescent adjustment would change with the development of RA applying a person-oriented approach while controlling for PA.

### *RA in the Context of Chinese Culture*

Chinese culture, characterized by both Confucianism and collectivism, is distinct from that of Western countries. According to Confucian teachings, the morality of benevolence, righteousness, and propriety is strongly emphasized, with restrictions against harming others. Consistent with this viewpoint, Chinese youth hold harsher attitudes toward bullying—a special subtype of aggressive behavior—than their English counterparts (Ji, Zhang, & Jones, 2016) and exhibit low levels of both PA and RA (Lansford et al., 2012).

Chinese culture emphasizes interdependent ties between individuals, limited personal privacy, and conformity to collective standards. These collectivistic features of Chinese culture may provide a powerful socializing context regarding RA. Within such a context, RA can be more harmful to the victims and thus be more efficient in harming others, given the importance of interpersonal interdependency (Crick & Grotpeter, 1995). In addition, maintaining social harmony and positive interpersonal relationships is highly valued in Chinese culture, such that direct physical conflict is highly discouraged. In comparison, RA (especially covert forms) may serve as an efficient and less costly means to harm others in collectivistic cultures (Kawabata, Crick, & Hamaguchi, 2010a), because it is less likely to result in detection and immediate punishment by authority figures. Consistent with this idea, there is empirical evidence showing that Chinese children showed similar or even higher levels of RA compared to PA (Kawabata et al., 2012; Lansford et al., 2012).

However, the cultural context factors and a handful of existing findings just described do not presume that RA is beneficial to aggressors in Chinese culture. Indeed, preliminary evidence suggests that Chinese children's RA is associated with psychological and behavioral maladjustment (Kawabata et al., 2012; Tseng, Banny, Kawabata, Crick, &

Gau, 2013). Children's aggressive behaviors, including RA, contradict the notion of maintaining social harmony and positive interpersonal relationships, thereby leading to further maladjustment. Research on other collectivistic cultures (e.g., Japan) has indicated that RA was more strongly associated with Japanese children's adjustment problems compared with U.S. children (Kawabata et al., 2010a).

### *Potential Gender Differences*

Studies have shown that girls are more likely than boys to exhibit RA (Björkqvist et al., 1992; Crick & Grotpeter, 1995; Vaillancourt et al., 2007)—although some studies find no or few gender differences (e.g., Casper et al., 2017; Cleverley et al., 2012; Karriker-Jaffe et al., 2008), and still others have shown higher levels in boys (Leadbeater et al., 2006; Orpinas et al., 2015). In their meta-analysis study, Card et al. (2008) found a significant but trivial mean difference ($M_d = -.06$), with girls being slightly higher than boys on average. In the largest international study to date, Lansford et al. (2012) found an average effect size of .08 (Cohen's $d$). Specifically, boys were higher than girls in RA in most countries (China, Colombia, Jordan, Kenya, Thailand, and United States), with Cohen's $d$ ranging from .11 to .22, but in three other countries girls showed similar (in Italy and Philippines) or higher (in Sweden, Cohen's $d = -.12$) levels of RA than boys.

Beyond the general question of which gender is associated with higher RA on average, it is both interesting and important to examine whether gender differences in RA vary across cultures. Studies conducted with children and youth in collectivistic-oriented cultures have found no gender differences in RA in Philippines (Lansford et al., 2012), or higher RA in boys in Japan (Kawabata, Crick, & Hamaguchi, 2010b), Colombia, Thailand, and China (Lansford et al., 2012). Previous studies on Chinese youth also have indicated either no gender difference (Tseng et al., 2013) or higher relational bullying—a subtype of RA—in boys than girls (Zhang, Chen, & Chen, 2016). Research has revealed that Chinese boys and girls are equally interdependent in their self-construal, whereas boys in Western cultures are more independent than girls (Li, Zhang, Bhatt, & Yum, 2006). Thus, according to the integrated gender-linked model of aggression subtypes (Ostrov & Godleski, 2010), Chinese boys and girls would process social information in the same way to enact RA, such that collectivistic cultures might facilitate the use of RA for both genders. Therefore, it is plausible that boys show similar or even higher levels of RA than girls in collectivistic cultures, such as Chinese culture.

Moving beyond whether there is an average mean gender difference in RA, some investigators have explored whether gender moderates the associations between RA and its correlates, given Crick's (1997) gender normative hypothesis of RA that would suggest fewer deleterious consequences for girls than boys. Some studies have shown stronger deleterious effects of RA for boys compared to girls, perhaps because such behaviors are thought to be less gender normative for boys (e.g., Crick, 1997). Yet other studies found the opposite pattern, with larger effects for girls (e.g., Leadbeater et al., 2006). Furthermore, Ettekal and Ladd (2015) found that RA served more functional purposes and had more interpersonal benefits for girls than boys. However, no gender moderation effects were found in the meta-analytic study of Card et al. (2008). Thus, the evidence for gender as a moderator is mixed at best, but it remains an important question given the theoretical foundations of the research on RA. Turning to RA in collectivistic-oriented cultures, as stated above, RA may be normative for both boys and girls. If this is true, the gender normative hypothesis would not hold in Chinese culture. Preliminary studies have found no gender moderation effects among Japanese (Kawabata et al., 2010b) and Chinese youth (Kawabata et al., 2012; Tseng et al., 2013). In this study, we examined potential gender differences in RA and the moderating effects of gender on the associations between the trajectories and adolescent outcomes.

### *This Study*

To summarize, our broad goal was to investigate RA in a large longitudinal study of urban Chinese youth. In light of the potential cultural differences, an investigation of Chinese children's RA may reveal a distinct (though not completely) picture from the literature based on Western cultures. It is within this broader goal of conducting the first longitudinal research on RA in mainland China, which we addressed three specific aims.

Aim 1 of this study focused on the distinct longitudinal trajectories of RA. We attempted to address the gaps in literature by examining RA in a large sample of urban Chinese youth, annually for 7 years from 10 to 16 years of age covering the school transition period from elementary to middle schools. Information on RA was collected from multiple informants. On the basis of the literature

reviewed above and our theoretical considerations, we proposed the following hypothesis:

*Hypothesis 1*

At least four distinct developmental trajectories of RA would be identified from late childhood to middle adolescence, including stable low RA, stable high RA, decreasing RA, and increasing RA.

The second aim of this study was to determine if the chronicity of RA is an important factor in the development of child adjustment and to explore whether distinct trajectories of change in RA (i.e., increasing vs. decreasing trajectory) are differentially associated with changes in adolescent adjustment. We specifically focused on two domains of adjustment outcomes, including interpersonal status (i.e., peer acceptance and rejection) and behavior problems (i.e., rule-breaking behaviors), to examine whether RA in Chinese culture showed distinct features with respect to maladjustment outcomes. According to life course developmental models, individual adjustment has as much to do with the *duration* as it does with the absolute *level* (at any point in time) of a construct or predictor. In line with the social–cognitive deficit perspective, children who have the highest RA would show the most problematic adjustment. More importantly, the disadvantaging effects of chronic RA may accumulate over the course of development (Burt, 2012). Hence, we proposed that:

*Hypothesis 2a*

Those with chronically high levels of RA will show the lowest levels of peer acceptance, the highest levels of peer rejection, and the most rule-breaking behaviors overall across time. Also, their maladjustment would persist and even get worse (i.e., showing declines in peer acceptance and increases in peer rejection and rule-breaking behaviors), as their RA persists over time, that is, a *chronicity hypothesis*.

