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A Cross-regional Study of the Reactive and Proactive Aggression of Youth in Spain, Uruguay, Mainland China, and Hong Kong

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Conflict of Interest Statement

Annis Lai-chu Fung declares that she has no conflict of interest. Xiang Li declares that she has no conflict of interest. Martín J. Ramírez declares that he has no conflict of interest. Bess Yin Hung Lam declares that she has no conflict of interest. Luis Millana declares that he has no conflict of interest. Natalia Fares declares that she has no conflict of interest.

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Abstract

This study is the first attempt to measure reactive and proactive aggression in 1,203 youths aged between 11 and 20 from Hong Kong, mainland China, Spain, and Uruguay using the Reactive-Proactive Aggression Questionnaire (RPQ). The two-factor RPQ construct was found to exhibit an excellent model fit for all sub-samples, and the measurement and structural invariance across the four regions was also revealed. After controlling for age, the youth in Uruguay exhibited the highest levels of general, reactive, and proactive aggression, followed by Spain, Hong Kong and mainland China. Reactive, proactive, and general aggression increased with age in the total sample, but the effects differed among regions. Boys were found to exhibit higher levels of general, reactive, and proactive aggression than girls only in Uruguayan sample. These findings confirmed the cross-cultural generalizability of the two-factor RPQ model, and suggested culture, age, and gender to be significant determinants of youth aggression.

Keywords: youths, reactive aggression, proactive aggression, cross-cultural comparisons, four regions

Reactive and proactive aggression have been widely recognized as distinct subtypes of aggression for more than two decades (Cima, Raine, Meesters, & Popma, 2013; Dodge & Coie, 1987; Fung, Gerstein, Chan, & Engebretson, 2013; Raine et al., 2006). Reactive aggression is defined as aggressive behavior in response to provocation or perceived threat, while proactive aggression is defined as goal-oriented and calculated aggression performed to obtain external rewards (Cima et al., 2013). The two subtypes demonstrated a differentiated relationship with youth's behaviors. Vitaro, Gendreau, Tremblay, and Oligny (1998) found that only proactive aggression predicts delinquency, oppositional defiant disorder and conduct disorders, but not reactive aggression. Stevens and Hardy (2011) also found proactive aggression to be the only predictor of adolescents' involvement and psychological investment in fights. In contrast, Fite, Rubens, Preddy, Raine, and Pardini (2014) found only reactive aggression in adolescent have association with internalizing problem (i.e. depression and anxiety). The distinction represented two underlying roots of aggressive behaviors and thus suggested meaningful implication in treating youth aggression (Coie & Koeppl, 1990).

The identification of subtypes of aggression contributed to effective therapeutic outcome of aggression intervention (Fung, 2012). The Reactive-Proactive Aggression Questionnaire (RPQ), first developed by Raine et al. (2006), was commonly used to differentiate and measure reactive and proactive aggression. RPQ has been validated in the United States and many other regions, such as mainland China (Li & Fung, 2015), Hong Kong (Fung, Raine, & Gao, 2009), Singapore (Ang, Huan, Li, & Chan, 2016), Turkey (Baş & Yurdabakan, 2012), and Italy (Fossati et al., 2009).

Studies on developmental trajectory of reactive and proactive aggression have yielded inconsistent results. Barker, Tremblay, Nagin, Vitaro, and Lacourse (2006) found that the

majority of Canadian boys with low to average socioeconomic levels showed stable or desisting trajectory, while only a small proportion of boys showed increased proactive and reactive aggression from age 13 to 15, followed by a decrease thereafter. However, Jia, Wang, and Shi (2014) found that levels of both reactive and proactive aggression among Chinese preschooler increased with age; Baş and Yurdabakan (2012) also found that the reactive aggression and proactive aggression of Turkish children generally increased from Grade 4 to Grade 7, with slight decrease in Grade 8. Fung et al. (2009) found that reactive aggression generally increased with age among Hong Kong students, but proactive aggression increased only in boys but not girls. In spite of the unclear results yielded from different regional-bound studies, no cross-regional studies have been conducted to date on effects of age on reactive and proactive aggression.

Previous studies also generated inconsistent findings on the effects of gender on reactive and proactive aggression. Skripkauskaite et al. (2015) surveyed 482 Dutch adolescents, and found that boys exhibited higher levels of reactive and proactive aggression than girls. Li and Fung (2015) found that gender exerted influence on proactive but not reactive aggression in Chinese adolescents. In a survey of 200 Grade 9-12 Latino adolescents at risk of dropping out of school in the United States, researchers found males and females exhibit similar levels of reactive and proactive aggression (Evans, Fite, Hendrickson, Rubens, & Mages, 2015). These inconsistent findings may be due to differences between the sampled culture and regions. It remained unclear whether the effects of gender on reactive aggression and proactive aggression would vary across regions.

The cultural differences which led to inconsistent findings on aggression shall be defined as the interaction between individuals' social environment and their ideas and beliefs (Harrison &

Turner, 2011; López & Guarnaccia, 2000). In a cross-cultural study conducted in the United States (Baker, Raine, Liu, & Jacobson, 2008), African American children exhibited significantly higher levels of both reactive and proactive aggression than Hispanic American, Asian American, and Caucasian children. In another cross-regional study (Ang, Huan, & Florell, 2014), American adolescents displayed higher levels of reactive and proactive aggression than Singaporean adolescents. These findings implied that the manifestation of aggression varied across cultures.

