



Motivations for emotional expression and emotion regulation strategies in Chinese school-aged children

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Abstract

This mixed-methods study investigated cognitive appraisal, emotional experience, motivations for showing and hiding emotions, and strategies for emotional regulation in children attending a Chinese boarding school. Sixty-nine children ($M_{\text{age}} = 9.04$ years, $SD = 0.98$) were presented with vignettes designed to elicit a range of emotions and subsequently interviewed regarding their appraisals, motivations for emotional display, and strategies for emotional regulation. Transcripts were analysed thematically and associations between appraisal and emotion were explored quantitatively. Similar to findings in other cultures, anger was found to be associated with causal/blame appraisal, sadness with loss/helplessness, fear/worry with potential punishment/threat, and happiness/OK with problem-solving/positive appraisal. In contrast to findings from Western cultures, Chinese children reported greater willingness to show emotions in a peer context compared to a family context. “Other-protective” motivations for hiding emotion were reported more by older children than by younger children, and more in a family context than in a peer context. Finally, six areas of emotion regulation strategies were identified by thematic analysis. Older children reported broader repertoires of emotion regulation strategies than did younger children, with the two largest differences being “mental engagement” and “social engagement” strategies.

Keywords Appraisal · Motivation for emotional expression · Emotion regulation strategy · Chinese children · Boarding school

Introduction

How children experience and regulate their emotions is closely related to their mental well-being. On the one hand, the development of cognitive capabilities provides possibilities and constraints for children’s emotional development; on the other hand, children are constantly under emotional demands arising from social interactions and cultural influences (Saarni 1999; Thompson 2011). The present study is an investigation of the appraisal, motivation, and strategies relating to the experience, expression, and regulation of emotions among 7- to 10-year-old children in a Chinese boarding school.

A boarding school context where pupils regularly separate from their family, combined with a Chinese culture which places high value on academic performance, could

raise potential emotional challenges which influence children’s experience, expression, and regulation of emotions. Understanding how children facing these challenges appraise emotion-eliciting encounters and how they regulate their emotions with various motivations and strategies, not only allows for the examination of relations among cognition, emotion, and motivation in general, but also has the potential to contribute to the prevention of psychopathology among children at risk.

A search of the main social sciences/education databases (ERIC, Scopus, Web of Science, PsychInfo) yielded no previous research investigating appraisal and emotion regulation strategies in primary school aged children attending boarding schools, from any culture. However, there is some evidence to corroborate the notion that boarding schools present an emotional challenge to young children. Most relevant to the current paper, a study by Wang et al. (2017), used questionnaire methodology to establish that children living on campus at a boarding school in rural China had lower levels of social-emotional competence than day students. Additionally, in a non-empirical analysis Schaverien (2004)

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reports that boarding schools in Britain have been associated with poor emotional adjustment and increased experience of mental distress.

Theoretical background

The present study therefore aims to explore individual differences in emotional experience, expression and regulation as a starting point for understanding the experiences of Chinese boarding school children. Our study adopts an “appraisal theory” approach to the study of emotion, due to its suitability for examining individual differences and developmental changes in emotional responses in childhood (Arnold 1961; Lazarus 1991; Scherer et al. 2001).

According to this approach, emotion arises when an individual appraises the significance of external and internal events in preparation for adaptive responses to deal with their consequences (Scherer 2001). Although various stimuli could elicit different emotions, a stable relation between appraisal and emotions is assumed within this paradigm (Moors et al. 2013). For example, anger is proposed to occur when one appraises that someone can be blamed for a harmful action, while sadness is elicited by the estimation of a loss to one’s goals or well-being (Lazarus 1991). While similar appraisal–emotion patterns have been found across cultures, cultural differences have also been documented regarding appraisal tendencies, emotional experience, and the relationship between appraisal and emotion (Ellsworth and Scherer 2003). For example, a study using questionnaire in 37 counties found similar associations between appraisal and emotion across regions, while also revealing that participants from African countries tended to appraise events as more immoral, unfair and more externally caused than participants in other regions (Scherer 1997). A comparative study between Tongan participants’ and German participants’ emotional appraisal found that the former ascribed more responsibility to self, while the latter ascribed more responsibility to others (Bender et al. 2012). From a developmental perspective, changes in children’s goals and cognitive abilities, as well as continuous interactions with the social environment (e.g. family, peers, culture), can also result in various developmental outcomes in appraisal styles and emotional experience (Saarni 1999). For example, children whose mothers used more hostile than prosocial appraisals were found to show higher anger biases at school (Root and Jenkins 2005).

Consistent with a functionalist approach to emotion adopted by appraisal theories, emotion regulation (ER) has been defined as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions” to accomplish one’s goals (Thompson 1994, p. 27). Whereas some argue that emotion is inseparable from emotion regulation (Kappas 2011), advocates of a separate

ER construct emphasise “the valuation of a valuation” where a first emotional response is judged and efforts are made to modify it (Gross 2014, p. 12). With its multiple components, emotion can be regulated by using various strategies. For example, cognitive reappraisal, distraction, and expressive suppression have been widely studied as ER strategies, with the former two focusing on the appraisal component of emotion, and the latter on the behavioural component of emotion (Gross 2014). Managing both negative and positive emotions, ER has been differentiated from coping as the latter focuses on the adaptive responses under stress (Compas et al. 2017). Nevertheless, considerable overlap has been found between ER strategies and coping strategies that have been studied separately, with the integration of research on both domains being advocated as a future direction (Compas et al. 2017). The present study was therefore informed by theories and empirical studies on ER and coping.

As with emotional appraisal and experience, children’s emotion regulation is markedly influenced by culture and their levels of development. One important aspect of children’s ER development is understanding and using display rules, which are social norms for how to express one’s feelings according to the characteristics of the displayer and the social context of the evoked emotions (Ekman and Friesen 1969). With the development of cognitive capabilities and socialisation, children learn to modify their emotional expression though intensifying, minimizing, neutralizing, or dissimulating emotional display (Saarni 1999). Several types of motivation underpinning these display rules, such as other-protective (or prosocial), self-protective and norm-maintenance, have been identified (e.g. Gnepp and Hess 1986; Jones et al. 1998; McDowell and Parke 2000; Zeman and Garber 1996). Studies have found that school-aged children’s use of display rules increases with age (McDowell and Parke 2000; Saarni 1979). Furthermore, the use of display rules has also been found to vary depending on contexts (e.g. in the presence of peers or parents) and cultures (Safdar et al. 2009; Zeman and Garber 1996).