Again in light of life course developmental models, individuals also have potential for improving from prior maladjustment following early experiences or exposure to adversity. Accordingly, psychosocial functioning would be better among those whose RA desists over time. Thus, we expected that:

*Hypothesis 2b*

Those whose RA is high earlier in development but that decreases over development will show increases over time in peer acceptance and decreases in peer rejection and rule-breaking behaviors, that is, a *desistance hypothesis*.

Finally, according to social dominance and resource control theories, children's increasing RA during school transitions might be strategic and efficient in gaining social status (Hawley et al., 2007; Pellegrini, 2008). If true, children displaying RA would have strengthening peer status (particularly peer acceptance) following such transitions. Considering the reliable associations between RA and externalizing behaviors (Card et al., 2008), however, it is plausible that children's adjustment problems (i.e., peer rejection and rule-breaking behaviors) could be exacerbated if their relationally aggressive behavior increases with age across school transitions. Therefore, we expected that:

*Hypothesis 2c*

Those whose RA is lower earlier in development but that increases with age (especially during school transitions), will show increases in peer acceptance and decreases in peer rejection, that is, an *efficient-strategy hypothesis*.

*Hypothesis 2d*

Those whose RA is lower earlier in development but that increases with age will show increases in rule-breaking behaviors, that is, an *exacerbation hypothesis*.

It is important to note that children's RA is moderately to highly correlated with PA (Card et al., 2008; Lansford et al., 2012), and as noted in the literature review above, PA is a well-established predictor of lower peer acceptance, greater peer rejection and more rule-breaking behaviors. Although the emphasis of our study was on RA, we controlled for the effect of PA in the key person-oriented analyses.

For the third and final aim, we explored potential gender differences in average levels of RA and potential gender moderation effects. On the basis of the literature, we did not expect to find such effects, although we examined this question as an exploratory analysis.

## Method

### *Participants*

The data used in this study were derived from the Longitudinal Study of Chinese Children and

Adolescents (LSCCA). This project started in year 2006 when the participants were in third grade ($M_{age}$ = 9.27 ± 0.35 years; Time 1). Assessments of children's RA began in the second year of the study, and were gathered annually from 10 to 16 years of age.

All participants lived in the urban area in Jinan, the capital city of Shandong Province in eastern China. At Time 1, the sample consisted of 2,274 students from 40 classrooms attending 14 elementary schools, with the number of students ranging from 26 to 69 in each classroom (1,186 boys and 1,088 girls). Eighty-eight percent of participants had no siblings. Almost all the participants (97%) were of Chinese Han ethnicity, and all were Mandarin Chinese speaking. Mothers' and fathers' average age at Time 1 was 36.17 ± 2.48 and 37.94 ± 2.99 years, respectively. At Time 1, 60% of mothers and 68% of fathers had an educational attainment ranging from vocational school to a college or university degree. Most of the parents worked outside the home in occupations ranging from blue collar to professional. Both the median and mean monthly combined family income was between about $650 and $800. The sample was well representative of school children in urban China.

In China, children attend elementary school from first (i.e., about 7 years) to sixth grade, and then the junior high school from seventh to ninth grade followed by the 3-year senior high school. At Time 5 of LSCCA (seventh grade), as children entered junior high schools, a vast majority of the original participants (89%, $n$ = 2,016) were followed. No participation bias was found in terms of gender, age, and family contextual variables. Until Time 8 (10th grade), when the children entered senior high schools, about 65% ($n$ = 1,477) of the original participants were retained. These remaining participants showed no participation bias regarding gender and age but had relatively higher family socioeconomic status (SES) than those who were lost to attrition. Both in elementary and high schools, students are not allowed to switch classrooms. All the students spend roughly the same amount of time in the classroom. One teacher is designated to be in charge of a class. This head teacher often teaches one major course and takes care of the social and daily activities of the class.

In this article, specifically, the trajectory analyses were based on 2,202 and 2,200 children for teacher reports and peer ratings, respectively (52% boys for both informants).

### *Overview of Data Collection*

Informed consent and assent was obtained from participating students, parents, teachers, and the school principals prior to data collection. The data were collected annually during each spring semester. Questionnaires for participating students were group-administered by trained postgraduates in students' classrooms during regular school hours. Meanwhile, the participating head teachers in each school were called together and administrated a set of measures on behaviors of the students in their classes. At each wave, all the students involved acquired a gift (about $1), and teachers received an honorarium (about $25–$30).

### *Measures*

#### *Peer Ratings of Aggression*

Child aggression was assessed using a Chinese version of social behavior questionnaire adapted from previous studies (Archer & Coyne, 2005; Crick & Grotpeter, 1995). Four items were used to assess RA, including "gossip or spread rumors about some peers," "deliberately exclude others from his or her peer group," "deliberately tell others not to play, hang out or interact with a target child," and "deliberately tell others not to make friends with a target child." Three items were used to evaluate PA, including "hit others," "push or shove others," and "kick or punch others." Children were provided with rosters of their same-gender classmates and were asked to indicate on a 4-point Likert scale ranging from 0 (*never*) to 3 (*always*) about how often these children enact aggressive behavior. Thus, each participant was rated by multiple same-gender classmates, ranging from 7 to 28 raters (mean number: 16.10 ± 2.91) depending on the size of the class. The intraclass correlation of each item was over .65 in each year indicating acceptable interrater agreement. The peer version of the aggression measure had acceptable construct validity and strong measurement invariance (i.e., there were no discernible differences in the factor loadings) across age and gender (see Supporting Information and Table S1). The items were averaged to calculate RA and PA scores (Cronbach's αs ranging from .91 to .98).

#### *Teacher Ratings of Aggression*

The head teacher in each class was asked to rate each participating child's social behavior on a parallel version of the peer rating measure. Two

of the RA items in the peer version were combined into one, such that the teacher version of RA subscale consisted of three items, including "deliberately tell others not to play, hang out or interact with or make friends with someone," "gossip or spread rumors about some peers," and "deliberately exclude others from his or her peer group." PA subscale contained the same three items with the peer rating version. Teachers rated the participating students' PA and RA on a 5-point scale from 0 (*never*) to 4 (*always*). The teacher version of aggression measure had acceptable construct validity and strong measurement invariance across age and gender (see Supporting Information and Table S1). The items were averaged at each time point to produce teacher-rated RA and PA scores (Cronbach's αs ranging from .84 to .91).

### *Peer Acceptance and Rejection*

Children's peer acceptance and rejection were assessed annually from age 10 to 15. A standardized peer-nomination procedure was used to collect information on children's social status. Each child was asked to nominate up to three classmates as (a) being liked most and (b) being liked least. Both same-sex and cross-sex nominations were allowed. The nominations received were summed and then standardized within each class to permit appropriate comparisons.

### *Rule-Breaking Behaviors*

Child rule-breaking behaviors were assessed based on teacher reports via the Teacher Report Form annually from age 11 to 16 (Achenbach, 1991). Teachers rated how true each item was of participants on a scale from 0 (*not true*) to 2 (*very true or often true*). Across the six waves, the subscale of rule-breaking behaviors consists of nine items, such as "breaks school rules," "lying or cheating," "steals," and so forth. This scale showed good construct validity and strong measurement invariance across age and gender (see also Supporting Information and Table S1). The measure of rule-breaking behaviors was the sum of these items (Cronbach's α*s* are from .70 to .82).