Cultural differences might in part explain cross-regional disparities in levels of reactive and proactive aggression and unclear findings regarding the effects of age and gender. However, in reviewing the existing literature, no previous studies have compared the reactive and proactive aggression level across Asian, European, and South American populations. To the best of our knowledge, the current study is the first attempt to compare the effects of age and gender on reactive and proactive aggression exhibited by young people in Asia, Europe, and South America.

Four places are included in the current study, and they are grouped into two pairs according to their geographic and culture region. Spain and Uruguay represented the Western culture. Because of the history of colonization by Spanish and Portuguese and European immigrants in 19th century, Uruguay was heavily influenced by the European culture (Kent, 1996). The most prominent influence is the language. Spanish is still the official language of Uruguay. Furthermore, 87.7% of the population in Uruguay are European descendant (Cabella, Nathan, & Tenenbaum, 2011). Both countries were influenced by the Catholic culture too (Gonzalez & Gonzalez, 2007). Although Uruguay shared great similarity with Spain, it also received culture influences from its other European immigrants, as well as African and native American. For example, Uruguay is relatively more collectivistic in comparison with Spain,

especially with the emphasis of family relationship (Hofstede, 2010). However, as a recently developed country, Uruguay suffers a growing crime threats, especially the robbery crime (Munyo, 2015), while Spain has a more stable economy and well-developed social service system that maintain a lower crime rate (Bourguignon, 2001).

On the other hand, mainland China and Hong Kong represented the Eastern culture. They are both influenced by the traditional Confucian values (Ralston, Gustafson, Elsass, Cheung, & Terpstra, 1992). Like Uruguay and Spain, Hong Kong and mainland China shared the same ethnic and language background despite their different dialects. However, Hong Kong is considered more westernized because of the colonization by British for over 150 years (Lam, Lau, Chiu, Hong, & Peng, 1999). Previous study had found that Hong Kong Chinese are preferred personal-intrinsic value than mainland Chinese (Lau, 1992). The two also have major differences in terms of the education policy (Chan & Mok, 2001) and political culture (Chu & Chang, 2001). Participants of mainland China were recruited from Fuzhou, which is also a port city with rapid growing economy and allows meaningful comparison with Hong Kong.

To fill these gaps in existing literature, the following hypotheses were developed and tested:

1. The two-factor RPQ model is applicable to all four regions.
2. The measurement and structural invariance of the 2-factor structure of the RPQ are established across the four different regions.
3. Young people in Uruguay (South America) and Spain (Europe) have higher levels of reactive and proactive aggression than those in Hong Kong and mainland China (Asia).
4. Reactive aggression and proactive aggression increase with age in Asia, Europe, and South America.

5. Young males have higher levels of reactive and proactive aggression than young females in Asia, Europe, and South America.

Method

Participants

The participants comprised 1,203 young people aged between 11 and 20 (M_{age} = 14.5, *SD* = 1.51, 8 did not report their age), who were recruited as volunteers from high schools in four regions across the East and the West: Hong Kong (*n* = 329; 193 boys, 131 girls; M_{age} = 14.0, *SD* = 1.30), mainland China (*n* = 394; 200 boys, 194 girls; M_{age} = 13.3, *SD* = .90), Spain (*n* = 153; 90 boys, 63 girls; M_{age} = 15.0, *SD* = 1.33), and Uruguay (*n* = 327; 147 boys, 180 girls; M_{age} = 16.0, *SD* = .90). Six hundred and thirty (52.6%) of the participants were male and 568 (47.4%) were female (5 did not report their gender). In Hong Kong, the participants were recruited from high schools in the New Territories. In mainland China, the participants were recruited from high schools in Fuzhou. The participants in Spain and Uruguay were recruited from high schools in Madrid and Montevideo respectively. None of the participants presented with pathological, neurological or psychiatric symptoms. Written informed consent was obtained from each participant, and parents also gave assent to allow their children to participate in the survey in the four regions. The participants were asked to fill out the Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006) in their respective classrooms.

Measure

A 23-item, self-reported version of the RPQ (Raine et al., 2006) was used to assess the participants' reactive aggression and proactive aggression. The participants reported the frequency of their engagement in aggressive behavior on a 3-point scale ranging from 0 (never) to 2 (often). The RPQ consisted of two subscales: reactive aggression (11 items) and proactive

aggression (12 items). A score for general aggression was computed by summing the scores for all 23 items, and reactive-aggression and proactive-aggression scores were computed by summing the scores for their respective items. The construct validity, criterion validity, convergent validity, and discriminant validity of the RPQ were confirmed by Raine et al. (2006). In addition, Raine et al. (2006) obtained satisfying reliability: .90 (general aggression), .84 (reactive aggression), and .86 (proactive aggression). The RPQ has been adapted for use in Hong Kong (Fung et al., 2009), mainland China (Li & Fung, 2015), Spain (Fernández, Rodríguez, & Gibbs, 2013), and Uruguay (Fares, Cabrera, Lozano, Salas, & Ramírez, 2012) before, and in each case has been found to exhibit a high degree of internal consistency, with Cronbach's alpha values of .83, .78, .84, and .77 for reactive aggression and .89, .85, .87, and .78 for proactive aggression, respectively. This study employed the Chinese version of RPQ validated in the cross-cultural study by Fung et al. (2009) in mainland China and Hong Kong, and demonstrated a good to excellent internal consistency .88, .83, and .80 for general aggression, reactive aggression, and proactive aggression, respectively. The Cronbach's alpha values obtained for the sub-samples ranged from .80 to .88 (general aggression), .73 to .82 (reactive aggression), and .71 to .84 (proactive aggression).

