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Bidirectional effects between expressive regulatory abilities and peer acceptance among Chinese adolescents

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ABSTRACT

The current study examined potential bidirectional effects between adolescents' expressive regulation (the ability to enhance and suppress overt emotional behavior in line with situational demands) and peer interactions via two experiments. Experiment 1 tested the hypothesis that adolescents' expressive regulation affects their social acceptance from peers. Participants ($N = 147$) were randomly divided into three conditions and watched video clips in which a same-sex partner differed in his or her levels of expressive enhancement and suppression abilities. Results showed that participants reported greater liking of the partner when he or she was able to flexibly enhance and suppress emotional expressions in line with situational demands compared with when either one of these abilities was impaired. Experiment 2 then examined whether peer rejection reduced participants' enhancement and suppression abilities. We manipulated participants' feelings of rejection through a virtual Cyberball game. Following this manipulation ($N = 100$; Inclusion vs. Exclusion), we tested participants' expressive enhancement and suppression abilities, as well as their natural expressivity, via an observational task. Peer exclusion resulted in lower levels of enhancement ability and natural expressive behaviors but did not impair suppression ability. The results of these experiments suggest that both expressive enhancement and expressive suppression are important for adolescents to obtain higher peer acceptance. In addition, peer exclusion also caused impairments in expressive regulation, specifically reduced

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enhancement abilities. In summary, these results evidenced the bidirectional effects between expressive regulation and peer acceptance.

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Introduction

Adolescence is a developmental stage characterized by dramatic emotional and social transformations. Adolescents tend to experience more intense and unstable emotions than either children or adults (Silk, Steinberg, & Morris, 2003), which highlights the importance of developing mature emotion regulation abilities. In addition, adolescents' main source of social support changes from families to peers, and the establishment of healthy peer relationships becomes one of the most important tasks at this stage (Brown & Larson, 2009). Developments and problems in these two domains are likely interrelated. Prior research has shown that adolescents' greater abilities to regulate overt emotional behavior predict more successful peer interactions (e.g., Perry-Parrish & Zeman, 2011; Perry-Parrish et al., 2017). In the meantime, healthy social relationships also construct a supportive environment for gaining experience in regulatory skills and predict increases in expressive regulation over time (Wang & Hawk, 2019). In other words, adolescents' expressive regulatory abilities and social adjustment may influence one other in a reciprocal fashion. Although longitudinal studies can demonstrate that earlier levels of expressive regulation can predict later social adjustment and vice versa, acquiring further experimental evidence of bidirectional causal relationships is crucial for designing effective interventions aiming to promote adolescents' emotional and/or social development. Thus, the current research aimed to examine potential reciprocal effects between expressive regulatory abilities and peer acceptance among a sample of early to middle adolescents using an experimental approach.

Enhancement and suppression: Two forms of expressive regulation

Because youths experience an increasing diversity of social contexts in the transition from childhood to adolescence, they need to learn to both up-regulate (i.e., enhance) and down-regulate (i.e., suppress) their emotional expressions in line with situational demands. Expressive *enhancement* concerns the ability to exaggerate emotion expressions or show increased emotional intensity when appropriate (e.g., to laugh along with unfunny jokes). Expressive *suppression*, in contrast, concerns the ability to hide or minimize emotion expressions in certain contexts (e.g., to remain outwardly modest after getting a top exam score). Importantly, both of these strategies may at times bring individuals' outward emotional behaviors out of line with their subjectively experienced emotions (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004). In the current research, we conceptualized enhancement and suppression as effortful expressive regulation instead of spontaneous or unconscious emotional expressions; we also focused on the abilities to purposefully enact these behaviors instead of habitual or dispositional tendencies toward using certain strategies.

Although enhancement and suppression seem to reflect two opposing facets of emotional expression, they are actually relatively independent skills. Several self-report scales, including the Emotion Amplification and Reduction Scale (TEARS; Hamilton et al., 2009) and the Flexible Regulation of Emotion Expression (FREE) Scale (Burton & Bonanno, 2016), suggest that the up-regulation and down-regulation of emotion are distinct dimensions. Recent correlational studies further showed that daily emotional expression (efforts to share emotions) and daily suppression (efforts to hide emotions) hold differential associations with markers of psychological adjustment (Cameron & Overall, 2018). Importantly, Chen, Chen, and Bonanno (2018) directly compared the effects of expressive enhancement and suppression among Chinese college students. Results indicated that higher suppression ability predicted lower levels of depression and anxiety, whereas higher enhancement ability predicted higher levels of life satisfaction. In general, the extant literature suggests that expressive enhancement and

expressive suppression are distinct regulatory abilities that might be uniquely associated with certain aspects of youths' psychosocial adjustment.

The importance of expressive regulation for social relationships

One of the most important functions of emotional expressions is to serve as social signals in interpersonal interactions (van Kleef, 2009). Prior studies have tended to regard expressive enhancement or effortful expression as beneficial for social relationships. For example, Nils and Rimé (2012) tested the effects of different social sharing modes among a sample of psychology students (recruited as confederates) and their intimate partners (recruited as participants). The participant in each pair watched an emotion-inducing video and shared the content and their feelings with the confederate. Confederates received instructions in advance to behave differently during the sharing, by responding with socio-affective support, cognitive reframing, both, or neither. Immediately after the sharing, participants who received confederates' affective support (e.g., expression of empathy and comprehension) reported lower loneliness and higher emotional proximity within the dyad compared with those who were devoid of affective responses. Daily diary and observational studies also demonstrated that expressing negative emotions when confronted with stressful events increases the possibility of getting support from close others (Collins & Feeney, 2000; Iida, Seidman, Shrout, Fujita, & Bolger, 2008). Nevertheless, emotional expression is not always linked to greater social success. In laboratory-based competitive games, for example, Hubbard (2001) found that rejected children displayed more facial and verbal anger, as well as more nonverbal happiness, compared with average-status children. Therefore, the ability to amplify emotional expressions when appropriate could enhance interpersonal relationship quality, but excessive use of expressive enhancement might instead hinder healthy relationships.