### *Covariates: Family SES*

We used five variables to calculate family SES, including mother's and father's educational level and occupational prestige, as well as household income per month. Educational level was coded as 1 = *junior high school or lower* (mothers: 15%; fathers: 12%), 2 = *senior high school graduate* (mothers: 25%; fathers: 20%), and 3 = *some college* (mothers: 60%; fathers: 68%), whereas occupational prestige was coded as 1 = *peasant or jobless* (mothers: 10%; fathers: 6%), 2 = *blue collar* (mothers: 35%; fathers: 31%), and 3 = *professional or semiprofessional* (mothers: 55%; fathers: 63%). Monthly income was divided into three grades with 1 = < *$500* (23%), 2 = *between $500 and $1,000* (53%), and 3 = *more than $1,000* (24%). Each was standardized and then averaged to calculate a z-score with higher scores indicating higher SES.

### *Analytical Strategy*

Latent class growth analysis (LCGA) was used to identify distinct trajectories of RA, separately for peer and teacher ratings. The censored normal distribution was used to model the trajectories to account for the skewed distribution of RA. The statistical criteria to determine the optimal number of classes include: (a) the Baysian information criterion (BIC) are the lowest, (b) the Lo–Mendell–Rubin adjusted likelihood ratio test (LMR-LRT) against the one-less class model is significant ($p < .05$), (c) the entropy—a measure of classification accuracy (range 0–1) is closer to 1, and (d) the average posterior probability of assignment of each trajectory class was acceptable (i.e., > .70). In addition, we also considered that the identified trajectory model should be parsimonious and interpretable.

Latent growth models (LGM) were used to examine the effects of trajectory group membership of RA on the development of adjustment variables. We first built unconditional growth models to demonstrate the average development of each adjustment variable. Once significant individual differences in the trajectories were found, conditional growth models were then created by adding individual's gender, SES, and trajectory group memberships in RA into the LGM models as time-invariant predictors of the growth factors. Finally, PA was added as a time-varying covariate beyond these predictors to explore the unique effect of RA on adjustment. Mplus 7.0 (Muthén & Muthén, 1998–2012) was used, and both LCGA and LGM models were estimated using the full information maximum likelihood method that allows for incomplete data.

## Results

### *Descriptive Statistics*

The bivariate correlations, means, and standard deviations of all studied variables over time for the total sample were presented in Table S2. RA showed moderate to high annual consecutive stability across time (with correlations between consecutive time points ranging from .34 to .73 for peer ratings and .13 to .48 for teacher ratings). Note that the consecutive time point correlations within informant during the periods of school transition between age 12–13, and age 15–16 were lower than those during other periods (.52 and .34 for peer ratings and .16 and .13 for teacher ratings chronologically), highlighting the individual differences in the development of RA. There was modest to moderate agreement between peers and teachers (with correlations ranging from .25 to .42 depending on the time point). Furthermore, RA was associated with rule-breaking behaviors and peer rejection positively, and with peer acceptance negatively.

In terms of peer ratings, boys were rated each year as having significantly higher RA scores by peers ($6.80 \leq t\text{s} \leq 10.89$, $p\text{s} < .001$, $.29 \leq d\text{s} \leq .52$), except for age 16 ($t = 0.37$, $p = .71$). Similarly, teachers rated boys each year as higher in RA ($2.46 \leq t\text{s} \leq 9.15$, $p\text{s} < .05$, $.13 \leq d\text{s} \leq .41$), except for age 11 ($t = 1.60$, $p = .11$). Paired-samples $t$ tests indicated that children were rated as having less RA than PA from age 10 to age 15 for both peer ($-1.22 \leq d\text{s} \leq -.73$) and teacher ratings ($-.32 \leq d\text{s} \leq -.08$). However, children showed more RA than PA at age 16 for both peer ($d = .49$) and teacher ratings ($d = .21$).

### *Trajectory Classes of RA*

For peer ratings, a four-class model was the best fit to the data. The BIC values for two-, three -, four-, and five-class models were 5,846, 4,710, 4,230, and 3,653, respectively. The LMR-LRT statistic indicated that the increment of estimated fit from the three-class model to the four-class model was significant ($p = .016$), whereas it became nonsignificant in the five-class model ($p = .348$). The entropy value of the four-class model was .83, and the average posterior probability of assignment of each trajectory class ranged from .80 to .94, suggesting that the classes were well separated (see Figure 1). Estimated growth parameters can be found in Table S3.

Children assigned to the "no aggression" trajectory (estimated proportion = 61.1%, observed $n = 1{,}372$) exhibited little RA over the whole developmental period. Children in the "low-increasing" trajectory (13.0%, $n = 254$) showed low levels of RA at age 10 with increasing levels from age 12 onward. Children in the "moderate-decreasing" trajectory (20.1%, $n = 443$) showed moderate levels of RA at age 10 that increased slightly at age 11 and then decreased to low levels. Children in the "chronically high" trajectory (5.8%, $n = 131$) started highest in RA, and remained high across this developmental period albeit with a significant declining trend.

Turning to teacher ratings, the BIC values for two-, three-, four-, and five-class models were 28,757, 28,374, 28,077, and 27,998, respectively. Although the LMR-LRT test values were significant from two- to five-class model ($p\text{s} < .001$), the four-class model had relatively lower BIC and higher entropy index (.65). Thus, the four-class model was chosen as optimal in that it best balanced goodness of fit and parsimony (see Figure 1 and Table S3).

Children assigned to the "no aggression" trajectory (estimated proportion = 23.0%, observed $n = 538$) exhibited little RA across time. Children in the "low-increasing" trajectory (37.3%, $n = 817$) showed low levels of RA at age 10 and increasing levels since age 12. Children in the "moderate-decreasing" trajectory (23.7%, $n = 522$) started at moderate levels of RA but decreased to low levels across time. Finally, children in the "chronically high" trajectory (16.0%, $n = 325$) started highest in RA and remained high over time even though the levels of RA decreased significantly.

The trajectory group membership was significantly differentiated in terms of gender for both peer and teacher ratings ($\chi^2_{\text{peers}} = 67.09$, $\chi^2_{\text{teachers}} = 37.97$, $p\text{s} < .001$). Boys were more likely to be overrepresented among the chronically high group for both peer and teacher ratings, and the increasing and decreasing groups rated by peers (see Table 1).

Peer- and teacher-rated trajectories of RA were positively associated but with low cross-informant agreement ($\chi^2 = 416.06$, $df = 9$, $p < .001$; $\kappa = .13$, $p < .001$; see Table S4). Children of the peer-rated high RA trajectory were significantly more likely to be assigned to the teacher-rated high RA trajectory. In turn, children of the no RA trajectory identified by teachers were more likely to be on the peer-rated no RA trajectory. Only low to moderate agreement existed on both the increasing and decreasing trajectories between peer and teacher ratings.