Empirical research

The theoretically hypothesised association between appraisal and emotion has been investigated in empirical studies. Using four hypothetical scenarios, Smith and Lazarus (1993) asked university students in the USA to imagine themselves in the scenarios and answer questionnaires on their appraisal and emotional reactions associated with these scenarios. It was hypothesised that anger, guilt, fear/anxiety, and sadness would be associated respectively with the appraisal of different core relational themes: other-blame, self-blame, danger/threat, and loss/helplessness. It was found that appraisal of other-blame had a strong direct effect on reported anger ($\beta = 0.51$), while appraisals of self-blame and threat were

found to contribute directly to guilt ($\beta = 0.32$) and fear/anxiety ($\beta = 0.31$) respectively. However, only weak support was found for the prediction of appraisal of loss/helplessness for sadness ($\beta = 0.20$) (Smith and Lazarus 1993). A more recent study used an experience-sampling method with university students in Belgium to examine the appraisal related to six emotions (joy, love, anger, guilt, fear and sadness) (Nezlek et al. 2008). It was found that other-blame, self-blame, threat, and loss were the best predictors for anger, guilt, fear, and sadness respectively. However, the strengths of these relationships were found to differ across individuals, highlighting the need to examine individual differences in appraisal–emotion relations. Moreover, such relations may also differ between adults and children, as well as among people from various cultures (Mesquita and Ellsworth 2001). Given that existing findings on the appraisal–emotion relations are largely based on research on adults in Western countries, new empirical evidence is needed from more diverse cultures and contexts. Understanding how children under emotional challenges, such as those in boarding schools, appraise and express their emotions, could allow for the examination of similarities and differences in the appraisal–emotion relationship from different contexts.

Studies on children's ER have investigated their knowledge, perceptions and actual use of regulatory strategies. When asked how story protagonists could alleviate sadness and anger, 5- and 6-year-old children in the USA were found to most commonly report three ER strategies: goal substitution (action directed toward attaining an alternative goal, reported by 94% participants), goal reinstatement (action directed toward achieving the initial goal, reported by 91% participants), and metacognitive strategies (explicitly mentioning changing one's thoughts and goals, reported by 52% participants) (Davis et al. 2010). When asked how they coped with negative emotions in their own lives, 5- and 6-year-olds were found to report metacognitive strategies to alleviate sadness and fear more often than to alleviate anger (Davis et al. 2010).

Using illustrated vignettes related to anger and sadness, a further study found that 6- and 9-year-olds rated "problem solve" as more effective for alleviating anger than for sadness and rated "seek adult support" and "vent emotion" more effective for alleviating sadness than for anger (Waters and Thompson 2014). 6-year-olds were also found to rate "vent emotion" and "doing nothing" as more effective than 9-year-olds (Waters and Thompson 2014). Alongside hypothetical and retrospective report, children's actual behaviour in response to real time emotion-eliciting situations has also been examined. In an experimentally manipulated peer rejection situation with 10- to 13-year-old Dutch children, those who spent more time on behavioural distraction such as reading comic books were found to report higher levels of mood improvement subsequently ($\beta = 0.18$, $\Delta R^2 = 0.03$,

$\Delta F = 3.50$), while lower levels of mood improvement were reported by those who spent more time on disengagement or passive behaviour ($\beta = -0.17$, $\Delta R^2 = 0.03$, $\Delta F = 3.37$) (Reijntjes et al. 2006).

In addition to ER strategies, children's motivations for regulating their emotions have also been empirically investigated. Using hypothetical vignettes with school-aged children, several studies found three main reasons given by children for not expressing real emotions: "self-protective" (e.g. anticipating negative interpersonal interactions), "other-protective" (or prosocial, e.g. concerned about negative impact of their emotional expression on others), and "norm maintenance" (e.g. concerned with normative expectations) (Gnepp and Hess 1986; Jones et al. 1998; Saarni 1979). Evidence from hypothetical self-report by children also suggests that first-graders were more likely than third- and fifth-graders to express anger and sadness, and that girls were more likely than boys to express sadness and pain (Zeman and Garber 1996). The same study also found that children reported showing their emotions significantly less in the presence of peers than in the presence of their mother or father or when they were alone (Zeman and Garber 1996). Using an observational method, a longitudinal study found a decrease in expressions of sadness and anxiety among boys from 4 to 6 years old, as well as more expressions of sadness and anxiety among girls than among boys (Chaplin et al. 2005). Given that studies on emotion regulation have been mostly conducted within Western cultures and focused on specific strategies (Tull and Aldao 2015), much remains to be understood regarding a wider range of ER strategies and the motivations behind them among children in non-Western cultures.

The present study

Using vignette-based individual interview with sixty-nine 7- to 10-year-old children in a boarding school in China, the present study aimed to examine the appraisal, motivation, and strategies behind children's experience, expression, and regulation of emotions within a Chinese culture and a boarding school context. We targeted children aged between 7 and 10 years because studies have shown that children of this age range have developed the ability to understand, use, and articulate a variety of cognitive appraisal styles, display rules, and ER strategies (e.g. Gnepp and Hess 1986; Waters and Thompson 2014; Zeman and Garber 1996). Social interactions in diverse contexts (e.g. with parents, peers, teachers) also expose school-aged children to considerable cultural influences, which can impact the way they interpret emotional situations, and, experience, display and regulate emotions (Harris 2017; Saarni 1999). To investigate the developmental changes within this age range, we examined

children in two age groups (Year Two, $M_{\text{age}} = 8.11$ years, $SD = 0.35$; Year Four, $M_{\text{age}} = 9.94$ years, $SD = 0.31$).

Our study aimed to address three main questions. The first main question concerned children's reported emotions and appraisals, and included three sub-questions: (1) What emotions were reported by children when asked about hypothetical and real emotional situations? (2) How were these situations appraised by children according to their own reports? (3) Were there associations between the reported emotions and appraisals? The second main question addressed children's reported tendency of and motivation for showing or hiding their emotions, and included three sub-questions: (1) Did children report showing or hiding their emotions in hypothetical and real situations? (2) What were the motivations reported by children for showing and hiding their emotions? (3) Did the reported tendency of and motivation for showing or hiding emotions differ as a function of children's age, gender, and the context of the emotional encounters? The third main question concerned children's reported ER strategies, and was addressed by two sub-questions: (1) What strategies did children report to alleviate their negative emotions in hypothetical and real life situations? (2) Did older children have a broader repertoire of ER strategies than younger children?

A vignette-based interview was chosen because of its affordance for investigating an individual's thoughts and emotions across a variety of situations (Roseman 1991; Smith and Lazarus 1993). Using a mixed methods design, the present study intended to answer the above questions both qualitatively and quantitatively. Thematic analysis was used to analyse the emotions, appraisals, motivations and strategies reported by the children, while hypothesis testing was conducted to examine the relations between appraisal, motivation, strategies and emotions, as well as age, gender, and contextual differences in these measures.