Similar patterns also apply to expressive suppression. Habitual emotional suppression has been widely linked to numerous negative consequences, including social costs. Experimental studies indicated that a lack of expressive behavior during discussions disrupts social bonds with partners, resulting in reduced rapport, decreased willingness to affiliate, and fewer intimacy-building behaviors (e.g., Butler et al., 2003). Dispositional emotional suppression, as measured by self-reported scales or daily sampling, also predicts lower relationship quality over time (Srivastava, Tamir, McGonigal, John, & Gross, 2009; Impett et al., 2012). Although the habitual use of suppression tends to predict greater social difficulties, the ability to suppress is not necessarily harmful in itself. Studies have shown that adolescents with greater self-reported ability to inhibit sadness and anger experienced higher peer acceptance and fewer parent-rated social problems (Perry-Parrish & Zeman, 2011; Perry-Parrish et al., 2017). Moreover, expressive suppression is socially desirable in certain contexts such as minimizing outward displays of pride when outperforming others (Schall, Martiny, Goetz, & Hall, 2016, Study 3). Therefore, the social effects of suppression appear to vary across different contexts.

Taken together, the prior literature suggests that neither enhancement nor suppression always leads to satisfactory or detrimental social outcomes. Both strategies might be adaptive under certain circumstances while being problematic in other situations. The majority of existing research, however, has singularly focused on only expressive enhancement or expressive suppression instead of jointly investigating both regulatory abilities in a single study. To address this gap, Bonanno et al. (2004) proposed the notion of *expressive flexibility*, arguing that the ability to switch easily between enhancing and suppressing emotional expressions in line with situational demands is more adaptive than the rigid use of any single strategy. Bonanno et al. also developed a laboratory task to test individuals' flexibility in using expressive enhancement and suppression by instructing participants to enhance, suppress, or normally express (baseline) overt affective responses to sets of emotion-inducing images. A score of expressive flexibility is composited from naïve observers' ratings of participants' enhancement and suppression as compared with "normal" behavior. Using this paradigm, studies have shown that expressive flexibility predicts various well-being outcomes in adults such as less distress, fewer depressive symptoms, and better friend-rated adjustment (e.g., Rodin et al., 2017; Westphal, Seivert, & Bonanno, 2010).

Although prior research has primarily emphasized the links between expressive flexibility and various indices of intrapersonal well-being, it is possible that this construct is also important to

interpersonal functioning. As extrafamilial relationships continue to expand during adolescence, it is unlikely that the rigid use of any one regulatory strategy will yield consistently beneficial social outcomes. Therefore, the flexibility with which youths can deploy enhancement and suppression, depending on the situation, might be important for achieving high-quality social relationships during adolescence. Importantly, a recent study tested longitudinal associations between expressive abilities and peer relations among Chinese children and adolescents (Wang & Hawk, 2019). Results indicated that expressive flexibility showed a trend ($p = .058$) toward predicting higher peer-nominated social status 6 months later, providing initial support regarding the social benefits of expressive flexibility. Considering the ever-changing nature of emotional expressions, it is possible that the social benefits of expressive flexibility primarily manifest in terms of more short-term effects on interpersonal interactions. Thus, compared with longitudinal designs, experimental research can potentially reveal more immediate impacts of adolescents' expressive regulation on specific social interactions. In the current research, we expected that adolescents would report lower immediate liking of a novel peer who demonstrated less expressive flexibility.

The importance of social relationships for expressive regulation

In addition to potential influences on social adjustment, adolescents' expressive regulation is also likely shaped by experiences within peer interactions. The last decade has witnessed an increasing theoretical emphasis on the social interdependency of emotion regulation. Rimé (2009) argued, for example, that interpersonal processes play a vital role in emotion regulation by (a) soothing emotional distress, (b) facilitating development of cognitive processing of stress, (c) aiding in comprehension of emotional experiences, (d) implanting necessary cultural information, (e) nourishing emotional knowledge base, and (f) providing opportunities to share emotions and get feedback. Specific to expressive regulation, supportive interactions might contribute to the deeper understanding of display rules, set examples for socially appropriate emotion expression, and provide fertile ground for expressive training.

One line of evidence suggesting that social relationships affect expressive regulation comes from studies of rejection and ostracism, which have repeatedly shown that social exclusion impairs self-regulation. For instance, compared with nonrejected individuals, participants who were led to anticipate being lonely in the future were more prone to eating unhealthy foods, giving up during a difficult task, and having trouble in avoiding distractions (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Brain imaging studies have also shown that social rejection caused greater recruitment of the right ventrolateral prefrontal cortex (rVLPFC). The rVLPFC activation then predicted higher activation of the nucleus accumbens (NAcc) to appetitive cues, which has been identified as a crucial substrate of cravings and impulses (i.e., self-regulatory imbalance; Chester & DeWall, 2014). Considering that both the upward regulation and downward regulation of emotional expressions is costly to cognitive and self-regulatory resources (Bonanno et al, 2004; Vohs, Baumeister, & Ciarocco, 2005), we speculate that social exclusion would further lead to difficulties in expressive regulation.

In addition, social exclusion or rejection also causes changes in interpersonal behaviors. Some studies revealed that rejected individuals were more likely to behave aggressively toward interaction partners following a provocation (e.g., Twenge, Baumeister, Tice, & Stucke, 2001). This increased aggression might indicate impaired suppression abilities. However, other research has reported emotional "numbness" as an initial response to social exclusion, where individuals show reduced emotional sensitivity and affective reactions (see Baumeister, Brewer, Tice, and Twenge, 2007, for a review). From this perspective, social exclusion might lead to deficits in the ability to enhance or naturally express emotional expressions. Taken together, evidence exists that experiences of social exclusion might cause impairments in expressive enhancement, expressive suppression, or both, thereby resulting in lower overall flexibility in regulating emotional behaviors.

The longitudinal study by Wang & Hawk (2019) provided more direct evidence for this speculation. Chinese youths' self-reported friendship quality and peer-nominated social status significantly predicted later expressive enhancement, expressive suppression, and overall flexibility. Thus, although prior theorizing has focused more strongly on the social functions of emotion regulation, and many cross-sectional studies have interpreted correlations between these constructs in a similar direction,

it also appears that social relationships predict changes in youths' expressive regulation. Although this longitudinal study was capable of revealing the developmental order of these constructs, its correlational nature still impeded any causal inference. Further experimental investigation is necessary to determine whether the quality of peer interactions positively affects adolescents' expressive regulatory abilities.

Overview of the current research

The current experimental research aimed to examine potential bidirectional influences between adolescents' expressive regulatory abilities and peer acceptance. We designed two experiments to test the effects of each causal direction, respectively. Experiment 1 focused on the effects of expressive regulatory abilities on peer acceptance. We hypothesized that adolescent participants would report greater liking of a novel peer who could flexibly enhance and suppress emotional expressions compared with a peer who could only successfully enact either one of these abilities. Experiment 2 then focused on the reversed effects, namely the impact of peer relationships on expressive regulation. We expected participants to show reduced enhancement and suppression abilities following an experience of social exclusion.