Additionally, we examined the extent to which the identified RA trajectories overlapped with the development of PA (see Table S5). In brief, children's group membership in RA trajectories accounted for 14%–48% of the variance in peer-rated PA and 4%–30% of the variance in teacher-

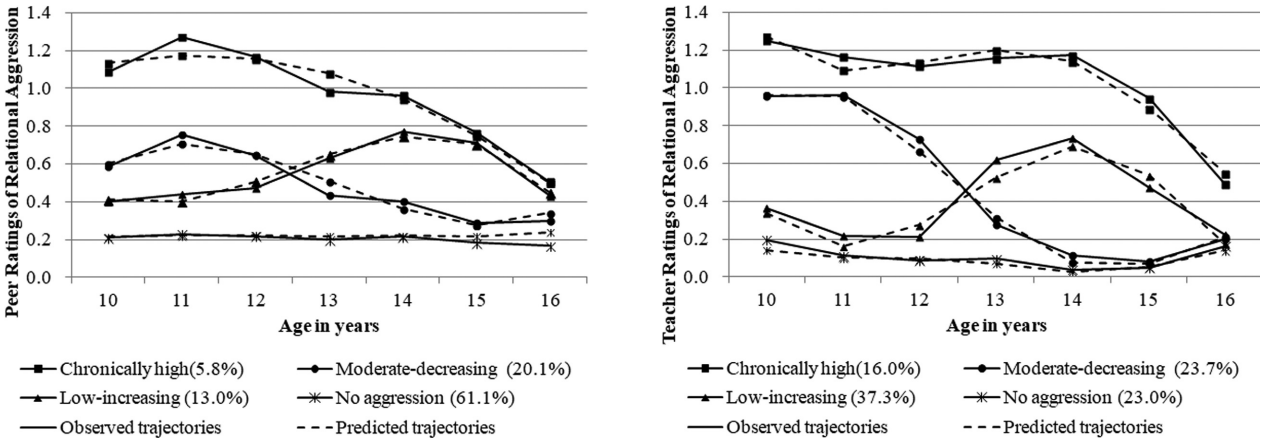


*Figure 1.* Trajectories of peer- and teacher-rated relational aggression.

Table 1
*Gender Differences in Trajectory Group Membership*

| | Girls | | | Boys | | |
|---|---|---|---|---|---|---|
| Informants | *n* | % | Standard residual | *n* | % | Standard residual |
| Peer ratings | | | | | | |
| No RA | 751 | 34.1 | 3.5*** | 621 | 28.2 | −3.4*** |
| Increasing RA | 99 | 4.5 | −2.1* | 155 | 7.0 | 2.0* |
| Decreasing RA | 170 | 7.7 | −3.0** | 273 | 12.4 | 2.9** |
| High RA | 39 | 1.8 | −3.0** | 92 | 4.2 | 2.9** |
| Teacher ratings | | | | | | |
| No RA | 317 | 14.4 | 3.6*** | 221 | 10.0 | −3.5*** |
| Increasing RA | 364 | 16.5 | −1.5 | 453 | 20.6 | 1.4 |
| Decreasing RA | 248 | 11.3 | −0.2 | 274 | 12.4 | 0.2 |
| High RA | 130 | 5.9 | −2.1* | 195 | 8.9 | 2.0* |

*Note.* Negative standard residual reflect a lower than expected probability of being assigned into this group, whereas positive standard residual reflect a higher than expected probability of being assigned into this group. RA = relational aggression.
*$p < .05$. **$p < .01$. ***$p < .001$.

rated PA. These findings suggest that the statistical effect of individual differences in PA should be controlled for when examining the contributions of RA trajectory group membership on child adjustment.

### *Associations With Changes in Adjustment*

In each growth model, the intercept was centered relative to scores at the first time point (i.e., peer acceptance and rejection at age 10 and rule-breaking behaviors at age 11). In preliminary analyses, we found that family SES was not predictive of the growth factors of peer acceptance, peer rejection, and rule-breaking behaviors. Thus, this potential covariate was not included in the following analyses. Child trajectory group memberships were recoded into three dummy variables using a weighted effect coding strategy, such that each trajectory group category of the independent variables was compared with the total sample (see Table S6 for specific coding strategies).

### *Peer Acceptance and Rejection*

Given that the scores of peer acceptance and rejection were standardized with a mean of 0 and a standard deviation of 1 within each wave, there could not be any overall slope or change (i.e., the mean is 0 at each time point). However, the variance of both intercept and slope were significant (acceptance: $D_{\text{intercept}} = .660$, $D_{\text{slope}} = .030$, $p$s $< .001$; rejection: $D_{\text{intercept}} = .893$, $D_{\text{slope}} = .036$, $p$s $< .001$), so there was substantial variability to be explained for both peer acceptance and peer rejection. Linear-change models showed acceptable fit (so quadratic-change models were not used) for peer acceptance, peer-rated RA: $\chi^2(32) = 223.54$, $p < .001$, comparative fit index (CFI) = .954, Tucker-Lewis index (TLI) = .944, root mean square error of approximation (RMSEA) = .052; teacher-rated RA: $\chi^2(32) = 201.25$, $p < .001$, CFI = .956, TLI = .946, RMSEA = .049, and peer rejection, peer-rated RA: $\chi^2(32) = 288.53$ $p < .001$, CFI = .941, TLI = .928, RMSEA = .060; teacher-rated RA: $\chi^2(32) = 320.72$, $p < .001$, CFI = .940, TLI = .926, RMSEA = .065. Table 2 presents the estimates of the LGM models and Figure 2 illustrates the growth curve of adjustment outcomes conditioned on RA trajectories.

Regarding the growth of peer acceptance, gender was predictive of neither the intercept nor the slope. Children's group membership in RA trajectories accounted for some of the variance in intercepts

(peer-rated RA, 9%; teacher-rated RA, 4%), but very modest portions of variance in slopes (< 1%). Overall, the peer- and teacher-rated high RA group exhibited the lowest levels of peer acceptance, supporting the chronicity hypothesis. No evidence was provided for the desistance hypothesis in terms of peer acceptance, given that no significant changes occurred in peer acceptance for the decreasing RA group. The teacher-rated increasing RA group showed no significant associations with changes in peer acceptance. The peer-rated increasing RA group showed lower initial levels of peer acceptance than the total sample, and a significant decline in peer acceptance, which is contrary to the efficient-strategy hypothesis but supporting the exacerbation hypothesis.

Regarding changes in peer rejection, gender contributed significantly to the intercept factor (explaining about 3% of the variance), but not the slope factor, with boys being more likely to be rejected than girls. Peer-rated RA trajectories accounted for modest to moderate portions of variance in intercept (about 36%) and slope (about 8%) of peer rejection. Specifically, the peer-rated high RA group exhibited the highest level of peer rejection over the whole period, supporting the chronicity hypothesis, although they experienced a slight decline in peer rejection over time. The peer-rated decreasing RA group showed higher initial levels of peer rejection than the total sample and a significant decreasing trend with age, supporting the desistance hypothesis. The peer-rated increasing RA group experienced average levels of peer rejection at age 10 and an increasing trend in peer rejection, which is contrary to the efficient-strategy hypothesis but in line with the exacerbation hypothesis.

