Which emotional regulatory strategy makes Chinese adolescents happier? A longitudinal study

Biao Sang1,2, Xinmei Deng2, and Ziyuan Luan2

1School of Preschool and Special Education, East China Normal University, Shanghai, China
2School of Psychology and Cognitive Science, East China Normal University, Shanghai, China

Growing interest in emotion regulation is reflected in the studies of cognitive and social development. However, the extant studies mainly highlight how emotion regulation develops based on a western value system. This study utilised a longitudinal design to examine the development of emotion regulation and explored the contributions of different regulatory strategies to emotion experience regarding the early adolescent development period in a Chinese population. A total of 303 Chinese adolescents (age range = 10–14 years) were followed up in a three-phase longitudinal study for 3 years. In each phase of the study, participants completed Adolescents Emotion Regulation Questionnaire and Daily Emotion Scale. Results of hierarchical linear regressions revealed that Chinese adolescents reported more down-regulation. Down-regulation is more effective than up-regulation in enhancing desirable emotion experience and reducing undesirable emotion experience during adolescents’ development. Also, the adaptive functions of emotional regulatory strategies in Chinese background were discussed.

Keywords: Emotion regulation; Early adolescence; Emotion experience; Longitudinal design; Chinese context.

Challenges and changes intertwine, fuse and reinforce one another in human development (Casey et al., 2010). Increased demands of emotion regulation catalyse adolescents’ acquisition of effective regulatory strategies, and the development of emotion regulation in turn affects their interpersonal interactions, mental health and general well-being (Casey, Getz, & Galvan, 2008). Therefore, understanding emotion regulation development in adolescence might give important insights into the nature of social development during adolescence, with implications for adjustment in later life.

Emotion regulation is a multifaceted process that integrates physiological, cognitive and behavioural changes (John & Gross, 2007). According to the regulatory consequence, emotion regulation can be classified into two categories: up-regulation and down-regulation. Down-regulation is defined as those strategies that could decrease and minimise the intensity of emotion experience, and weaken the behavioural and facial response. Conversely, up-regulation is defined as those strategies that could increase and maximise the degree of emotion experience and amplify the behavioural and facial response (Krompinger, Moser, & Simons, 2008).

Individuals become more effective in modulating their emotions over the course of adolescence (Silvers et al., 2012). With age, people persist or even increasingly use some effective regulatory strategies, while abandoning maladaptive ones (Compas et al., 2001). Previous studies found that with age, adolescents use more down-regulation that is considered as more adaptive when facing stress (Garnefski & Kraaij, 2006; Griffith, Dubow, & Ippolito, 2000). Up-regulation of negative emotions is considered as less effective and highly related to depressive symptoms and problem behaviour (Silk, Steinberg, & Morris, 2003). Hence, it is reasonable to assume that adolescents, as a consequence of increasing maturity, will show specific patterns in their choice of regulatory strategies.

However, previous studies mainly focused on the outcomes of different emotional regulatory strategies among adolescents in western culture, it is not yet clear how emotional regulatory strategy develops and performs in other culture contexts. Although variations within a culture can be observed, the Chinese culture stands as the prototypical collectivistic culture that is heavily influenced by Confucianism and the dialectical beliefs.
about emotions (Miyamoto & Ma, 2011). Different from their American counterparts, interpersonal harmony is the core social norm, which requests Chinese adolescents to down-regulate emotion on most occasions (Soto, Perez, Kim, Lee, & Minnick, 2011). For example, concealing one’s happy expression when getting praise from the teacher is considered as a proper way to maintain interpersonal harmony and prevent jealousy. Moreover, unlike the advocating of expression the truly internal feeling of self in Western countries, concealing strong emotions and being calm is seen to be prerequisite for success (Soto et al., 2011). For example, Chinese phrases “泰然自若”, “荣辱不惊”, (stay calm and in control of oneself in every situation and in all circumstances), which appear to be indifferent confronting honour or failure, are typical description for sophisticated and successful seniors. Moreover, Chinese culture is extremely relational and it makes Chinese people regulate their emotions according to the preference of others (Fung & Jin, 2011). For example, kinship is one of the most important references when people regulate their emotions (Fung & Jin, 2011). Consequently, examining the development of emotion regulation among Chinese adolescents might contribute to the literature on a broader scope.

The present study was guided by two hypotheses. First, given the developmental consequences of up- and down-regulation mentioned above and the effect of culture values during socialisation, adolescents in China were expected to use more down-regulation with age. Second, considering the cultural value about emotion regulation goal and the characteristics of Chinese emotion regulatory style mentioned above, down-regulation might be more effective than up-regulation under Chinese context. Adolescents who reported down-regulation were expected to report experiencing more positive emotions.