We examined participant sex as a between-participants factor in both experiments to investigate potential differences between girls and boys. Some previous correlational research has examined sex differences in links between expressive regulation and social functioning, but has not found consistent results. For example, the ability to minimize sadness displays was significantly related to higher peer acceptance among adolescent boys but not adolescent girls (Perry-Parrish & Zeman, 2011). In another study, however, both self-reported and peer-nominated anger inhibition showed significant correlations with higher peer acceptance for all adolescents regardless of sex (Perry-Parrish et al., 2017). Given these inconsistencies, we explored sex differences as an open research question with no *a priori* hypotheses.

Experiment 1

Experiment 1 tested the effects of expressive regulation on peer acceptance. Participants were randomly assigned to one of three conditions and watched different sets of video clips in which a same-sex partner differed in his or her levels of two forms of regulation (showing high flexibility by being able to both enhance and suppress expressions, only being able to enhance expressions, or only being able to suppress expressions). Participants then reported their liking of this partner. We expected these liking scores to be higher when the partner demonstrated greater ability to flexibly enhance and suppress expressions, as instructed, compared with when either of these abilities seemed to be impaired. Because girls and boys watched a different (same-sex) model, we examined sex as an additional factor in order to distinguish the manipulation effects from potential video/model effects.

Method

Participants

Participants ($N = 153$) were recruited from three junior high schools of Shandong Province in eastern China. Six participants were excluded because they did not understand or follow the instructions correctly or showed obvious distraction while watching the video clips. Thus, there remained 147 valid participants (50.3% female). A total of 82 participants (55.8%) came from two urban-area schools, whereas the other 65 participants (44.2%) came from a rural-area school. All participants were in Grade 7 and aged 12.42 to 14.33 years ($M = 13.27$ years, $SD = 0.38$).

Video stimuli

Before the formal experiment, we produced video stimuli with one female and one male adolescent as our models from a junior high school in Shenzhen, China. The models were volunteers from a drama

class who were nominated by a teacher. Adolescent models and their parents were fully aware of the purposes of the video recording and the right to withdraw at any time. Researchers worked with each model to produce three video clips in which they needed to show strong, weak, or no facial expressions, respectively. A co-author trained in the Facial Action Coding System (Ekman & Friesen, 1976) supervised this filming and provided feedback to models regarding the clarity and strength of their emotional expressions. When filming the strong-expression video, models viewed 10 emotion-inducing pictures (5 positive and 5 negative) shown in a random order. Each picture was shown for 7 s, with a 5-s interval between pictures. We asked models to express emotions as strongly and clearly as possible while they viewed pictures. For the weak-expression video, models viewed another set of pictures, but this time they were asked to express their emotions minimally (i.e., to show some reactions but in a weak and fleeting manner). For the no-expression video, models viewed 10 neutral pictures (e.g., images of furniture and household objects) and showed absolutely no emotions. The length of each video was about 2 min. Participants viewed the model matched for sex in the following experiment.

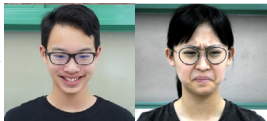
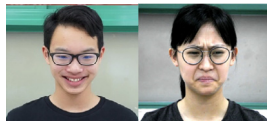
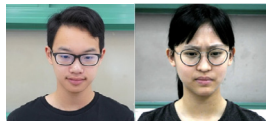

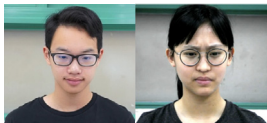
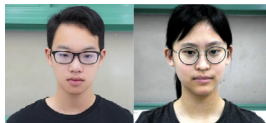
Procedure

The authors gained ethical approval for all experimental procedures. The experiments took place during a 1-week training camp that all junior high school students in the surrounding area were required to attend. Participants took part in the experiment during their spare time. Participants and their parents received consent forms ahead of the research, detailing their right to withdraw with no negative consequences. This was also the case for Experiment 2.

Preparation and instruction. Participants were randomly assigned to one of three conditions: Enhancement–Suppression ($n = 50$, 50% female), Enhancement ($n = 49$, 51% female), and Suppression ($n = 48$, 50% female). They were informed that some other students had just completed a task about emotional expressions, in which they had viewed a series of pictures and enhanced or suppressed their facial expressions as instructed. Participants were asked to watch one student's (actually the model) videos and rate the intensity of his or her emotional expressions. Each participant watched two video clips of the same-sex model corresponding to the instructional “demands” of enhancement or suppression. Participants were told that, to help them have a better understanding of the partner's emotional expressions, they would first view the pictures that had been shown to the partner. They would also be informed of the instructional demand (enhancement or suppression) given to the partner before each video clip.

Video viewing. Video clips were presented after participants viewed the emotion-inducing picture sets used when filming the model's expressions (except for the neutral pictures). As shown in Table 1, the videos were presented to participants in two blocks. For the Enhancement–Suppression condition (i.e., high-flexibility condition), we wanted to give participants an impression that the partner was highly capable of both enhancing and suppressing his or her expressions in line with instructional demands. Thus, participants watched the strong-expression video in the enhancement block and watched the no-expression video in the suppression block. In the next two conditions, we employed the relatively minimal, weak-expression video to indicate low enhancement or suppression ability, depending on the condition. For the Enhancement condition, participants viewed the strong-expression video in the enhancement block and viewed the weak-expression video in the suppression block. As a result, from participants' perspective, the partner was able to enhance expressions well but failed to fully suppress his or her expressions as instructed. For the Suppression condition, participants watched the weak-expression video in the enhancement block and watched the no-expression video in the suppression block. By doing so, we gave participants the impression that the partner was able to suppress expressions but was not good at enhancing expressions. The two videos and their corresponding instructions were shown in a random order within each condition. Participants rated the intensity of the partner's emotional expressions on a 5-point scale (1 = none, 3 = moderate, 5 = extreme) after each video. We retained these ratings to check the effectiveness of the manipulation.

Table 1
Videos presented to participants in two blocks across three conditions (Experiment 1).

		Experimental condition					
		Enhancement- Suppression		Enhancement		Suppression	
Instructional demand	Enhancement block						
	Suppression block						
		Strong-expression video		Strong-expression video		Weak-expression video	
		No-expression video		Weak-expression video		No-expression video	

Note. The two models and their guardians consented for their photographs to appear in academic publications.

Liking measurement. After two video blocks, participants completed a short questionnaire, containing 9 items, to indicate how much they liked the partner in the video. Items were adapted from Rubin's (1970) Liking Scale, which contains 13 items. Four items were excluded because they were not applicable in the current situation (e.g., "When I am with him/her, we are almost always in the same mood"). Examples of the 9 retained items included "I would vote for him/her in a class or group election" and "He/She seems to be a likeable person." All items were rated on a 5-point scale from 1 = *strongly disagree* to 5 = *strongly agree*, with higher mean scores representing greater liking of the partner. The internal consistency was acceptable ($\alpha = .79$).

