Title: Reactive and proactive aggression in mainland Chinese secondary school students

Author(s): Xiang Li and Annis Lai-chu Fung


Published by: SAGE Publications

This is the author’s accepted manuscript (post-print) of a work that was accepted for publication in the following source:


Notice: Changes introduced as a result of publishing processes such as copy-editing and formatting may not be reflected in this document. For a definitive version of this work, please refer to the published source.

© 2015 SAGE Publications
Reactive and Proactive Aggression in Mainland Chinese Secondary School Students

Xiang Li*

Annis Lai-chu Fung

Author note.

Xiang Li, Psychological Studies Academic Group, National Institute of Education, Nanyang Technological University

Annis Lai-chu Fung, Department of Applied Social Studies, City University of Hong Kong

*Corresponding author:

Xiang Li, Psychological Studies Academic Group, National Institute of Education, Nanyang Technological University, 1 Nanyang Walk, Singapore 637616.

Email: lixiang.ann@gmail.com
Abstract

Summary: As there has been little research in mainland China on the distinction between reactive and proactive aggression, the country’s educators and social workers work with an oversimplified definition of aggression that fails to consider different subtypes, thereby preventing the development of effective interventions. There is a pressing need to learn more about the particular types of reactive and proactive aggression that prevail among mainland Chinese students. Here we report the validation and generalization in China of a well-designed assessment tool, the Reactive-Proactive Aggression Questionnaire (RPQ), which is widely used in the West to measure students’ reactive and proactive aggression. Our twofold objective is to determine 1) whether reactive and proactive aggression can be distinguished; and 2) whether the two-factor structure of the reactive and proactive aggression model is appropriate in a non-Western setting. This is a pioneering study designed to develop a reliable reactive/proactive aggression assessment instrument for the mainland Chinese context.

Findings: Consistent with the findings of previous validation studies on the RPQ, our findings indicate that reactive and proactive aggression are distinguishable in mainland China, but the factor structure differs slightly from the prior findings.

Applications: With modification of its factor structure, the RPQ can be considered a valid
scale to measure the two dimensions of aggression in mainland China. An understanding of the distinction between them will facilitate effective treatment for aggressive students in this region.

Keywords: reactive aggression, proactive aggression, adolescents, cross-cultural, mainland China
Reactive and Proactive Aggression in Mainland Chinese Secondary School Students

Introduction

Aggression is a complicated and multidimensional construct (Little, Henrich, Jones, & Hawley, 2003). In terms of forms, aggression can be classified as physical and verbal aggression (Tremblay, 2000), direct and indirect aggression (Lagerspetz, Björkqvist, & Peltonen, 1988), and overt and relational aggression (Crick & Grotpeter, 1995). In terms of functions, offensive and defensive aggression are distinguished by Pulkkinen (1987), and three pairs of terms are adopted by Kempes, Matthys, de Vries, and van Engeland (2005) to further describe these two types of aggression: impulsive and non-impulsive aggression, hostile and instrumental aggression, and reactive and proactive aggression. The classification of physical, verbal, and social aggression only emphasizes the expression or manifestation of aggression, while the distinction between reactive and proactive aggression stresses the differences in motivations and functions of aggression. Dodge and Coie (1987) were actually the first to propose the reactive and proactive aggression subtypes, and many scholars (e.g., Day, Bream, & Pal, 1992; Fung, Raine, & Gao, 2009; Raine et al., 2006; Xu & Zhang, 2008) have accepted and generalized this classification in the intervening decades.
Reactive aggression and proactive aggression have their own distinct causes, developmental processes, and prognoses (Vitaro, Brendgen, & Barker, 2006). The essential difference lies in the intrinsic motivation behind the aggressive behavior (Baker, Raine, Liu, & Jacobson, 2008). Reactive aggression is an aggressive response to a perceived threat or provocation, whereas proactive aggression is aggressive behavior in anticipation of a reward (Kempes et al., 2005). Such words as “defensive,” “angry,” “hot-blooded,” “impulsive,” “emotional,” and “retaliatory” are often used to describe reactive aggression, whereas “offensive,” “predatory,” and “instrumental” are associated with proactive aggression (Vitaro & Brendgen, 2005). Reactive aggression involves poor emotional and behavioral control (Barry et al., 2007), and is related to situational triggers (Crick & Dodge, 1996). Proactive aggression, in contrast, is viewed as fearless, calculative, and “cold-blooded” behavior (Dodge, 1991) that is highly organized and characterized by little autonomic activation (Reis, 1974) and positive outcome expectancies for aggressive behavior (Smithmyer, Hubbard, & Simons, 2000). The distinction between reactive and proactive aggression is theoretically important but empirically controversial (Bushman & Anderson, 2001; Polman, Orobio de Castro, Thomaes, & van Aken, 2009). Bushman and Anderson (2001) hold the view that reactive and proactive aggression can co-occur, and their correlation can be moderate or high (ranging from 0.41 to 0.83) (Brown, Atkins,
Osborne, & Milnamow, 1996; Day et al., 1992; Dodge & Coie, 1987; Polman et al., 2009; Price & Dodge, 1989; Vitaro & Brendgen, 2005).