Four hypotheses were tested in the study:

- (1) Based on the appraisal theories and empirical research on the relations between appraisal and emotion (e.g. Nezlek et al. 2008; Smith and Lazarus 1993), it was hypothesised that children's reported appraisals of the vignettes would be significantly associated with the emotions that they indicated they would experience. These associations were hypothesised to exist regardless of vignettes or variables such as age, gender, and context.
- (2) Based on empirical evidence concerning the factors (e.g. age, gender, context) that may influence children's emotional expression (e.g. Chaplin et al. 2005; Zeman and Garber 1996), it was hypothesised that children's decisions of showing or hiding emotions would be predicted by their year group, gender, and the context of the vignettes. Specifically, it was hypothesised that

decisions to hide emotions would be more likely to be reported by Year Four children than Year Two children, more likely to be reported by girls than boys, and more likely to be reported in a peer context than in a family context.

- (3) Based on studies of display rules (e.g. Gnepp and Hess 1986; Jones et al. 1998; Saarni 1979), it was hypothesised that children's other-protective and self-protective motivations for showing or hiding emotions would differ as a function of age, gender and context. Specifically, it was hypothesised that other-protective motivation would be more likely to be reported by Year Four children than Year Two children, and more likely to be reported by girls than boys.
- (4) Based on developmental studies on emotion regulation and coping strategies (e.g. Skinner and Zimmer-Gembeck 2006; Thompson 2011), it was hypothesised that Year Four children would have a broader repertoire of strategies than Year Two children.

Method

Participants

Sixty-nine children from a private primary boarding school in China participated in this study, with 35 children from Year Two (19 girls and 16 boys, $M_{\text{age}} = 8.11$ years, $SD = 0.35$) and 34 from Year Four (18 girls and 16 boys, $M_{\text{age}} = 9.94$ years, $SD = 0.31$). As part of a larger scale study on children's play and emotional development, the 69 children were recruited through letters circulated to four Year Two classes and three Year Four classes. All participants were Chinese and spoke Mandarin. A signed parent informed consent letter was obtained for each child before data collection. The study was reviewed and approved by the University of Cambridge, Faculty of Education ethics committee.

All participants stayed in school five days a week and went home for weekends. Apart from the emotional challenges which may be faced by children of similar ages in non-boarding schools, the participants in this study may face additional emotional challenges such as separating from their carers. This allowed the investigation of certain aspects of children's emotional expression and regulation in an ecologically valid context.

Development of vignettes

To develop the interview vignettes used in the present study, a pilot was conducted in a public primary school in China with 30 children aged between 8 and 10. In a sheet titled "four stories about my emotions", each child was asked to

complete two sentences with their recent experiences for each of the four emotions: happiness, sadness, anger, and fear. These four emotions were selected as they have been proposed as four of the basic emotions (e.g. Ekman and Cordaro 2011; Izard 2011), and have been widely examined in studies on appraisal and ER (e.g. Nezlek et al. 2008; Smith and Lazarus 1993; Waters and Thompson 2014). An example of the sentences began with “I was sad one day because _” and “I was so sad that I_”. The sheet was given to each child after a play session and returned voluntarily to the researcher within two weeks.

The 120 stories collected from the pilot indicated that school and home were the two main social contexts where the four emotions occurred. Academic related instances (e.g. not doing well in exams, having lots of homework), loss or damage of property (e.g. pen, book, homework), and relationships with classmates and parents were frequently listed as incidents eliciting negative emotions. Meanwhile, academic related experiences (e.g. getting high scores in exams, winning competitions) and spending time with family and friends, were frequently listed as events that elicited positive emotions.

These stories, together with example vignettes from previous research, were used as the basis for development of six vignettes used in the present study (Table 1). Among them, five vignettes were likely to be experienced by primary school aged children in China (taking a hard exam, notebook getting lost in classroom, winning a competition while a friend loses, having a birthday without the company of parents, and homework getting dirty at home), while one vignette (leaving home after weekend) was derived from children’s real experience in the boarding school. Whereas most vignettes contained components that might evoke negative emotions, one vignette (winning a competition while a friend loses) contained components that might evoke both positive and negative emotions. Among the six

vignettes, three took place in a school context, while the other three took place in a family context.

Procedures

Each child was interviewed individually by the first author for 15–20 min in a quiet room. Before the interview, all children had seen the researcher on two occasions during play. At the beginning of the interview, the child was presented with six cards randomly displayed on a desk and told that on the other side of each card was a different story that may have had happened to children in other schools. The child was invited to pick one card each time and imagine that he or she was the protagonist of the story. As the child could not see the story before picking a card, the sequence of the six stories chosen by each participant was random. After each card was chosen, the researcher read the story out loud together with the child and asked him or her a series of questions for each story: one question about emotion, one question about appraisal, two follow-up questions about emotional expression and one question about strategies for feeling better if a negative emotion was reported. The translations of the questions asked in Mandarin (see Appendix) are as follows:

1. “How would you feel in your heart if this happened to you?”
2. “What would you think in your mind if this happened to you?”
3. “Would you be willing to let your friends (for vignettes in school contexts)/parents (for vignettes in family contexts) know that you had this feeling?”
4. “Why?”
5. If any negative feeling was reported for the first question, the child would also be asked “What would you think or do to make yourself feel better?”

Table 1 Descriptions of vignettes

Vignette	Target emotion	Context	Hypothetical or real
You leave a new notebook on your desk and go out of the classroom for a while. When you come back to your desk, you can’t find your notebook	Negative	Peer	Hypothetical
You finish your homework and leave it on the table at home before you go out to play. When you come home, you find a bottle of ink lying on the table and your homework is covered with ink	Negative	Family	Hypothetical
Your parents have promised to spend time with you on your birthday. The day before your birthday, they tell you that they will not be able to spend time with you on the next day	Negative	Family	Hypothetical
You are taking an exam, and find that there are quite a few questions that you don’t know how to answer	Negative	Peer	Hypothetical
You and your friend both attend a competition. You win the first prize and your friend does not win	Positive & negative	Peer	Hypothetical
You have spent a happy weekend with your family. It’s time to leave home and go back to school where you will stay until Friday	Negative	Family	Real

For the vignette of leaving home after a weekend, an additional question was asked using a neutral human figure: “This girl/boy (the same gender as the interviewee) is of the same age as you and has just started going to the same school as yours, what can she/he think or do to feel better if she/he misses her/his family?” This question was included as some children might not report negative emotions related to separation with family at the point of interview, either because they had coped with the separation to a certain degree, or because this was a sensitive topic for them. By asking their advice to a hypothetical child with the same experience of separating with family, this question allowed children to talk about the ER strategies that they had used, or that they knew, in a more child-friendly way.

Planned data analyses

Qualitative analysis plan

Children’s responses to the interview questions were analysed using a thematic approach (Creswell 2014). Each child’s responses were first transcribed verbatim. To facilitate the thematic analysis, all children’s transcribed responses to all interview questions were then organised into three tables: (1) “Emotion and Appraisal Table”, (2) “Expression and Motivation Table”, and (3) “ER Strategies Table”. Guided by appraisal theories and the empirical research discussed above, the contents within each table were read and re-read to identify and generate categories that best described the raw data for each table (Creswell 2014).