Results and discussion

Manipulation checks

Participants' video rating scores were examined in a 3 [between-participants: Condition (Enhancement–Suppression, Enhancement, or Suppression)] \times 2 [between-participants: Sex (female or male)] \times 2 [within-participants: Instruction (enhancement or suppression)] mixed analysis of variance (ANOVA). Results showed that the main effect of sex was not significant, nor were its interactions with condition and instruction ($ps \geq .301$). Thus, the video stimuli produced by the male and female models did not differ in intensity. The interaction between condition and instruction was significant, $F(2, 141) = 24.84, p < .001, \eta^2 = .26$. Further pairwise comparisons (as shown in Fig. 1) indicated that, for the enhancement block, participants' intensity ratings in the Enhancement–Suppression condition and Enhancement condition were significantly higher than those in the Suppression condition ($ps < .001, ds = 1.54$ and 1.63 , respectively), but there was no significant difference between the former two conditions ($p = .478, d = 0.13$). For the suppression block, participants in the Enhancement–Suppression condition and Suppression condition rated the model significantly lower in expressivity than participants in the Enhancement condition ($ps < .001, ds = 1.85$ and 1.62 , respectively). Again, there was no significant difference between the Enhancement–Suppression and Suppression conditions ($p = .843, d = 0.04$).

In sum, these results showed that intensity ratings for the strong-expression video (Enhancement–Suppression condition and Enhancement condition, in the enhancement block) were significantly higher than those for the weak-expression video (Suppression condition, in the enhancement block), whereas ratings for the no-expression video (Enhancement–Suppression condition and Suppression condition, in the suppression block) were significantly lower than those for the weak-expression video (Enhancement condition, in the suppression block). In addition, the ratings for the same type of video

did not differ across conditions, and participants perceived the male and female models in an equivalent way. Taken together, the rating results corresponded to our original intentions and demonstrated the effectiveness of the manipulation.

Liking scores

A 3 (Condition: Enhancement–Suppression, Enhancement, or Suppression) \times 2 (Sex: female or male) between-participants ANOVA was conducted on participants' self-reported liking scores. Results indicated that neither the main effect of sex ($p = .246$) nor the interaction between sex and condition ($p = .647$) was significant. However, the main effect of condition was significant, $F(2, 141) = 3.22$, $p = .043$, $\eta^2 = .04$. Participants in the Enhancement–Suppression condition ($M = 3.56$, $SD = 0.61$) reported significantly higher liking of the model compared with participants in the Enhancement condition ($M = 3.32$, $SD = 0.58$) and the Suppression condition ($M = 3.30$, $SD = 0.47$), $ps = .036$ and $.026$, $ds = 0.40$ and 0.48 , respectively. There was no significant difference between the latter two conditions ($p = .885$, $d = 0.04$).

In summary, Experiment 1 tested the effects of expressive regulatory abilities on adolescent peer acceptance. Participants reported greater liking of peers who were able to flexibly regulate emotional expressions, as instructed, compared with peers who demonstrated proficiency in only one type of regulatory skill. In other words, both enhancement and suppression abilities were indispensable for achieving greater peer acceptance.

Experiment 2

Experiment 2 focused on the effects of peer rejection on expressive regulatory abilities. We manipulated participants' feelings of rejection through a virtual Cyberball game (Williams, Cheung, & Choi, 2000; two conditions: Inclusion vs. Exclusion). Following this manipulation, we examined participants' expressive enhancement and suppression abilities via an observational task in which participants viewed a set of emotion-inducing pictures and expressed emotions as instructed (Bonanno et al., 2004). Youths' self-reports of dispositional emotional expression and constraint were collected in advance to control for habitual expressive tendencies in the analyses. We hypothesized that excluded participants would demonstrate impaired enhancement and suppression abilities in the observational task compared with included participants.

Method

Participants

Participants were students in Grade 7 from one urban and one rural junior high school in Shandong Province ($N = 105$). None of these individuals participated in Experiment 1. Five participants were excluded because they did not follow the instructions for playing Cyberball (e.g., reported imagining the other two players as their parents instead of peers) or because they showed obvious distraction during the experiment. The final sample size was 100 participants (48% female; 57% urban) aged 12.50 to 14.67 years, with a mean age of 13.19 years ($SD = 0.42$).¹

Procedure

Picture stimuli selection. To guarantee that the pictures used in the expressive regulatory task (described below) could induce participants' positive or negative emotions, we conducted a pilot study for stimuli selection. We initially selected 80 pictures from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2005), the Chinese Affective Picture System (CAPS; Bai, Ma, Huang, & Luo, 2005), the Taiwan Affective Picture System (TAPS; Yen, Liao, Yang, Huang, & Tsai, 2013), and online image searches. For ethical reasons, we also asked several teachers to check these pictures

¹ We examined the comparability of Experiment 1 and Experiment 2 samples on age, gender distribution, and the proportions of urban and rural participants. Results indicated that there were no significant differences between the two samples in terms of age, $t(240) = 1.64$, $p = .101$, gender distribution, $\chi^2(1) = 0.13$, $p = .718$, or the proportion of participants recruited from urban versus rural schools, $\chi^2(1) = 0.04$, $p = .850$. Thus, the samples recruited in the two experiments were quite similar to one another.

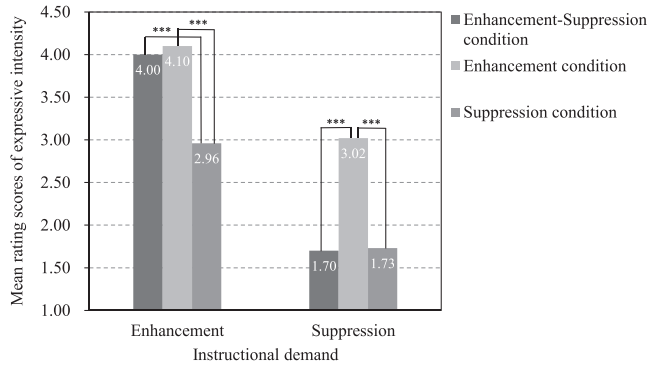


Fig. 1. Video rating scores of participants in three conditions across the enhancement and suppression blocks (Experiment 1). *** $p < .001$.

and agree that they were suitable for youths. A total of 94 adolescent participants ($M_{age} = 12.25$ years, $SD = 0.53$) rated them on a 7-point scale (1 = *very unpleasant*, 4 = *neutral*, 7 = *very pleasant*). We retained 40 pictures (20 positive and 20 negative) that evoked the strongest feelings. We used 30 of them in the formal task and used the remaining 10 pictures in the practice blocks. Positive pictures included content such as cute animals (e.g., IAPS 1440, CAPS 781, TAPS 15_034), beautiful scenery (e.g., CAPS 430, CAPS 029), and delicious food (e.g., IAPS 7390); conversely, negative pictures included images such as seriously ill patients (e.g., IAPS 3230, IAPS 2053), starving children (e.g., CAPS 196), insects on food or skin (e.g., IAPS 7380, CAPS 213), and school bullying (e.g., TAPS 08_010).