As human behavior is driven by intrinsic motivation, educators and social workers should understand well the underlying functions and motivations of aggression before adopting strategies that aim to prevent the exacerbation of aggression. Unfortunately, studies of child aggression are mostly conducted in North America and Europe; few consider the phenomenon in a Chinese cultural setting (Chen & Astor, 2010). It is unclear if the Western concepts of reactive and proactive aggression could be applied in the same way to Chinese society. The collectivism-individualism continuum is often employed to describe cultural characteristics (Oyserman, Coon, & Kemmelmeier, 2002), with East Asian/Chinese (collectivist) and Western/American (individualistic) cultures representing the two extremes (Triandis, 1995). The former values group harmony and group benefits over individual interests (Bond, 1996; Duong, Schwartz, Chang, Kelly, & Tom, 2009), whereas the latter emphasizes independence (Markus & Kitayama, 1991), personal choice, self-expression, and individualism (Triandis, Bontempo, Villareal, Asai, & Lucca, 1988). Since children of different cultural backgrounds tend to display different norms, values, and beliefs, children in different countries and areas have different perceptions of aggression (French, Jansen, & Pidada, 2002; Li, Wang, Wang, & Shi, 2010). These profound
differences may have an effect on the form that aggression takes in the two types of culture and the way in which it is measured.

So far, no specific scale for both subtypes has been developed in mainland China, which accommodates 20% of the world's population, even though the existence of the two subtypes of aggression, reactive and proactive, have been studied extensively over the past 20 years (Dodge & Coie, 1987). The very limited aggression research in mainland China has focused primarily on overt and relational aggression by employing teacher ratings or peer nominations (Li et al., 2010; Xu, Farver, Schwartz, & Chang, 2003). Only a few recent studies (e.g., Jia & Wang, 2011) have distinguished between reactive and proactive aggression, but in-depth exploration of the two subtypes remains rare. These circumstances sparked our interest in developing a reliable instrument to empirically test the distinction between reactive and proactive aggression in mainland China.

In the research on reactive and proactive aggression, informants include parents (Kempes, Matthys, Maassen, van Goozen, & van Engeland, 2006), teachers (Dodge & Coie, 1987), peers (Salmivalli & Nieminen, 2002), and the students themselves (Raine et al., 2006). In practice, parents are not the most suitable informants on children’s aggressive behavior because this behavior usually takes place in school, away from parents (Olweus, 1993). Teachers are familiar with students’ school performance and can be considered
reliable observers of students’ aggressive behavior (Polman et al., 2009). However, the very large class size (50-60 students) that prevails in mainland China renders it impracticable for teachers to fill out numerous questionnaires. Meanwhile, peer nomination is inappropriate for inter-class comparisons in large-scale projects, in that it calls only for the nomination of peers in the same class. The lack of suitable informants at least partially explains the inadequate reactive/proactive aggression research in mainland China, and drives us to develop a self-report scale to better understand the two subtypes of aggression.

The Reactive-Proactive Aggression Questionnaire (RPQ), which is used to distinguish and measure reactive and proactive aggression, was developed by Raine et al. (2006). Self-report RPQ comprises 23 items generated from teacher rating measures of reactive and proactive aggression (Brown et al., 1996; Dodge & Coie, 1987) and a review of the related conceptual and theoretical literature. Each of the 11 reactive aggression and 12 proactive aggression items in RPQ is rated on a three-point scale, a higher score indicating more aggression (0 = never, 1 = sometimes, and 2 = often). The scores for all items are totaled to obtain a general aggression score. In the original validity study in the United States (Raine et al., 2006), the internal consistency reliabilities of general, proactive, and reactive aggression were .90, .86, and .84, respectively. To date, RPQ has been validated in Italy (Fossati et al., 2009), Singapore (Seah & Ang, 2008), and Hong Kong
(Fung et al., 2009), indicating that the two-factor reactive-proactive aggression model is superior to a one-factor general aggression model. But RPQ has never been validated in mainland China.

Given that social problems should be addressed in local contexts, and cultural and social environments are crucial for social work practice (Huang & Zhang, 2012), it is necessary to further examine Western knowledge within the Chinese cultural background. Many researchers (e.g., Chang et al., 2005; Duong et al., 2009) have used Hong Kong to represent Chinese culture, but have generally failed to take its biculturalism into account (Ng, 2007). Although a similar validation study of RPQ has been conducted in Hong Kong (Fung et al., 2009), noteworthy differences exist between Chinese in mainland China, Hong Kong, Taiwan, and overseas due to the impacts of different historical/cultural/societal contexts (Ho, 1986). Hong Kongers are bicultural, at least to some extent, rather than simply Chinese (Ng & Lai, 2011). As noted, aggression research in the Chinese context is scarce. It is important, therefore, to do further research on the classification of aggression and provide related evidence-based problem solving strategies. The two aims of this study are: 1) to employ the self-report RPQ to test whether reactive aggression and proactive aggression are distinguishable in mainland China; and 2) to assess whether the RPQ factor structure used in Western or mixed cultures is suitable for the Chinese context, or requires
modification. To validate the translated RPQ in mainland China and guarantee the quality of the main study, a pilot study was conducted first.