Results

Confirmatory Factor Analysis (CFA)

To determine the cross-cultural validity of the two-factor (reactive aggression and proactive aggression) model, its fitness for use with each sub-sample was first assessed using LISREL 8.7 (Jöreskog & Sörbom, 2004). Diagonally weighted least squares (DWLS) estimation was used because of its fit for ordinal data (Jöreskog, 2005). The comparative-fit index (CFI), incremental-fit index (IFI), non-normed fit index (NNFI), and root mean square error of

approximation (RMSEA) were used to evaluate model fit. CFI, IFI, and NNFI values higher than .90 were considered to indicate an acceptable fit (Bentler, 1992), and values higher than .95 were taken to indicate a good fit. RMSEA values smaller than .06 indicated a good fit (Hu & Bentler, 1999). As shown in Table 1 and Table 2, the two-factor RPQ model was found to be suitable for use with each of the four samples.

Multigroup Confirmatory Factor Analysis (MGCFA)

MGCFA was conducted to determine whether the two-factor RPQ model was similarly applicable to youths in Hong Kong, mainland China, Spain, and Uruguay. Seven models were assessed using MGCFA to examine the measurement (i.e., configural, metric, scalar, and error variance) and structural (i.e., factor variances, factor covariances, and factor means) invariance of the two-factor structure of the RPQ across the different four regions. In Model 1 (i.e., configural invariance), no equality constraints were imposed on factor loadings, item intercepts, error variances, factor variances and covariances, and factor means. A series of progressively restrictive invariance models across the four regions is following (Vandenberg & Lance, 2000). In a sequential manner, based on Model 1, Model 2 further constrained factor loadings equally across regions to test metric invariance; Model 3 further constrained item intercepts equally across regions to test scalar invariance; Model 4 further constrained error variances equally across regions to test error variance invariance; Model 5 further constrained factor variances equally across regions to test factor variance invariance; Model 6 further constrained factor covariances equally across regions to test factor covariance invariance; and lastly, Model 7 further constrained factor means equally across regions to test factor mean invariance. The CFI change (i.e., ΔCFI) smaller than or equal to .01 recommended by Cheung and Rensvold (2002) was employed as an indicator of factorial invariance due to the over-sensitivity of $\Delta\chi^2$ to misfit.

Results of the seven successively restrictive invariance models indicate the measurement and structural invariance across the four regions based on $\Delta CFI \leq .01$ (see Table 2).

Comparison of RPQ Scores across Regions

Results from Pearson correlations suggested that participants' age was significantly and positively correlated with general aggression, $r = .39$, $p < .001$, reactive aggression, $r = .40$, $p < .001$, and proactive aggression $r = .30$, $p < .001$. Reactive aggression ($r = .28$, $p < .001$) and general aggression ($r = .23$, $p < 0.01$) increased with age in Spain, but age was found to cast no significant effect on general, reactive, nor proactive aggression in Hong Kong, mainland China, and Uruguay samples. Details were presented in Table 3. The respondents in the four sub-samples also differed significantly in age, $F(3, 1194) = 381.2$, $p < .001$. The Uruguayan respondents were the oldest ($M_{age} = 16.0$), followed by those from Spain ($M_{age} = 15.0$), Hong Kong ($M_{age} = 14.0$), and mainland China ($M_{age} = 13.3$). As age was associated with RPQ scores and country, age was treated as a covariate; the group means were adjusted for age differences between the sub-samples. After controlling for age, 2 (gender) × 4 (country) analysis of covariance (ANCOVA) was used to identify cross-regional differences in the subtypes of aggression. The means of aggression scores adjusted for age were presented in Table 4.

General aggression. The covariate of age was found to have a significant effect on general aggression, $F(1, 1186) = 5.16$, $p = .023$. Country was also found to have a significant main effect, $F(3, 1186) = 64.4$, $p < .001$. Bonferroni post-hoc comparisons revealed that the young people in Uruguay displayed more general aggression than those in Spain, $p < .006$, who in turn reported significantly higher levels of general aggression than the respondents in Hong Kong and mainland China, ps $< .001$. The two Asian samples reported similar levels of general aggression, $p > .05$. Overall, gender was found to have a significant effect on general aggression: male

respondents were more aggressive than female respondents, $F(1, 1186) = 6.27$, $p = .012$. In addition, gender and country were found to have a significant interaction effect, $F(3, 1186) = 5.86$, $p = .001$, suggesting that the influence of gender varied across the four sub-samples. Gender difference was not significant in Hong Kong, $p = .90$, mainland China, $p = .38$, or Spain, $p = .97$, but boys in Uruguay reported significantly higher scores for general aggression than girls in the same sample, $p < .001$. See Table 4.

Reactive aggression. The covariate of age was found to have a significant effect on reactive aggression, $F(1, 1186) = 5.46$, $p = .020$. In addition, country had a significant main effect, $F(3, 1186) = 67.4$, $p < .001$. Bonferroni post-hoc comparisons revealed that respondents in Uruguay and Spain reported similar levels of reactive aggression ($p > .05$), but both samples exhibited greater reactive aggression than the young people in Hong Kong and mainland China (ps $< .001$). The two sets of Asian respondents reported similar levels of reactive aggression, $p > .050$. Gender had a non-significant effect on reactive aggression, $F(1, 1186) = .025$, $p = .87$. However, gender and country had a significant interaction effect, $F(3, 1186) = 4.63$, $p = .003$, suggesting that the effect of gender varied across the four sub-samples. Gender difference was not significant in Hong Kong, $p = .28$, mainland China, $p = .87$, or Spain, $p = .23$, but the boys in Uruguay reported significantly higher scores for reactive aggression than the girls in the same sample, $p = .001$. See Table 4.