Teacher-rated RA trajectories accounted for about 10% of the variance of the intercept factor of peer rejection but did not contribute to the slope factor. Specifically, the teacher-rated high RA group showed the highest level of peer rejection over the whole period but no significant changes with time, supporting the chronicity hypothesis. The teacher-rated decreasing RA group did not differ significantly in all growth factors from the total sample, thus not supporting the desistance hypothesis. The teacher-rated increasing RA group showed relatively low levels of peer rejection compared to the total sample and no significant changes with age;

Table 2
*Effects of Trajectory Group Memberships of RA on the Development of Adjustment*

| | Peer acceptance | | Peer rejection | | Rule-breaking behaviors | |
|---|---|---|---|---|---|---|
| | Peer-rated RA | Teacher-rated RA | Peer-rated RA | Teacher-rated RA | Peer-rated RA | Teacher-rated RA |
| Initial level | | | | | | |
| Intercept | −0.008 (.019) | −0.005 (.020) | −0.006 (.017) | −0.013 (.020) | −0.077 (.042) | −0.089 (.041)* |
| Gender | 0.024 (.020) | 0.001 (.020) | 0.089 (.016)*** | 0.145 (.019)*** | 0.304 (.033)*** | 0.338 (.032)*** |
| Increasing | −0.186 (.050)*** | −0.023 (.026) | −0.060 (.053) | −0.094 (.026)*** | 0.121 (.083) | −0.238 (.043)*** |
| Decreasing | −0.257 (.037)*** | −0.006 (.035) | 0.378 (.043)*** | −0.004 (.033) | 0.414 (.056)*** | 0.293 (.053)*** |
| High | −0.620 (.057)*** | −0.303 (.042)*** | 1.998 (.166)*** | 0.681 (.077)*** | 0.918 (.087)*** | 0.796 (.057)*** |
| Slope | | | | | | |
| Intercept | 0.011 (.005)* | 0.011 (.005)* | 0.007 (.005) | 0.007 (.005) | −0.100 (.035)** | −0.104 (.035)** |
| Gender | −0.001 (.005) | −0.002 (.005) | −0.005 (.005) | −0.007 (.005) | −0.017 (.029) | −0.041 (.028) |
| Increasing | −0.031 (.014)* | 0.008 (.007) | 0.132 (.017)*** | 0.008 (.006) | 0.189 (.071)** | 0.305 (.037)*** |
| Decreasing | 0.003 (.010) | 0.019 (.010) | −0.057 (.012)*** | −0.016 (.009) | 0.009 (.048) | −0.166 (.049)** |
| High | 0.005 (.017) | −0.018 (.012) | −0.083 (.041)* | 0.002 (.019) | 0.161 (.071)* | 0.262 (.047)*** |
| Quadratic term | | | | | | |
| Intercept | | | | | 0.022 (.007)** | 0.022 (.007)** |
| Gender | | | | | −0.001 (.006) | 0.004 (.005) |
| Increasing | | | | | −0.028 (.014)* | −0.046 (.007)*** |
| Decreasing | | | | | −0.005 (.010) | 0.012 (.010) |
| High | | | | | −0.029 (.013)* | −0.050 (.009)*** |
| Residual variances | | | | | | |
| Initial level | 0.601 (.033)*** | 0.634 (.033)*** | 0.545 (.052)*** | 0.776 (.074)*** | 0.606 (.054)*** | 0.566 (.051)*** |
| Slope | 0.030 (.002)*** | 0.030 (.002)*** | 0.033 (.003)*** | 0.036 (.004)*** | 0.373 (.044)*** | 0.302 (.041)*** |
| Quadratic term | | | | | 0.011 (.002)*** | 0.009 (.002)*** |

*Note.* Gender was coded as 1 = boys and −1 = girls. RA = relational aggression.
*$p < .05$. **$p < .01$. ***$p < .001$.

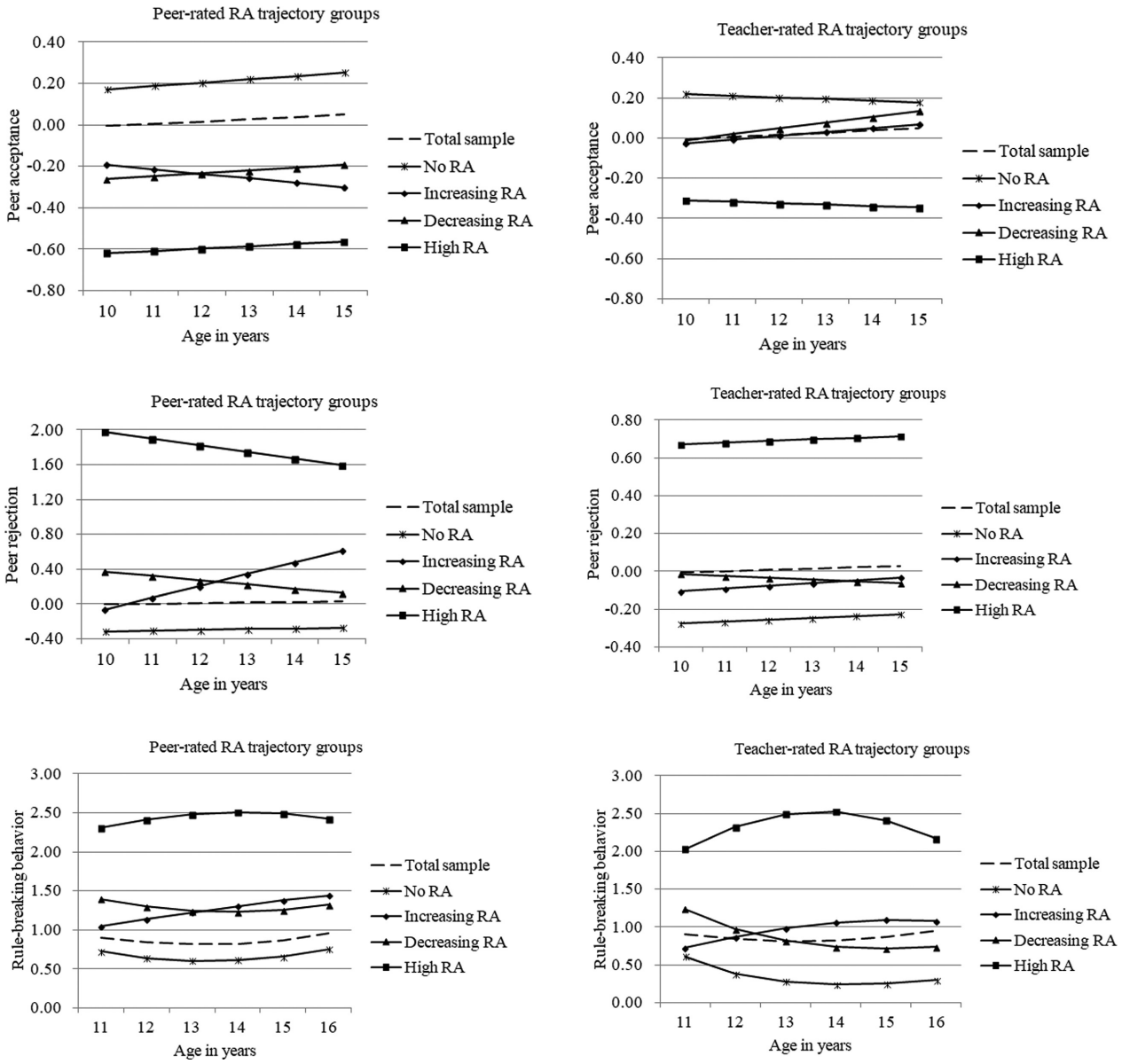


*Figure 2.* Estimated trajectories of peer acceptance, peer rejection, and the Poisson part of rule-breaking behaviors conditioned on peer- and teacher-rated relational aggression trajectory groups.

thus, the efficient-strategy hypothesis was not supported.