**Pilot Study: Application of RPQ to Chinese Secondary School Students**

**Methods in the pilot study**

Before proceeding to the main study, we carried out a pilot study. Since data collected in international metropolises such as Beijing and Shanghai are not representative of mainland Chinese society (Xu, Farver, Schwartz, & Chang, 2004) due to their relatively high level of modernization and cultural diversity, we selected Fuzhou, the capital of Fujian Province in southeast China, as our research site to address this issue. Fujian is neither one of the most nor least developed areas on the mainland according to a set of economic and social indicators such as economic structure, quality of population, and living quality (Wang, Du, & Liu, 1998). With a population of around seven million, Fuzhou not only retains its Chinese culture, but it has shared in the economic growth mainland China has enjoyed during the past 30 years of economic reform. Uniform nationwide teaching curriculums and syllabuses designed by the Ministry of Education are widely applied across mainland China, and compulsory nine-year education from primary to secondary school has
been universally implemented in urban areas, meaning that the participating schools could represent the education model of urban schools. Moreover, students are enrolled in the secondary schools of Fuzhou, which are located in their residential areas, without special selections according to performance or socio-economic status, thus guaranteeing random sampling in the present study.

The pilot study conducted in January 2010 involved 572 students ($M_{\text{age}} = 14.16, SD = 1.004$) from 12 seventh- and ninth-grade classes at two urban public secondary schools in Fuzhou. Participation was voluntary, and students were informed they could decide not to participate in this study without penalty. Ethical approval was granted by the Ethical Review Committee of the College of Liberal Arts and Social Sciences at the City University of Hong Kong. Written informed consent was obtained from all respondents’ parents.

We administered a structured self-report questionnaire comprising the RPQ and additional scales which were not discussed here. The authors of this study translated the RPQ into Mandarin Chinese, and it was then back-translated into English by bilingual professionals to ensure consistency of meaning. Students completed the 20-minute questionnaire in their classrooms under the guidance of their head teacher and a research assistant, both of whom received training prior to data collection. Students were
discouraged from talking while completing the questionnaires, and were assured of anonymity and confidentiality.

Results of the pilot study

Exploratory factor analysis in the pilot study

RPQ has been widely used in North America (e.g., Baker et al., 2008), but has never been employed in a Chinese setting other than Hong Kong (Fung et al., 2009). An exploratory factor analysis (EFA) was first conducted to examine its factor structure empirically using the Statistical Package for the Social Sciences (IBM SPSS Version 20.0 for Windows). In this pilot study, the data were 99.94% complete. Since total mean substitution is the most commonly used replacement approach (Raaijmakers, 1999), we selected the default option of “series mean” in the SPSS to replace all missing values. The value of Kaiser-Meyer-Olkin (KMO = .897) measuring the sampling adequacy (Norusis, 1985) was higher than .5 (Kaiser, 1974) and Bartlett’s test of sphericity was significant ($\rho = .000$), suggesting that the data were appropriate to proceed with factor analysis. Principal component analysis (PCA) with varimax rotation and several procedures, such as eigenvalue > 1, scree plot, and percentage of explained variance, could be used to decide
the number of extracted factors. The first five eigenvalues were 6.49, 2.52, 1.19, 1.09, and 1.03, but the scree plot (see Figure 1) suggested a sudden drop after the third component in the slope. Given that the first two principal components have explained a substantial amount of variance (39.15%), and the other three components only account for cumulative 14.38% variance, the two-factor solution is preferable. Therefore, the EFA results indicate that RPQ has a bidimensional rather than unidimensional structure.

![Scree Plot](image)

**Figure 1.** Eigenvalue plot for scree test criterion \((n = 572)\)
Although use of the two-factor reactive-proactive model is supported in mainland China, consistent with prior studies, its factor structure requires alteration. As the factor loading of each item was higher than .40 in the original study (Raine et al., 2006), we adopted .40 here as the threshold for factor structure analysis, on which basis we excluded Item 4, “Taking things from other students,” which exhibited a low item loading on both reactive (.290) and proactive aggression (.207). In the original study, items 16 and 19 were found to correlate to reactive aggression, but their factor loadings fell under proactive aggression in the pilot study (see Table 1). The loading of Item 16 on reactive aggression was .368 but .533 on proactive aggression, whereas Item 19 had factor loadings of .179 and .520 on reactive and proactive aggression, respectively.