METHOD

Participants

Data collection proceeded in three phases according to a longitudinal design. All the participants were randomly selected from one junior high school in Shanghai. There were 303 participants, all 6th grade, junior school students (173 male, 130 female; \( M_{\text{age}} = 11.89, SD = 0.68, \) age range: 10–14 years) who were followed up for 3 years. After 1 year, 248 adolescents participated in the second phase of the study. In the third year, 215 adolescents participated in the study. During the 3 years assessment, because of moving to middle school or due to personal reasons, some of the participants shifted their homes and were lost to contact. A total of 215 adolescents took part in all the three phases of the study (70.96%).

Measures

Demographic information

Participants reported their age, gender, student ID, grade, paternal and maternal education level and family structure.

Emotional regulatory strategy usage

Chinese version of Adolescents Emotion Regulation Questionnaire was used to measure the usage of up- and down-regulation in different emotional conditions, respectively (Deng & Sang, 2011). A total of 35 items were rated on a 5-point scale ranging from 1 (least frequently) to 5 (most frequently). The questionnaire assessed regulatory strategies by two subscales as follows: (a) positive emotion regulation subscale: 8 items assessing up-regulation in positive emotional condition (e.g. “When I was praised by the teacher, I will express my happiness in front of other classmates”) and 7 items assessing down-regulation (e.g. “When I was praised by the teacher, I will conceal my happiness in front of other classmates”); (b) negative emotion regulation subscale: 10 items assessing up-regulation in negative emotional condition (e.g. “When I was scolded by the teacher, I will ruminate in the sadness”) and 10 items assesses down-regulation (e.g. “When I was misunderstood by my friends, I will conceal my anger in front of others”).

Frequency of daily emotion experience

Chinese version of Daily Emotion Scale (DES-IV) was used to assess the frequency of positive and negative emotion experiences (Huang & Guo, 2001; Izard, Libero, Putnam, & Haynes, 1993). Positive emotion experiences were measured by three emotion items, including happy, interested and surprised. Negative emotion experiences were measured by nine emotion items, including sad, angry, hostile, disgust, arrogant, fear, shamed, shy and guilty. Participants rated the 36 items using a 4-point scale ranging from 1 (never) to 4 (always).

Design and procedure

The present study utilised a three-phase longitudinal design to explore the development and the outcomes of the usage of emotional regulatory strategies. In each phase of data collection, research protocol was approved by the university. The examiners visited the school during the first semester of the academic year. During assemblies, examiners provided each student with a booklet containing a description of the study and the questionnaires.
RESULTS

Preliminary analysis

Means and standard deviations of the measures are presented in Table 1. Both of the positive emotion regulation and negative emotion regulation subscales demonstrated acceptable reliabilities ($\alpha = .67$ and $\alpha = .85$ in phase 1, $\alpha = .66$ to .83 in phase 2, $\alpha = .62$ to .81 in phase 3). Also, both of the positive emotion experience and negative emotion experience subscales demonstrated acceptable reliabilities ($\alpha = .66$ and .78 in phase 1, $\alpha = .69$ to .80 in phase 2, $\alpha = .72$ to .77 in phase 3). No significant differences were found between adolescents who participated in the follow-up studies and those who did not (all $p$s < .05).

Statistical modelling of changes of emotional regulatory strategies usage

We initially examined the degree of changes of emotion regulatory strategies usage during assessment of the three phases. Hierarchical linear modelling (HLM) was used to estimate the intraclass correlation coefficient (ICC) by the null model (Appendix A). ICC is essentially a measure of the within-participant (group) variability and its values suggest the changes of adolescents’ emotion regulatory strategies usage. According to Cohen’s conventional criteria, an ICC of 0.01 to 0.059 might be a small effect, from 0.059 to 0.138 might be a medium effect and 0.138 to infinity might be a large effect (Cohen, 1998). As shown in Table 2, all the ICCs of the four null models reach medium and large effects. That is, there were considerable changes of adolescents’ emotion regulatory strategies usage during the 3 years.

A two-level HLM was used to investigate average developmental trends in emotion regulatory strategies usage (Appendix A). The estimated effects of linear growth are presented in Table 3 and the individual trajectories of different regulatory strategies are presented in Figure 1. Although the usage of each of the emotional regulatory strategy varied significantly with time, the coefficients of positive and negative emotion up-regulation were small (positive emotion: $\gamma_{10} = 0.07$, negative emotion: $\gamma_{10} = -0.09$). With age, participants used more down-regulation encountering both positive and negative emotional episodes.