Proactive aggression. The covariate of age was found to have a non-significant effect on proactive aggression, $F(1, 1186) = 2.39$, $p = .12$. Country had a significant main effect, $F(3, 1186) = 31.4$, $p < .001$. Bonferroni post-hoc comparisons suggested that young people in Uruguay reported a higher level of proactive aggression than their counterparts in Spain ($p < .01$), who in turn displayed significantly greater proactive aggression than the young people in Hong Kong

and mainland China (*p*s < .001). The respondents in Hong Kong and mainland China were found to have similar levels of general aggression, $p > .05$. Gender had a significant effect; boys exhibited greater proactive aggression than girls, $F(1, 1186) = 23.4$, $p < .001$. In addition, gender and country were found to have a significant interaction effect, $F(3, 1186) = 5.09$, $p = .002$, suggesting that the effect of gender varied across the four sub-samples. Gender difference did not significantly affect the proactive aggression reported by the respondents in Hong Kong, $p = .19$, mainland China, $p = .10$, or Spain, $p = .20$, but the male respondents in Uruguay received significantly higher scores for proactive aggression than the female respondents in the same sample, $p < .001$. See Table 4.

Discussion

This study investigated the influence of culture, age, and gender on the manifestation of reactive and proactive aggression. Overall, the findings supported the hypotheses. Consistent with both the hypotheses and the results in previous cross-cultural studies (e.g. Fossati et al., 2009; Fung et al., 2009), the two-factor (reactive and proactive) aggression construct was found to be applicable to East Asian, European, and South American samples. Meanwhile, the factorial invariance across the four regions was found.

As hypothesized, the young people in Uruguay and Spain exhibited higher levels of both reactive and proactive aggression than their counterparts in Hong Kong and mainland China, and Uruguay youths showed the highest level of both the subtypes of aggression. Reactive aggression and general aggression were found to increase with age in the Spanish sub-sample only; in the other three sub-samples, age was found to exert non-significant effect on reactive, proactive or general aggression. Male respondents exhibited significantly higher levels of general, reactive, and proactive aggression than female respondents in Uruguay only. This result is not wholly

consistent with either the hypotheses or the findings of previous studies (e.g. Baker et al., 2008; Fung et al., 2009; Skripkauskaite et al., 2015).

Reactive-Proactive Aggression Construct

Overall, the two-factor RPQ construct (Raine et al., 2006) achieved excellent goodness of fit (e.g. CFI > .95, RSMEA < .06) and good reliability ($\alpha > .70$), indicating that the construct is suitable for use with populations in Hong Kong, mainland China, Spain, and Uruguay. This finding is consistent with the results of previous studies of the RPQ in East Asia (Ang et al., 2016), Europe (Fossati et al., 2009), and North America (Raine et al., 2006). The measurement and structural invariance across the four regions was supported via a multigroup CFA, suggesting that young people in different regions conceptualized reactive aggression and proactive aggression in a similar way. In short, region confirmatory factor analysis confirmed that the two-factor reactive and proactive aggression structure was suitable for use in different cultural settings outside of the United States.

Differences in Aggression across Regions

After controlling for age, the young people in Uruguay and Spain received the highest scores for reactive aggression, followed by the respondents in Hong Kong and mainland China. In addition, significant differences in proactive aggression and general aggression were observed between the four regions: the respondents in Uruguay reported more proactive and general aggression than the respondents in Spain, and both samples exhibited significantly more proactive and general aggression than the respondents in mainland China and Hong Kong, even after controlling for age. These results are consistent with the observation made in previous studies (e.g. Forbes, Zhang, Doroszewicz, & Haas, 2009) that young people in the West are more aggressive than their Chinese counterparts. More importantly, our findings indicate that culture

plays a significant role in the manifestation of reactive and proactive aggression.

Several cultural differences may explain the disparity in aggression between the Chinese and Western respondents. For instance, the open expression of positive or negative emotion is discouraged in Chinese cultural settings, while self-control and emotional restraint are valued. In contrast, autonomy and the open expression of emotions are encouraged in Western cultural contexts (Garrett-Peters & Fox, 2007). People living in individualistic societies tend to emphasize individual identity, needs, rights, and pleasure, whereas people in collectivistic societies tend to emphasize group identity, obligations, and norms along with cooperation and harmony between in-group members (Duong, Schwartz, Chang, Kelly, & Tom, 2009; Gudykunst et al., 1996; Korostelina, 2007). In addition, the Chinese believe that controlling one's emotions can help to maintain a healthy body and mind, on the grounds that excessive emotion causes physical and mental damage. Compared with people socialized in individualistic cultures, the Chinese are less open and more introverted (Huang, 2011). As they live interdependently, they tend to hide their thoughts and feelings, especially dissatisfaction and anger (Phillips & Xiong, 1995), to ensure that collective peace and harmony are maintained. In fact, emotional outburst or even the disclosure of one's emotions is believed to reflect a weakness of character in Chinese culture (Arthur, 2002). These differences between collectivistic and individualistic cultures may be the underlying reasons for the disparate levels of aggression exhibited by young people in different regions.

Effects of Age and Gender across Regions

General, reactive, and proactive aggression increased with age in the full sample, but the effect of age on aggression varied between regions. Specifically, reactive and general (but not proactive) aggression increased with age in Spain, whereas age had no influence on general,

reactive, or proactive aggression in the other three regions. This finding suggests that age is an unstable cross-regional predictor of aggression, and that further examination is required to determine its effects.