Table 1. PCA of reactive and proactive aggression in the pilot study (n = 572)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Mean</th>
<th>SD</th>
<th>Reactive</th>
<th>Proactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yelled at others when they have annoyed you</td>
<td>.702</td>
<td>.637</td>
<td>.620</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reacted angrily when provoked by others</td>
<td>.564</td>
<td>.633</td>
<td>.697</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Gotten angry when frustrated</td>
<td>.404</td>
<td>.579</td>
<td>.653</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Had temper tantrums</td>
<td>.727</td>
<td>.664</td>
<td>.650</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Damaged things because you felt mad</td>
<td>.250</td>
<td>.504</td>
<td>.449</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Become angry or mad when you don’t get your way</td>
<td>.404</td>
<td>.583</td>
<td>.674</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Gotten angry or mad when you lost a game</td>
<td>.306</td>
<td>.545</td>
<td>.523</td>
<td></td>
</tr>
</tbody>
</table>
Item 14  Gotten angry when others threatened you  .476  .665  .674
Item 22  Gotten angry or mad or hit others when teased  .414  .587  .634
Item 2  Had fights with others to show who was on top  .068  .279  .456
Item 6  Vandalized something for fun  .114  .373  .480
Item 9  Had a gang fight to be cool  .058  .275  .642
Item 10  Hurt others to win a game  .079  .300  .658
Item 12  Used physical force to get others to do what you want  .115  .366  .612
Item 15  Used force to obtain money or things from others  .045  .225  .514
**Item 16  Felt better after hitting or yelling at someone**  .154  .411  **.368**  **.533**
Item 17  Threatened and bullied someone  .108  .338  .681
Item 18  Made obscene phone calls for fun  .053  .259  .663
**Item 19  Hit others to defend yourself**  .138  .397  **.179**  **.520**
Item 20  Gotten others to gang up on someone else  .138  .384  .716
Item 21  Carried a weapon to use in a fight  .061  .274  .486
Item 23  Yelled at others so they would do things for you  .122  .368  .670

*Notes:* All items presented factor loadings above .44.

**Confirmatory factor analysis in the pilot study**

Based on the EFA results, we performed confirmatory factor analysis (CFA) using LISREL 8.70 (Jöreskog & Sörbom, 2004) to further examine the factor loadings of the two extracted factors. We tested four models separately based on the existing literature (e.g., Raine et al., 2006), and used Maximum Likelihood (ML) estimation. Model A is the “Null (or Independent) model,” the most commonly used baseline model (Bentler & Bonett, 1980), in which all observed variables are uncorrelated and all items are independent of
aggression (Fung et al., 2009). In Model B, the “One-factor general aggression model,” one factor alone can be used to explain aggression. Model C, the “Two-factor reactive-proactive model,” is widely used in the United States, and has been validated in Italy, Singapore, and Hong Kong. Model D is the “Modified mainland Chinese model,” which requires verification in this study.

All model fit indices in Table 2 show that Model B is much superior to Model A, all of its items correlated with general aggression. Model C is, in turn, much better than Model B, suggesting that the two-factor, reactive-proactive aggression model is suitable for use in mainland China. It is noted that AIC could be used to compare the parsimonious nature of non-nested models (Burnham, White, & Anderson, 1995), and the model with the lowest AIC fits the data best. Thus, Model D clearly provides a better model fit than Model C. Moreover, the factor loading of each item on reactive aggression and proactive aggression in Model D was higher than 0.52 and 0.42, respectively. In the pilot study, items 1, 3, 5, 7, 8, 11, 13, 14, and 22 explained reactive aggression with a high reliability (Cronbach’s $\alpha = .823$), and items 2, 6, 9, 10, 12, 15, 16, 17, 18, 19, 20, 21, and 23 explained proactive aggression with a high reliability (Cronbach’s $\alpha = .855$).
### Table 2. Model comparisons in the pilot study ($n = 572$)

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2/df$</th>
<th>AIC</th>
<th>CFI</th>
<th>GFI</th>
<th>IFI</th>
<th>NNFI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>Comparison</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
<th>$\rho$ for $\Delta \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A</td>
<td>10286/253</td>
<td>10332</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Model A&amp;B</td>
<td>8160</td>
<td>23</td>
<td>.000</td>
</tr>
<tr>
<td>Model B</td>
<td>2126/230</td>
<td>2218</td>
<td>.88</td>
<td>.76</td>
<td>.88</td>
<td>.87</td>
<td>.120</td>
<td></td>
<td>Model B&amp;C</td>
<td>1080</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Model C</td>
<td>1046/229</td>
<td>1140</td>
<td>.92</td>
<td>.86</td>
<td>.92</td>
<td>.91</td>
<td>.081</td>
<td>.079</td>
<td>Model B&amp;C</td>
<td>1080</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Model D</td>
<td>831/208</td>
<td>921</td>
<td>.93</td>
<td>.88</td>
<td>.93</td>
<td>.93</td>
<td>.070</td>
<td>.072</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Model A is the “Null model,” Model B the “One-factor general aggression model,” Model C the “Two-factor reactive-proactive model,” and Model D the “Modified mainland Chinese model.” AIC = Akaike’s information criterion; CFI = comparative fit index; GFI = goodness-of-fit index; IFI = incremental fit index; NNFI = non-normed fit index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation. The values of CFI, NNFI, and IFI above .95 are superior fit (Hu & Bentler, 1999), and an acceptable fit when these values are over .90 (Bentler, 1995). RMSEA is considered a mediocre fit ranging from .08 to .10; a good fit should be below .06 (Hu & Bentler, 1999). SRMR less than .08 means a good fit (Hu & Bentler, 1999).