Relations between emotional regulatory strategies usage and emotion experiences

HLM was used to investigate the effect of up- and down-regulation on emotion experience (Appendix B). Table 4 shows that emotion regulatory strategy was statistically significantly related to the emotion experience rating (all $p$s < .05). Adolescents who reported more down-regulation had lower negative emotion experience ratings. In contrast, adolescents who utilised up-regulation more frequently reported higher negative emotion experience ratings. Regarding the positive emotion experience, the coefficient of down-regulation was larger than the coefficient of up-regulation (up-regulation: $\gamma_{10} = 0.33$, down-regulation: $\gamma_{10} = 0.41$). Comparing with up-regulation, participants who used more down-regulation would report higher positive emotion experience.

DISCUSSION

The present study represents the first longitudinal study of emotional regulatory strategies usage in a sample of Chinese early adolescents. Examining the
TABLE 3
Hierarchical linear modellings for changes of emotional regulatory strategies usage

<table>
<thead>
<tr>
<th>Emotion regulation</th>
<th>−2LL</th>
<th>Effect</th>
<th>Coefficient</th>
<th>SE</th>
<th>df</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotion up-regulation</td>
<td>1060.23</td>
<td>γ₀₀ₐ</td>
<td>2.53</td>
<td>0.04</td>
<td>214</td>
<td>62.26***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>γ₁₀ₐ</td>
<td>0.07</td>
<td>0.03</td>
<td>214</td>
<td>2.43*</td>
</tr>
<tr>
<td>Positive emotion down-regulation</td>
<td>1292.60</td>
<td>γ₀₀ₐ</td>
<td>2.79</td>
<td>0.05</td>
<td>214</td>
<td>56.23***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>γ₁₀ₐ</td>
<td>0.28</td>
<td>0.03</td>
<td>214</td>
<td>8.78***</td>
</tr>
<tr>
<td>Negative emotion up-regulation</td>
<td>1360.99</td>
<td>γ₀₀ₐ</td>
<td>2.24</td>
<td>0.05</td>
<td>214</td>
<td>44.96***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>γ₁₀ₐ</td>
<td>−0.09</td>
<td>0.03</td>
<td>214</td>
<td>−2.52*</td>
</tr>
<tr>
<td>Negative emotion down-regulation</td>
<td>1338.67</td>
<td>γ₀₀ₐ</td>
<td>2.86</td>
<td>0.05</td>
<td>214</td>
<td>58.91***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>γ₁₀ₐ</td>
<td>0.17</td>
<td>0.03</td>
<td>214</td>
<td>5.58***</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.

Figure 1. This figure illustrates the individual trajectories of different regulatory strategies.

developmental trend of emotional regulatory strategies usage and its outcomes related to the frequency of emotion experience of Chinese early adolescents gives insight into their emotional lives.

Which emotional regulatory strategy makes Chinese adolescents happier?

Researchers regularly ask which emotional regulatory strategies are most adaptive during development (Srivastava, Tamir, McGonigal, John, & Gross, 2009). Our finding supports that down-regulation is an effective and adaptive emotional regulatory strategy in adolescence. First, effective strategies might reserve during development because of its adaptive functions (Compas et al., 2001). Increased demands of emotion regulation catalyse adolescents’ acquisition of effective regulatory strategies (Casey et al., 2010). And the developmental trend of regulatory strategies usage in turn suggests the adaptive value of the strategies (Casey et al., 2008; Casey et al., 2010). The increasing usage of down-regulation during adolescence might imply its value in human development to some extent. Moreover, in the present study, participants who used more down-regulation would report higher positive emotion experience, even in the positive emotional condition. The relationship between emotional regulatory strategies usage and emotion experience supports the argument that effective strategies
function by enhancing desirable emotion experience and reducing undesirable emotion experience during development (Srivastava et al., 2009).

Why is down-regulation so important in Chinese culture?