In the full sample, males were found to have higher levels of proactive aggression than females, which is consistent with previous findings (Baker et al., 2008; Fung et al., 2009). In addition, gender and country had a significant interaction effect on general, reactive, and proactive aggression, suggesting that the effect of gender on the subtypes of aggression varied between the four sub-samples. Specifically, gender was not found to affect aggression in the samples from Hong Kong, mainland China, or Spain, which is consistent with the finding of the recent survey done in United State (Evans et al., 2015); whereas boys in Uruguay received significantly higher scores for general, reactive, and proactive aggression than girls. This finding may be due to the significant gap in power and economic status between males and females in Uruguay. More specifically, men enjoy a higher employment rate and receive higher salaries than women in Uruguay (Amarante & Espino, 2004). As such disparities in power and economic status may increase the risk of violence against women (Delisante & Tagliani, 2010), men in Uruguay may be more likely to engage in aggressive behavior. To conclude, the effect of gender depends on the region sampled, and further studies should investigate the underlying cultural root of the differences in aggression subtypes.

Limitations and Implications

The study has three main limitations. First, as the sub-samples were collected from single cities in single regions, the findings may not be generalizable to the whole regions, as there would be potential differences in aggression between individuals of different ethnicities living in the same regions (Fry, 1998). Therefore, more regionally representative samples should be used

in future work. Second, a small sample was obtained for Spain (n = 153), which may lead to unstable CFA structure and reduce the stability of the results for this region. Therefore, the results concerning Spain should be interpreted with caution and sample sizes should be balanced across regions in the future work. Last but not least, shared-method variance cannot be avoided, as only self-reported data were analyzed. Although aggression is generally undesirable, attitudes towards aggression may vary between cultures. Therefore, future researchers should also ask third parties such as parents, teachers, and peers to evaluate the participants' behavior.

Although the study had some limitations, its contributions are considerable. Given that reactive and proactive aggression have different predictive abilities, the model that differentiates between the two subtypes of aggression is very important in both theoretical and practical terms. Aggression does not fade away, in contrast, high levels of aggression persists over time (Krabbendam et al., 2014). It implies that adolescents with aggression are more likely to be involved in criminal behaviors in adulthood. Compared to reactive aggression, proactive aggression is more related to physical violence and serious crimes (Pechorro, Ray, Raine, Maroco, & Gonçalves, 2017). Proactive aggression is not only linked to disruptive behaviors, conduct problems, and violent crime (Cima et al., 2013; Vitaro et al., 1998), but it also predicts violent recidivism as it is the characteristic of violent offenders (Swogger, Walsh, Christie, Priddy, & Conner, 2015). Therefore, differentiating between subtypes of aggression exhibited by young people may facilitate the development of prevention and intervention programs. This study extends cross-cultural research and complements the existing knowledge by validating the RPQ in the four regions across Asia, Europe, and the South America. Understanding cross-regional differences in aggression may also aid the design and implementation of culture-specific measures to reduce youth aggression in various regions.

References

Amarante, V., & Espino, A. (2004). La segregación ocupacional de género y las diferencias en las remuneraciones de los asalariados privados. Uruguay, 1990-2000 [Occupational segregation based on gender and differences in wages among private sector employees. Uruguay, 1990-2000]. *Desarrollo Economico, 44*, 109-129.

Ang, R. P., Huan, V. S., & Florell, D. (2014). Understanding the relationship between proactive and reactive aggression, and cyberbullying across United States and Singapore adolescent samples. *Journal of Interpersonal Violence, 29,* 237-254. doi:10.1177/0886260513505149

Ang, R. P., Huan, V. S., Li, X., & Chan, W. T. (2016). Factor structure and invariance of the reactive and proactive aggression questionnaire in a large sample of young adolescents in Singapore. *Child Psychiatry & Human Development, 47,* 883-889. doi:10.1007/s10578-015-0619-y

Arthur, D. (2002). The validity and reliability of the measurement of the concept expressed emotion in the family members and nurses of Hong Kong patients with schizophrenia. *Interregional Journal of Mental Health Nursing*, *11*, 192-198. doi: 10.1046/j.1440-0979.2002.00247.x

Baker, L. A., Raine, A., Liu, J., & Jacobson, K. C. (2008). Differential genetic and environmental influences on reactive and proactive aggression in children. *Journal of Abnormal Psychology*, *36*, 1265-1278. doi:10.1007/s10802-008-9249-1

Barker, E. D., Tremblay, R. E., Nagin, D. S., Vitaro, F., & Lacourse, E. (2006). Development of male proactive and reactive physical aggression during adolescence. *Journal of Child Psychology and Psychiatry, 47*(8), 783-790. doi: 10.1111/j.1469-7610.2005.01585.x

Baş, A. U., & Yurdabakan, İ. (2012). Factor structure of the Reactive-Proactive Aggression Questionnaire in Turkish children and gender, grade-level, and socioeconomic status differences in reactive and proactive aggression. *Journal of Psychoeducational Assessment, 30,* 284-297. doi:10.1177/0734282911428892

Bentler, P. M. (1992). *EQS structural equations program manual* [BMDP statistical software]. Los Angeles, California.

Bourguignon, F. (2001). Crime as a social cost of poverty and inequality: a review focusing on developing countries. In S. Yusuf, S. Evenett, & W. Wu (Eds.), *Facets of Globalization* (pp. 171-192). Washington, DC: World Bank.

Bray, M., & Koo, R. (2004). Postcolonial patterns and paradoxes: Language and education in Hong Kong and Macao. *Comparative Education, 40*(2), 215-239. doi:10.1080/0305006042000231365

Cabella, W., Nathan, M., & Tenenbaum, M. (2011). Atlas Sociodemográfico y de la Desigualdad del Uruguay, Fascículo 2 - La población afro-uruguaya en el Censo 2011 [Socio-demographic and Inequality Atlas of Uruguay, Fascicle 2 - The Afro-Uruguayan population in the 2011 Census]. Uruguay: Uruguay National Institute of Statistics.