**Main Study: Application of RPQ to Chinese Secondary School Students**

**Methods in the main study**

The main study conducted at the end of April 2010 involved 1,814 seventh- and eighth-grade students (980 boys, 817 girls, 17 unreported) from 41 classes of four urban public secondary schools in Fuzhou which had not participated in the pilot study. The students ranged in age from 11 to 17 ($M_{age} = 13.33$; $SD = .857$; 55 unreported).
Participation was voluntary, and students were informed that they could withdraw at any time without penalty. Informed written consents were obtained from student respondents’ parents.

Students were asked to complete a 30-minute self-report structured questionnaire comprising the RPQ and several other scales which were not relevant to this study. Although the pilot study has identified an RPQ factor structure different from that in previous studies, all 23 original items were included in the main study to test any potential changes. Trained head teachers and research assistants were on hand to maintain discipline and answer students’ questions, respectively. No discussion among students was allowed, and students were assured that their information would be kept strictly confidential.

Results of the main study

Exploratory factor analysis in the main study

In the main study, the missing rate was between 0.1% and 0.7% for all 23 items, and the mean of the observations available on a certain variable was used to replace the missing values by “series mean” of the corresponding variable. The value of KMO was .934 and Bartlett’s test of sphericity was significant ($\rho = .000$), suggesting that the data was suitable
for factor analysis. To retest the factor structure of the RPQ, EFA was first performed by PCA with varimax rotation, and the results (see Table 3) were consistent with the pilot study. As with the pilot study, two factors were extracted, explaining 36.63% of the variance, and Item 4 was deleted due to its low item-total correlations with reactive and proactive aggression (.253 and .321, respectively). Item 4’s low correlation with both two types of aggression suggests that it might not be valid in measuring either reactive or proactive aggression. Therefore, Item 4 is not considered a form of aggression in China. The factor loading of items 16 and 19 again fell under proactive rather than reactive aggression. Under reactive and proactive aggression, the factor loadings of item 16 were .367 and .416, respectively, and those of item 19 were .238 and .518, respectively. The reliability was .777 for reactive aggression (Cronbach’s $\alpha = .778$ for boys and .779 for girls) with nine items and .854 for proactive aggression (Cronbach’s $\alpha = .865$ for boys and .823 for girls) with 13 items, indicating a high degree of internal consistency.
Table 3. PCA of reactive and proactive aggression in the main study (n = 1,814)

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Mean</th>
<th>SD</th>
<th>Reactive</th>
<th>Proactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yelled at others when they have annoyed you</td>
<td>.795</td>
<td>.577</td>
<td>.610</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reacted angrily when provoked by others</td>
<td>.736</td>
<td>.601</td>
<td>.659</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Gotten angry when frustrated</td>
<td>.352</td>
<td>.536</td>
<td>.511</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Had temper tantrums</td>
<td>.781</td>
<td>.562</td>
<td>.648</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Damaged things because you felt mad</td>
<td>.285</td>
<td>.506</td>
<td>.431</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Become angry or mad when you don’t get your way</td>
<td>.465</td>
<td>.559</td>
<td>.640</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Gotten angry or mad when you lost a game</td>
<td>.297</td>
<td>.503</td>
<td>.431</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Gotten angry when others threatened you</td>
<td>.570</td>
<td>.633</td>
<td>.624</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Gotten angry or mad or hit others when teased</td>
<td>.471</td>
<td>.556</td>
<td>.569</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Had fights with others to show who was on top</td>
<td>.103</td>
<td>.333</td>
<td>.487</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Vandalized something for fun</td>
<td>.134</td>
<td>.380</td>
<td>.524</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Had a gang fight to be cool</td>
<td>.059</td>
<td>.263</td>
<td>.650</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Hurt others to win a game</td>
<td>.104</td>
<td>.334</td>
<td>.608</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Used physical force to get others to do what you want</td>
<td>.152</td>
<td>.395</td>
<td>.560</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Used force to obtain money or things from others</td>
<td>.060</td>
<td>.272</td>
<td>.667</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Felt better after hitting or yelling at someone</td>
<td>.163</td>
<td>.392</td>
<td>.367</td>
<td>.416</td>
</tr>
<tr>
<td>17</td>
<td>Threatened and bullied someone</td>
<td>.123</td>
<td>.354</td>
<td>.639</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Made obscene phone calls for fun</td>
<td>.062</td>
<td>.266</td>
<td>.637</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Hit others to defend yourself</td>
<td>.152</td>
<td>.382</td>
<td>.238</td>
<td>.518</td>
</tr>
<tr>
<td>20</td>
<td>Gotten others to gang up on someone else</td>
<td>.130</td>
<td>.366</td>
<td>.643</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Carried a weapon to use in a fight</td>
<td>.086</td>
<td>.318</td>
<td>.670</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Yelled at others so they would do things for you</td>
<td>.138</td>
<td>.374</td>
<td>.556</td>
<td></td>
</tr>
</tbody>
</table>

Notes: All items presented factor loadings above .41.
Confirmatory factor analysis in the main study

CFA comparisons of the four models (see Table 4) reveal that the “Null model” (Model A) fits the data most poorly. The significant chi-square difference ($\Delta \chi^2 = 1738, \Delta df = 1, \rho = .000$) shows the two-factor reactive-proactive aggression model (Model C) provides a significantly better fit than the one-factor general aggression model (Model B). A series of fit indices reveal that Model D, the “Modified mainland Chinese model,” (see Figure 2) best fits the data.