The “Emotion and Appraisal Table” contained all children’s answers to the first two interview questions for each vignette (i.e. how they would feel and what they would think if this happened to them). This information was used to create categories of emotions and appraisals.

The “Expression and Motivation Table” contained all children’s responses for the third and fourth interview questions for each vignette (i.e. whether they would be willing to let others know their feelings and why). This information was used to record children’s willingness to show or hide emotion, and to create categories to capture their motivations for this.

Finally, the “ER Strategy Table” contained children’s responses related to ER strategies for each of the five vignettes designed to evoke negative emotions. All responses to the fifth interview question (i.e. what they would think or do to make themselves to feel better) were copied into this table under the according vignette. As positive appraisal and emotional expression have been identified as ER strategies, relevant responses from the “Emotion and Appraisal Table” and the “Expression and Motivation Table” were also copied into this table under the according vignette. Categories for

the classification of ER strategies were generated from the “ER Strategy Table”.

Quantitative analysis plan

Testing of four hypotheses was planned:

- (1) To test the hypothesised association between reported cognitive appraisal and reported emotions across vignettes, we created the following categorical variables: “V1”—the type of emotion reported by each child for each vignette; and “V2”—the type of appraisal reported by each child for each vignette. We planned to use a Chi-squared test to test whether there was a significant association between V1 and V2.
- (2) To test the hypothesis that children’s decisions for showing or hiding emotion differed as a function of year group, gender, and context, a categorical variable “V3” was created based on children’s reported decisions of showing or hiding emotions. We planned to use logistic regression to test whether year group, gender, and context would predict V3.
- (3) To test the hypothesis that children’s other-protective and self-protective motivations for showing or hiding emotions differed as a function of year group, gender, and context, a categorical variable “V4” was created based on the other-protective and self-protective motivations for hiding or showing emotions reported by children. We planned to use logistic regression to test the hypothesis that year group, gender, and context would predict V4.
- (4) To test the hypothesis that Year Four children had a broader repertoire of strategies than Year Two children, a continuous variable “V5” was created based on the number of different ER strategies reported by each child across vignettes. We planned to use an independent-samples t-test to test whether there was a significant difference between the means of V5 between the two year groups.

Results

Thematic analysis and descriptive statistics

The results reported below are based on the analysis of data from 67 participants who were read all six vignettes in the interview. The remaining two children were read two and three vignettes respectively before the interview was discontinued, and their data were excluded from the analysis.

Categories of emotion

The thematic analysis of children's responses to how they would feel in the six vignettes resulted into four main categories: "Anger", "Sadness", "Fear/Worry", and "Happiness/OK" (examples of responses for each category are given in Table 2). Responses that did not fit into the main four categories were coded into "Non-classified" (where children indicated a feeling that did not clearly fall into one of the four main categories) or "Don't know" (where children did not give any answer after being asked a question or indicated that they did not know how to answer).

Across the six vignettes, the most frequently reported emotion was "Sadness" (42.8%), followed by "Happiness/OK" (24.1%), "Fear/worry" (16.2%), and "Anger" (11.9%). For the five vignettes targeting negative emotions, 63.8% children reported only one category of emotion for each vignette. For the vignette of winning a competition while a friend loses, 64.6% children reported a mixture of "Happiness/OK" and "Sadness". Table 3 shows the proportion of each category of emotion reported by children (or the first

category when more than one category was reported) in each of the six vignettes. A Chi square test indicated that there were significant differences in the types of emotion reported for the six vignettes ($X^2(15, N=382)=178.13, p<.001$, Cramer's $V=0.394$). Specifically, children were more likely to report feeling angry for the notebook getting lost vignette, and more likely to report feeling sad for the vignette of having a birthday without parents. Fear/worry was more likely to be reported for the vignette of having a hard exam, while happiness/OK was more likely to be reported for the vignette of winning a competition while a friend loses and the situation of leaving home after weekend. Children's reported emotions did not differ significantly by year group ($X^2(3, N=382)=2.23, p=.527$) or gender ($X^2(3, N=382)=2.28, p=.516$).

Categories of appraisal

The thematic analysis of children's responses to what they would think in each of the six vignettes resulted in four main categories: "Cause/blame-focusing", "Punishment/

Table 2 Examples of responses in each category of emotion

Emotion	Anger	Sadness	Fear/worry	Happiness/OK	Non-classified
Example	I would be angry/annoyed/furious/indignant/vexed	I would be sad/dismayed/heartbroken	I would be fearful/afraid/worried/nervous	I'll be happy/calm; That's OK/fine; I wouldn't feel bad	I would feel bad/unhappy/disappointed/guilty

Table 3 Proportions of emotions and appraisals reported across six vignettes

	Vignette					
	Notebook lost (%)	Work got dirty (%)	Birthday without parents (%)	Hard exam (%)	Winning while friend losing (%)	Leave home after weekend (%)
Reported emotion						
Anger	28.4	23.9	9	10.4	0	0
Sadness	38.5	37.3	68.7	37.3	26.9	50.7
Fear/worry	26.9	23.9	1.5	40.3	4.5	0
Happiness/OK	6	10.4	17.9	9	56.7	44.8
Non-classified	3	4.5	3	1.5	10.4	3
Don't know	0	0	0	1.5	1.5	1.5
Reported appraisal						
Cause/blame-focusing	52.2	17.9	4.5	14.9	0	0
Punishment/threat-focusing	14.9	29.9	4.5	38.8	3	0
Loss/helplessness-focusing	17.9	34.3	46.3	23.9	23.9	26.9
Positive appraisal/problem-solving	9	13.4	31.3	13.4	37.3	40.3
Non-classified	3	3	3	6	25.4	16.4
Don't know	0	0	0	1.5	1.5	0
Not asked	3	1.5	10.4	1.5	9	16.4

$N=67$ interviewees. Categories of emotion and appraisal in this table refer to the first category reported by children for each vignette

threat-focusing”, “Loss/helplessness-focusing”, and “Positive appraisal/problem-solving-focusing”. With a focus on the cause of a negative situation, “Cause/blame-focusing” appraisal comprised children’s responses that evaluated who was responsible or to be blamed for the negative situation. Although both focusing on the negative outcome of a situation, “Punishment/threat-focusing” appraisal contained responses that emphasised the potential punishment or threat happening to oneself, while “Loss/helplessness-focusing” appraisal emphasised the perceived loss or helplessness as opposed to ones’ goals. “Positive appraisal/problem-solving-focusing” appraisal included responses that evaluated the situation in a positive way, or focused on modifying the negative situation by solving the problem. Responses that did not fit into the four main categories were coded into “Non-classified” (where children indicated a feeling that did not clearly fall into one of the four main categories), or “Don’t know” (where children did not give any answer after being asked a question, or indicated that they did not know how to answer), or “Not asked” (where children were not asked the question). Examples of each category are given in Table 4. Frequencies of the categories of appraisal reported by children across the six vignettes are shown in Table 3. A Chi square test indicated that there were significant differences in types of appraisal reported for the six vignettes ($X^2(15, N=334)=172.66, p<.001$, Cramer’s $V=0.415$). Specifically, children were more likely to report “Cause/blame-focusing” appraisal for the lost notebook vignette, and more likely to report “Loss/helplessness-focusing” appraisal for the vignette of having a birthday without parents. “Punishment/threat-focusing” appraisal was more likely to be reported for the vignette of having a hard exam, while “Positive appraisal/problem-solving-focusing” appraisal was more likely to be reported for the vignette of winning a competition while a friend loses and the situation of leaving home after weekend. Children’s reported appraisal did not differ significantly by year group ($X^2(3, N=334)=0.411, p=.938$) or gender ($X^2(3, N=334)=2.56, p=.464$).