Pretesting. Several days ahead of the experiment, participants completed a scale of habitual emotional expression, which was previously composed and validated by Barr, Kahn, and Schneider (2008). This scale consists of items from seven commonly used measures of expressive tendencies such as the Emotional Expressivity Scale (Kring, Smith, & Neale, 1994) and the Ambivalence Over Emotional Expressiveness Questionnaire (King & Emmons, 1990). Although these separate measures were originally developed among adults, most of them have also been used with youth samples (e.g., Lee, 2013; Reigeluth, Pollastri, Cardemil, & Addis, 2016), suggesting that the composite scale should be usable with adolescents. According to factor analysis results with the seven original scales, Barr et al. (2008) constructed a hierarchical structure of emotional expression that contained seven first-order factors and two superordinate, second-order factors: emotional expression and emotional constraint. In line with Burton and Bonanno (2016), who also used this composite scale to control for habitual expression and suppression in their investigation of expressive flexibility, we excluded items from one first-order factor (disclosure of lack of affect) because they are not related with overt emotional expression. We used items from the remaining six first-order factors (affect intensity, ambivalence about expression, disclosure of negative emotion, disclosure of emotion, expression of positive emotion, and secret keeping) reported by Barr et al. (2008). All items were rated on 5-point scales (1 = *not at all true of me* to 5 = *extremely true of me* or 1 = *never* to 5 = *always*). Participant responses were averaged within each of the second-order factors to obtain scores on emotional expression ($\alpha = .85$; e.g., “I often laugh so hard that my eyes water or my sides ache”) and emotional constraint ($\alpha = .86$; e.g., “Often I’d like to show others how I feel, but something seems to be holding me back”). The items were presented in Chinese for the current experiment. Two bilingual researchers, whose mother languages were Chinese and English, respectively, carried out translation and back-translation in advance.

Preparation and practice. Participants were randomly assigned to two conditions: Inclusion ($n = 50$, 50% female) and Exclusion ($n = 50$, 46% female). They first practiced the expressive flexibility task developed by Bonanno et al. (2004), which has been adapted and validated in recent research with Chinese early adolescents (Wang & Hawk, 2019). In accordance with this adaptation, we told partic-

ipants that they would complete an “emotion expression game” with a same-sex partner in another room who in actuality did not exist. Participants were informed that they would see blocks of pictures shown on a computer screen; their “partner” had not seen the pictures, but he or she would observe participants’ facial expressions via a webcam and try to guess their feelings. One of three instructions appeared ahead of each block, instructing participants to (a) *enhance* their expressions so that the observer could easily guess their feelings, (b) *suppress* their expressions to increase the difficulty of guessing, or (c) *behave normally* because the camera was switched off, although it actually continued to record. Participants were asked to follow these instructions as closely as possible, so that they could better complete the game with the “partner.” In addition to the detailed oral explanations, we created two practice blocks for the enhancement and suppression tasks, respectively. Each block contained five pictures; each picture was presented for 7 s with an interval of 2 s between each picture. During the practice, participants’ understanding of the two instructions were checked and the camera placement was examined.

Inclusion–exclusion manipulation. Participants then played the Cyberball game (Williams et al., 2000) before the formal task to manipulate the level of perceived ostracism. Following the suggested guidelines of using the Cyberball paradigm with youths (Zadro et al. 2013), participants were informed that they would play an online ball-tossing game with two other players and that it was important to vividly imagine playing the game with two close friends. When participants received the ball, they could decide which player they wanted to throw to by clicking the corresponding cartoon figure. To achieve stronger engagement, we asked participants to imagine in as much detail as possible, such as who the other two players were, where they were playing the game, and how it felt to get or throw the ball. The game contained 20 throws in total, lasting for about 2 min (depending on the length of time that participants held the ball). Both of the other players were actually computer-programmed. In the Inclusion condition, participants received the ball from time to time throughout the entire game (about one third of the total throws). In the Exclusion condition, however, participants received the ball twice at the beginning and then were ostracized from the game (i.e., the other two players continually tossed the ball to each other).

Manipulation checks. As suggested by Zadro et al. (2013), we used the Primary Needs Questionnaire–Children (PNQ-C) to check the effectiveness of Cyberball manipulation. Eight items were rated on a 5-point scale (1 = *not at all* to 5 = *very much so*) assessing participants’ needs of *belonging* (e.g., “I felt like I was part of the group”), *self-esteem* (e.g., “I felt good about myself”), *control* (e.g., “I felt powerful”), and *meaningful existence* (e.g., “I felt like no one would notice if I left the game”; reversed), respectively. The correlations between the two items in each dimension ranged from .51 to .72, and therefore we computed a total score by averaging items across the four dimensions. The internal consistency of the whole scale was acceptable ($\alpha = .90$). We also used an additional single item (“I felt ignored”), rated on the same scale, as a direct measurement of participants’ feelings of ostracism (Zadro et al., 2013).

Expressive regulatory task. Immediately following the Cyberball session, participants completed the observational task to measure their expressive enhancement and suppression abilities. There were three positive blocks and three negative blocks corresponding to enhancement, suppression, and normal instructions, respectively. The picture valences (according to the results of pilot study) of the six blocks were also balanced to ensure that they were equally positive or negative across all three instructions. As in the practice session, each block contained five pictures, and each picture was presented for 7 s with a 2-s interval between pictures. The video clip of each participant was then cut into six blocks based on audio cues inserted into the task program. Three trained coders rated participants’ emotional expressivity for each block from 1 = *none* to 7 = *extreme* (Vohs et al., 2005). Coders were blind to the task instructions and had never seen the picture stimuli. Ratings from the three coders yielded adequate agreement, with an intraclass correlation coefficient (ICC) of .90. We created scores averaged across valence for the enhancement, suppression, and normal blocks, respectively, with higher mean scores representing more intense expressive behavior.