Chan, D., & Mok, K. H. (2001). Educational reforms and coping strategies under the tidal wave of marketisation: A comparative study of Hong Kong and the mainland. *Comparative Education, 37*(1), 21-41. doi:10.1080/03050060020020417

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233-255. doi:10.1207/S15328007SEM0902_5

Chu, Y. H., & Chang, Y. T. (2001). Culture shift and regime legitimacy: Comparing mainland

China, Taiwan, and Hong Kong. In S. Hua (Ed), *Chinese political culture*, *1989-2000* (pp. 320-347). New York: M. E. Sharpe.

Cima, M., Raine, A., Meesters, C., & Popma, A. (2013). Validation of the Dutch Reactive Proactive Questionnaire (RPQ): Differential correlates of reactive and proactive aggression from childhood to adulthood. *Aggressive Behavior, 39*, 99-113. doi: 10.1002/ab.21458

Coie, J. D., & Koeppl, G. K. (1990). Adapting intervention to the problems of aggressive and disruptive children. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 309–337). New York: Cambridge University Press.

Delisante, V., & Tagliani, A. (2010, September). *Gender, human security and violence: Uruguayan case.* Paper presented at the 7th Pan-European Conference on Interregional Relations, Stockholm, Sweden.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53*(6), 1146-1158. doi:10.1037/0022-3514.53.6.1146

Duong, M. T., Schwartz, D., Chang, L., Kelly, B. M., & Tom, S. R. (2009). Associations between maternal physical discipline and peer victimization among Hong Kong Chinese children: The moderating role of child aggression. *Journal of Abnormal Child Psychology, 37*, 957-966. doi:10.1007/s10802-009-9322-4

Evans, S. C., Fite, P. J., Hendrickson, M. L., Rubens, S. L., & Mages, A. K. (2015). The role of reactive aggression in the link between hyperactive–impulsive behaviors and peer rejection in adolescents. *Child Psychiatry & Human Development, 46*(6), 903-912. doi:10.1007/s10578-014-0530-y

Fares, N., Cabrera, J. M., Lozano, F., Salas, F., & Ramírez, J. M. (2012). Agresión reactiva y proactiva en niños y adolescentes uruguayos. *Psicopatología Clínica, Legal y Forense, 12*, 47-68.

Fernández, M. E. P., Rodríguez, J. M. A., & Gibbs, J. (2013). Psychometrical properties of the "How I Think" Questionnaire (HIT-Q) in adolescents. *Psicothema, 25*, 542-548. doi: 10.7334/psicothema2013.38

Fite, P. J., Rubens, S. L., Preddy, T. M., Raine, A., & Pardini, D. A. (2014). Reactive/proactive aggression and the development of internalizing problems in males: the moderating effect of parent and peer relationships. *Aggressive Behavior, 40*(1), 69-78. doi: 10.1002/ab.21498

Forbes, G., Zhang, X., Doroszewicz, K., & Haas, K. (2009). Relationships between individualism-collectivism, gender, and direct or indirect aggression: A study in China, Poland, and the US. *Aggressive Behavior, 35*, 24-30. doi: 10.1002/ab.20292

Fossati, A., Raine, A., Borroni, S., Bizzozero, A., Volpi, E., Santalucia, I., & Maffei, C. (2009). A cross-cultural study of the psychometric properties of the reactive-proactive aggression questionnaire among Italian nonclinical adolescents. *Psychological Assessment, 21*, 131-135. doi:10.1037/a0014743

Fry, D. P. (1998). Anthropological perspectives on aggression: Sex differences and cultural variation. *Aggressive Behavior, 24*, 81-95. doi: 10.1002/(SICI)1098-2337(1998)24:2<81::AID-AB1>3.0.CO;2-V

Fung, A. L. C. (2012). Group treatment of reactive aggressors by social workers in a Hong Kong school setting: A two-year longitudinal study adopting quantitative and qualitative approaches. *British Journal of Social Work, 42*(8), 1533 - 1555. doi:10.1093/bjsw/bcr156

Fung, A. L., Gerstein, L. H., Chan, Y., & Engebretson, J. (2013). Relationship of aggression to anxiety, depression, anger, and empathy in Hong Kong. *Journal of Child and Family Studies, 24*, 821-831. doi:10.1007/s10826-013-9892-1

Fung, A. L. C., Raine, A., & Gao, Y. (2009). Cross-cultural generalizability of the Reactive-Proactive Aggression Questionnaire (RPQ). *Journal of Personality Assessment, 91*, 473- 479. doi:10.1080/00223890903088420

Garrett-Peters, P. T., & Fox, N. A. (2007). Cross-cultural differences in children's emotional reactions to a disappointing situation. *Interregional Journal of Behavioral Development, 31*, 161-169. doi:10.1177/0165025407074627

Gonzalez, J. L., & Gonzalez, O. E. (2007). *Christianity in Latin America: A history*. UK: Cambridge University Press.