### *Rule-Breaking Behaviors*

A zero-inflated Poisson model (ZIP) model was employed to account for the highly skewed distribution of rule-breaking behavior. Within the LGM framework, the ZIP model simultaneously estimated a binary model (i.e., probability of not reporting rule-breaking behaviors) and a count model (i.e., number or levels of rule-breaking behaviors among those who reported such behaviors).

The unconditional LGM analysis revealed an intercept-only model for the zero-inflated part and a quadratic-change model for the count part. Specifically, the zero-inflated part suggested no overall changes occurred in the probabilities of children exhibiting rule-breaking behaviors with age. Regarding the count part, the intercept ($M_{\text{intercept}} = -.103$, $p < .05$; $D_{\text{intercept}} = .934$, $p < .001$), the slope ($M_{\text{slope}} = -.094$, $p < .01$; $D_{\text{slope}} = .381$, $p < .001$), and the quadratic term ($M_{\text{quadratic term}} = .021$, $p < .01$; $D_{\text{quadratic term}} = .011$, $p < .001$) indicated that adolescent rule-breaking behaviors decreased from age 11 until about age 13 and then increased with age.

Again, the significant variance of each growth factor indicated significant individual differences in the development of rule-breaking behaviors.

Results of the zero-inflated part of the model showed that, for both peer- and teacher-rated RA, children in the high RA trajectory, but not the other three trajectories, were more likely to exhibit rule-breaking behaviors (odds ratios: $OR_{peer} = 3.05$, $OR_{teacher} = 2.38$, $ps < .01$) compared to the total sample. Regarding the count part of the model, child gender only accounted for the intercept factor (explaining about 17% of the variance) rather than the slope or quadratic term of the growth curve, with boys showing more rule-breaking behaviors than the total sample (OR = 1.45, $p < .001$). Children's group membership in RA trajectories also contributed to the variance of the intercept (peer ratings, 18%; teacher ratings, 22%), the slope (peer ratings, 2%; teacher ratings, 21%), and the quadratic term (peer ratings, < 1%; teacher ratings, 17%) beyond any effect of child gender (see Table 2 and Figure 2).

Children in both the peer- and teacher-rated high RA group exhibited the most rule-breaking behaviors, and more importantly, their rule-breaking behaviors increased over time; this peaked at age 14, providing strong support for the chronicity hypothesis. With regard to the desistance hypothesis, the results on peer- and teacher-rated RA trajectories provided inconsistent evidence. On the one hand, children in the teacher-rated decreasing RA group showed more rule-breaking behaviors at the first time point (i.e., age 11), and their rule-breaking behaviors decreased at a higher rate than the total sample, which is consistent with the desistance hypothesis. On the other hand, although children in the peer-rated decreasing RA group had significantly more rule-breaking behaviors at age 11, they experienced similar developmental changes in rule-breaking behaviors to those in the rest of the sample—thus, not supporting the desistance hypothesis. Finally, the exacerbation hypothesis was supported, such that both peer- and teacher-rated increasing RA groups showed similar or lower levels of rule-breaking behaviors at age 11, but then their rule-breaking behaviors increased more rapidly with age, compared to the total sample.

### *Associations With Changes in Adjustment: Controlling for the Effects of PA*

We examined whether the results above changed after controlling for the effects of PA (see Table 3 and also Figure S1). Estimates of the effects of PA on the three variables can be seen in Table S7. Peer-rated PA was negatively associated with peer acceptance (accounting for about 3%–9% variance) and positively linked to peer rejection (accounting for about 30%–45% variance). Teacher-rated PA was associated negatively with peer acceptance from age 10 to 12 (accounting for about 2%–4% variance) and positively with peer rejection (accounting for 11%–25% variance). PA also positively predicted adolescent rule-breaking behaviors ($OR_{peer}$ ranging from 1.48 to 2.25 and $OR_{teacher}$ ranging from 1.45 to 2.51).

After controlling for the effects of PA, the high RA group still showed the lowest level of peer acceptance and the highest level of peer rejection, indicating that the chronicity effect of RA was robust. The desistance effect of peer-rated decreasing RA trajectory on peer rejection disappeared; however, the exacerbation effect of peer-rated increasing RA trajectory on peer rejection still remained. Taken together, children's peer rejection status would be exacerbated with the increases in RA, but their rejected peer status would not improve even if their RA decreased unless their PA also decreased simultaneously.

After controlling for PA, the peer-rated RA trajectories no longer predicted the change in rule-breaking behaviors. The desistance effect of the teacher-rated RA also disappeared. However, both the increasing group and the chronically high group of teacher-rated RA still contributed to the prediction of changes in adolescent rule-breaking behaviors.

### *Examining Gender Differences*

Using a group invariance modeling approach, we tested whether child gender moderated the links between RA group membership and the changes in peer acceptance and rejection. On the basis of the conditional growth model (only with RA trajectory group membership as covariates), we first estimated a baseline model, in which no cross-group equality constraints were imposed across gender. Then we estimated a constrained model in which the effects of RA trajectories on the intercept and slope of peer acceptance or rejection were constrained to be equal across gender. The model fit of the constrained model was acceptable and did not differ significantly from the baseline model (see Table S8 for the model fit indices), indicating no gender differences in the effects of RA trajectories on the growth of adolescent peer acceptance and rejection.

Given that the group invariance modeling approach is not appropriate for ZIP models, we examined whether child gender interacted with RA trajectory groups in predicting rule-breaking behaviors. We found no significant interaction effect

Table 3
*Effects of Trajectory Group Memberships of RA on the Development of Adjustment After Controlling for the Effects of Physical Aggression*

| | Peer acceptance | | Peer rejection | | Rule-breaking behaviors | |
|---|---|---|---|---|---|---|
| | Peer-rated RA | Teacher-rated RA | Peer-rated RA | Teacher-rated RA | Peer-rated RA | Teacher-rated RA |
| Initial level | | | | | | |
| Intercept | 0.168 (.033)*** | 0.075 (.026)** | −0.382 (.034)*** | −0.149 (.023)*** | −0.445 (.092)*** | −0.381 (.070)*** |
| Gender | 0.061 (.024)* | 0.014 (.023) | −0.005 (.018) | 0.096 (.020)*** | 0.173 (.050)** | 0.206 (.046)*** |
| Increasing | −0.160 (.057)** | −0.045 (.029) | −0.053 (.058) | −0.053 (.026)* | 0.023 (.114) | −0.052 (.057) |
| Decreasing | −0.142 (.044)** | 0.013 (.039) | 0.106 (.046)* | −0.080 (.032)* | 0.035 (.093) | 0.116 (.075) |
| High | −0.334 (.081)*** | −0.257 (.047)*** | 1.190 (.168)*** | 0.548 (.080)*** | 0.027 (.187) | 0.334 (.093)*** |
| Slope | | | | | | |
| Intercept | −0.005 (.010) | −0.003 (.007) | 0.012 (.010) | 0.025 (.007)*** | −0.221 (.076)** | −0.215 (.050)*** |
| Gender | −0.005 (.006) | −0.006 (.006) | −0.004 (.005) | −0.002 (.005) | −0.008 (.043) | −0.033 (.036) |
| Increasing | −0.021 (.016) | 0.012 (.007) | 0.071 (.016)*** | −0.002 (.007) | 0.124 (.101) | 0.149 (.045)** |
| Decreasing | −0.017 (.011) | 0.020 (.011) | −0.013 (.012) | 0.004 (.009) | 0.080 (.080) | −0.087 (.063) |
| High | −0.034 (.022) | −0.028 (.014)* | −0.050 (.042) | 0.014 (.021) | 0.319 (.179) | 0.307 (.082)*** |
| Quadratic term | | | | | | |
| Intercept | | | | | 0.052 (.014)*** | 0.047 (.009)*** |
| Gender | | | | | −0.002 (.008) | 0.000 (.007) |
| Increasing | | | | | −0.014 (.019) | −0.025 (.008)** |
| Decreasing | | | | | −0.005 (.015) | 0.009 (.012) |
| High | | | | | −0.050 (.030) | −0.057 (.015)*** |
| Residual variances | | | | | | |
| Initial level | 0.584 (.035)*** | 0.624 (.036)*** | 0.410 (.053)*** | 0.622 (.067)*** | 0.533 (.079)*** | 0.509 (.076)*** |
| Slope | 0.030 (.002)*** | 0.029 (.002)*** | 0.026 (.003)*** | 0.033 (.003)*** | 0.433 (.060)*** | 0.335 (.052)*** |
| Quadratic term | | | | | 0.014 (.002)*** | 0.011 (.002)** |