Decision to show or hide emotions

Children’s responses to whether they would like others to know their indicated feelings were categorised into five

categories: “Showing”, “Hiding”, “Non-classified”, “Don’t know”, and “Not asked”. Responses that indicated a willingness to let others know one’s emotion were coded as “Showing”, while responses that only indicated an unwillingness of showing emotion was coded as “Hiding.” Children were asked whether they would show/hide emotion only if they responded with a negative emotion for the five negative vignettes, or conversely if they reported a positive emotion associated with the vignette of winning a competition while their friend lost. Table 5 shows the proportions of decisions of showing/hiding emotions reported by children across the six vignettes. Chi square tests indicated that children’s reported decision to show or hide emotions was related to types of emotions ($X^2(3, N=335)=11.41, p=.10$, Cramer’s $V=0.185$) and appraisals ($X^2(3, N=289)=8.11, p=.44$, Cramer’s $V=0.168$).

Motivation for showing or hiding emotions

The thematic analysis of children’s motivations for showing or hiding their emotions resulted in five categories. Reasons that emphasised the avoidance of negative consequences towards the self (e.g. “My mum would tell me off if she sees me sad”, “Other people would laugh at me if they see me worried”) were categorised as “Self-protective”, while reasons that emphasised the avoidance of negative consequences towards others (e.g. “My mum would feel sad if she sees me sad”, “I don’t want my parents to worry about me”) were categorised as “Other-protective”. “Support-seeking” contained reasons that stated a motivation for seeking help (e.g. “They will help me solve the problem if they see me angry”) or comfort (e.g. “I would feel better if I tell my family what makes me sad”). “Norm-maintenance” included reasons that emphasised the norm of showing or hiding emotions (e.g. “because it’s OK to let people know”, “because other people would not show it if they are sad”). Responses that did not fit into the main four categories were coded as “Non-classified” (where children indicated a feeling that did not clearly fall into one of the four main categories), or “Don’t know” (where children did not give any answer after being asked a question, or indicated that they did not know how to answer), or “Not asked” (where children were not asked the question). Among 351 instances across the six

Table 4 Examples of responses in each category of appraisal

Appraisal	Cause/blame-focusing	Punishment/threat-focusing	Loss/helplessness-focusing	Positive appraisal/problem-solving
Example	I would think who had stolen my notebook; I would be angry at myself because I didn’t work hard enough	I would be scolded/punished by my parents/teacher; I would be laughed at by others	I wouldn’t be able to turn in my homework now that it’s ruined; My parents can’t stay with me on my birthday	My parents could celebrate my birthday at another time; I can ask my teacher to give me a new homework

Table 5 Proportions of showing/hiding decisions and reasons reported across six vignettes

	Vignette					
	Notebook lost (%)	Homework got dirty (%)	Birthday without parents (%)	Hard exam (%)	Winning a competition while friend losing (%)	Leave home after weekend (%)
Reported showing/hiding emotions						
Showing	62.7	50.7	22.4	25.4	29.9	11.9
Hiding	28.4	38.8	61.2	61.2	56.7	74.6
Non-classified	3	1.5	1.5	0	1.5	1.5
Don't know	1.5	1.5	4.5	1.5	3	0
Not asked	4.5	7.5	10.4	11.9	9	11.9
Reported reasons for showing/hiding emotions						
Other-protective	4.5	14.9	38.8	7.5	22.4	32.8
Self-protective	16.4	17.9	6	37.3	26.9	26.9
Support-seeking	47.8	31.3	17.9	16.4	4.5	6
Norm-maintenance	3	3	4.5	6	19.4	1.5
Non-classified	14.9	13.4	9	9	4.5	4.5
Don't know	4.5	7.5	7.5	7.5	7.5	9
Not asked	9	11.9	14.9	16.4	14.9	19.4

N = 67 interviewees

vignettes where a show or hide decision was given, “showing” and “hiding” accounted for 38.7% and 61.3% respectively. The most frequently reported motivation for showing emotions was “support-seeking” (61%), followed by “norm-maintenance” (16.9%), while the most frequently reported motivation for hiding emotion was “self-protective” (40.9%), followed by “other-protective” (37.7%). Proportions of showing or hiding decisions and categories of motivations in each of the six vignettes are shown in Table 5.

ER strategies

The thematic analysis of children’s ER strategies resulted in 11 categories (see Table 6). Two strategies focused on thoughts: the “Thought-avoiding” strategy emphasised the avoidance of thinking about the negative emotions, while the “Thought-reappraisal” strategy emphasised a positive appraisal of the situation. Four strategies (“Eating”, “Sleeping”, “Physical adjusting”, and “Physical venting”) focused on physiology. The “Problem-solving” strategy focused on the problem that elicited the emotion, while the “Comfort-seeking” strategy focused on the emotion that needed to be regulated. Two strategies focused on engaging in solitary mental activities, with “Non-digital mental activities” referring to those that required active mental representations (e.g. drawing, reading, singing, and solitary play), and “Digital mental activities” referring to those that involved a more passive intake of information (e.g. watching TV and play

video games). The last category was “Social play”, which emphasised social engagement (e.g. with friends or siblings), and therefore was distinguished from solitary play. The reason for keeping the more detailed strategies rather than only having the six strategy focuses was to allow for the comparisons of children’s repertoire of ER strategies. In each of the five negative vignettes, a child may indicate one or more than one strategy in response to being asked about how to feel better.

Each strategy was dummy coded as present or absent for each child across the five negative vignettes, because the aim of the analysis was to examine each child’s repertoire of strategies. A total number of categories of ER strategies reported by each child (possible range between 0 and 11) was calculated by adding up the number of categories coded as present. Of 67 children, 51 children reported ER strategies for all 5 negative vignettes, 14 reported ER strategies for 4 of the 5 negative vignettes, while 2 reported ER strategies for less than 4 vignettes. On average, children reported 5.18 categories of ER strategies ($SD = 1.32$) when they responded to the interview question regarding ER strategies in five negative vignettes. For those who responded to 4 of the 5 negative vignettes regarding ER strategies, an average of 4.86 categories of ER strategies ($SD = 1.03$) were reported by each child. The weighted mean for categories of ER strategies reported by the 65 children who discussed 4 or 5 vignettes was 1.07 per vignette, or 5.35 for 5 vignettes.