Debriefing session. After the whole experiment ended, participants were fully debriefed regarding the virtual nature of the Cyberball game. Excluded participants were also invited to play a Cyberball inclusion session. We made every effort to ensure that participants left in a positive mood. No participant guessed the real hypothesis of the study. Participants were also asked to not discuss the experimental procedures with other classmates.

Results and discussion

Manipulation checks

A 2 (Condition: Inclusion or Exclusion) \times 2 (Sex: female or male) between-participants multivariate analysis of variance (MANOVA) was conducted on the primary needs score and the ostracism feeling score. The main effect of sex and the interaction between sex and condition were not significant for either score ($p \geq .409$). However, the main effect of condition was significant for both the primary needs score, $F(1, 96) = 45.51, p < .001, \eta^2 = .32$, and the ostracism feeling score, $F(1, 96) = 31.29, p < .001, \eta^2 = .25$. Specifically, participants in the Inclusion condition ($M = 3.86, SD = 0.55$) scored significantly higher on primary needs fulfillment compared with participants in the Exclusion condition ($M = 2.83, SD = 0.92$), $d = 1.36$; they also reported feeling less ignored than participants in the Exclusion condition (Inclusion: $M = 1.54, SD = 0.65$; Exclusion: $M = 2.76, SD = 1.38$), $d = 1.13$. Thus, the Cyberball game appeared to be effective in manipulating feelings of peer rejection.

Expressive regulatory abilities

A 2 [between-participants: Condition (Inclusion or Exclusion)] \times 2 [between-participants: Sex (female or male)] \times 3 [within-participants: Instruction (enhancement, suppression, or normal)] mixed ANOVA was conducted, with observationally coded expressivity ratings as the dependent variable. The main effect of sex was not significant, nor were its interactions with instruction and condition or the three-way interaction Instruction \times Condition \times Sex ($ps \geq .208$). Results showed a significant main effect of instruction, $F(1.68, 161.28) = 172.59, p < .001, \eta^2 = .64$.² The mean expressivity rating of the enhancement task ($M = 3.21, SD = 1.05$) was significantly higher than that of the normal task ($M = 2.60, SD = 0.85$), which in turn was significantly higher than that of the suppression task ($M = 1.59, SD = 0.74$), $ps < .001, ds = 0.64$ and 1.27 , respectively. These results demonstrated the effectiveness of different task instructions. The main effect of condition was also significant, $F(1, 96) = 4.33, p = .040, \eta^2 = .04$. In general, participants in the Inclusion condition ($M = 2.62, SD = 0.79$) showed stronger emotional expressions in the task than those in the Exclusion condition ($M = 2.32, SD = 0.62$), $d = 0.42$.

Most important, the interaction between task and condition was significant, $F(1.68, 161.28) = 4.45, p = .018, \eta^2 = .04$. Further pairwise comparisons (Fig. 2) showed that, for the enhancement task, participants in the Inclusion condition were rated as significantly more expressive than those in the Exclusion condition ($p = .016, d = 0.50$). Similarly, in the normal task, participants in the Inclusion condition scored significantly higher than those in the Exclusion condition ($p = .023, d = 0.45$). Regarding the suppression task, however, there was no significant difference between the two conditions ($p = .990, d = 0.00$).³

To eliminate potential influences of individual differences in habitual expressivity, we conducted a supplementary mixed analysis of covariance (ANCOVA) with self-reported scores of emotional expression and emotional constraint as covariates. Results indicated that neither of the covariates showed significant main effects or interactions with other factors (all $ps \geq .148$). Most important, there remained a significant interaction between instruction and condition, $F(1.71, 160.80) = 3.31$,

² Because the assumption of sphericity was violated in repeated-measures ANOVA ($ps < .001$), degrees of freedom with Greenhouse–Geisser corrections are reported.

³ We also tested the effects of stimuli valence in a 2 [between-participants: Condition (Inclusion or Exclusion)] \times 2 [between-participants: Sex (female or male)] \times 3 [within-participants: Instruction (enhancement, suppression, or normal)] \times 2 [within-participants: Valence (positive or negative)] mixed ANOVA. Although the interaction between condition and instruction remained significant ($p = .018$), the three-way interaction Condition \times Instruction \times Valence was not ($p = .748$). The two-way interactions Condition \times Valence and Task \times Valence were also not significant ($p \geq .226$). Therefore, results were similar for both positive and negative stimuli.

$p = .047$, $\eta^2 = .03$, and pairwise comparisons of mean scores yielded the same pattern of results. Thus, controlling for habitual levels of emotional expressivity and emotional constraint had no meaningful impacts.

In summary, experiencing peer rejection resulted in lower levels of emotional expressivity in the enhancement and normal tasks but did not cause significant changes in the suppression task compared with experiencing peer inclusion. This was the case for both boys and girls and applied to both positive and negative stimuli (see Note 3). Therefore, the immediate effect of rejection experiences appeared to be a weakening of adolescents' abilities to enhance emotional expressions as well as their more natural expressive behaviors. In contrast, the experience of rejection did not impair participants' abilities to suppress their emotional expression.

General discussion

Adolescence is a sensitive period for both the grasp of emotion regulation skills (Zeman, Cassano, Perry-Parrish, & Stegall, 2006) and the establishment of healthy social relationships (Brown & Larson, 2009). Expressive regulation, as a component of the broader construct of emotion regulation, appears to be an important predictor of adolescents' social adjustment (e.g., Perry-Parrish & Zeman, 2011). In addition, the quality of peer interactions might also contribute to the development of expressive regulatory abilities (Wang & Hawk, 2019). Thus, discerning the links between expressive regulatory abilities and peer interactions at this developmental stage could be instructive for promoting adolescents' positive development in emotional and social domains. However, there has been no empirical evidence supporting causal effects in this potentially reciprocal relationship. To address this gap, the current study aimed to explore the bidirectional effects between adolescents' expressive regulatory abilities and peer interactions via experimental designs.

Experiment 1 tested the short-term effects of adolescents' expressive regulation on peer acceptance. We manipulated early-adolescent participants' perceptions of a partner's expressive regulatory abilities by exposing participants to different videos, and we then tested their immediate impressions and liking of this partner. Experiment 2, in contrast, examined the effects of peer rejection on expressive regulation. Participants experienced inclusion or exclusion within the Cyberball paradigm, and we then tested their expressive enhancement and suppression abilities via an observational laboratory task. Thus, by testing the effects of each causal direction, respectively, these two experiments provided initial support for the existence of mutual influences between adolescents' expressive regulatory abilities and peer interactions.