Table 4. Model comparisons in the main study ($n = 1,814$)

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$/df</th>
<th>AIC</th>
<th>CFI</th>
<th>GFI</th>
<th>IFI</th>
<th>NNFI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>Comparison</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
<th>$\rho$ for $\Delta \chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A</td>
<td>29467/253</td>
<td>29513</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Model A&amp;B</td>
<td>26142</td>
<td>23</td>
<td>.000</td>
</tr>
<tr>
<td>Model B</td>
<td>3325/230</td>
<td>3417</td>
<td>.93</td>
<td>.86</td>
<td>.93</td>
<td>.92</td>
<td>.064</td>
<td>.086</td>
<td>Model B&amp;C</td>
<td>1738</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Model C</td>
<td>1587/229</td>
<td>1681</td>
<td>.96</td>
<td>.93</td>
<td>.96</td>
<td>.95</td>
<td>.054</td>
<td>.057</td>
<td>Model B&amp;C</td>
<td>1738</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Model D</td>
<td>1201/208</td>
<td>1291</td>
<td>.97</td>
<td>.94</td>
<td>.97</td>
<td>.96</td>
<td>.047</td>
<td>.051</td>
<td>Model D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Model A is the “Null model,” Model B is the “One-factor general aggression model,” Model C is the “Two-factor reactive-proactive model,” and Model D is the “Modified mainland Chinese model.”
We also performed multi-group CFA using data from both the pilot and main studies to examine the invariance in the modified mainland Chinese model. When the loadings,
variances and covariance of the two factors, reactive and proactive aggression, and the error variances of the items were permitted to differ across the two groups, the fit indices were adequate: $\chi^2 (416) = 2023.05$, $\rho = .000$, RMSEA = 0.057, SRMR = 0.047, CFI = 0.959, and NNFI = 0.954. Good fit indices were achieved when we constrained the factor loadings, variances and covariance, and the error variances were fixed to be equal for the two samples (pilot and main study): $\chi^2 (461) = 2266.79$, $\rho = .000$, RMSEA = 0.057, SRMR = 0.050, CFI = 0.954, and NNFI = 0.953. Based on Cheung and Rensvold (2002) and Vandenberg and Lance’s (2000) stipulation that CFI changes at or below 0.01 are indicative of factor invariance across samples, the $\Delta$CFI = 0.959 – 0.954 = 0.005 in this study suggests that the pilot and main studies are equivalent in terms of empirical fit.

**Gender comparisons**

Given that gender has been shown to play an important role in aggression, independent $t$-tests were conducted to compare boys and girls in terms of their reactive, proactive, and general aggression (see Table 5). Since the missing values for gender could not be estimated (Acock, 2005), we excluded 17 cases where gender was not indicated when we did the comparisons. The results showed that no significant gender difference was found in general aggression, but gender did have a significant effect on proactive aggression. Interestingly, girls’ reactive aggression was slightly higher than boys’,
although the difference was nonsignificant. In addition, the participants displayed more reactive aggression (Item $M = 0.528$) than proactive aggression (Item $M = 0.113$) ($t = 60.838, \rho = .000$), no matter whether they were boys ($t = 42.123, \rho = .000$) or girls ($t = 44.369, \rho = .000$).

Table 5. Gender comparisons on all types of aggression in the main study

<table>
<thead>
<tr>
<th>Aggression</th>
<th>All ($n = 1, 814$)</th>
<th>Boys ($n = 980$)</th>
<th>Girls ($n = 817$)</th>
<th>$t$</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive</td>
<td>4.752 3.025</td>
<td>4.672 3.078</td>
<td>4.856 2.955</td>
<td>-1.287</td>
<td>0.061</td>
</tr>
<tr>
<td>Proactive</td>
<td>1.465 2.693</td>
<td>1.670 2.920</td>
<td>1.202 2.303</td>
<td>3.800***</td>
<td>0.178</td>
</tr>
<tr>
<td>General</td>
<td>6.217 4.975</td>
<td>6.342 5.265</td>
<td>6.058 4.540</td>
<td>1.228</td>
<td>0.058</td>
</tr>
</tbody>
</table>

Notes: ***$\rho < .001$.

Through testing the modified mainland Chinese model by the subsamples of boys and girls, respectively (see Table 6), we found a relatively good fit to the data for two genders, although the fit indices for boys were slightly better than for girls. The correlation between reactive and proactive aggression was .64 and .55 for boys and girls respectively.
Table 6. Gender comparison of RPQ in the main study ($n = 1,797$)