*Note.* Gender was coded as 1 = boys and −1 = girls. RA = relational aggression.
*$p < .05$. **$p < .01$. ***$p < .001$.

between gender and RA trajectory groups on the growth factors of rule-breaking behaviors.

Taken together, the results indicated that the effects of RA trajectories on the growth of peer acceptance, rejection and rule-breaking behaviors were comparable for girls and boys.

## Discussion

This study examined the developmental trajectories of RA as rated by peers and teachers from age 10 to age 16 using a representative urban sample in mainland China. We also examined whether adolescent adjustment changed as a function of the distinct RA trajectories. We discuss the major results, highlighting the implications of the findings for theory, practice, and future directions.

### *Developmental Patterns of RA*

As expected (Hypothesis 1), we identified four trajectories of RA for both peer and teacher ratings using LCGA: no aggression, low-increasing RA, moderate-decreasing RA, and chronically high RA. Despite the differences in the prevalence of each trajectory, the trajectories identified by the two informants revealed similar patterns.

Nearly half of the children in this study were rated as relationally aggressive by peers, and even more by teachers, at some point during late childhood and early adolescence. Studies on Western samples also evidenced similar prevalence of RA (Cleverley et al., 2012). It is notable that a small proportion of them followed a chronically high aggression trajectory (5.8% rated by peers and 16.0% by teachers). More children showed moderate levels of RA only during late childhood (20.1% rated by peers and 23.7% by teachers) or early adolescence (13.0% rated by peers and 37.3% by teachers). Both the chronically high and moderate-decreasing trajectory showed a declining trend with age overall, despite the differences in trajectory shapes. Generally, the trajectories of no aggression, decreasing and high aggression converge with patterns identified by prior studies (Cleverley et al.,

2012; Ehrenreich et al., 2014; Ettekal & Ladd, 2015; Orpinas et al., 2015).

It is the first time that a low-increasing trajectory (13.0% rated by peers and 37.3% by teachers) was identified. As stated above, such a "late-onset" trajectory has been masked in previous studies due to the limitations in research design. As expected, children in this trajectory showed low and stable levels of RA in childhood, but sharp increase since the last year of elementary school (i.e., age 12), when the biological and ecological transition begin, highlighting the importance of bio-ecological transition on RA (Pellegrini, 2008). This finding implied that early adolescence was a critical period for the development of RA, particularly for the late-onset RA users.

It is also worth noting that adolescents in the low-increasing trajectory experienced relatively rapid decrease in RA since age 14—the second year in junior high school. One major reason may be that these children's use of RA is strategic and might be episodic, and therefore their aggression would decrease or desist with the gradual establishment of peer hierarchies in their junior high school settings. A similar rapid decline in RA also occurred among youth in the chronically high trajectory, despite that their RA was chronic rather than episodic in nature. These results are consistent with the other long-term longitudinal study, showing that levels of RA decrease after early adolescence (Karriker-Jaffe et al., 2008).

### *Covarying Changes in RA and Adjustment*

Consistent with previous studies (Card et al., 2008), we found that more RA was associated with lower peer acceptance, higher peer rejection, and more rule-breaking behaviors. Furthermore, the unique aspect of this study was that we detected longitudinally dynamic links over development, with respect to chronicity and change.

First, we found evidence for the chronicity hypothesis (i.e., Hypothesis 2a)—that children with chronically high RA experienced the most adjustment problems from late childhood through early adolescence. These findings are consistent with previous studies (Cleverley et al., 2012; Ehrenreich et al., 2016; Ettekal & Ladd, 2015). These children are most likely to have social-cognitive and emotional deficits (Crick et al., 2002). Thus, their use of RA is excessive and inefficient, resulting in the most adjustment problems. Also noteworthy, these children's risk for rule-breaking behaviors accumulated with age. Hence, the findings verified Burt's (2012) idea that more severely antisocial individuals would demonstrate more severe levels of both aggression and rule-breaking behaviors.

Second, we found mixed evidence for the desistence hypothesis (i.e., Hypothesis 2b). Although the peer-rated decreasing RA group experienced a decline in peer rejection, and the teacher-rated decreasing RA group showed less and less rule-breaking behaviors with time, the evidence for the desistance hypothesis was not adequate. For one thing, these results might, at least partly, be due to common method effects (i.e., peer reports of RA and rejection; teacher reports of RA and rule-breaking behaviors). More importantly, when the effect of PA was statistically controlled, decreases in RA made no contributions to changes in adolescent adjustment. In addition, children in the desisting RA group showed no significant changes in peer acceptance, suggesting that it is difficult for aggressors to be liked by their peers. All in all, adolescent adjustment would not be necessarily improved for those whose RA decreased, unless their PA also decreased simultaneously.

Third, in contrast to the efficient-strategy hypothesis (i.e., Hypothesis 2c), children's increasing use of RA in early adolescence showed no increases (and even decreases) in peer acceptance. Moreover, these children showed elevated levels of peer rejection. These results may say something about Chinese cultural norms. Although some aggressive children may be well-liked by a subgroup of their peers in Western cultures (Ettekal & Ladd, 2015; Kawabata et al., 2014), this does not appear to be the case in Chinese culture. According to our findings and previous studies on Chinese children (Tseng et al., 2013), RA may not function as they do in Western contexts to establish high status and popularity in the peer group. These findings strongly highlight the maladaptive nature of RA in Chinese culture.

Furthermore, preliminary evidence for the exacerbation hypothesis (i.e., Hypothesis 2d) was found, such that children's increasing use of RA led to their greater risk for peer rejection and rule-breaking behaviors, even after controlling for the effect of PA. Notably, we found that there was not much of an increase in rule-breaking behaviors in this study on average, which is inconsistent with findings in the existing literature (Burt, 2012). One of the possible reasons might be that the use of teacher reports alone may not be ideal for assessing rule-breaking behaviors that are more covert. More likely, however, there exist great heterogeneities in the development of rule-breaking behaviors, as our

findings have indicated that children in both the chronic RA group and the increasing RA group experienced significant increases in rule-breaking behaviors during early adolescence. Taking the findings on the chronicity and exacerbation hypothesis together, this study provided additional evidence that RA may share a similar underlying pathology with other subtypes of externalizing behaviors. In future studies, researchers should pay more attention to the question that how different types of externalizing problems (including PA, RA, and rule-breaking behavior) develop jointly.