Gudykunst, W. B., Matsumoto, Y., Ting-Toomey, S., Nishida, T., Kim, K., & Heyman, S. (1996). The influence of cultural individualism-collectivism, self-construals, and individual values on communication styles across cultures. *Human Communication Research, 22*, 510-543. doi: 10.1111/j.1468-2958.1996.tb00377.x

Harrison, G., & Turner, R. (2011). Being a "culturally competent" social worker: Making sense of a murky concept in practice. *British Journal of Social Work, 41*, 333-350. doi:10.1093/bjsw/bcq101

Hofstede, G. (2010). *Culture's Consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling, 6,* 1-55. doi:10.1080/10705519909540118

Huang, Y. (2011). On adding cultural contents to English teaching. *Journal of Language Teaching and Research, 2*, 248-250. doi:10.4304/jltr.2.1.248-250

Jia, S., Wang, L., & Shi, Y. (2014). Relationship between parenting and proactive versus reactive aggression among Chinese preschool children. *Archives of Psychiatric Nursing, 28*, 152-157. doi:10.1016/j.apnu.2013.12.001

Jöreskog, K.G. (2005). *Structural equation modeling with ordinal variables using LISREL.* Technical report, Scientific Software Interregional, Inc., Lincolnwood, IL.

Jöreskog, K. G., & Sörbom, D. (2004). *LISREL 8.7 for Windows* [computer software]. Lincolnwood, IL: Scientific Software Interregional, Inc.

Kent, R. B. (1996). Peopling the purple land: A historical geography of rural Uruguay, 1500-1915. *Geographical Review, 86*, 479-480.

Korostelina, K. V. (2007). *Social identity and conflict.* Gordonsville, VA: Palgrave Macmillian.

Krabbendam, A. A., Jansen, L. M., Van De Ven, P. M., Van der Molen, E., Doreleijers, T. A., & Vermeiren, R. R. (2014). Persistence of aggression into adulthood in detained adolescent females. *Comprehensive Psychiatry, 55,* 1572-1579. doi:10.1016/j.comppsych.2014.05.002

Lam, S. F., Lau, I. Y., Chiu, C. Y., Hong, Y. Y., & Peng, S. Q. (1999). Differential emphases on modernity and Confucian values in social categorization: The case of Hong Kong adolescents in political transition. *International Journal of Intercultural Relations, 23*(2), 237-256. doi:10.1016/S0147-1767(98)00037-6

Lau, S. (1992). Collectivism's individualism: Value preference, personal control, and the desire for freedom among Chinese in Mainland China, Hong Kong, and Singapore. *Personality*

and Individual Differences, 13(3), 361-366. doi:10.1016/0191-8869(92)90115-6

Li, X., & Fung, A. L. (2015). Reactive and proactive aggression in mainland Chinese secondary school students. *Journal of Social Work, 15,* 297-316. doi:10.1177/1468017314548119

López, S. R., & Guarnaccia, P. J. (2000). Cultural psychopathology: Uncovering the social world of mental illness. *Annual Review of Psychology*, *51*, 571-598. doi:10.1146/annurev.psych.51.1.571

Munyo, I. (2015). The juvenile crime dilemma. *Review of Economic Dynamics, 18*(2), 201-211. doi:10.1016/j.red.2014.03.004

Pechorro, P., Ray, J. V., Raine, A., Maroco, J., & Gonçalves, R. A. (2017). The Reactive-Proactive Aggression Questionnaire validation among a Portuguese sample of incarcerated juvenile delinquents. *Journal of Interpersonal Violence, 32*(13), 1995-2017. doi: 10.1177/0886260515590784

Phillips, M. R., & Xiong, W. (1995). Expressed emotion in Mainland China: Chinese families with schizophrenic patients. *Interregional Journal of Mental Health, 24*, 54-75. doi:10.1080/00207411.1995.11449319

Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., . . . Liu, J. (2006). The Reactive-Proactive Aggression Questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior, 32*, 159-171. doi: 10.1002/ab.20115

Ralston, D. A., Gustafson, D. J., Elsass, P. M., Cheung, F., & Terpstra, R. H. (1992). Eastern values: A comparison of managers in the United States, Hong Kong, and the People's Republic of China. *Journal of Applied Psychology, 77*(5), 664-671. doi: 10.1037/0021-9010.77.5.664

Stevens, D. L., & Hardy, S. A. (2011). Individual, family, and peer predictors of violence among Samoan adolescents. *Youth & Society, 45*(3), 428-449. doi:10.1177/0044118X11424756

Skripkauskaite, S., Hawk, S. T., Branje, S. J., Koot, H. M., van Lier, P. A., & Meeus, W. (2015). Reactive and proactive aggression: Differential links with emotion regulation difficulties, maternal criticism in adolescence. *Aggressive Behavior, 41*, 214-226. doi: 10.1002/ab.21583

Swogger, M. T., Walsh, Z., Christie, M., Priddy, B. M., & Conner, K. R. (2015). Impulsive versus premeditated aggression in the prediction of violent criminal recidivism. *Aggressive Behavior, 41,* 346-352. doi: 10.1002/ab.21549

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3,* 4-70. doi:10.1177/109442810031002

Vitaro, F., Gendreau, P. L., Tremblay, R. E., & Oligny, P. (1998). Reactive and proactive aggression differentially predict later conduct problems. *Journal of Child Psychology and Psychiatry, 39*(3), 377-385.