Effects of expressive regulation on peer interactions

According to the results of Experiment 1, both male and female participants showed greater liking of a same-sex partner when that partner was able to enhance and suppress emotional expressions in line with situational demands compared with when either one of these abilities was impaired. However, these two impairment conditions did not show significant differences in liking scores. Thus, consistent with our expectation, the flexible use of enhancement and suppression strategies yielded the highest level of peer acceptance. To our knowledge, this is the first study to demonstrate the social functions of expressive flexibility via an experimental design.

Although previous studies regarding expressive regulation have mainly focused on only expressive enhancement or suppression separately, findings of the current study suggested that the combination of these two abilities is indispensable for adolescents' obtaining high peer acceptance. The expansion of social networks and exposure to various novel social situations that accompany adolescence require youths to develop and use a variety of regulatory strategies, and the rigid use or overreliance on any one approach is likely maladaptive (Bonanno et al., 2004). For instance, social norms typically demand that adolescents express happiness when hearing about a friend's top score on an exam; conversely, if adolescents outperform others, they might themselves need to maintain outward modesty to avoid the impression of gloating (e.g., Schall et al., 2016). Therefore, impairments in either form of expressive regulation may lead to adolescents' improper behaviors in certain situations, which could nega-

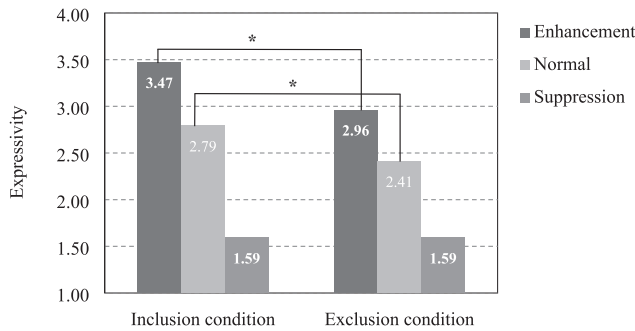


Fig. 2. Expressivity scores of included and excluded participants in the enhancement, normal, and suppression tasks (Experiment 2). * $p < .05$.

tively affect novel peers' first impressions. Greater expressive flexibility seems to be more important than any single strategy for obtaining high acceptance with new interaction partners and likely signals that adolescents can handle diverse social contexts with ease.

By examining the effects of adolescents' actual enhancement and suppression abilities, as opposed to habitual or dispositional tendencies toward using these strategies, the current research can advance our understandings about how regulatory behaviors might influence social adjustment. Existing studies have consistently suggested that habituated expressive suppression, in particular, leads to a series of intrapersonal and interpersonal costs such as greater depression and anxiety, lower social acceptance, and lower relationship quality (see [Aldao, Nolen-Hoeksema, & Schweitzer, 2010](#), for a review). It is very likely that habitual suppression is detrimental to social functioning by blocking information exchange and enlarging interpersonal distance with peers ([Cameron & Overall, 2018](#)). As shown by the current study, however, the *ability* to suppress is still an adaptive skill that can benefit adolescents' social interactions when applied in correct contexts. Therefore, neither regulatory strategy can be easily categorized as wholly "adaptive" or "maladaptive." To form a comprehensive picture about the characteristics of certain strategies, future studies must expand the variety of contexts in which they are investigated. In addition, future research may also need to more clearly differentiate between the habit of using particular regulatory strategies and the ability to do so when necessary.

Although expressive flexibility only trended toward a significant link with later peer status in the longitudinal research by [Wang and Hawk \(2019\)](#), the current study demonstrated a significant effect of expressive flexibility on peer acceptance. This contrast might suggest that expressive flexibility is more important to the formation of first impressions as compared with established ongoing peer relationships. Thus, greater expressive flexibility might be a possible approach to achieving successful short-term impression management. Nevertheless, this does not necessarily mean that expressive flexibility does not contribute to long-term social relationships. Adolescents' peer relations are undergoing tremendous development and are shaped by numerous factors such as personality characteristics and academic achievement (e.g., [Chen, Chang, & He, 2003](#); [Jensen-Campbell et al., 2002](#)). Expressive flexibility might be a relatively advanced skill, and it is possible that its benefits have not yet fully manifested at this stage. With increasing age, however, the immediate effects of expressive flexibility in social interactions might gradually accumulate into longer-term influences. Therefore, future research might target older (e.g., late-adolescent, emerging adult) age groups to test this suggestion.

Effects of peer interactions on expressive regulation

Experiment 2 examined potential effects of peer exclusion on adolescents' expressive regulatory abilities. First, compared with peer inclusion, peer exclusion experiences significantly reduced adolescents' expressive enhancement abilities. Second, participants' natural expressiveness, in the blocks where they were not asked to up-regulate or down-regulate expressions, was also lower after being excluded. Third, expressive suppression abilities did not differ between the Inclusion and Exclusion conditions. This pattern applied to both male and female adolescents as well as to both positive and negative stimuli, and it held even after controlling for youths' habitual expressive tendencies.

Based on the previous findings that social rejection led to impaired self-regulation (e.g., Baumeister et al., 2005) and predicted lower enhancement and suppression abilities over time (Wang & Hawk, 2019), we originally expected to observe impairments in both enhancement and suppression abilities following social exclusion. The current findings, although somewhat inconsistent with our hypotheses, also align with prior evidence that the typical initial reaction to social exclusion is "numbness" and decreased emotional reactivity (see Baumeister et al., 2007, for a review). The current study measured adolescents' expressive enhancement and suppression abilities immediately after the Cyberball game, at a time when this "numb" state would be most likely to impair the exaggeration of positive and negative responses. The fact that excluded participants also evidenced lower spontaneous expressivity further supports this interpretation. Conversely, the suppression task instructed participants to avoid showing any emotional responses to picture stimuli. This would not have required any additional effort from participants who were in a numb state, and thus they would not have shown any impairments compared with included participants.

It is also the case that expressive suppression is normatively encouraged in social interactions within Chinese culture to promote in-group harmony (Matsumoto, Yoo, & Nakagawa, 2008). Accordingly, the enhancement task might require more effort and motivation for Chinese adolescents. The negative outcomes of peer exclusion, such as reduced self-regulatory resources (e.g., Baumeister et al., 2005), would therefore mainly manifest as impairments in enhancement. From another perspective, influenced by collectivistic social norms, some Chinese adolescents might regard exaggerated expressions as detrimental to peer interactions. Prior research has indicated that social exclusion makes individuals especially eager to establish a sense of reconnection with novel interaction partners (Maner, DeWall, Baumeister, & Schaller, 2007). Thus, excluded participants might have consciously controlled their emotional expressions to improve the possibility of being accepted by the new "partner" in the expressive flexibility task. According to the findings of Experiment 1, however, this is not likely to be a successful strategy.