First, down-regulation of both positive and negative emotion fits the regulation goal according to the Chinese cultural norm (Deng, Sang, & Luan, 2013). In Chinese culture, the demand for maintaining interpersonal harmony and considering others’ feeling is the core regulation goal. Yet, undue expression of emotion is seen as harmful for health and interpersonal relationships (Butler, Lee, & Gross, 2009). Chinese people focus on the interpersonal outcomes of emotional expressing, and they tend to down-regulate their emotions and minimise the possible risk of up-regulation (such as annoying others). Second, down-regulating positive emotion experience meets Chinese dialectical beliefs about emotions (Miyamoto & Ma, 2011). Chinese people believe that happiness result in misery and misery could turn into happiness. Therefore, when there is a conflict between short-term hedonic benefits and long-term outcomes, Chinese adolescents tend to down-regulate their short-term positive emotions for their longer-term instrumental benefits (Deng et al., 2013; Tamir, 2005). Third, down-regulating facial expression might be related to psychological dysfunctions for Western participants, but not for Chinese participants (Soto et al., 2011). Chinese adolescents who use down-regulation more frequently in their daily life reported higher pleasant experience (Deng et al., 2013). Taking together, emotion down-regulation avoids the potential harms of interpersonal harmony, meets the Chinese beliefs of emotions and provides benefits to psychological functions. These make it a more effective social function during development in Chinese context.

Limitations and future direction

There are several noticeable limitations in the study. First, participants of the study were all from urban area and the sample size is relatively small. Thus, future research should be conducted in larger samples with diverse backgrounds. Second, the present study lacks culture comparison. In future studies, researchers should explore emotion strategies in other countries, modifying these daily emotion episodes according to the specific culture, which will provide a more complete picture.

The present longitudinal study suggests the importance of understanding emotion regulation under different cultural contexts. Developmental trend and consequences of different emotional regulatory strategies might imply their effectiveness. Considering the developmental trend and effectiveness of different regulatory strategies, prevention and intervention may be used to help adolescents pass through the period of storm and stress.

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APPENDIX A

Statistical modelling of changes of emotion regulatory strategies usage

To examine the degree of changes of emotion regulatory strategies usage during the assessment of the three phases, HLM was used to estimate the ICC by the null model.

Level 1 : Emotion Regulation$_{ij} = \beta_{0j} + \epsilon_{ij}$

Level 2 : $\beta_{0j} = \gamma_{00} + \mu_{0j}$

$\beta_{0j}$ is the grand mean value of emotion regulation, $\epsilon_{ij}$ is random level 1 factor, $\gamma_{00}$ is the random regression coefficient and $\mu_{0j}$ is the residual term.

Another two-level HLM was used to investigate average developmental trends in emotional regulatory strategies usage. In level 1, the dependent variables were negative emotion regulation up-regulation, positive emotion down-regulation, negative emotion up-regulation and negative emotion down-regulation, which together formed four equations.

Level 1 : Emotion Regulation$_{ij} = \beta_{0j} + \beta_{1j} \times \text{Time}_j + \epsilon_{ij}$

Level 2 : $\beta_{0j} = \gamma_{00} + \mu_{0j}, \beta_{1j} = \gamma_{10} + \mu_{1j}$

The regression equation at level 1 related the emotion regulation scores of the $j$th participant with the test time, where $\beta_{0j}$ is the grand mean value of emotion regulation in phase 1, $\beta_{1j}$ is the mean effect of time representing the developmental trend, the coefficient $\epsilon_{ij}$ is random level 1 factor that represent the participant’s deviations from the overall scores, the parameters $\gamma_{00}$ and $\gamma_{10}$ are participant-specific random regression coefficients, and $\mu_{0j}$ and $\mu_{1j}$ are the residual terms.

APPENDIX B

Statistical modelling of influences of emotion regulatory strategies usage on emotion experience

A two-level HLM modelling was used to investigate the influence of up- and down-regulation on emotion experience. In level 1, the dependent variables were emotion experience (positive and negative emotion experience). The independent variables were emotion regulatory strategies (up- and down-regulation), which together formed four equations.

Level 1 : Emotion Experience$_{ij} = \beta_{0j} + \beta_{1j} \times \text{Emotion Regulation}_j + \epsilon_{ij}$

Level 2 : $\beta_{0j} = \gamma_{00} + \mu_{0j}, \beta_{1j} = \gamma_{10} + \mu_{1j}$

The regression equation at level 1 related the emotion experience scores of the $i$th participant with the $j$th phase of assessment to their emotion regulatory strategy, where $\beta_{0j}$ is the grand mean value of emotion experience, $\beta_{1j}$ is the mean effect of emotion regulatory strategy, the coefficient $\epsilon_{ij}$ is random level 1 factor that represent the participant’s deviations from the overall scores, the parameters $\gamma_{00}$ and $\gamma_{10}$ are participant-specific random regression coefficients, and $\mu_{0j}$ and $\mu_{1j}$ are level 1 residual terms.