Table 1

Factor Loadings and Internal Consistency of Two-factor RPQ by Region

	Items	Factor Loadings			
		HK	Mainland	Spain	Uruguay
Reactive	1. Yells when annoyed	.51	.50	.32	.31
Aggression	3. Angry when provoked	.60	.53	.60	.50
	5. Angry when frustrated	.47	.47	.27	.40
	7. Has temper tantrums	.55	.55	.24	.45
	8. Damages things when angry	.63	.43	.58	.43
	11. Angry when unable to escape a situation	.62	.57	.47	.42
	13. Angered by losing a game	.47	.45	.38	.45
	14. Angry when threatened	.55	.48	.45	.44
	16. Feels better after hitting others	.58	.42	.75	.51
	19. Hit to defend self	.41	.30	.56	.42
	22. Hits others when teased	.55	.54	.60	.50
Proactive	2. Fights for status	.45	.37	.57	.43
Aggression	4. Taken things from others	.31	.36	.46	.23
	6. Vandalizes for fun	.52	.45	.55	.44
	9. Engages in gang fights to appear “cool”	.49	.45	.14	.48
	10. Hurts others to win games	.55	.45	.55	.43
	12. Uses force to manipulate others	.63	.61	.71	.49
	15. Uses force to obtain money	.55	.38	.64	.38
	17. Threatens and bullies	.66	.67	.70	.57

18. Makes obscene phone calls for fun	.36	.37	.57	.37
20. Manipulates others to form gangs	.61	.63	.63	.47
21. Carries weapon to use against others	.49	.55	.44	.39
23. Yells to manipulate others	.63	.50	.72	.50
Cronbach's α (Reactive Aggression)	.82	.76	.76	.73
Cronbach's α (Proactive Aggression)	.80	.79	.84	.71
Cronbach's α (General Aggression)	.88	.83	.87	.80

Note. HK = Hong Kong. Mainland = mainland China.

Table 2

Two-factor RPQ Model Fit by Region and Region Invariance

Region	SBχ^2	*df*	CFI	IFI	NNFI	RMSEA
Hong Kong	351*	229	.992	.992	.991	.040
Mainland China	378*	229	.989	.989	.988	.041
Spain	310*	229	.986	.986	.985	.048
Uruguay	378*	229	.978	.978	.976	.045

	SBχ^2	*df*	CFI	IFI	NNFI	RMSEA	Compare	△CFI
Model 1	1427	916	.991	.991	.990	.043		
Model 2	1523	979	.990	.990	.990	.043	2 vs. 1	.001
Model 3	1703	1042	.988	.988	.988	.046	3 vs. 2	.002
Model 4	1815	1111	.987	.987	.988	.046	4 vs. 3	.001
Model 5	1846	1117	.987	.987	.988	.047	5 vs. 4	.000
Model 6	1810	1120	.988	.988	.989	.045	6 vs.5	.001
Model 7	1874	1126	.987	.987	.988	.047	7 vs.6	.001

Note. SBχ^2 = Satorra-Bentler chi-square; CFI = comparative fit index; IFI = incremental fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation. *$p < .001$. Model 1—configural invariance, Model 2—metric invariance, Model 3—scalar invariance, Model 4—error variance invariance, Model 5—factor variance invariance, Model 6—factor covariance invariance, Model 7—factor mean invariance. SBχ^2 = Satorra-Bentler chi-square; CFI = comparative fit index; IFI = incremental fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation.

Table 3

Correlation of Age with Aggression Scores by Region

Country	n	GA	RA	PA
Overall	1195	.39*	.40*	.30*
Hong Kong	321	.004	-.013	.028
Mainland	394	.033	.026	.033
Spain	153	.23*	.28*	.14
Uruguay	327	.046	.077	-.004

Note. * $p < .05$. GA = General Aggression. RA = Reactive Aggression. PA = Proactive Aggression.

Table 4

Means and Standard Deviations of Aggression Scores by Gender and Region

Scale	Sex	Hong Kong			Mainland			Spain			Uruguay			Overall		
		M	*SD*	M_{Adj}	*M*	*SD*	M_{Adj}	*M*	*SD*	M_{Adj}	*M*	*SD*	M_{Adj}	*M*	*SD*	M_{Adj}
GA	All	6.95	5.58	7.14[a]	6.34	4.60	6.70[a]	11.69	6.38	11.52[b]	13.63	5.28	13.29[c]	9.19	6.19	9.66
	Male	6.99	5.39	7.08	6.54	4.63	6.87	11.71	6.37	11.56	15.26	5.56	14.78[*]	9.45	6.47	10.07[*]
	Female	7.07	5.91	7.20	6.13	4.56	6.52	11.67	6.45	11.48	12.29	4.64	11.80[*]	8.91	5.86	9.25[*]
RA	All	5.25	3.67	5.40[a]	5.03	3.16	5.27 [a]	8.61	3.59	8.57[b]	9.70	3.31	9.44[b]	6.83	3.99	7.17
	Male	5.11	3.43	5.17	5.06	3.13	5.27	8.32	3.26	8.22	10.39	3.37	10.10[*]	6.78	4.01	7.19
	Female	5.56	4.01	5.63	5.01	3.20	5.26	9.03	4.00	8.91	9.13	3.16	8.81[*]	6.88	3.98	7.15
PA	All	1.71	2.51	1.74[a]	1.31	2.15	1.43[a]	3.08	3.56	2.96[b]	3.93	2.80	3.85[c]	2.36	2.86	2.49
	Male	1.88	2.56	1.91	1.49	2.29	1.60	3.39	3.93	3.34	4.86	3.04	4.70[*]	2.67	3.13	2.89[*]
	Female	1.51	2.46	1.57	1.13	1.98	1.26	2.63	2.94	2.57	3.16	2.34	3.00[*]	2.03	2.49	2.10[*]

Note. GA = General Aggression. RA = Reactive Aggression. PA = Proactive Aggression. M_{Adj} = Means of aggression scores adjusted for age at 14.5. Adjusted means with differing letter superscripts within row were significantly different at the $p < .05$ level, based on Bonferroni post-hoc comparisons. *Significant difference at the $p < .05$ level.