Table 6 Descriptions and examples of the 11 emotion regulation strategies

Focus of the strategy	Strategy	Description	Examples	Children reporting the strategy (%)
Thoughts	Thought-avoiding	Suppresses the thoughts about current situation	Forget about it; Don't think about it; Think about nothing	38.8
	Thought-positive appraisal	Appraises the current situations in a positive way; or Plans to achieve or look forward to positive situations in the future; or Direct the thoughts to positive situations either from memories or by imagination	I tell myself that 5 days pass quickly; You can look forward to seeing your family in the weekend; I'll think that I'll work hard and get a better score next time; Look at photos of my family which remind me of the happy times we had together; I can pretend that my parents were with me	79.1
Problem	Problem-solving	Focuses on solving the problem by oneself or with the help of others An aim of changing the external situation is emphasised	Search everywhere to find my notebook; Ask classmates if they've seen my notebook; Write my homework again; Ask other relatives to celebrate my birthday	86.6
Emotion	Comfort-seeking	Focuses on seeking emotional support by talking to others	Give a phone call to my Mum and talk to her; Having a chat with friends would make me feel better; I would feel less worried if I tell the teacher what has happened	82.1
Physiology	Eating	Uses eating to make oneself feel better	I would be in a better mood if I eat something spicy; I would feel better if I eat something yummy	19.4
	Sleeping	Uses sleeping to make oneself feel better	I would just go to sleep by myself (not at normal bedtime)	9
	Body adjusting	Adjusting one's body by calming down or attend to physical movement	Take a deep breath; Go out for a walk; Drink some water and wash your face	25.4
	Physical venting	Uses one's body to vent emotions (e.g. kicking, hitting)	I would feel better after hitting the pillow/hitting the sandbag/kicking my younger brother	6
Mental engagement	Non-digital mental activities	Occupies oneself with solitary activities that require mental representation such as drawing, reading, sing, and solitary play	I would read a story book; Drawing would make me feel better; I always feel better when I sing	41.8
	Digital mental activities	Occupies oneself with solitary activities based on passive intake of digital information such as watching TV and playing video games	I would watch TV; Play with the iPad/ games on the phone	37.3
Social engagement	Social play	Occupies oneself with social play	Play with my friends/sister/dad/ neighbours	76.1

A random selection of 15% of the 67 original interview transcripts was coded by a second coder who was unaware of the hypotheses of the study. Interrater reliabilities were calculated using Cohen's kappa. Kappa values for "emotion", "appraisal", "showing/hiding decision", "motivation" and "ER strategies" were 0.78, 0.75, 0.82, 0.83, and 0.87 respectively ($p < .001$).

Inferential statistics

Hypothesis 1

Based on appraisal theories and empirical research on the relations between appraisal and emotion (e.g. Smith and Lazarus 1993; Nezlek et al. 2008), associations were hypothesised between children's reported appraisals of the vignettes and their reported emotions. Specifically, four associations were hypothesised between emotion and appraisal: children who reported feeling anger would be more likely to focus on appraising who caused or should be blamed for the given situation, while children who reported feeling sad would be more likely to focus on appraising personal loss or helplessness in the given situation. Children who reported feeling fearful or worried would be more likely to focus on appraising the potential punishment or threat brought by the given situation, while children who reported feeling happy or OK would be more likely to focus on solving the problem in the given situation or appraising it in a positive way.

To test these hypotheses, a Chi-squared test was performed to assess the associations between the four categories of emotions ("Anger", "Sadness", "Fear/Worry", and "Happiness/OK") and the four categories of appraisal ("Cause/blame-appraisal", "Loss/helplessness-appraisal", "Threat/punishment-appraisal", and "Positive appraisal/problem-solving"). Rather than running separate tests for each vignette, one Chi-squared test was performed across six vignettes. This was to prevent increasing Type I error by running multiple tests, as well as to account for the fact that there would be more than 20% of cells with an expected count less than 5 if Chi-squared tests were run for separate vignettes. The result of the Chi-squared test was found to be statistically significant, $X^2(9, N = 323) = 466.6, p < .001$, Cramer's $V = 0.694$.

To follow up the Chi-squared test, standardized residuals were calculated for all cells to better understand the nature of the associations. The four largest standardised residuals were found in the cells associating "Positive appraisal/problem-solving" and "Happiness/OK" (15.9), "Threat/punishment-appraisal" and "Fear/worry" (11.4), "Cause/blame-appraisal" and "Anger" (10.9), and "Loss/helplessness-appraisal" and "Sadness" (10.4). These positive residuals indicate that when each of the four emotions ("Anger", "Sadness", "Fear/worry", and "Happiness/OK") was reported, its hypothetically

associated appraisal was reported more frequently than would be expected by chance. Residuals in all other cells were negative and smaller in magnitude (see Table 7).

Hypothesis 2

Based on previous research on factors that may affect children's emotional expression, it was hypothesised that children's decisions on showing or hiding emotions in the six vignettes differed as a function of context, age, and gender. To test this hypothesis, a multiple binary logistic regression was performed with data across six vignettes to predict showing or hiding decision using context, year group, and gender as predictors. A test of the full model against a constant only model was statistically significant ($X^2(3) = 9.94, p = .019$), indicating that the predictors as a set distinguished between showing and hiding. The Wald criterion indicated that gender ($p = .031$) and context ($p = .025$), but not year group ($p = .815$), made significant contributions to the prediction. Exp (B) values suggested that children were 1.65 times (95% CI [1.064, 2.548]) more likely to report being willing to show their emotions in a peer context than in a family context, and that boys were 1.62 times (95% CI [1.045, 2.502]) more likely than girls to report showing their emotions. To further examine the interaction between gender and context, a model using gender, context, and gender * context to predict showing/hiding decision was run. No significant interaction effect was found between gender and context.