One potential drawback of our design in Experiment 2 was that normal expressivity was tested after the inclusion/exclusion manipulation and therefore could not be treated as a true baseline. This prevented us from calculating a composite score of expressive flexibility, as in prior research, by subtracting the differences between enhancement and suppression scores (indexed by the differences in expressivity between the normal task and the enhancement/suppression task) from their sum (Westphal et al., 2010). Although this drawback existed, it allowed us to demonstrate that the results were not a byproduct of the artificiality inherent to the enhancement instruction given that excluded participants also showed reduced natural expressivity. In addition, our findings still indicated the negative effects of problematic peer interactions on adolescents' overall flexibility because excluded participants became more rigidly suppressive. In summary, these results remained consistent with the previous finding that more successful peer relationships predicted greater expressive flexibility (Wang & Hawk, 2019). On this basis, the current study is one of the first to provide causal evidence regarding the importance of supportive social interactions in promoting adolescents' expressive regulation.

Theoretical and practical implications

Taken together, the current experiments provided novel support for the existence of bidirectional effects between adolescents' expressive regulatory abilities and peer acceptance/rejection. Results of Experiment 1 showed positive effects of expressive flexibility on social adjustment. This is an exten-

sion of previous correlational studies (e.g., [Bonanno et al., 2004](#); [Westphal et al., 2010](#)) that showed positive links between expressive flexibility and a series of adjustment indices but did not provide causal evidence. Experiment 2 highlights the functions of peer interactions for adolescents' expressive regulation, thereby providing causal evidence regarding the socially interdependent nature of emotion regulation ([Rimé, 2009](#)).

Our findings point to the social implications of flexibly using different expressive regulatory strategies to meet various situational demands. Practically speaking, parents and educators might need to pay special attention to improving youths' variability and flexibility in strategy implementation. In light of research on parents' meta-emotion philosophies ([Gottman, Katz, & Hooven, 1996](#)), we suggest that parents can cultivate children's regulatory flexibility by providing more emotion coaching such as acknowledging and validating children's emotions, encouraging open discussion about different feelings, and giving specific and diversified guidance about how to modulate emotions under different types of social demands. Gradually, children can grasp the skills necessary for flexibly and independently regulating emotions and can find the best matches between regulation strategies and contexts in which they occur. Conversely, parents' emotion-dismissive beliefs and behaviors (e.g., viewing negative emotions as toxic, invalidating emotions, trying to shield children from negative emotions), while temporarily controlling children's negative emotions, likely impede long-term development of regulatory flexibility. Furthermore, the significant bidirectional effects observed in our experiments suggested that problems in peer interactions and expressive regulatory abilities often go hand in hand. Relevant interventions may need to consider these mutual influences when helping children experiencing social and/or self-regulatory difficulties.

Strengths and limitations

The current research has several methodological strengths. In Experiment 1, we developed a new paradigm to manipulate participants' perceptions of a partner's expressive regulatory flexibility, which could potentially be used in future studies. Following the research of [Wang and Hawk \(2019\)](#), we adopted [Bonanno et al.'s \(2004\)](#) laboratory task in Experiment 2 to examine adolescents' expressive regulatory abilities. The task was originally developed among adults, but the current study again demonstrated its viability with younger individuals. These methodological innovations provided usable tools for both manipulating and measuring youths' expressive regulatory abilities, which would facilitate future explorations in this field.

Nevertheless, some limitations of the research should be noted. First, we did not incorporate actual social contexts in both the manipulation and the measurement of expressive regulation, which may reduce ecological validity. Future studies may consider testing the reciprocal links between expressive regulation and peer interactions by asking participants to enhance and suppress expressions in more realistic social situations. In addition, we only broadly differentiated positive and negative eliciting stimuli without considering more discrete emotion categories (e.g., happiness, sadness, fear, anger). This also calls for further investigation given that regulation attempts for discrete emotions appear to differ in both strategies and effectiveness ([Rivers, Brackett, Katulak, & Salovey, 2007](#)). However, our focus on adolescents' general expressive regulation may provide a global picture about its links with peer interactions and set a foundation for more specific research in the future.

Second, regarding adolescents' social interactions, we examined participants' liking of a novel partner in Experiment 1 and manipulated peer rejection via an online game in Experiment 2. The acceptance or rejection from novel peers might reflect only a part of adolescents' social relationships. Other aspects, such as the status in a group of familiar peers and the quality of intimate mutual friendships, are also important for the establishment of healthy interpersonal relationships ([Gifford-Smith & Brownell, 2003](#)). It would be of interest to use other paradigms and measures to manipulate or examine these different elements of adolescents' social interactions in future studies.

Third, the current research investigated the bidirectional effects between adolescents' expressive regulation and peer interactions, but the possible behavioral or cognitive mechanisms that drive these links are still unclear. For example, expressive flexibility may promote higher levels of peer acceptance

via the establishment of a trustworthy image. Conversely, peer rejection could impair expressive regulation by depleting adolescents' finite self-control resources. In addition, some moderating factors might also exist in this reciprocal association such as social anxiety, rejection sensitivity, and various fundamental personality characteristics. Deeper investigations into these possible mediating and moderating effects would be an important extension of the current findings.

Finally, the age range of participants in both experiments was rather limited, and adolescents were recruited exclusively from China. This rather homogeneous sample might limit the generalizability of our findings. The results of Experiment 2, showing that peer rejection affected only enhancement but not suppression abilities, might be especially driven by culture-specific elements. Therefore, it is important for future research to examine whether our findings could be replicated in other cultural contexts (e.g., more individualistic societies) and other age groups (i.e., younger children, late adolescents, and emerging adults). Nevertheless, our efforts to recruit participants from urban and rural areas improved the sample's representativeness with respect to the Chinese cultural context. This increases the possibility of generalizing the findings to youths in China and, potentially, to other collectivistic societies.

Conclusion

Our research investigated the bidirectional effects between adolescents' expressive regulatory abilities and peer interactions with an experimental design. The results indicated that both expressive enhancement and expressive suppression were important for adolescents to obtain higher peer acceptance. In other words, the flexible use of both strategies yielded the best social outcomes compared with the more rigid use of any one approach. Meanwhile, peer exclusion experiences also caused impairments in expressive regulation, specifically reduced enhancement abilities. Therefore, development and problems in expressive regulation and peer interactions are likely to be interrelated during adolescence. Parents and educators may need to consider these mutual influences when helping children who have difficulties in either expressive regulation or peer interactions.

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