### *Gender and RA in Chinese Culture*

We consistently found that girls use less RA than boys across late childhood and early adolescence in this study, and the effect size was moderate in magnitude. In light of these results and previous findings on Chinese samples (Kawabata et al., 2012; Zhang et al., 2016), we can conclude that Chinese boys showed more (and certainly not less) RA than girls. These findings should be understood in the context of Chinese culture. As mentioned earlier, both genders in China are socialized to be interdependent in self-construal, perhaps making RA a more feasible strategy to enact aggression for both boys and girls (Ostrov & Godleski, 2010) compared to cultural contexts that emphasize independence. Additionally, to the extent that Chinese girls are expected to be reserved and quiet, it is plausible that the overall levels of aggressive behavior (including RA) should be lower in girls compared to boys.

Furthermore, previous studies have indicated that Chinese youth showed similar or even higher levels of RA compared to PA (Kawabata et al., 2012; Lansford et al., 2012). In this study, although we found that children showed less RA than PA before and during early adolescence, the direction of the difference between RA and PA reversed in middle adolescence. Taken together, these findings echoed and highlighted the idea that collectivistic cultures facilitate children's use of RA for both genders.

Taking the current results into consideration, along with prior studies in collectivistic-oriented cultures (Kawabata et al., 2010b; Lansford et al., 2012), the evidence is mounting that the gender normative hypothesis of RA for girls—derived in Western culture samples—does not hold in Chinese and perhaps other collectivistic cultures. Correspondingly, regarding the development of peer status and rule-breaking behaviors, we found that boys and girls experienced the same changes in these variables, regardless of their RA trajectory group membership. In sum, there were far more gender similarities than differences in developmental outcomes associated with RA.

### *It Matters Who You Ask: Agreement Between Peers and Teachers*

Given that there have been only a few prior studies using a multi-informant method like ours to assess children's RA, this study provided important new information on the extent to which peers and teachers converge in their views of group and individual differences in RA. The interinformant agreement on RA between teachers and peers was found to be low. This is not surprising, given that it is much more difficult for teachers to detect RA. Other than those youth who chronically aggress relationally, teachers may be not as knowledgeable as the students themselves given the covert nature of RA.

Nonetheless, similarities rather than differences were found for the two informants regarding both the number and shapes of the trajectories. Only the prevalence of each trajectory differed across the two informants. Compared to that of peer ratings, relatively more children were rated by teachers to be in the increasing, decreasing, and chronically high aggression trajectories. Teachers are more sensitive and hold harsher attitudes toward aggression than children, making them more likely to rate unsubmissive children as aggressors. Even so, children with the highest level of RA were much more prone to be distinguished from others by both teachers and peers, as evidenced by the fact that children in the peer-rated chronically high trajectory were more likely to be assigned to the same trajectory based on teacher ratings.

Regarding the associated adjustment outcomes, the results were also similar for peer- and teacher-rated RA trajectories. Although there was a common informant effect (i.e., effect sizes were largest for variables from the same informants), the effect sizes for variables across informants were strong enough to be significant and interpretable, providing sufficient evidence for the associations between RA trajectories and adolescent outcomes. Overall, using multiple informants, this study provided robust findings on the trajectories of RA and their associations with changes in adolescent adjustment.

### *Strengths, Implications, Limitations, and Future Directions*

Several strengths of this study should be noted. First, by covering a long age period, we provided

detailed information on the developmental patterns of RA during the transition from late childhood to middle adolescence. Second, we assessed RA using both teachers and peers as informants, thus the findings are more abundant, reliable, and robust. Third, we examined how adolescent adjustment changed as a function of the RA trajectories in a dynamic view of human development. The findings emphasized the role of the chronicity and change in RA in predicting adolescent adjustment, and further offered evidence for the predictive validity of the four RA trajectories. Finally, this study provided unique information about Chinese adolescent RA and highlighted cultural differences.

This study provided important insights for theory about the development of RA. Relationally aggressive behaviors occur within the context of interpersonal relationships that are influenced by cultural norms. Aside from whether RA serves as an adaptive or maladaptive behavior, it depends in part on culturally based standards of relationship processes. In collectivistic cultures such as Chinese culture, in which interpersonal interdependency and social harmony are highly valued, RA strongly violates cultural norms and brings more costs than benefits. When considering the mixed findings in the literature on gender differences in RA, cultural context also should be considered.

The findings of this study might inform the development of interventions for aggression. First, practitioners should pay special attention to the children in the chronically high trajectory, as these children showed the worst adjustment outcomes. More importantly, the chronic nature of the high RA trajectory acted as an important risk factor for adolescent rule-breaking behaviors, suggesting that interventions should start as early as possible in order that their RA will not become chronic or stable. Second, the bio-ecological transition during early adolescence contributed to adolescent use of RA for a considerable proportion of students and interventions should start as soon as children enter into new peer ecologies. Third, our findings suggest that multiple forms of aggression should be considered in the intervention simultaneously in order to improve adolescents' adjustment efficiently.

It is also important to consider the limitations in this study. First, our samples are representative for urban Chinese children but not for rural ones. A more extensive and representative sample should be employed in the future. The second limitation pertains to the sample loss, especially during the school transition toward senior high schools. Sample loss is often unavoidable in longitudinal studies. It is necessary to confirm these findings using other samples, particularly those with less attrition in the future. Third, we did not examine the development of PA given the main purpose of the study. Both physical and relational forms of aggression are prevalent among children and adolescents, and are highly correlated, although they are distinct constructs. Therefore, the joint development of PA and RA ought to be examined in the future. Finally, we only focused on how RA affected adolescent adjustment in this study. Future studies should pay attention to the etiologies of RA, based on which effective prevention and intervention programs on RA can be developed.

In conclusion, the current investigation demonstrates the heterogeneities in the developmental course of RA. Furthermore, our findings suggest that children's adjustment varies as a function of RA trajectories (i.e., levels, duration, and developmental timing of RA), emphasizing the importance of understanding the impact of RA in a dynamic view. Additionally, this study suggest that RA in Chinese culture reveals a distinct picture compared to that in Western cultures (i.e., the gender differences and the maladaptive nature of RA), highlighting the role of culture norms in the development of RA for the first time.

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## Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

**Figure S1.** Estimated Trajectories of Peer Acceptance, Rejection, and the Poisson Part of Rule-Breaking Behaviors Conditioned on Peer- and Teacher-Rated Relational Aggression Trajectory Groups After Controlling for the Effects of Physical Aggression

**Table S1.** Model Fit Indices of the Nested CFA Models

**Table S2.** Descriptive Statistics of All Studied Variables

**Table S3.** Unstandardized Growth Factor Parameter Estimates and Standard Errors (in Parentheses)

**Table S4.** Cross-Tabulations of Trajectory Group Membership Based on Peer and Teacher Ratings

**Table S5.** Comparisons of Physical Aggression by Relational Aggression Trajectories in MANOVAs

**Table S6.** Weighted Effect Coding Strategy of Relational Aggression Trajectories in Conditional Growth Modeling of Adjustment Outcomes

**Table S7.** Concurrent Effects of Physical Aggression on Adjustment Outcomes in Conditional Growth Modeling

**Table S8.** Summary of Nested Model Tests Regarding Conditional Growth Curve Models

**Appendix S1.** Measurement Invariance of Aggression and Rule-Breaking Behavior Across Age and Gender