<table>
<thead>
<tr>
<th>Item</th>
<th>Male ($n = 980$)</th>
<th>Female ($n = 817$)</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Reactive</td>
</tr>
<tr>
<td>Item 1</td>
<td>.739</td>
<td>.592</td>
<td>.52</td>
</tr>
<tr>
<td>Item 3</td>
<td>.769</td>
<td>.606</td>
<td>.59</td>
</tr>
<tr>
<td>Item 5</td>
<td>.321</td>
<td>.522</td>
<td>.45</td>
</tr>
<tr>
<td>Item 7</td>
<td>.727</td>
<td>.579</td>
<td>.57</td>
</tr>
<tr>
<td>Item 8</td>
<td>.279</td>
<td>.499</td>
<td>.46</td>
</tr>
<tr>
<td>Item 11</td>
<td>.426</td>
<td>.560</td>
<td>.57</td>
</tr>
<tr>
<td>Item 13</td>
<td>.327</td>
<td>.531</td>
<td>.50</td>
</tr>
<tr>
<td>Item 14</td>
<td>.597</td>
<td>.658</td>
<td>.55</td>
</tr>
<tr>
<td>Item 15</td>
<td>.487</td>
<td>.562</td>
<td>.55</td>
</tr>
<tr>
<td>Item 2</td>
<td>.121</td>
<td>.353</td>
<td>.46</td>
</tr>
<tr>
<td>Item 6</td>
<td>.141</td>
<td>.382</td>
<td>.53</td>
</tr>
<tr>
<td>Item 9</td>
<td>.077</td>
<td>.292</td>
<td>.55</td>
</tr>
<tr>
<td>Item 10</td>
<td>.122</td>
<td>.354</td>
<td>.56</td>
</tr>
<tr>
<td>Item 12</td>
<td>.174</td>
<td>.420</td>
<td>.60</td>
</tr>
<tr>
<td>Item 15</td>
<td>.068</td>
<td>.294</td>
<td>.57</td>
</tr>
<tr>
<td>Item 16</td>
<td>.152</td>
<td>.380</td>
<td>.54</td>
</tr>
<tr>
<td>Item 17</td>
<td>.139</td>
<td>.374</td>
<td>.65</td>
</tr>
<tr>
<td>Item 18</td>
<td>.077</td>
<td>.295</td>
<td>.57</td>
</tr>
<tr>
<td>Item 20</td>
<td>.178</td>
<td>.408</td>
<td>.55</td>
</tr>
<tr>
<td>Item 21</td>
<td>.161</td>
<td>.400</td>
<td>.64</td>
</tr>
<tr>
<td>Item 23</td>
<td>.145</td>
<td>.388</td>
<td>.63</td>
</tr>
</tbody>
</table>

Fit Indices

<table>
<thead>
<tr>
<th></th>
<th>$\chi^2$/df</th>
<th>AIC</th>
<th>CFI</th>
<th>GFI</th>
<th>IFI</th>
<th>NNFI</th>
<th>SRMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>813/208</td>
<td>903</td>
<td>.96</td>
<td>.93</td>
<td>.96</td>
<td>.96</td>
<td>.050</td>
<td>.055</td>
</tr>
<tr>
<td>Female</td>
<td>890/208</td>
<td>980</td>
<td>.94</td>
<td>.91</td>
<td>.94</td>
<td>.94</td>
<td>.058</td>
<td>.063</td>
</tr>
</tbody>
</table>

Notes: Group 0 = boys, and Group 1 = girls. † $p = .05$; *$p < .05$; **$p < .01$; ***$p < .001$. 
Discussion and conclusions

The results of our pilot and main studies show a moderate correlation ($r_s = .54$ and .61) between reactive and proactive aggression, suggesting that they are closely related but distinct types of aggression. This finding demonstrates that reactive aggression and proactive aggression could be distinguished in mainland China as in Western countries (e.g., Raine et al., 2006). Comparable to previous studies (Fung et al., 2009; Raine et al., 2006), our findings show that children display much more reactive than proactive aggression. As has been noted, in Table 5, the score for boys’ proactive aggression is significantly higher than girls’. Possible reasons for this might be that girls in mainland China are expected to be polite, obedient, elegant, and well-behaved, thus proactively aggressive behavior is considered a more serious behavioral problem for girls than boys. Our findings show some differences in reactive and proactive aggression among Chinese students compared to previous studies using US samples. As noted above, Item 4, “Taking things from other students,” is not considered a form of aggression in China, and Item 16, “Felt better after hitting or yelling at someone,” and Item 19, “Hit others to defend yourself,” explain proactive aggression rather than reactive aggression. Specifically, the mean values of items 16 ($M = 0.163$) and 19 ($M = 0.152$) are far lower than the mean values of other items attributed to reactive aggression, as low as that of proactive aggression.
Indeed, Item 16 shows the same pattern of loading here as it does in the study of Fossati et al. (2009).

To the best of our knowledge, the RPQ has only been validated in two East Asian regions: Hong Kong (Fung et al., 2009) and Singapore (Seah & Ang, 2008). In Fung et al. (2009), the RPQ was validated in a sample of Hong Kong secondary school students. Although their model fit indicators were good enough, we found items 4 and 19 had the lowest factor loadings and contributed least to the factors of proactive aggression and reactive aggression, respectively. Seah and Ang (2008) proved the two-factor model was much better than the one-factor model among secondary school students in Singapore. However, the CFI of the two-factor model was only .83, which is not acceptable. The studies conducted in the East Asian regions could be seen as references for mainland China, in that Confucianism and related philosophical roots shape the shared social values and cultures in East Asia (Forbes, Zhang, Doroszewicz, & Haas, 2009). Both studies suggest that reactive and proactive aggression could be distinguished well in Eastern Asia, but the loading pattern may need to be further modified and validated.