Hypothesis 3

Based on the theories and previous research on the socialization of children in emotional expression and regulation (e.g. Saarni 1979; Gnepp and Hess 1986; Jones et al. 1998), it was hypothesised that Year Four children were more likely to report other-protective motivations than Year Two children, and girls were predicted to be more likely to report other-protective motivations than boys. As children may form different relationships with family and with peers, it was also hypothesised that the reported other-protective motivations would differ as a function of context. To test these hypotheses, a binary logistic regression was performed using data from all six vignettes to predict the report of other-protective and self-protective motivations, with year group, gender, and context as predictors. A test of the full model against a constant only model was statistically significant ($X^2(3) = 25.61, p < .001$), indicating that the predictors as a set distinguished between self-protective and other-protective motivations. The Wald criterion indicated that context ($p < .001$) and year group ($p = .039$), but not gender ($p = .059$), made significant contributions to the prediction. Exp (B) values suggested that children

Table 7 Edited SPSS output of Chi square test

	Appraisal				Total
	Cause/blame	Threat/punishment	Positive reappraisal/ problem solving	Loss/helplessness	
Emotion					
Anger					
Observed count	35	5	0	8	48
Expected count	8.5	8.8	14.3	16.5	48.0
% Within appraisal	61.4%	8.5%	0.0%	7.2%	14.9%
Residual	26.5	−3.8	−14.3	−8.5	
Standardized residual	9.1	−1.3	−3.8	−2.1	
Adjusted residual	10.9	−1.5	−4.9	−2.8	
Sadness					
Observed count	18	13	15	91	137
Expected count	24.2	25.0	40.7	47.1	137.0
% Within appraisal	31.6%	22.0%	15.6%	82.0%	42.4%
Residual	−6.2	−12.0	−25.7	43.9	
Standardized residual	−1.3	−2.4	−4.0	6.4	
Adjusted residual	−1.8	−3.5	−6.3	10.4	
Fear/worry					
Observed count	4	41	1	12	58
Expected count	10.2	10.6	17.2	19.9	58.0
% Within appraisal	7.0%	69.5%	1.0%	10.8%	18.0%
Residual	−6.2	30.4	−16.2	−7.9	
Standardized residual	−1.9	9.3	−3.9	−1.8	
Adjusted residual	−2.4	11.4	−5.2	−2.4	
Happiness/OK					
Observed count	0	0	80	0	80
Expected count	14.1	14.6	23.8	27.5	80.0
% Within appraisal	0.0%	0.0%	83.3%	0.0%	24.8%
Residual	−14.1	−14.6	56.2	−27.5	
Standardized residual	−3.8	−3.8	11.5	−5.2	
Adjusted residual	−4.8	−4.9	15.9	−7.5	
Total					
Observed count	57	59	96	111	323
Expected count	57.0	59.0	96.0	111.0	323.0
% Within appraisal	100.0%	100.0%	100.0%	100.0%	100.0%

Adjusted residuals in bold are the four largest residuals

were 3.94 times (95% CI [2.035, 7.618]) more likely to report other-protective motivations in a family context than in a peer context. Year Four children were 2.04 times (95% CI [1.037, 4.012]) more likely than Year Two children to report other-protective motivations. No significant interaction effect was found between context and year group when a model using context, year group and, context * year group to predict the report of motivations was run.

Hypothesis 4

Based on developmental studies on emotion regulation and coping strategies (e.g. Thompson 2011; Skinner and Zimmer-Gembeck 2006), it was hypothesised that year 4 children would report a broader repertoire of strategies than year 2 children. To test this hypothesis, an independent-sample t-test was performed to compare the average number of different ER strategies between the two age groups. The scores of year 4 children ($N=34$, $M=1.16$, $SD=0.22$) were significantly higher than the scores of year 2 children ($N=31$, $M=0.97$, $SD=0.26$), $t(63) = -3.16$, $p=.002$, 95%

CI $[-0.314, -0.071]$. Cohen's effect size value ($d=0.79$) suggested a moderate to high practical significance (Cohen 1988).

To further compare the group differences regarding the six focuses of the 11 ER strategies, a multiple binary logistic regression was run to predict the two age groups using the six focuses of ER strategies (thoughts, physiology, problem, emotion, mental engagement, and social engagement) as predictors. A test of the full model against a constant only model was statistically significant, $X^2(6)=15.54$, $p=.016$, with the overall percentages of correct prediction improved from 52.3 to 70.8%. The Wald criterion indicated that strategies focused on mental engagement and social engagement both made significant contributions to the prediction ($p=.027$ and $p=.013$ respectively). Strategies with the remaining four focuses did not make significant contributions. Exp (B) values suggested that those who reported strategies focused on mental engagement were 3.72 times (95% CI [1.162, 11.93]) more likely to be in Year Four than in Year Two, while those who reported strategies focused on social engagement were 6.56 times (95% CI [1.476, 29.121]) more likely to belong to Year Four than to Year Two.

Discussion

Findings from this study provide empirical support to appraisal theories of emotions from a Chinese culture and a sample of children between 7 and 10 years old in a boarding school. Firstly, the findings supported appraisal theory's argument that the same situation can elicit different emotions and be evaluated in different ways by individuals (Lazarus 1991; Moors et al. 2013; Smith and Kirby 2009). Four categories of emotion ("Anger", "Sadness", "Fear/worried", and "Happiness/OK") and four types of appraisal ("Cause/blame-focusing", "Punishment/threat-focusing", "Loss/helplessness-focusing" and "Positive appraisal/problem-solving-focusing") were identified from children's responses to the six vignettes. Each category of emotion and appraisal was reported at various proportions for each vignette. While these findings add further support to appraisal theories, they also highlight the possibility that individuals may focus on specific components of appraisal when they evaluate a situation (e.g. focusing only on the cause or only on the outcome), rather than evaluating various components simultaneously. With the constraints of time and cognitive resources in real life situations, individuals, especially children, might appraise limited aspects of their situation. Furthermore, the tendency to focus on aspects of appraisal can also be related to culture. As previously discussed in the introduction, there is emerging evidence of different appraisal tendencies in samples drawn from various countries (e.g. Bender et al. 2012; Scherer 1997). Future research is warranted to

investigate individual and cultural difference in appraisal tendencies.

With regard to the associations between appraisal and emotion, four specific associations were found between appraisal and emotion: "Anger" and "Sadness" were associated with "Cause/blame-focusing" and "Loss/helplessness-focusing" appraisal respectively, while "Fear/Worry" and "Happiness/OK" were associated with "Punishment/threat-focusing" and "Positive appraisal/problem-solving-focusing" appraisal respectively. This was consistent with previous findings on the relationships between "other-blame" and anger, between "danger/threat" and fear, as well as between "loss/helplessness" and sadness (e.g. Nezlek et al. 2008; Smith and Lazarus 1993). It should be noted, however, that the magnitudes of the four associations found in the present study varied. Among all the four associations, the "Happiness/OK"—"Positive appraisal/problem-solving-focusing" association was strongest (with an adjusted residual of 15.9 compared to adjusted residuals of 11.4, 10.9 and 10.4 for the other three associations). This suggests that the strength of emotion-appraisal association may vary according to positive and negative emotions. It also highlights the importance of examining age and cultural differences in appraisal-emotion relations (Mesquita and Ellsworth 2001).