Culture is an important concept in society, and plays a role in constructing people’s perceptions and shaping people’s behavior (Harrison & Turner, 2011). Individualistic cultures are more tolerant of aggression (Forbes et al., 2009), and children in these cultures
are more likely to be aggressive than their counterparts in collectivistic cultures. Group harmony (Korostelina, 2007) and the avoidance of conflict (Nisbett, 2003) are emphasized in the latter, and children are encouraged to share, whereas those growing up in individualistic cultures are encouraged to protect their property and rights. Thus, Item 4’s low level of item-total correlation with both reactive and proactive aggression is unsurprising, as most mainland students do not consider taking their classmates’ things to be aggressive behavior. Doing so would, in fact, be seen as more akin to borrowing than to stealing. Chinese culture emphasizes interdependency, social obligations, and group awareness over individual needs (Xu, Farver, Chang, Yu, & Zhang, 2006), and hence children are instilled from kindergarten with an understanding of the need to share, which is in line with the ancient Chinese saying “Helping others is the foundation of happiness” (Ye, Leung, & Mok, 2011).

Chinese cultural characteristics also provide an explanation for the factor loadings of items 16 and 19 being on proactive rather than reactive aggression, in contrast to findings in the United States. Traditional Chinese culture stresses social harmony, and there are strong cultural sanctions against aggression (Xu & Zhang, 2008). In the Chinese context, aggression is viewed as a threat to social harmony (Bond, 2004) and strictly forbidden (Chen, Chen, Wang, & Liu, 2002). Without any doubt, aggressive behavior at school is
likely to incur the dislike of peers and serious punishment from the school and teachers. Thus, children are primarily concerned with getting along well with their peers (Xu et al., 2004), and are taught to exercise self-control in the face of aggression (Nisbett, 2003) from a very early age (Chen et al., 2002). Accordingly, the Chinese are more likely to value low-arousal positive effects such as calmness (Zhang et al., 2011) and to be better able to control their emotions in conflict situations (Chen & Wei, 2011) than their Western counterparts. Based on the dichotomous view of aggression posited by Bushman and Anderson (2001), harm is the goal of reactive aggression, whereas it is merely a means to some other goal of proactive aggression. Discipline and self-control are highly emphasized and valued in primary and secondary schools, and students receive a grade on their daily behavior as well as their academic performance, both of which can influence the awarding of honors and scholarships for students. The result is that students are reluctant to violate norms and proactively trigger a dispute at the risk of punishment, unless they have a clear purpose.

It is worth noting that while Confucianism represents traditional Chinese culture, Marxism is a dominant ideology in contemporary China and is prevalent throughout the school system. Marxist socialist theory, the sole guideline for education after the founding of the new China (Jin & Dan, 2004), exerts a profound influence on students’ perceptions
of aggression and their aggressive behavior in daily life. Under the impact of Marxist ideology, it is possible that conflict philosophy may be entrenched in students’ minds, leading them to consider fighting and struggling reasonable and proper means of achieving certain goals. Although Chinese students often hide their emotions and control their behavior, rendering them less likely to display reactive aggression, which is purely emotion-driven, due to the high cost of aggressive behavior, they may perceive proactive aggression as a helpful approach to achieve certain purposes. For example, hitting others could help students achieve the goals of feeling better or defending themselves.

**Implications and limitations**

The indigenous development of the RPQ in a specific Chinese social and cultural context is of great importance. A tiny number of studies regarding reactive and proactive aggression have been conducted thus far in Asian countries (e.g., Seah & Ang, 2008). The present study validating the mainland Chinese case can enrich the body of reactive and proactive aggression research across cultures, and provide the basic evidence-based guidance to problem solving strategies that prevent aggression with different functions and motivations. Through modifying and developing a qualified self-report instrument adapted
for Chinese culture to measure reactive and proactive aggression, the present study provides valuable knowledge to give educators and social workers a clear idea of which specific measures to take, rather than oversimplified interventions to help aggressors with different types of aggression.

Several limitations should be noted here. First of all, the biggest limitation of the RPQ is inevitably that the accuracy of data obtained from self-report questionnaires may be biased, disputable, or unreliable (Martens, 1993). In particular, children may be concerned about reporting their aggressive behavior honestly. In this case, information from peers, teachers, and parents could be added in future studies to further confirm the distinction between reactive and proactive aggression. Second, the samples of our pilot and main studies are from urban areas in mainland China. One should be careful not to generalize the findings in this study to rural areas, since China’s fast-paced economic development has led to a considerable rural-urban divide. This study should be replicated with samples from rural areas to help capture the full picture of aggressive adolescent behavior in mainland China.
References


Ng, S. H. (2007). Biculturalism in multicultural Hong Kong. Journal of Psychology in
Chinese Societies, 8, 121–140.


Zhang, B. S., Fokkema, M., Cuijpers, P., Li, J., Smits, N., & Beekman, A. (2011). Measurement invariance of the center for epidemiological studies depression scale