Consistent with previous studies, gender and context were found to be significant predictors of children's decisions regarding showing or hiding emotions. With regard to the influence of gender on emotion expression, there are mixed findings: in some studies, girls were found more likely than boys to express sadness, pain, and anxiety (e.g. Chaplin et al. 2005; Zeman and Garber 1996); in other studies, girls were found to report more masking of anger and more use of display rules (e.g. Underwood et al. 1992; Wang et al. 2012). Evidence from the present study adds support to the greater masking of emotions among girls than among boys: it was found that boys were 1.62 times more likely than girls to report showing their emotions across all six vignettes. One possible explanation of this finding is that the girls were more aware of social norms than boys and therefore adopted more emotion display rules. The gender difference found in our study could also be due to cultural variations in the relations between gender and emotion. Although most previous studies have indicated a higher tendency of females to express emotions than males, the majority of these studies have been conducted in Western countries, and gender difference in emotional expression may differ in non-Western cultures (Fischer and Manstead 2000). A further possible explanation for the greater tendency found among girls to report showing their emotions may lie in the types of emotions examined in the present study.

With regard to context, previous studies have found that children reported showing their emotions more in the presence of parent or teachers than with peers (e.g. Underwood

et al. 1992; Zeman and Garber 1996). However, children in the present study were found to be 1.65 times more likely to report showing their emotions in a peer context than in a family context. This might be because children in a Chinese culture had learnt to show or hide their emotions in ways different to those raised in Western cultures. A considerable number of children in the present study indicated that they would choose to hide their emotions to avoid being told off by their parents or making their parents unhappy. As has been shown by other studies, non-supportive (i.e. punitive or dismissive) responses from parents are associated with low levels of emotional expression among children (Denham et al. 1997; Eisenberg et al. 1996). It is therefore a necessity to take into account cultural differences in parents' reactions to children's emotions when interpreting children's choices to show or hide their emotions. Another possible explanation for children's tendency to show their emotions in a peer context rather than a family context lies in the context of a boarding school. As they spend more time with peers rather than with family, boarding school children might form a different relationship with peers compared to non-boarders.

Although previous studies have found gender differences in the expression of certain emotions to be larger when children were with peers than with parents (Chaplin and Aldao 2013), the current study did not find significant interaction effect between gender and context in children's reported decisions of showing or hiding emotions. Similarly, no significant interaction effect was found between context and year group in children's report of "other-protective" motivations. It should be noted, however, that these non-significant results should not be interpreted as evidence of no interaction. It is possible that the non-significant results were due to low statistical power to detect interaction effects (Cohen et al. 2015). Increasing the statistical power to detect interaction effects among variables such as gender and context could be of interest for future investigations.

With regard to emotion regulation (ER) strategies, the current study identified 11 strategies that captured multiple dimensions of these processes. Two of these strategies ("thought-positive appraisal" and "thought-avoiding") captured the cognitive and distance dimensions at the same time. They encompassed strategies that have been labelled as cognitive reappraisal (e.g. Gross 2014) and as metacognitive strategies (e.g. Davis et al. 2010) in previous studies, but also distinguished between approach and avoidance strategies, as suggested by other researchers (e.g. Skinner and Zimmer-Gembeck 2006). Rather than using the distraction strategy labelled in previous studies (e.g. Gross 2014), the current study differentiated strategies according to the degree of social interaction and distinguished mental from physical activities (e.g. "mental engagement", "social engagement", "eating" and "sleeping"). Such a structure not only captured the diversity of the ER strategies reported by the children,

but also allowed for the comparisons of children's repertoire of ER strategies. It was found that Year Four children had a broader repertoire of ER strategies than did Year Two children, with the two most significant differences being report of "mental engagement" and "social engagement" strategies. This was not surprising given the cognitive development occurring between Year Two and Year Four which could allow older children to engage in more mental activities.

Despite its contribution, the present study has its limitations. Firstly, the interview method could only measure children's knowledge, perceptions, and beliefs rather than their actual behaviours in real life situations. Although the validity of vignette-based methodology has been supported by high correlations found in the appraisal–emotion relation across hypothetical and online accounts of emotion (Robinson and Clore 2001), there are possible factors that might have affected children's responses to the interview questions. These include children's ability to understand their own emotions, ability to imagine themselves in hypothetical situations, as well as their language ability. For those able to report their emotions and thoughts in hypothetical and real situations, the degree of self-discourse might be affected by social desirability or the sensitivity of certain emotional topics. A promising way to reduce this limitation would be to also include behavioural observation and reports from other informers (e.g. peers, parents, and teachers). Nevertheless, the unique value of examining children's knowledge and beliefs about emotion, appraisal, and ER strategies should not be overlooked, as the acquisition of knowledge and beliefs could prepare children for behavioural change in development. One interesting direction for future research would be to understand the relationship and discrepancy between knowledge and actual behaviour in the context of emotional development.

The content of the six vignettes used in the study could also limit the interpretation and generalisability of the findings. Although a pilot was conducted to develop the vignettes, it was carried out with children in a public primary school. It is possible that these vignettes carry different emotional significance for children in boarding and non-boarding schools. Although a real life situation specific for boarding school (leaving home after weekend) was included as one of the vignettes in family contexts, no real life situation related to a peer context was used. Although this study examined both negative and positive emotions, only one vignette (winning a competition while a friend loses) was designed to elicit positive/mixed emotions, which was in a peer context. These limitations constrain the extent to which conclusions should be made regarding the function of contexts in emotional expression. Additionally, children's reported experience and regulation of emotion, especially those for the real life vignette (leaving home after weekend), may not be generalizable to children in non-boarding schools. It should be

also noted that children's social relationships with peers and family may also differ between boarders and non-boarders.

While this study provides new evidence of emotional experience, appraisal and regulation from a Chinese culture and a boarding school context, it did not include an additional group of children (e.g. Chinese children from non-boarding school, or boarding school students in a Western country), therefore we cannot disentangle effects of culture and context in the interpretation of results. Future research using a comparative design is needed to investigate the effects of culture, context and their interaction on children's emotional experience, appraisal and regulation. As only the first emotion reported by each child was analysed in this study, further investigation is warranted to examine the experience, expression and regulation of mixed emotions among children.

Conclusion

The present study provides empirical evidence from a Chinese culture and a sample of children aged between 7 and 10 from a boarding school in relation to the appraisal theories of emotion. Apart from the identification of appraisal styles (i.e. "Cause/blame-focusing", "Punishment/threat-focusing", "Loss/helplessness-focusing", and "Positive appraisal/problem-solving-focusing") associated with specific emotions (i.e. Anger, Sadness, Fear/worry, and Happiness/OK), this study also suggested that individuals may focus on specific aspects of appraisal when evaluating a given situation. Context and gender were found to predict children's willingness to show or hide their emotions, while year group and gender differences were found in the report of other-protective motivations for hiding emotions. Eleven ER strategies which focused on thoughts, emotions, problems, physiology, mental engagement, and, social engagement were identified, with older children reporting a broader repertoire of strategies than did younger children.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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Appendix

Interview questions in Chinese

1. “如果这件事发生在你身上，你的心里会是什么感受?”
2. “如果这件事发生在你身上，你的脑子里会想些什么?”
3. “你会愿意让你的朋友（或家人）看出你的感受吗?”
4. “为什么?”
5. “你会想什么或做什么让自己心里好受些?”

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